



# Next Generation Networks: Developing the regulatory framework

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# 1. Summary

## Introduction

- 1.1 In June 2005 Ofcom published a consultation (“Next Generation Networks: Further Consultation”) which proposed a number of policy principles and processes to support the development of NGNs in the UK. One of our priorities was to ensure that the deployment of BT’s Next Generation Network (NGN) did not foreclose competition, either through disrupting existing competitive businesses or through preventing equality of access being provided in the future.
- 1.2 In September 2005, BT agreed to undertakings to support these aims<sup>1</sup>, including commitments to provide unbundled network access, to do so on an ‘Equivalence of Inputs’ basis, and not to make design decisions which would foreclose specific product options without adequate consultation.
- 1.3 There are now two important areas that need to be addressed to support the deployment of NGNs:
  - First, for consumers to fully benefit from NGNs, we need to help NGN based competition become a reality. This will require both market led commercial engagement as well as development of the ex ante competition framework so that it reflects convergence and new services such VoIP. Addressing these issues inevitably raises quite complex questions about the structure of markets and the nature of interconnection between communications providers.
  - Second, whilst ultimately beneficial to consumers, the move to NGNs may lead to new or different consumer concerns for which an effective approach is needed.
- 1.4 This document sets out how we see those challenges being addressed.

## Taking forward NGN competition issues

- 1.5 The key challenge in taking forward NGN competition issues is establishing an appropriate balance between Ofcom’s role in providing certainty as to the regulatory framework and the role of the market in determining the commercial outcome of NGN-based competition. Regulatory intervention which is too early or too prescriptive could pre-empt the role of the market in determining the nature of NGN-based competition, whilst regulatory intervention which is too late or which is ineffective could result in there being no competition at all. In order to maintain an appropriate balance we propose two parallel and complementary strands of work:
  - An improved framework for industry engagement
  - Greater certainty as to the application of the ex ante competition regime

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<sup>1</sup> See Undertakings in lieu of a reference under the Enterprise Act 2002 [http://www.ofcom.org.uk/consult/condocs/statement\\_ts/](http://www.ofcom.org.uk/consult/condocs/statement_ts/) (‘BT’s Undertakings’)

## **An improved framework for industry engagement**

### *A new industry body*

- 1.6 Following the suggestion in our consultation for a new NGN industry body, there has been significant work to refine this concept, and we will now be launching 'NGN UK' (as it is now known) later this month. Its purpose will be to ensure that the UK telecoms industry moves forward in step on NGN development. Ofcom firmly supports this initiative and welcomes the commitment that has already been made by several stakeholders to take it forward. We hope and anticipate that others will follow.
- 1.7 Ofcom will continue to facilitate the start-up process, and in particular has today announced the appointment of Peter Black as Executive Chairman. Peter's task will be to translate the current industry commitment into an effective and independent organisation. Peter will undertake this in parallel with his role of Telecommunications Adjudicator and ongoing commitment to local loop unbundling.
- 1.8 We propose that the new body initially focus on three issues for which a clearer commercial vision is urgently required, specifically:
- IP interconnect architecture
  - IP interconnect commercial model
  - Network intelligence interoperability
- 1.9 The body would not provide a substitute for Ofcom's regulatory functions. As discussed below, Ofcom is proposing an ambitious programme of work to develop the ex ante competition framework, and will still have responsibility for resolving disputes and setting charges in cases where commercial agreement cannot be reached. In order to ensure that any intervention that is required is both timely and effective, Ofcom expects to participate as an observer on the executive committee of the new body.

### *Operational dispute adjudicator*

- 1.10 In our previous consultation we also suggested that operational disputes arising from the planning or implementation of any communication provider's NGN transition could be referred to an operational dispute adjudicator. Ofcom does not plan to establish a formal adjudication scheme at this stage, but will revisit this issue if a substantial volume of minor operational disputes arise.

### *Network Interoperability Consultative Committee (NICC)*

- 1.11 NICC has an essential role in relation to technical aspects of network interoperability, and this will be critical to the success of NGN-based competition. However, Ofcom has had concerns about NICC's current governance arrangements in which it is formally an advisory body to Ofcom. Ofcom has been in discussion with NICC to find an arrangement which would give a greater degree of industry ownership. We are currently considering specific proposals to achieve this and expect to be able to make an announcement shortly.

**Greater certainty as to the application of the *ex ante* competition regime**

- 1.12 Alongside the commercial process discussed above, Ofcom acknowledges the need to provide greater clarity as to the nature of the *ex ante* competition framework which applies to NGNs. There are four aspects we address: initial continuity of existing products; clarity on issues related to current industry negotiations; issues to be addressed this year; and identification of more fundamental long term changes.
- 1.13 First, as set out in our June 2005 consultation, there is an initial need for continuity of existing SMP products. This requires no further *ex ante* regulation from Ofcom, as the obligation to provide these is enshrined in the existing set of *ex ante* competition regulation. However, we do not expect all products to continue indefinitely and will review obligations to supply as they are replaced by future products. One of the first to be reviewed is likely to be Flat Rate Internet Access Call Origination (FRIACO).
- 1.14 Second, there are three specific issues on which greater clarity is needed now as industry negotiations are currently in progress:
- At present Ofcom regulates the provision of Datastream and the margin between Datastream and IPStream. There has been substantial debate as to what types of bitstream remedies will be supported by BT's NGN, and in particular whether the current distinction between IPStream and DataStream, and the associated margin squeeze test, is still appropriate in an NGN era. Ofcom can see benefits in focusing future regulation on a single bitstream product, designed to be complementary to LLU, which combines the service control capabilities of DataStream with the traffic aggregation capabilities of IPStream. We are currently discussing the practicality of this approach with stakeholders. If it does prove to be practical, then we will take this into account when looking at what remedies should be imposed in our forthcoming broadband market review, assuming that a communications provider is found to have SMP in the relevant market.
  - There has also been substantial debate as to how the existing 'Wholesale Line Rental' (WLR), 'Carrier Pre-Selection' (CPS) and 'Indirect Access' (IA) remedies will be supported by BT's NGN. An 'MSAN voice access' product has been proposed which would allow an alternative provider to take over a BT line, as with the current WLR product, and control the origination of calls on that line via their own call server. If such a product were introduced, a separate CPS remedy, and possibly a separate IA remedy, may no longer be necessary. A potential benefit of this approach is that it could greatly increase the potential for service providers to differentiate their retail services. If this approach does prove to be practical, then we will take this into account when looking at what remedies should be imposed in our forthcoming 'voice access and origination' market review, assuming that a communications provider is found to have SMP in the relevant market.
  - There are current industry discussions about a new NGN interconnect call conveyance product which would provide PSTN emulation services over BT's 21CN. Our early thinking is that there are benefits in adopting

an initial commercial model where charges are broadly derived from the Network Charge Control (NCC), but only as an interim position until a future NGN interconnect model is agreed. The details of that future model are likely to be worked out over the next year, therefore we anticipate this interim model may have a relatively limited life span.

- 1.15 Third, there are a number of backhaul related issues which we expect to crystallise this year:
- Negotiations are underway as to future models of local interconnection. But the desirability of local interconnection depends critically on the distance dependence of NGN-based backhaul interconnection charges (their 'distance gradient'). We will soon be publishing an independent study into the implications of NGNs for distance gradients.
  - BT has committed to delivering 'Equivalence of Inputs' in relation to Ethernet-based backhaul products by September 2006. These products are expected to be used by BT for 21CN backhaul, and may also be used as the backhaul element of other NGNs.
  - There is potential for market and service convergence in backhaul, so that it becomes independent of the services (eg narrowband or broadband) being carried.
- 1.16 We will start work on a converged backhaul market review this Spring to consider these issues and develop the ex ante framework for NGN based backhaul.
- 1.17 Fourth, in the slightly longer term we anticipate more fundamental changes in wholesale, (and possibly retail) market structures and remedies, including:
- As noted above, a new voice access product could allow the call control elements of call origination, which is currently a 'bottleneck' service, to become replicable by alternative providers. Arrangements for call termination might also evolve if this product allows alternative providers to control termination of calls on BT lines. In addition, a more sophisticated 'call-by-call' remedy than Indirect Access could be possible in the future (if one is still necessary).
  - For wholesale broadband, backhaul convergence could mean that the same quality of service is available for broadband applications (eg voice over broadband) as for PSTN emulation services. Future broadband services might allow providers greater control over the configuration of the broadband line, and allow greater innovation in the packaging of broadband and narrowband services (such as 'broadband dial-tone' or 'pay-as-you-go' broadband).
  - At the retail level we expect increased competition between NGN-based VoIP services and broadband-based VoIP services. This may be accompanied by greater take-up of bundles comprising voice and broadband services.
- 1.18 Our work programme for the market analysis required to address these issues is summarised in Figure 1 below.

### Taking forward NGN consumer issues

- 1.19 Whilst NGNs create the potential for significant benefits to consumers, our June 2005 consultation also recognised a number of potential consumer issues relating to the move to NGNs. These included the future of text relay services, maintaining quality of service, and provision of information about the migration process.
- 1.20 In considering how best to take forward these issues, we recognise there is a balance between those aspects of consumer protection which ought to be in providers' interest to handle effectively, those where improved consumer protection ought to be a natural consequence of a well-designed NGN, and those where there may be a case for greater Ofcom involvement, and perhaps more formal intervention.
- 1.21 We intend wherever practical to adopt a co-regulatory approach to these issues, in the expectation that Ofcom and industry do have a common interest in addressing them. Ofcom is however aware that there may be some areas where interests may not be aligned. In such cases Ofcom may need to intervene more formally, and we will consider these cases as part of a review of the General Conditions of Entitlement currently planned for Autumn 2006.
- 1.22 Where Ofcom does formally intervene, we will try to avoid specifying how a particular consumer protection issue should be resolved. Instead we will specify the overall objective, and provide industry with the flexibility to determine how best to fulfil this objective.

### Summary of future work

- 1.23 Our planned next steps for each of the issues discussed above are summarised in Figure 1 below.

**Figure 1: Ofcom's future work to support the introduction of NGNs**

Issue	Next steps
A new NGN industry body	Ofcom will support and facilitate the rapid establishment of this body (March 2006).
Future broadband remedies	Wholesale Broadband Access market review (2006)
Convergence of backhaul services	Converged backhaul market review (starting Spring 2006)
Evolution of voice markets and remedies	Voice access and origination review (starting towards the end of 2006)
Convergence of access services	Converged access review (2007)
NGN related consumer issues	Co-regulatory approach to be reviewed in our review of General Conditions (Autumn 2006)

## 2. Introduction

### Overview

2.1 In June 2005 Ofcom published a consultation<sup>2</sup> which proposed a number of policy principles and processes to support the development of Next Generation Networks (NGNs) in the UK. This document sets out our conclusions on those policy principles (excluding those covered by BT's Undertakings) and describes the way forward for:

- Processes to support development of NGNs, in particular the creation of a new NGN industry body
- Development of the ex ante competition framework to support NGNs, including likely future market reviews
- NGN related consumer issues

### Background

2.2 The introduction of Next Generation Networks (NGNs) is the most significant change to telecoms networks since competition was introduced two decades ago. These new networks have the potential to deliver significant benefits to consumers, competitive communication providers and BT. The plans announced by various communication providers will put the UK at the forefront of these developments. Ofcom is therefore committed to creating the conditions for all providers, including BT, to invest in NGNs. There will however be important effects on competition with many of the existing wholesale products and even some competitive models needing to change as the new networks develop.

2.3 Our June 2005 consultation explained that Ofcom had an important role to play in the move to NGNs because:

- Implementation of BT's NGN, 21CN, represents a unique opportunity to ensure that equality of access, a key principle of the TSR and embodied in BT's Undertakings, is implemented from the start.
- Investment in NGNs will be affected by regulatory risks, including uncertainty about the nature and extent of future regulatory intervention and the expected returns from NGN investments.
- Given the scale of the change brought by NGNs, we need to ensure that appropriate measures are taken to protect consumers during that process

2.4 Our immediate priority has been to ensure that the deployment of BT's NGN does not foreclose competition, either through disrupting existing competitive businesses or through preventing equality of access being provided in the future. The June 2005 consultation set out several policy principles to ensure this and most were subsequently implemented as part of BT's Undertakings. These included commitments by BT to provide unbundled network access to services in SMP markets, to do so on an 'Equivalence of Inputs' basis, and

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<sup>2</sup> "Next Generation Networks: Further Consultation", see <http://www.ofcom.org.uk/consult/condocs/nxgnfc/>



not to make design decisions which would foreclose specific product options without first entering into consultation with other communications providers.

- 2.5 Several stakeholders have called on us to take on a more detailed role in relation to NGN competition issues, both directly through specific interventions in the market, and indirectly by establishing appropriate industry processes. The challenge here is to establish an appropriate balance between Ofcom's role in providing regulatory certainty and the role of the market in determining the commercial outcome of NGN-based competition. Regulatory intervention which is too early or too prescriptive could pre-empt the role of the market in determining the nature of NGN-based competition, whilst regulatory intervention which is too late or which is ineffective could result in there being no competition at all. We therefore believe that two parallel and complementary strands of work are required in order to deliver effective NGN-based competition.
- 2.6 Firstly, we recognise the need for Ofcom to provide greater certainty as to the nature of the ex ante competition regime associated with NGNs. The most immediate way in which the deployment of NGNs might effect the ex ante competition regime is via IP-based convergence of certain wholesale markets. We therefore need to consider the impact of IP-based convergence on existing market definitions, and on the associated SMP analysis and remedies. This document sets out our proposed approach to this issue, and an initial timetable for the market reviews which are likely to be required. There are some areas where existing regulation may artificially constrain the development of effective NGN-based competition in the future. An example of this is the current regulation of wholesale broadband services (DataStream and the margin with IPStream). This document provides an early indication of our thinking in some of these areas, and sets out how we expect to progress these issues within future market reviews.
- 2.7 Secondly we believe that an industry body needs to be established which is capable of providing a strong strategic vision for the access and interconnection arrangements required to support NGN-based competition. This will help to ensure that the detailed design of access and interconnection is driven by those parties with a commercial stake in the outcome rather than by the regulator. This document sets out the manner in which we propose to take this initiative forward.
- 2.8 Alongside these two strands of work on NGN-based competition, a third strand of work is required to consider those consumer protection issues raised by the migration to NGNs.

### **This document**

- 2.9 The rest of this document:
- Proposes a way forward for a new NGN industry body (Chapter 3);
  - Considers how ex ante competition regulation may need to evolve in the future to reflect the move to NGNs (Chapter 4);
  - Considers the consumer issues that NGNs raise and how these can be taken forward (Chapter 5).
- 2.10 This document does not contain a regulatory impact assessment as it does not include any specific proposals to impose or amend regulation.

## 3. NGN industry processes

### Introduction

3.1 In our June 2005 consultation we considered the industry processes that seemed to be necessary to support the move toward NGNs. We proposed:

- That there appeared to be a gap not adequately addressed by existing processes which could be filled by a new NGN industry body;
- An NGN operational dispute adjudicator; and
- The re-constitution of NICC as an independent industry owned body.

### New NGN industry body

3.2 The proposal for a new NGN industry body generated significant comment. Nearly all respondents agreed there was a need to address NGN issues that was currently not being met by current bodies. However, some cautioned against proliferating fora which might simply add another layer of complexity and bureaucracy. Many wanted a clearly defined scope and remit for the new body, and many questions were raised about membership criteria, governance and funding.

3.3 To help address these questions, and allow an informed decision to be made about the creation of the new body, Ofcom engaged consultants to develop a more detailed proposal including its purpose, scope and mechanics of operation, ie its membership, governance, funding etc. To do this they sought the views of a wide cross section of stakeholders. Their report is available on Ofcom's website at <http://www.ofcom.org.uk/consult/condocs/nxgnfc/ngn/>.

3.4 Following discussions with stakeholders about that proposal, we have developed a revised proposal for a body which can be established quickly, has a tighter focus, and reduced operating costs.

### Purpose and scope

3.5 We propose that the new body initially focus on three issues for which a clearer commercial vision is urgently required, specifically:

- **IP interconnect architecture.** A reference architecture is required for IP interconnection, covering such matters as service characteristics and required interoperability standards. This is particularly urgent in relation to IP-based voice interconnection, but any proposed architecture also needs to take a forward-looking view of the requirements of new multimedia services. Note that Ofcom will still have responsibility for resolving interconnection disputes where commercial agreement is not possible.
- **IP interconnect commercial model.** There is a need to establish commercial principles for NGN interconnection, including in particular charging principles (e.g. distance dependence of charging structures, definition of grades of services) and contractual terms and conditions. Note that where commercial agreement cannot be reached Ofcom will

still have responsibility for setting charges and/or charging principles and resolving disputes.

- **Network intelligence interoperability.** There is a need to understand the types of network intelligence which need to be exchanged between operators of NGNs, the commercial basis for such exchange, and technical interoperability issues. The timescale for this work is likely to be longer than the other two workstreams, since the debate is less advanced. Note that Ofcom will still have responsibility for determining whether access should be provided to capabilities where this cannot be agreed by industry participants.

### **Relationship of the proposed body to Ofcom**

- 3.6 The role of the proposed body is not to provide a substitute for Ofcom's regulatory functions. The aim instead is to ensure that there is a clear commercial vision led by industry for competition based on interconnected NGNs, so that regulation can follow the market rather than leading it.
- 3.7 Ofcom does recognise the critical importance of prompt regulatory intervention where intervention is required, and therefore expects to have a close relationship with the new body. In particular, Ofcom would expect to participate as an observer at meetings of the NGN executive.
- 3.8 In parallel, we will be undertaking further work to develop the regulatory framework for NGNs and our future work is set out in Chapter 4.

### **Governance**

- 3.9 We consider that the key elements of the body's governance should be:
- The organisation will be independent, accountable only to its members;
  - Membership will be open and members will be able to participate in any working group;
  - An executive committee consisting of 8-10 industry representatives will approve the body's recommendations and to drive its agenda forward;
  - Ofcom will be an active observer on the executive committee.
- 3.10 Our expectation, subject to agreement of the parties, is that the executive committee will comprise representatives from BT, cable and alternative network providers, mobile operators and service / content providers.

### **Lifetime**

- 3.11 The NGN body should have a finite life span. It is proposed a review would be taken after its first six months of operation with a check point at 18 months to decide whether to extend its function for an additional 18 months.

### **Costs**

- 3.12 Given the reduced scope compared to the consultant's original proposal we estimate the operating costs would be approximately half their original estimate (~£1.4m). Ofcom will fund the initial set-up costs of the new body.

### **Way forward**

- 3.13 We are now at a stage where we intend to launch 'NGN UK' (as the body is now known) later this month. Ofcom firmly supports this initiative and welcomes the commitment that has already been made by several stakeholders to take it forward. We hope and anticipate that others will follow.
- 3.14 Ofcom will continue to facilitate the start-up process, and in particular has today announced the appointment of Peter Black as interim Executive Chairman. Peter's task will be to translate the current industry commitment into an effective and independent organisation. He will undertake this in parallel with his role of Telecommunications Adjudicator and his ongoing commitment to local loop unbundling.

### **Operational dispute adjudicator**

- 3.15 In our previous consultation we also suggested that disputes arising from the planning or implementation of any communication providers NGN transition could be referred to an operational dispute adjudicator. This would exclude disputes which raised material commercial or policy issues.
- 3.16 However, several respondents raised concerns that the proposed scope of the adjudicator is very narrow, as few operational issues do not give rise to commercial or policy issues. Ofcom acknowledges these concerns, but does however remain concerned about the possibility that a large number of minor operational disputes might be referred to it for resolution. This is unlikely to be an effective means of resolving such disputes, and could unnecessarily delay NGN deployment.
- 3.17 It is possible that an effective NGN industry body, coupled with BT's Undertakings, will promote a climate within which minor operational issues are resolved without them escalating into formal disputes. If this is the case, then a separate operational dispute adjudicator may not be required. Ofcom therefore proposes not to establish such a scheme at this stage, but will review this position if a significant number of operational disputes do arise.

### **Network Interoperability Consultative Committee (NICC)**

- 3.18 Nearly all providers that commented on the role of NICC agreed that NICC should remain responsible for technical aspects of network interoperability. Ofcom fully supports this view.
- 3.19 Several respondents also commented that they saw no compelling reason why NICC needed to be re-constituted as an independent industry owned body, as has been proposed by Ofcom. They would however be supportive of any changes that NICC itself chooses to carry out. The main concerns raised in relation to Ofcom's proposal were that current arrangements were already efficient and capable of addressing NICC's technical responsibilities, and that re-constitution would not necessarily improve resourcing.
- 3.20 Ofcom does however remain of the view that the current governance arrangements for NICC are not appropriate. NICC is formally constituted so as to provide advice to Ofcom, so that the standards which it develops are effectively owned by Ofcom. Ofcom does not believe that it is appropriate for it to have such detailed responsibility for technical interoperability standards, especially given Ofcom's stated aim of adopting a 'light touch' approach to regulation.

## Next Generation Networks: Developing the regulatory framework

- 3.21 Ofcom has been in discussion with NICC to find an arrangement which would give a greater degree of industry ownership. We are currently considering specific proposals to achieve this and expect to be able to make an announcement shortly. Ofcom does however recognise the importance of not disrupting the current work programme of NICC, and commits to providing full support for this work programme pending confirmation of future governance arrangements.

## 4. Developing ex ante competition regulation

### Introduction

- 4.1 In addition to the commercial processes discussed in the previous chapter, Ofcom acknowledges the need to provide greater clarity as to the nature of the ex ante competition framework which applies to NGNs. Substantial change is expected, especially at the wholesale level, as the markets for network conveyance converge, and service intelligence is decoupled from the network. To provide a framework for dealing with these changes this chapter looks at:
- principles for continuity of existing products;
  - evolution of economic market structure;
  - evolution of products and remedies; and
  - distance gradients and depth of interconnect.
- 4.2 Some of these changes raise backhaul related issues which we expect to crystallise this year:
- Negotiations are underway as to future models of local interconnection. But the desirability of local interconnection depends critically on the distance dependence of NGN-based backhaul interconnection charges (their 'distance gradient').
  - BT has committed to delivering 'Equivalence of Inputs' in relation to Ethernet-based backhaul products by September 2006. These products are expected to be used by BT for 21CN backhaul, and may also be used as the backhaul element of other NGNs.
  - Market and service convergence in backhaul, so that it becomes independent of the service (eg narrowband or broadband) being carried.
- 4.3 The analysis also identifies the potential for more fundamental changes in wholesale (and possibly retail) market structures and remedies in the slightly longer term, for example:
- The potential for call control elements of call origination, which is currently a 'bottleneck' service, to become replicable by alternative providers.
  - Possible evolution of call termination arrangements.
  - Broadband applications (eg voice over broadband) having identical quality of service characteristics as PSTN emulation services.
  - Increased competition between NGN-based VoIP services and broadband-based VoIP services. This may be accompanied by greater take-up of bundles comprising voice and broadband services.
- 4.4 There are also issues on which greater clarity is needed now in order to provide the framework for current commercial negotiations. This is because

in many cases replacement of existing SMP products by approximate equivalents on the NGN may not be the most effective way of addressing competition problems in the future. For example, new technology might allow a more efficient alternative, or one that address the problem at further upstream, hence supporting the potential for eventual downstream competition and de-regulation. Three specific issues considered are:

- There has been substantial debate as to nature of future wholesale broadband products. This chapter discusses this issue and considers the benefits of focussing future regulation on a single bitstream product.
- There has also been substantial debate about future narrowband access products, in particular a 'MSAN voice access' product. This chapter discusses this issue and sets out Ofcom's current views of the potential benefits of a new approach to narrowband access.
- Negotiations are currently underway in relation to a new "NGN interface call conveyance" product. We set out some initial views on how this relates to the existing Network Charge Control and the future interconnect model.

4.5 The overall aim of this chapter is to provide stakeholders with visibility of our early thinking on these issues. However, it should be noted that each of them will be addressed when each of the relevant market reviews are conducted and will be based upon the information available to Ofcom at that time.

### **Continuity of existing SMP products and eventual withdrawal of regulation**

4.6 In our June 2005 consultation we set out our view that whilst there initially needs to be continuity of existing SMP products (those products that BT is obliged to offer in markets where they have Significant Market Power), this should only be for an interim period during which both legacy and next generation products are available. To ensure a timely move to next generation interconnect we proposed that the requirement for existing SMP products be reviewed if:

- there was evidence that BT no longer had SMP in the relevant market; or
- there were no longer reasonable demand for the existing SMP product; or
- it is reasonable to move to alternative next generation SMP products.

4.7 Nearly all respondents agreed with this principle, but offered a number of comments on the criteria for when withdrawal should be considered. We respond in more detail to these comments in Annex B.

#### *Next steps*

4.8 To ensure continuity of existing SMP products requires no further ex ante regulation from Ofcom as the legal obligation to provide these is enshrined in the existing set of ex ante competition regulation. We can also investigate complaints where providers believe BT is not complying with its existing legal obligations.

- 4.9 With regard to considering whether regulation of existing SMP products can be withdrawn, we have already indicated that we will be undertaking a number of market reviews over the next year. A fundamental part of these reviews is to consider whether SMP designations and network access SMP remedies are still appropriate. This could lead to a removal of regulation from existing SMP products.
- 4.10 For most existing SMP products, we think it is currently too early to apply the other two criteria (reasonable demand, reasonable to move to new product). This is because at present the migration to NGNs has not yet begun, and in most cases, future NGN SMP products, which might eventually replace existing products, have yet to be fully defined.
- 4.11 At present, we believe that Flat Rate Internet Access Call Origination (FRIACO) is likely to be the first SMP product where obligations will need to be reviewed. Respondents argued that FRIACO should continue whilst there is still demand from consumers and industry for narrowband products, and until there are wholesale broadband products that support effective competition.
- 4.12 Although there is still demand for narrowband unmetered Internet, this has been declining rapidly. Ofcom's research indicates that the percentage of adults with internet access at home, who claimed to use unmetered narrowband access declined from 28% in the first quarter of 2004, to 11% in the second quarter of 2005<sup>3</sup>. One approach for communications providers to manage this decline may be the migration of FRIACO traffic onto a pence per minute (ppm) interconnect arrangement. To facilitate this, Ofcom will be making a minor amendment to its numbering scheme to make it clear that existing FRIACO numbering ranges can be used in conjunction with a ppm interconnect billing arrangement, so long as the calls remain free to the retail user.

### **NGN economic markets**

- 4.13 It is important that we start to consider how the economic markets, on which ex ante regulation is based, will change as the industry, and BT in particular, moves to NGNs. One reason is that existing wholesale market definitions, may ultimately become outdated if they refer to network elements (eg tandem exchanges) that no longer exist on an NGN. There is also a positive incentive for revisiting market structures as this may support simplification of the ex ante regulatory framework, and enable regulation to focus on a reduced set of markets and remedies.

### **Possible impact of NGNs on economic market structure**

- 4.14 Ofcom's methodology for defining markets is based on standard tests used in competition analyses and is consistent with EU guidelines<sup>4</sup>. This framework remains the same, regardless of the change of technologies to NGNs. However, it is possible that the changes in cost structures brought

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<sup>3</sup> See Annex 5 of Ofcom's Consumer Policy consultation

<sup>4</sup> See Commission guidelines on market analysis and the assessment of significant market power, OJ C165 2002, p. 3. Also see previous Ofcom market reviews, for example Chapter 2 of Ofcom's broadband market review, <http://www.ofcom.org.uk/consult/condocs/wbamp/wholesalebroadbandreview/chapter2/> for further explanation of Ofcom's approach to market definition.



about by the switch to NGNs could affect substitution possibilities in a way which changes markets definitions.

- 4.15 Demand-side substitution occurs if consumers would switch to other products in response to a price increase. Supply-side substitution occurs if suppliers of other products would begin to compete with a hypothetical monopolist in the supply of the product under consideration in response to a price increase.
- 4.16 On the supply side, Ofcom believes that one of the key issues to be considered is the impact of convergence on market structures. Existing service specific markets have been linked to separate networks, with points of interconnect at different locations and using different technical Interfaces. NGNs remove these differences, theoretically separating the provision of specific applications (eg voice) from the underlying network, so that all services are provided using a single network, with a common set of interconnect locations and technical interfaces.
- 4.17 On the demand side, NGNs might affect substitution possibilities between products in two ways. First by affecting their relative functionality, for example increasing the functionality of an existing service so that it is a closer substitute for a service previously in a different market. Second, by affecting the relative price of services. This is because the efficiency gains for some services of using NGNs might be greater than others.
- 4.18 A third factor which is relevant to market definition is the existence of common pricing constraints across customers, services or areas, even in the absence of demand- or supply-side substitutability. Such constraints can arise where, for example, consumers prefer to purchase a bundle of services from a single supplier rather than on a service-by-service basis. Failure to consider the existence of a common pricing constraint could otherwise lead to unduly narrow markets being defined. NGNs are converged networks which may offer economies of scope in the provision of multiple types of services being offered over them. These economies of scope could lead to consumers preferring to purchasing bundles of services to a greater extent than they do today.
- 4.19 Ofcom's initial thinking is that the impact of NGNs, leading to market simplification and convergence, is likely to differ between services at different level in the network. Unbundled copper loops are already 'converged' in the sense that they can support multiple downstream markets, and this market seems less likely to be directly impacted by the move to NGNs.

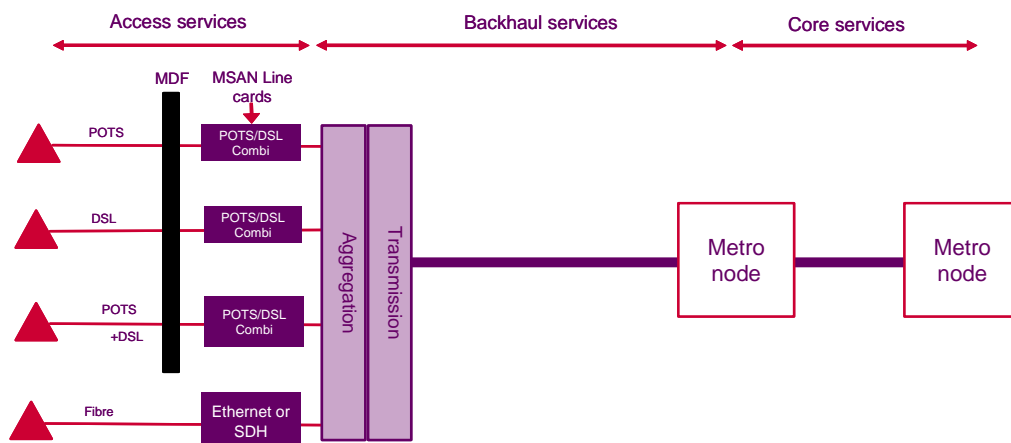
#### *Terminology*

- 4.20 Terms commonly used to describe current markets are 'access', 'conveyance' and 'origination'. However, these terms are sometimes used in different ways to refer to different parts of the network. For example "broadband origination" has been used to describe the physical connection between the end users' premise and the core network, it thus encompasses access and backhaul. In contrast narrowband call origination provides backhaul from the concentrator to a digital local exchange, but not to the core of the network, and does not include narrowband access (that is provided by wholesale line rental). To discuss convergence of markets and products we need to use a single

consistent set of terminology, which in some cases is different to that employed in existing market reviews:

- **Wholesale access services.** We use “access” in this document to broadly refer to services, for example narrowband exchange lines and end user DSL access, provided up to the local access node where the Main Distribution Frame is normally located and where Multi-Service Access Nodes will be located.
- **Wholesale backhaul services.** We use “backhaul” in this document to broadly refer to services that run from local access nodes to other networks nodes. There are two main types of backhaul discussed:
  - point-to-point dedicated backhaul services (eg backhaul extension services)
  - backhaul conveyance services, supporting some degree of aggregation and sharing of capacity (eg narrowband call origination)
- **Wholesale core services.** Provision of point-to-point or shared / aggregated services between core network nodes.

**Figure 2: Generic services on an NGN**



4.21 These different types of services are illustrated in Figure 2. Some early thinking on the potential arguments related to convergence in access and backhaul services is set out below. The purpose is to help identify issues that will need to be considered in future markets. It does not aim to replicate or pre-judge the market definition and analysis that Ofcom will undertake in subsequent market reviews. The issues for core services are not discussed in detail here, but are likely to be similar to those for backhaul services. In addition there is greater potential for competition in core services than backhaul, and hence in some markets these are less likely to be regulated (as evidenced by the recent deregulation of inter-tandem narrowband services).

### Convergence in backhaul conveyance

4.22 At present there are separate networks for different services, ie broadband and narrowband, and this has led to separate, service specific markets being defined for backhaul conveyance. However, with a converged NGN it may no longer be appropriate to have access (service) specific backhaul. Instead, it may be possible to have a single backhaul product that is capable

of supporting multiple access services. With such an approach it would be necessary to configure the backhaul so that it had the right characteristics. Therefore, on a NGN, capacity and quality may be a more relevant for conveyance market definitions than the nature of the downstream service.

- 4.23 There might also be supply side arguments for a convergence of markets. For example, if NGNs enabled a conveyance service with configurable quality, this might be used as an input to both narrowband and broadband downstream services.
- 4.24 There could be important implications of taking a more converged approach to conveyance markets. In particular, this might support a breaking of the historical link between downstream services and conveyance products, ie so that conveyance service of a given quality could be used to support any downstream service. This could allow regulation to focus on a reduced set of upstream conveyance remedies. The implications for evolution of SMP conveyance products are discussed further in the next section on product evolution.

#### **Convergence in dedicated point-to-point backhaul**

- 4.25 Dedicated backhaul (point-to-point) markets are arguably already converged as they include products that can be used for a range of downstream services. For example they can support consumer broadband, business services, or mobile services (as in the case of radio base station backhaul). Therefore the impact on these markets may be less significant than in backhaul conveyance.

#### **Network topology**

- 4.26 The other important dimension to existing wholesale backhaul markets is the network topology they encompass. Typically wholesale economic markets correspond to different points in the value chain, corresponding to whether the product is provided near the edge or core of the network. For example, in narrowband there are separate call origination and local-to-tandem conveyance markets. The move to NGNs is likely to see these being replaced by distinctions based on NGN topology, eg conveyance to metro nodes. However, whether and how markets are split into several topological levels (eg a separate market for conveyance between tier-1 MSANs and metro nodes) will be related to whether provision of interconnect at those levels is sustainable and ultimately the relative charges for interconnect at different points. This is discussed further in the section on 'distance gradients' below.

#### **Convergence in wholesale access services**

- 4.27 Previous market reviews have considered whether broadband and narrowband access are demand-side substitutes for each other. It is not yet clear to what extent the move to NGNs will change this in the short-to-medium term, but two potential changes are discussed below.
- 4.28 First, NGNs might support the reduction of current differences in pricing between broadband and narrowband access, so that 'naked' broadband access (ie one not requiring the consumer to have narrowband access) was priced similarly to narrowband line rental. It is important to note that at present narrowband access includes the cost of the copper loop, but usage

(calls) are usually charged in addition. In contrast broadband access usually does not include the cost of the copper loop, but often includes usage (possibly up to a download limit).

- 4.29 Second, NGNs should allow exploitation of economies of scope in access, as the additional cost of providing broadband or narrowband access may be small in comparison to the cost of the access loop. These economies of scope may make it efficient for suppliers to offer a bundle of narrowband voice and broadband, potentially driving consumers to buy a 'double play' of narrowband voice and broadband from the same supplier. However, both of these changes may be a step change from current market conditions and depend on changes in consumer behaviour, as well as changes driven by the implementation of NGNs.
- 4.30 On the supply-side, NGNs are converged networks and therefore could facilitate a supplier of one service to start providing another. This is because convergence potentially reduces the service specific elements which need to be changed to support the new service. However, the key point for market definition purposes is whether this would create an additional constraint on prices arising from such substitution. This would not be the case where potential substituters (ie network operators) *are already supplying all the services in question* and hence their competitive impact in each service market is already taken account of by the demand-side analysis and the possibility of supply-side substitution would not then justify a wider market definition.
- 4.31 In theory the move to NGNs might allow providers of only broadband access to start providing narrowband access in the future at relatively low cost (in the past they would have had to incur significant costs in new network equipment, eg PSTN switches). However, in practice providers might not switch from providing broadband only to voice only, they may actually start to sell a 'double play' bundle of voice and broadband. The question would then be whether 'double play' represented a significant proportion of the market and could act as an additional constraint on pricing.
- 4.32 The implications of a move to a converged access market could be quite significant. For example, it might imply that alternative operators would fully take over a customers line at least at a wholesale level, for both narrowband and broadband, (conceptually the combi card in the MSAN), even if the customer were only being provided with narrowband access. Our very early thinking suggests that this aspect of convergence is further away than convergence in conveyance, but we will consider and consult fully on these issues in the market reviews outlined below. The implications for converged access products are discussed in the next section.

*Next steps*

- 4.33 Whilst some initial arguments that support convergence of markets as we move towards NGNs are outlined above, this cannot replace a full economic market definition exercise which is an essential part of a market review. In its forthcoming market reviews, Ofcom will examine all factors relevant to its market definition, including the implications of NGNs over the period of the review (normally a 2-3 year forward look).

## NGN SMP product evolution

4.34 The purpose of existing regulatory remedies (SMP conditions) and corresponding SMP products is to address competitive problems identified in relevant markets, which would otherwise lead to sub-optimal outcomes for consumers. The aim of that regulation is generally to enable competing providers to compete in downstream markets. However, it should not be assumed that replacement of the existing SMP product set by an approximately equivalent products on the NGN will continue to be the most effective means of achieving that in the future. Therefore, we believe it is important to consider afresh what the most effective remedies are in light of:

- The change in network technology and design implied by NGNs
- The possible convergence of markets (see above)
- Ofcom's strategic principles for telecoms regulation, including the application of Equivalence of Input, and focus of regulation at deepest sustainable point.

4.35 Ofcom's objective here is not to specify what next generation products would be, but rather to identify what characteristics would best address regulatory aims and principles. In addition, the discussion below concerning regulatory remedies is based on the assumption that a communications provider is found to have SMP in a particular market which may of course turn out not to be the case following a market review.

4.36 To do this it is important to consider:

- Does the move to NGNs change the need and/or purpose of regulatory remedies? Normally the aim is promote competition in downstream markets. In general we would expect that the move to NGNs, in itself, does not normally remove or change this objective, other than when it enables new forms of competition which remove SMP.
- Are there limitations, disadvantages, or problems with existing remedies that the move to NGN could address?
- What opportunities are there for next generation products to more effectively address regulatory objectives?
- What opportunities are there for remedies to more closely reflect Ofcom's regulatory principles, for example, to focus on the deepest point rather than regulating more than one point in the value chain?
- Does the move to NGNs create new challenges or necessary changes for the remedies to remain effective?

4.37 The sections below set out some initial thinking on the application of these considerations to current regulated products and their future evolution. The following are considered:

- Carrier Pre-Selection (CPS), Wholesale Line Rental (WLR) and Indirect Access (IA)
- Narrowband call conveyance
- Call termination

- FRIACO
- Wholesale broadband
- Converged conveyance
- Converged access

**CPS, WLR, IA and future narrowband access**

- 4.38 The purpose of Wholesale Line Rental (WLR) is to enable competing providers to compete in retail access markets without building their own access networks by allowing them to re-sell a BT narrowband access line. It also aims to enhance the effectiveness of Carrier Pre-Selection (CPS) as a remedy for promoting competition in narrowband (outbound) calls.
- 4.39 The move to NGNs does not in itself change the need for remedies to address the underlying competitive problem, but it does offer opportunities to develop new remedies that potentially offer greater competitive benefits. In particular, a next generation narrowband access product could provide the functionality of both traditional WLR and CPS, ie allowing a provider to re-sell the access line and route outbound calls, but in addition it could:
- Allow other communication providers (OCPs) to control and own terminating calls;
  - Allow OCPs control over the line and calling features;
  - Support equivalence of input (EoI). Whilst BT has made an undertaking to apply EoI to WLR, this could also be extended to call routing (ie what is currently covered by CPS, which is not an EoI product).
- 4.40 These differences are summarised in Figure 3 below which also illustrates the potential role of converged backhaul services (discussed in paragraphs 4.83 to 4.90 below). There are current industry discussions over an MSAN voice access product which might support these characteristics.

**Figure 3: Comparison of WLR, CPS and possible future narrowband access**

Functionality	Current narrowband products	Future?
Rental and ability to bill narrowband access line	WLR	
Control of narrowband access line	-	
Ability for OCP to route outbound (originating) calls	CPS	
Ability for OCP to route inbound (terminating) calls	-	
Conveyance of outbound n/b calls over BT's network	Call origination LTC	
Conveyance of inbound n/b calls over BT's network	Call termination LTC	

- 4.41 Our initial view is that there could be significant benefits from moving to a new form of voice access.
- 4.42 Firstly, the call control elements of call origination are currently a 'bottleneck' service, in the sense that a call originating on BT's network is always controlled by BT (ie by its DLE). Future voice access could allow that functionality to become externally replicable, by allowing other communication providers to control call origination.
- 4.43 Secondly, a future voice access product could allow OCPs much greater control of line and calling features than with traditional WLR. This could allow greater differentiation of narrowband access products and innovation in the features provided over them. Assuming that such a service supported equivalence of input, it should also allow alternative providers to replicate any new 'WLR' product or line feature that BT could introduce, hence potentially removing the need to regulate those new features. In the longer term, it might eventually allow de-regulation of traditional WLR, if the next generation voice product were an adequate replacement and widely used (also see our general approach to moving from existing to next generation SMP products).
- 4.44 In addition, if a future voice access product allowed OCPs to take control of terminating calls, this could also have implications for call termination, as the OCP might then collect payments for terminating calls rather than BT. Implications for call termination arrangements are discussed further in paragraph 4.70 below.
- 4.45 Another aspect of next generation narrowband access might be convergence with broadband access, where a provider would take over a line and have the option of using it for narrowband and/or broadband access. See 'converged access products' below.

*Future of Indirect Access (IA)*

- 4.46 IA has a similar purpose as CPS, ie as a remedy to promote competition in narrowband (outbound) calls, but allows calls to be routed via alternative networks on a call-by-call basis by the customer dialling a prefix.
- 4.47 It is possible to imagine two different futures for Indirect Access. Firstly, NGNs might enable more sophisticated methods of enabling call-by-call competition. Manually dialling a prefix could be supplemented or superseded by a more intelligent and efficient process. For example, a next generation 'Indirect Access' product might allow consumers to configure their call preferences via a web portal, say to route all their calls to India via a preferred carrier. There might however continue to be a demand for traditional Indirect Access to support certain services, for example pre-paid cards for international calls. Alternatively, it might be argued that the need for a call-by-call remedy will diminish in the future if WLR, CPS and new forms of narrowband voice access are successful in further promoting competition in calls.

*Next steps*

- 4.48 Ofcom's intention is to initiate a review of voice access and origination towards the end of 2006 which would include consideration of the above issues, and potentially include consideration of call termination.

#### **Narrowband call conveyance**

- 4.49 Existing narrowband call conveyance products, including call origination and local-tandem conveyance, allow communication providers to convey calls partially across BT's network when they own the call but are not able to convey it end-to-end on their own network. The move to NGNs does not in itself change the need for such remedies but does present questions about the appropriate evolution path for these remedies.
- 4.50 There have been industry discussions about a new NGN interconnect call conveyance product which would provide PSTN emulation services over BT's 21CN. In essence this would offer similar functionality to existing narrowband origination and conveyance products but use a NGN interface, rather than a PSTN interface. BT's initial proposal was that charging for this product would be 'congruent' with existing narrowband interconnect charges, ie it would have the same call prices as for legacy interconnect at the same point of handover.
- 4.51 Ofcom believes it is important to set out our initial thinking about how such a product might relate to the legacy PSTN charging regime (ie regulated by the Network Charge Control) and the possible evolution of interconnect charging. Our early thinking is that there are benefits in an initial commercial model where charges are broadly derived from the Network Charge Control (NCC), but only as an interim position until a future NGN interconnect model is agreed. The details of that future model are likely to be worked out over the next year, therefore we anticipate this intermediate model may have a relatively limited life span.
- 4.52 The context for this view is that whilst the continuation of the current charging model has a number of beneficial incentive characteristics (including stability of existing business models and incentives for efficient investment by BT in its NGN), in the longer term it will be necessary for charges to provide the correct incentives to interconnecting operators, by properly reflecting NGN cost structures. This issue is separate from, but consistent with, our "holistic" view of cost recovery (see Annex B) which relates to the *level* of NGN charges, relative to the costs of a hypothetical stand alone NGN, rather than the *structure* of NGN charges. The characteristics of the current and possible future interconnect model are discussed further below.

#### *Characteristics of legacy and future interconnect models*

- 4.53 Continuation of the legacy interconnection model has a number of beneficial incentive characteristics which are summarised below.
- 4.54 Ofcom has already required BT to continue to provide PSTN interface products at a controlled price<sup>5</sup>, and hence is limited in its ability to pass on costs to interconnecting operators as a result of its network migration. This ensures that BT's NGN investment is efficient in the sense that it takes account of the costs imposed on others (the 'social' costs) as well as the

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<sup>5</sup> See Explanatory Statement and Notification of decisions on BT's SMP status and charge controls in narrowband wholesale markets <http://www.ofcom.org.uk/consult/condocs/charge/statement/>



benefits to BT. If this were not the case, then BT's NGN investment decisions might be based purely on the private costs and benefits to BT, without taking account of costs imposed on others, for example, the cost of re-locating points of interconnection.

- 4.55 Second, the network charge control has the beneficial incentive property of any charge control, ie it provides incentives for BT to efficiently reduce its costs over the period of the control because once the cap is set the maximum level of charges is independent of costs for the duration of the cap.
- 4.56 Third, the NCC technology neutral model provides BT with good incentives to migrate traffic efficiently to its NGN. This is because it provides BT with an incentive to use the least-cost network, as BT charges the same for all services delivered using PSTN interfaces, regardless of whether or not the service is delivered using its NGN.
- 4.57 Finally, continuity of this model provides stability for the existing business models of communication providers.
- 4.58 However, as set out our previous documents, we do not believe this model should continue indefinitely as a model for interconnection of NGNs. In particular, future NGN interconnection will need to reflect underlying NGN cost structures so that it creates efficient investment incentives for communications providers. Specifically:
- The structure of existing charges, ie based on DLEs and tandem exchanges, does not reflect the architecture and hence cost structure of BT's NGN. Preserving these pricing signals indefinitely into the future is likely to create inefficient incentives for communication providers.
  - Similarly, inefficient incentives may be created by indefinitely preserving the PSTN 'distance gradient' for NGN interconnection charges. Distance gradients are discussed further below and Ofcom will soon be publishing an independent study on this issue.
  - The costs of providing PSTN and IP interfaces may be different on an NGN, and hence charging at the same level could give incorrect price signals as a result of not reflecting the relative costs of these interfaces. On the other hand it may be optimal to continue to use PSTN assets for some time, where these would be "stranded" by rapid migration to the NGN.
- 4.59 As noted above and discussed in Annex B, the level of NGN charges would still need to take account of the 'holistic approach' to cost recovery.
- 4.60 In addition, we have identified at least two ways in which the nature of narrowband interconnection on NGNs could evolve more fundamentally:
- Convergence in conveyance could remove the need for a specific narrowband conveyance product. For example, PSTN emulation services may simply employ the same bitstream conveyance service used for broadband services, albeit with a potentially higher quality of service (see also paragraphs 4.83-4.90 below).

- A future voice access product (eg MSAN voice access) could allow alternative communication providers to provide call control functionality that is currently integrated with narrowband origination products. Hence providers using this new form of voice access would no longer need a 'call origination' service (see also paragraph 4.39 above).

*Migration to a future interconnect model*

- 4.61 Whilst the current interconnect regime is well defined, it is not yet possible to specify the future model, which may incorporate the characteristics outlined above, as clearly. However, in migrating from the current model to the future model it is clear that there will need to be a balance between the different incentive properties of each. Our initial thinking is to view the proposals under discussion as a step along the migration path to a future NGN interconnect model. However, there are two important implications.
- 4.62 First, communications providers ought to recognise that such arrangements are expected to be an interim position whilst the future framework is developed, and take that into account in their investment decisions.
- 4.63 Second, it is crucial that development of more forward looking arrangements progresses in order to avoid the industry becoming locked into a legacy model.

*Next steps*

- 4.64 The actions we see as important in developing this future model are:
- publication of an independent study on NGN distance gradients in order to progress that issue;
  - establishment of a new industry body, whose initial remit includes consideration of IP interconnection architecture and charging structures;
  - Ofcom's market review of converged backhaul planned to start in Spring 2006;
  - Ofcom's market review of voice access and origination planned to start towards the end of 2006.

**FRIACO**

- 4.65 The purpose of Flat Rate Internet Access Call Origination (FRIACO) is to promote competition in unmetered narrowband internet services. However, this market is expected to continue to decline in size as broadband access continues to grow, driven by broadband's superior capabilities compared to narrowband, falling broadband prices and increasing bandwidth. Therefore, it does not appear to be appropriate or relevant to consider next generation evolutions of this product.

*Next steps*

- 4.66 As discussed above, Ofcom will be making a minor amendment to the numbering scheme to allow a pence per minute interconnect billing arrangement to be used on existing FRIACO number ranges, so long as the calls remain free to the retail user.

### Call termination

- 4.67 At present there are separate products and markets for narrowband voice origination and termination. This is because there is a fundamental difference in competitive conditions between them. Under the calling party pays system, there is an externality in call termination because the individual paying for the call has no choice over the network on which it terminates. This results in all operators having SMP in narrowband termination. This externality does not apply to origination. Although the move to NGNs does not in itself seem to fundamentally change this, tariff and product changes potentially associated with a move to NGNs might have an effect.
- 4.68 First, the move to NGNs might remove the need for a specific call termination conveyance product if NGN interconnect products used capacity based tariffs, rather than per minute as today. These interconnect products might allow exchange of traffic *in either direction* up to a certain capacity (eg x Mbit/s) in a similar way to current wholesale broadband or Internet transit products. However, even if providers no longer needed a specific call termination conveyance product, this may not necessarily remove the externality and hence market power resulting from calling party pays at the retail level.
- 4.69 Second, NGNs might indirectly change or reduce the importance of the calling party pays principle by supporting a greater move to flat rate tariffs at the retail level. This change is already underway and not directly linked to NGNs, but may be supported by a move to capacity based interconnect tariffs which could be introduced with NGN interconnect products.
- 4.70 Third, the move to a next generation narrowband access product could change *who* controls the call termination bottleneck. This is because at present, where a line is taken over by WLR/CPS, BT still controls the termination of calls. This might change with a next generation narrowband access, if (as discussed above) it meant that alternative providers took full control of the access line, for originating and terminating calls. In other words, BT might no longer be technically able to prevent calls from terminating on those lines. An implication could be that alternative providers start to collect call termination charges rather than BT. This might change the dynamics of call termination, perhaps leading similar sized providers to simplify their interconnect billing by agreeing 'peering' arrangements.

### Next steps

- 4.71 In summary, our initial thinking is that the move to NGNs might ultimately lead to a number of indirect impacts on call termination. However, it is not yet clear if and when those changes will materialise. Therefore, a pragmatic approach may be to wait until it is clearer how those changes are likely to play-out, before commencing a further review of fixed call termination. Consequently, we currently suspect it would not be appropriate to initiate a review, if necessary, before 2007. However, it may be appropriate to consider call termination at the same time as our review of voice access and origination, and we will consider this when scoping that work later this year.

### Wholesale broadband services

- 4.72 Regulation in wholesale broadband markets is designed to promote competition in downstream markets, including retail broadband internet access. At present, there are local loop unbundling and Wholesale

Broadband Access (WBA) remedies. For BT's network the product that is currently used as the remedy at the WBA level is ATM interconnection (also known as DataStream). However, an intermediate level, between WBA and retail services, also currently exists and this intermediate level is addressed by the IPStream/BT Central product bundle.

- 4.73 The move to NGNs is likely to have limited direct impact on the LLU product because the copper loop is essentially unchanged by the migration to a NGN. However, for wholesale broadband services, there are three aspects of evolution to be considered:
- Evolution of the current Datastream & IPStream products
  - Convergence in conveyance – see separate section below
  - Evolution of broadband end user access

*Evolution of Datastream & IPStream*

- 4.74 As discussed above there are currently two broadband wholesale products which can be used to provide downstream broadband services. These are:
- Datastream, which is essentially a network elements product and as such operators purchase dedicated capacity between DSLAMs and points of interconnect at ATM nodes. This provides operators with the ability to determine how the capacity is used and allows product innovation and differentiation.
  - IPStream, which provides a shared service with traffic from all DSLAMs delivered to a single point. The contention and quality of service is defined as part of the product, and offers limited flexibility for providers to differentiate their services.
- 4.75 What is apparent is that a move to NGNs will result in the removal of the ATM network and as such the ATM interconnect product – DataStream – will cease to exist. Faced with such a prospect it may be considered that a product with similar characteristics to DataStream could be created on NGNs. This may seem attractive as it supports continuity of service, but before pursuing this option it would be wise to consider whether this is appropriate given the characteristics of NGNs.
- 4.76 In reality the DataStream product was a result of the network architecture that existed at the time. The legacy network architecture consists of a number of discrete levels and this has led to the development of the WBA and intermediate levels and their respective products DataStream and IPStream. However, the DataStream product does provide additional flexibility and control that is not available on IPStream and this has supported a number of innovations.
- 4.77 One of the main drivers for moving to NGNs is to rationalise the legacy network architecture and as such a NGN can be expected to have fewer levels than its legacy counterpart. Further, NGNs will provide more control over the individual traffic streams, as this is necessary when supporting multiple services on a single converged network.
- 4.78 It therefore seems that a multi-layered broadband product structure on a NGN could be unnecessary and potentially reintroduce inefficiencies that the

NGN is intended to remove. Ideally, a next generation bitstream product would improve on the current situation by offering the following characteristics:

- Complementary to LLU, ie promotes broadband competition in geographies where LLU is not effective. Currently, DataStream does not fulfil this role, because of the scale economies present with purchasing dedicated capacity to each DSLAM. To successfully address the geographic issue it seems likely that a next generation product would need to provide some form of capability to aggregate traffic across multiple MSANs.
- Allow all operators to benefit from the increased economies of scale and scope provided by NGNs.
- Ability for operators to differentiate their services, as this should support greater innovation and competition in downstream broadband markets. DataStream currently allows this, but IPStream is less flexible. This suggests a new bit-stream product may allow sufficient control over, for example, contention and quality of service (eg delay).
- Provide an appropriate incentive for operators who deploy their own infrastructure (see 'distance gradients' below). The current DataStream charging structure provides a very limited incentive, and IPStream provides no incentive at all because all traffic is charged at the same rate regardless of where it is delivered.

4.79 Finally, the current structure of products and regulation effectively creates multiple margins within a single value chain (ie the margins between Retail broadband to IPStream to DataStream to LLU). Our principle of focusing regulation suggests that it may be desirable to focus on a next generation bitstream product that does not create multiple margins within the same value chain.

#### *Broadband end user access*

4.80 The move to NGNs may allow evolution in broadband end user access, potentially allowing alternative providers to have greater control of the end user service. This might offer an alternative provider the same control over the capabilities of the broadband access line as BT would have, for example by being able to directly configure the broadband line card for parameters such as:

- upstream and downstream data rates
- the quality of the service

4.81 This would be similar to the evolution envisaged for next generation narrowband access, ie it would be a broadband equivalent for MSAN voice access. The benefits might be to allow greater differentiation and innovation in broadband services. Assuming that such a service supported equivalence of input, it could also allow alternative providers to replicate any new broadband access features that BT could introduce, and hence reduce the need for regulation of those features.

**Figure 4: Comparison of Datastream, IPStream and possible future bitstream**

Functionality	Datastream	IPStream	Future?
Rental and ability to bill b/b access line	EUDP	✓	Future broadband end user access?
Control of b/b access line	✗	✗	
Conveyance from MSAN/DSLAM to POI	✓	✓	Future bitstream backhaul conveyance?
Ability for CP to control contention	✓	✗	
Ability for CP to control quality	✓	✗	
Economic for low density areas	✗	✓	
Pricing reflects multiple POIs	✓	✗	

*Next Steps*

4.82 Under BT’s Consult21 meetings there is the opportunity for industry to shape the future bit-stream product(s). Separate to this Ofcom will be reviewing the wholesale broadband access market in 2006 which will take into account the above issues to the extent they are expected to impact of the market within the timeframe of that review.

**Converged backhaul**

4.83 The above section on market evolution noted that the move to NGNs might support a convergence of backhaul conveyance markets (ie backhaul with some degree of aggregation and sharing). Related to this is the potential convergence of conveyance products and the separation of conveyance from the services provided over them. At present, products that incorporate an element of backhaul conveyance include:

- Call origination and local-tandem conveyance. These provide the conveyance of narrowband calls between remote concentrators, local exchanges and tandem exchanges.
- Datastream. This includes bitstream conveyance between DSLAMs and ATM nodes and supports downstream broadband services.

4.84 A future converged backhaul conveyance remedy might take a number of forms:

- A single conveyance product with sufficient flexibility and control of its quality of service characteristics (presumable via some form of API) to support all downstream services, including narrowband voice, broadband internet and new services such as video streaming.
- A ‘menu’ of conveyance products each with different quality characteristics. For example, one could imagine separate categories of

services with 'best effort', 'assured throughput', 'low latency' and 'high availability' characteristics.

- 4.85 Even if a 'menu' approach were taken, the key change would be that conveyance would no longer be service specific, ie it would be de-coupled from the service provided over it and independent of the access product (eg broadband or narrowband) it is combined with. Specific services might have requirements for particular characteristics from the underlying conveyance service, but would not be tied to it.
- 4.86 The implications and benefits of such an approach might be far reaching:
- It could enable voice over broadband services to offer equivalent quality and reliability as 'PSTN replacement' services.
  - It could enable differentiation in the quality of service used for the conveyance of voice calls, ie higher or lower than today's PSTN voice. This could provide greater opportunities for providers to innovate.
  - It could avoid the need for new service-specific wholesale conveyance products to be supplied each time a new downstream service is launched, possibly allowing greater opportunities for innovation and competition in new downstream services.
  - It could eliminate the potential for arbitrage between narrowband and broadband services, and more generally.
  - It would make the price versus quality trade-off between best-effort and 'high quality' conveyance much more explicit, and allow consumers to make this trade-off.
- 4.87 For dedicated point-to-point backhaul, there are a number of existing products that provide dedicated capacity between local access (MDF) sites and larger sites higher in the network hierarchy (eg tier-1 SDH nodes and tandem exchanges), These include:
- Alternative interface products. This includes Backhaul Extension Services (BES) which provide backhaul from LLU sites and hence support competition in related downstream services including broadband internet, leased lines and other business services.
  - Traditional interface products. These include PPC terminating segments which provide dedicated capacity between a local serving exchange and a node on BT's trunk network or another communication provider's network. Their purpose is to support competition in the provision of retail (traditional interface) leased lines and other business services by providing wholesale access to those parts of BT's local access network for which it would be uneconomic for others CPs to physically replicate.
  - Narrowband Interconnect Extension Circuits (IECs). These provide dedicated backhaul capacity for narrowband calls between points of interconnect, typically between DLEs and tandem exchanges.
- 4.88 As the network converges, backhaul requirements for narrowband calls are likely to look very similar to backhaul for any other type of downstream service. Hence, next generation voice interconnect may not require a voice

specific backhaul product like IECs, and instead may rely on a converged backhaul product.

- 4.89 As part of implementing BT's Undertakings, Openreach is required to offer new backhaul services: Traditional Interface Leased Line Backhaul Product (TILLBP) and Wholesale Extension Service Backhaul Product (WESBP) by September 2006. The WEBBP Ethernet-based backhaul products are expected to be used by BT for 21CN backhaul, and may also be used as the 'converged backhaul' element of other NGNs.

*Next steps*

- 4.90 Ofcom intends to undertake a 'converged backhaul' review, starting in Spring 2006 which will include further consideration of the above issues for next generation backhaul. This will be related to, and consistent in approach with, our broadband market review and future leased line reviews.

**Converged access**

- 4.91 A future scenario for narrowband and broadband end user access might be a converged access product, where an alternative provider would take over a line and the associated 'combi' line card in the MSAN and have the option of using the line for narrowband and/or broadband access.
- 4.92 This might be a result of finding a converged access market, ie if narrowband and broadband were found to be in the same market, then a converged remedy might follow. However, even in absence of a converged market, there might be competitive benefits from providers taking over (and paying for) both the narrowband and broadband capabilities on the line. This is because this approach could give alternative providers the same flexibility as BT in offering innovative packaging of broadband and narrowband services. In particular, it could allow alternative providers to offer 'broadband dial-tone'<sup>6</sup> to their narrowband customers in the same way as BT (another example might be the provision of pay-as-you-go broadband internet services).

*Next steps*

- 4.93 Ofcom intends to undertake a 'converged access review, starting in 2007 which will include further consideration of the above issues.

**Network intelligence**

- 4.94 Respondents to our consultation generally agreed that network intelligence was an important area where there ought to be further debate in the future. There was also some agreement on the principle of when access should be provided, ie when network intelligence was associated with BT's SMP and could not be independently replicated by alternative providers.
- 4.95 However, although some respondents found the analysis in Annex G of our consultation a helpful start, the general view was that it was too early to identify all the issues and not yet possible to have a detailed debate on them.

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<sup>6</sup> Broadband dial-tone refers to the potential ability of consumers to plug a broadband device into their phone line and immediately subscribe to a broadband service



*Next steps*

- 4.96 In line with industry views, we agree that this is an important area but that it would be premature to launch further work at present. In particular, the precise questions that it would be necessary and appropriate for Ofcom to address in this area are not sufficiently crystallized, for example in the way they are starting to for new forms of voice access and interconnect. In chapter 3 we propose that the scope of the new NGN industry body include the consideration of network intelligence issues. Therefore, our approach is to keep this area under careful review, in order to assess what and when it is necessary for Ofcom to embark on more detailed policy work.

**Depth of interconnect and distance gradients**

- 4.97 A cross-cutting issue relevant for conveyance and backhaul services is the depth and location within the network at which interconnect is possible. At present, this varies depending on the type of product:
- For narrowband, interconnect is possible at local or tandem exchanges
  - For broadband, interconnect is possible at ATM nodes
  - For PPCs and leased lines, interconnect is possible at nodes within BT's SDH network
- 4.98 The issue to be addressed for NGN interconnection products is whether interconnect will be possible at only metro nodes, all MSANs, or just Tier-1 MSANs (approx 1100 sites). Ofcom's strategy is to promote competition at the deepest level of infrastructure where it will be efficient and sustainable. However, whether competition will be sustainable at any given depth will depend on the relative pricing of interconnect products at different points in the network (sometimes referred to as the 'distance gradient'). For example, current pricing of narrowband interconnection provides an incentive for providers to interconnect at BT's DLEs, but there are weaker incentives for broadband interconnect products. What distance gradients look like in NGNs is a fundamental question on which the case for deep interconnect will depend.
- 4.99 The move to NGNs, typically based on an IP based core, often raises arguments about the 'death of distance', ie whether the economics of IP networks means that the cost of transmitting information becomes effectively independent of distance. On the other hand, distance does seem to be a significant factor in some cases, eg the costs of civil engineering for new network build are clearly distance dependent.

*Next steps*

- 4.100 Because the approach taken to distance gradients is likely to be a fundamental factor for the extent of sustainable infrastructure competition and the viability of different types of interconnect product (ie MSAN verses metro node interconnect), Ofcom has appointed independent economic consultants ("DotEcon") to study the effect of NGNs on distance gradients. We hope to publish their findings in March 2006.

**Summary of next steps**

- 4.101 Our planned next steps for the issues discussed above are summarised in the table below.

**Figure 1. Ofcom's work to develop the ex ante framework for NGNs**

<b>Issue</b>	<b>Next steps</b>
Market and product convergence in backhaul	To be considered in converged backhaul market review starting in Spring 2006.
Market and product convergence in access	To be considered in 2007 converged access review
CPS, WLR, IA and future narrowband access	To be considered in voice access and origination market review starting towards the end of 2006.
Evolution of narrowband call conveyance	Issues to be addressed as part of independent study into distance gradients, converged backhaul market review and voice access and origination market review.
Next generation wholesale broadband	To be considered in 2006 broadband market review
Implication of NGNs for distance gradients	Publish independent study on NGN distance gradients (March 2006).

## 5. Taking forward NGN consumer protection issues

### Introduction

5.1 Our consultation set out three consumer protection principles for NGN migration and described a number of wider NGN issues, many related to consumer protection. This section sets out how we intend to take these issues forward.

### Consumer protection principles for NGNs

5.2 In our consultation we proposed that:

- The services offered to consumers on NGNs should at least be equivalent to their existing services;
- Consumers should suffer no detriment during the transition to NGNs, for example due to loss of access to emergency services, or degraded call quality; and
- Any changes to end user services are fully explained to consumers.

5.3 Most respondents agreed with the principles and thought it important that consumer protection issues and the communication programme in particular were addressed on a wider basis by the whole industry. Ofcom still believes these are the right principles and has addressed specific comments on them in Annex B.

5.4 In considering how best to apply these principles and take forward specific issues, we recognise there is a balance between:

- Those aspects of consumer protection which ought to be in providers' interest to handle effectively, eg avoiding service problems during the NGN migration;
- Areas where improved consumer protection ought to be a natural consequence of a well-designed NGN. For example, the deployment of NGNs should be able to support an improved implementation of number portability; and
- Those areas where there may be a case for greater Ofcom involvement, and perhaps more formal intervention.

5.5 Therefore in general, where communication providers have some incentive and ability to address consumer protection issues, our initial approach is to monitor progress as a critical observer. However, this means that if communication provider actions do not seem sufficient to adequately address these concerns, we will consider the case for greater intervention.

5.6 There are several general conditions of entitlement which impose technical constraints on network design in order to protect consumers (for example General Conditions 1-5, 17, 18). We expect to review these general conditions during Autumn 06, since there are a number of policy projects currently underway which might impact on these conditions. If any formal

intervention is required in relation to NGN issues, we propose to consider this in the context of this review.

## **Consumer protection issues**

### **Managing potential service disruption during network migration**

5.7 The complexity of NGN migration means that technical co-ordination between providers is extremely important. Ofcom believes that all providers have strong incentives to ensure that their customers experience the minimum level of disruption during the migration. More importantly, formal intervention or direct Ofcom management is unlikely to be a simple means of addressing this, as managing the migration will require extremely thorough and detailed co-ordination between providers. This is currently within the remit of the Consult 21 Implementation & Migration working group. Our approach is therefore to monitor and contribute as necessary to the established industry mechanisms.

### **Communication to consumers about the migration**

5.8 As above, providers should have incentives to ensure that there is appropriate communication to consumers about NGN migration. Ofcom is currently participating in the Consult 21 Communications Group to help ensure that all end user customers get clear and consistent messages, regardless of which provider they subscribe to, and can access a contact point where they can raise queries and get objective information.

### **Management of end-to-end call quality over interconnected NGNs**

5.9 Although providers should have incentives to provide high quality services to their customers, there is a potential externality where the actions of one operator could have a negative impact on the end-to-end call quality for customers of other operators. Ofcom understands that the existence and extent of end-to-end quality issues may be dependent on multiple factors, for example:

- Which network operators roll out NGNs and when
- The availability of IP interconnect products and rate of migration from existing TDM interconnect to IP interconnect
- Routing for transit and number portability
- Choice of different coding standards (codecs) by different networks
- End user equipment, for example use of cordless handsets and hand-free headsets

5.10 There are two implications. First, the potential complexity means that this is not an issue that is amenable to a straightforward regulatory solution, for example it would be very difficult and undesirable for Ofcom to specify a particular technical implementation. Second, there will need be successful multi-lateral co-ordination to effectively address this. Current industry activity related to this issue is:

- Specification of technical criteria to support end-to-end QoS, including delay, echo cancellation etc. This is being addressed by the NICC end-to-end QoS group.
  - Development of more efficient routing architectures, in particular for ported numbers. This is currently being considered by the NICC routing architectures group.
  - Development of IP interconnection for narrowband voice may also address some QoS concerns. Development of technical and product aspects are currently being addressed by NICC and Consult 21 respectively.
- 5.11 Ofcom supports this important existing work, but considers that there are two further aspects. First, given the potential complex inter-dependencies between several factors, there may be benefit in some additional overall co-ordination and management of this issue by the new multi-lateral NGN industry group (see Chapter 3).
- 5.12 Second, to help objectively identify whether and to what extent the move to NGNs has any impact on end-to-end call quality, we believe it is important that quality is measured before, during and after the migration. To ensure that any consumer issues can be adequately monitored and understood, these measurements should include perceptual quality of service. We are planning to commission some independent research in order to ensure that we have adequate benchmark data to support the objective monitoring of this issue.

### **Emergency call prioritisation**

- 5.13 The purpose of the Government Telephony Preference Scheme (GTPS) is to provide communications priority for key responders in the event of an emergency. However, the current implementation severely restricts access to the network by other users during an emergency. There is therefore a need to upgrade and extend this capability (known as Enhanced GTPS) and a NICC working group has been established to develop the necessary technical standards. We believe there is a strong commercial incentive for providers to support enhanced GTPS requirements when deploying their NGNs, as this is generally a requirement for the provision of services to government and private industry involved in operation of critical national infrastructure. At this stage we do not believe that pro-active intervention from Ofcom is necessary, but will continue to monitor this issue.

### **Text relay services**

- 5.14 Ofcom supports the continued availability of text relay services to customers connected to NGNs. Looking further ahead and thinking about future capabilities that NGNs might enable, have commissioned a study into the feasibility of alternative relay services, for example video relay.

### **Emergency call location**

- 5.15 As we move to NGNs with nomadic and fixed-mobile services, the method for obtaining reliable location information for emergency services will need to evolve. There is currently a requirement for Publicly Available Telephone

Services to provide this information where technically feasible. Ofcom believes there are two aspects to addressing this issue. First to develop the technical means to provide this information for IP networks – this is currently being addressed by a NICC workgroup in which Ofcom is participating. Second to ensure consumers are adequately informed where this information is not being provided – this is addressed by the guidelines that the industry has developed for new voice services. Ofcom is consulting on these guidelines in the context of its consultation on VoIP regulation.

### **Number portability**

- 5.16 Some respondents to the consultation were sceptical that existing providers had sufficient incentive to improve number portability. The technical aspects of future number portability are currently being considered by the NICC routing architectures group. As NGNs are rolled out, Ofcom believes there to be an opportunity to support an improved approach to number portability, in terms of efficiency and ability to protect consumers in the case of communication provider failures (as discussed in previous Ofcom documents).
- 5.17 Ofcom would like to take a co-regulatory approach to moving to an improved number portability solution and think that many providers should have an incentive to do so. At present there would not appear to be a need for a greater Ofcom intervention. However, as part of the review of General Conditions planned for later in 2006, we will consider whether this approach is sufficient or whether a stronger approach, for example, modification of the number portability general conditions might be necessary and proportionate. Such modifications would not set out the detailed technical specification of a new implementation of number portability, but they might specify some overall performance metrics such as:
- That portability be provided in a manner that is resilient to any failure in the donor's network.
  - That portability be provided within a specified timescale.

### **Network integrity**

- 5.18 In our previous consultation on New Voice Services<sup>7</sup>, we proposed the withdrawal of the existing essential requirements guidelines on network integrity. One reason for this is that the guidelines were originally drawn up in the context of traditional PSTN networks, and we do not believe it is appropriate or practical for Ofcom to update these to provide specific guidance for designing NGNs. Our recent consultation on the regulation of VoIP services<sup>8</sup> confirmed the withdrawal of the essential requirements guidelines in favour of applying the 'reasonably practicable' test set out in General Condition 3. In addition we provided guidelines on network integrity for VoIP providers in order to meet their obligations when offering PATS. In relation to 'Critical National Infrastructure' (CNI) issues, we take note of and continue to engage with other bodies, for example, the cabinet office and the Telecommunications Industry Emergency Planning Forum (TI-EPF).

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<sup>7</sup> See [http://www.ofcom.org.uk/consult/condocs/new\\_voice/anev\\_voice/](http://www.ofcom.org.uk/consult/condocs/new_voice/anev_voice/)

<sup>8</sup> See "Regulation of VoIP Services" <http://www.ofcom.org.uk/consult/condocs/voipregulation/>

### **Social alarms and telecare systems**

- 5.19 One respondent to our June 2005 consultation emphasised that most social alarms use DTMF tones for signalling and control information and for many products the tone duration is critical. Ofcom agrees that it is important that NGNs continue to faithfully convey these tones and notes that there is already a requirement on communications providers to support end-to-end DTMF signalling under General Condition 16. Therefore, our view is that this best taken forward through discussions, where necessary, between social alarm suppliers and providers of NGNs.

### **New consumer issues**

- 5.20 Several respondents suggested that other issues were likely to emerge in the future and identified some potential NGN issues to be considered. Ofcom believes it is important to pro-actively identify and where appropriate address these issues. In many cases, these may be similar to problems that already exist in for Internet services, for example:

- Mis-use of NGN services that causes harm to consumers, for example 'SPAM over Internet Telephony' (SPIT).
- Potential for fraud and identity theft.
- Privacy concerns and potential for mis-use of personal information (eg through greater personalisation capability provided by NGNs).

- 5.21 As the nature of future services becomes clearer we will undertake research and analysis to understand and assess any risks to consumers, and where appropriate, consider if and how those risks need to be mitigated. As a first step we have raised these issues in the context of our recent consultation on VoIP services<sup>9</sup>.

### **Continuity for large business customers**

- 5.22 Large business customers often have much more demanding and complex requirements than residential consumers and small businesses. They are also likely to be able, and want, to engage in a constructive dialogue about future network changes to ensure their business needs can continue to be met. In this situation, we believe that close commercial engagement between the affected businesses and their communication providers will be the best approach.

- 5.23 A particular example of a business sector with significant communication requirements is the energy industry. This sector has been particularly proactive in thinking through potential implications of NGN migration at an early stage and we support their continued engagement with BT and other suppliers to effectively address their concerns. Ofcom will continue to monitor this process closely (see also annex B).

### **Summary of next steps**

- 5.24 Our planned next steps for the NGN related consumer protection issues discussed above are summarised below.

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<sup>9</sup> See Regulation of VoIP services <http://www.ofcom.org.uk/consult/condocs/voipregulation/>

**Figure 2. Taking forward NGN related consumer protection issues**

<b>Issue</b>	<b>Ofcom's Next steps</b>
Service disruption during NGN migration	Monitor the effectiveness of the responsible industry group (currently Consult 21 Implementation and Migration Working Group) and contribute where necessary.
Communication to consumers about NGN migration	Continue to participate in the industry communications working group.
Management of end-to-end call quality	Work with industry to ensure there are adequate processes to manage and co-ordinate this issue.
Emergency call prioritisation	Continue to monitor this issue
Text relay services	Commission a study into feasibility of alternative relay services
Emergency call location	Monitor technical work and address in VoIP consultation.
Number portability	Review as part of General Conditions review.
Network integrity	Withdrawal of the essential requirements guidelines in VoIP consultation in favour of relying on the reasonably practical test in General condition 3.
Social alarms and telecare systems	If necessary, we will help to ensure there is adequate dialogue between NGN providers and telecare system suppliers.
New NGN related consumer issues	Considered in recent consultation on VoIP services. Further research and analysis to understand future risks to consumers.
Continuity for large business customers	Support pro-active engagement between affected customers and their suppliers.



# Annex A Summary of comments on consultation

## Introduction

A.1 This annex summarises the main comments made on the proposals made in our June 2005 consultation. The responses to some questions are grouped together where they are related. It does not cover responses about BT's Undertakings as these were considered at part of our Telecoms Strategic Review and statement on BT's undertakings.

## General comments

- A.2 Respondents were generally supportive of Ofcom's moves to create a policy and process framework. BSG, Ericsson and H3G in particular emphasise importance of clear policy framework to support investment.
- A.3 BT thought that the consultation appeared to strike right balance between industry and Ofcom's responsibilities for addressing the move to NGNs. They considered it essential that issues relating to BT's NGN are firmly set in context of proposed undertakings.
- A.4 Several respondents agreed with our approach of not becoming increasingly involved in the detailed management of NGN migration, however, there were calls for us to:
- monitor all aspects of industry discussions around 21CN design and development
  - take more proactive role where appropriate, ie where issues are starting to become better understood.
  - be "hands-on" during the setup phase of the industry processes

## Scope of consultation

- A.5 Some respondents recommended areas that needed considering further which they felt were not address sufficiently by the consultation:
- Next generation access.
  - Demand side issues.
  - Radio access to NGNs.
  - Critical Nation Infrastructure and law enforcement
  - Exchange of network intelligence information.
  - International issues.
- A.6 Some respondents called on us to undertake timely market analysis and full market reviews where necessary to ensure regulatory certainty, noting that NGN architecture could make the existing market definitions obsolete.

## Migration

A.7 Several specific comments were raised about migration:

## Next Generation Networks: Developing the regulatory framework

- Migration principles in initial UKCTA response are crucial and should be revisited.
- Concerned that no equivalence will be applied to the migration process.
- Commercial and contractual framework needs to be agreed in advance of Pathfinder
- Essential that there is a complete set of fit for purpose migration paths from today's products to future products at all levels of value chain. Where providers are effectively forced to migrate, this should be financially neutral.

### **MSAN interconnect**

A.8 Comments made on MSAN interconnect included :

- Concerns about the principle of MSN interconnect, including its impact on LLU, and its additional cost.
- Until sufficient information is available to support the analysis of where MSAN interconnect is required, BT should not make any design decisions which would preclude such interconnect.

### **Impact on electricity industry**

A.9 The Energy Networks Association (ENA) explained the problems the industry will face in securing suitable private wire services for operational high voltage protection equipment. Specific comments raised were:

- The risk to protection services is very real and requires immediate clarification.
- Their members are still in loose terms 'telecoms network operators'. Although the telecoms networks built for operational purposes by the utility companies do not carry income generating public communication services, the network is essential for compliance with DTI licensing and Ofgem regulatory requirements.
- The consultation addresses the interests of other communications providers, but not corporate companies with private legacy networks.
- The possible impact on electricity industry's ability to support the Critical National Infrastructure must be considered and monitored by Ofcom.
- If protection services cannot be delivered via 21CN it will be necessary for the energy industry to consult Ofgem regarding recovery of very significant costs for alternative telecoms solutions.

A.10 Scottish and Southern Energy similarly expressed concerns that BT may not continue to support or provide a replacement for retail low bandwidth traditional interface leased lines (up to and including 8Mbps) in the migration to NGN, resulting in costly and severe operational consequences. They believe there is a continuing role for a strong regulatory framework governing BT's investment in NGN technology.

**1. Do you agree with Ofcom's proposed approach for the charges of narrowband voice SMP products provided over next generation interconnects?**

- A.11 Many commented thought the overall approach seemed reasonable. However, several stressed the need for certainty and for further pro-active Ofcom work rather than wait until inconclusive and potentially time consuming 'negotiation' has stopped. Kingston suggested our priorities should be policy work to identify NGN cost drivers and development of a detailed cost model for 21CN based on BT's actual costs.
- A.12 Several respondents did not agree because they viewed that it penalised operators who want to enter voice market by moving straight to new technology.
- A.13 Others thought elimination of arbitrage is not a justifiable objective in its right, that it could be natural consequence of different technologies and cost basis and should not be regulated against per se. Some questioned how existing and new voice interconnection charges could be compared if they had different structures.
- A.14 Many queried the practical implementation of the approach, thinking it would be far from straightforward, and desired further clarification. BT provided more detailed input over the specific questions that will need to be addressed to turn the concept into a workable model.
- A.15 Two respondents considered that the approach was inconsistent with the Network Charge Control.
- A.16 BT thought that to achieve consistency it may be desirable to apply the holistic approach wider than narrowband voice because NGNs will support a wide range of products.

**2. Do you agree with the overall approach that there needs to be continuity for existing SMP products, but that it would not appropriate to continue them indefinitely?**

**3. Do you agree with the general criteria Ofcom has proposed for the withdrawal of legacy SMP products after an interim period?**

- A.17 Nearly all respondents agreed with principle that there needs to be continuity for existing SMP products, and that it would not appropriate to continue them indefinitely. Specific comments were:
- Some products should remain indefinitely, in particular LLU
  - Between now and completion of 21CN national rollout, legacy products should continue to be updated and improved so that they remain fit for purpose .
  - Continuity should not indemnify Communication Providers against normal commercial uncertainty.
  - Industry demand for legacy product and adequacy of next generation product are linked, ie BT needs to offer commercially attractive products to entice, rather than force people to move.

- A.18 There were several comments on improving the proposed criteria for withdrawal:
- Ofcom should undertake a series of market reviews to decide on product withdrawal and should not pre-judge that process
  - More clarity and detail needed on the criteria for withdrawal to create investment and business planning certainty. In particular the meaning of 'where practical' 'adequate replacements' / fit for purpose raised several questions and concerns
  - Wide use of next-generation products alone would not constitute conclusive evidence that next-generation products were necessarily adequate
  - Consultation alone should not be taken into account at all and better to say that legacy products may not be removed unless it is reasonable to move to next gen products
  - Should not be withdrawn until replacements available *nationwide*
  - Vital to consider migration costs and processes, specifically:
    - Withdrawal must be co-operative process
    - BT should also pay any relevant migration charges when moving its own customer base to ensure equivalence
    - Compensation needs to include soft costs like project management and development of alternative system interfaces
    - Important that migration processes have been certified as fit for purpose by alternative providers
    - Availability of acceptable, zero-cost migration should be a pre-requisite for third criterion to apply
- A.19 ISPA commented on the withdrawal of FRIACO specifically. They would not agree to the withdrawal of FRIACO and other wholesale narrowband products until consumers no longer demand wholesale narrowband products; the industry reaches the point where it no longer makes commercial sense to continue offering a flat-rate narrowband product; and wholesale broadband products are considered able to support sustainable competition and provide an effective "substitute" for flat-rate narrowband services.
- A.20 The ENA did not agree with proposed approach. The electricity network needs private wire services for protection and control services, which depend on deterministic performance of current network. They wish to have sensibly realistically priced existing or fully equivalent services continued for at least a further 25 years to allow for realistic development and asset replacement timescales. Similarly, Scottish and Southern Energy considered that users of such products should be protected from having to migrate to an NGN product that does not provide a similar level of service at similar or lower cost. BT should continue to support these products.
- A.21 They were also concerned that number of private wire services used by electricity industry may not be sufficient to be classed as 'reasonable

demand' and that migration to an NGN product may not be possible due to specific requirements of protection and control systems.

**4. Which network intelligence capabilities are likely to be associated with the underlying network where BT has SMP and cannot be independently provided by alternative providers, and why? (including network intelligence aspects of Q5)**

5.25 Respondents to our consultation generally agreed that network intelligence was an important area where there ought to be further debate in the future. There was also some agreement on the principle of when access should be provided, ie when network intelligence was associated with BT's SMP and could not be independently replicated by alternative providers.

A.22 However, although some respondents found the analysis in Annex G of our consultation a helpful start, the general view was that it was too early to identify all the issues not yet possible to have a detailed debate on them. Some respondents felt that they could not make further comment without knowing more detail of BT's plans, while others stated that it had an impact on the comments they could make. The following specific points were made:

- network intelligence “hooks” should be provided at the deepest level possible, i.e. at the lowest level of the OSI stack, or at the most appropriate level to meet specific requirements (although security and integrity were noted as issues with deep “hooks”). Deep “hooks” will allow Altnets to design innovative and competitive services, “Hooks” that are shallower level allow for less innovation.
- A number of respondents expressed concern that BT is implementing the 21CN as a vertically integrated operator, which has two effects:
  - BT's wholesale products will be tailored specifically to the requirements of BT Retail and will not take into account the requirements of Altnets.
  - BT Retail may have access to network “hooks” prior to Altnets allowing them to leverage network intelligence capabilities based on their existing subscriber base. This would not necessarily be as a result of strategy on BT's part, but a result of slow progress in the process for defining the required wholesale products throughout the industry. It was also stated that the same set of products and should be available to Altnets as those available to BT Retail. Some respondents stated that BT Retail should not be permitted to offer services until wholesale products are available across the industry.
- Some respondents proposed that network intelligence should be available to all network operators/service providers through a federated network intelligence model.
- Equivalence of Input for network intelligence is easier to provide, with the migration to 21CN, than at any other time previously. The use of standardised interfaces and middleware makes third party integration relatively simple.

- Equivalence of Input to OSS is just as important in order to provide high quality managed services, however, it is currently not feasible to define requirements as the details of the OSS architecture, open interfaces and supported products are not yet decided.
- One respondent stated that Equivalence of Input to network intelligence capabilities provided an opportunity for the implementation of a central database approach to number portability.
- Access to location information is essential to Altnets in the provision of emergency services. PATS obligations state that a provider must where technically feasible make location information available to emergency services.
- There were varying views expressed about the provision of some network intelligence capabilities, in particular presence, with some respondents believing that these capabilities could be provided at the application level as it is now with for example messaging services, while others stating that it should be provided centrally at the network level.

**5. What are your views of the practical implications of applying Equivalence of Input to NGNs (eg in relation to MSAN interconnection, end-to-end quality of service, and depth of network hooks)?**

Many alternative providers emphasised that Equivalence of Input (EoI) is vital and that anything other than EoI for SMP products should be exception rather than rule. BT thought it was difficult to reach definitive conclusions at a time when crucial areas of functionality and performance remain undefined.

Several providers raised concerns that by identifying practical implications of EoI, Ofcom was giving BT the option of not applying EoI and believed this should not be foreclosed in advance of detailed analysis. On the specific examples mentioned:

- MSAN interconnection - see general comments
- End to end QoS. Two respondents thought that if this cannot be achieved today then, it should be made available in future and BT needs to publish a product roadmap,
- Network hooks. Some respondents were concerned that annex F implied that network hooks would be difficult to provide on an EoI basis.

**Q6. Do you agree with the issues Ofcom has identified that need to be addressed by all communication providers as they move to NGNs and what others are there?**

A.23 Nearly all providers agreed with the issues Ofcom had identified and offered a number of comments on specific issues. Many suggested that others were likely to emerge in the future and Ofcom should take a flexible approach. Comments on specific issues raised in the consultation were:

- **End-to-end quality.** Some providers thought that quality could or would be negatively impacted. Vodafone suggested that an 'NGNCo' should seek to avoid this.
- **Number portability.** ITSPA and others the opportunity presented by NGNs to move to a new solution for number portability was very important. However, some were concerned about the lack of incentive of established players to improve the current system.
- **Emergency call prioritisation.** COLT welcomed the opportunity to use an enhanced EGPTS service and NICC strongly recommended that a UK technical standard needs to be developed if EGTPS is to be implemented.
- **Text relay.** One respondent suggested whether NGNs can bring wider benefits beyond what is currently proscribed under existing framework.
- **Interconnect model.** Kingston believed that the architecture for interconnect must evolve predominantly through commercial negotiation, but cautioned a move to exchange point architecture until cost drivers are understood and noted traffic, fraud and security vulnerabilities. Vodafone suggested 'NGNCo' should develop new charging models & principles as soon as possible.

A.24 The following additional issues were mentioned:

- Essential Requirements and security, including mains independence, alternative and diverse routing, separation of services;
- Directory enquiries
- Emergency calls in power outages
- Location based services
- Customer service management
- Support of conference and video calls

**7. Do you agree with the policy principles Ofcom has identified for consumer protection during the move to NGNs?**

A.25 Most respondents agreed with the principles and thought it important that the consumer protection issues and the communication programme in particular were addressed on a wider basis by the whole industry. Alternative providers generally thought that this communication should be agreed so to ensure it did not favour one particular party.

- Several providers thought the first principle, to ensure services offered to consumers on NGNs was at least equivalent to existing services was impractical and inconsistent with policy on new voice services.
- BT and others thought it was important to give consumers the ability to trade off price versus quality, eg 'best effort' calls and a slightly higher price for guaranteed level of service.
- Kingston and others warned about deterioration in the consumer experience (eg E2E QoS)
- Some concerns were raised the potential for compatibility issues between BT's MSANs and current installed base of broadband modems.
- Privacy, safety, fraud protection, intrusion mitigation were raised as additional consumer concerns
- ENA and Scottish & Southern would like these principles to apply to all BT products and not just those mentioned in document.
- Need to explicitly consider large business customers, as their needs and technical competency are different from residential / small business.

#### **8. Do you agree with the overall processes for developing 21CN obligatory products?**

- A.26 The main theme of responses from alternative providers was that the proposed high level process seems quite sensible, but that it is important it is translated into a workable and formalised operational process, eg with defined timescales.
- A.27 Several respondents noted issues over the timing of the process, particularly the need to resolve the issues quickly and the timing of market reviews. BT suggested it would be preferable for Ofcom to provide a clear policy steer on cost-orientated pricing approach *prior* to commercial negotiation.
- A.28 Ericsson noted that the development of new interconnect arrangements needs involvement of manufacturers, but that the process does not take into account their needs. Scottish and Southern Energy expressed concern that there should be more explicit protection end-users of BT products, including all changes being discussed with end-users. ENA believed Ofcom should provide greater regulatory support to the electricity industry and that BT should commit to discuss a technical solution with Electricity Network Operators.



**9. Do you believe that there is a need to co-ordinate and steer cross industry NGN issues which is not met by existing bodies and process?**

**10. Do you agree that there is a need to co-ordinate the planning and implementation of NGNs on an industry wide basis?**

**16. What are your views on the establishment of a new multi-lateral industry group to address NGN issues, its terms of reference and governance arrangements?**

#### **The need for a new NGN industry body**

- A.29 Nearly all respondents who commented on this agreed there was a need to address NGN issues that was currently not being met by current bodies. One respondent went further, to state that Ofcom should *require* industry to co-ordinate work on NGN and 21CN in a single body as the current processes are too fragmented. No respondents expressly disagreed with the concept of a new industry NGN body, but some cautioned against proliferating fora which might simply add another layer of complexity and bureaucracy. BT noted the reluctance of some companies to share too much information in advance in a multi-lateral forum.
- A.30 Several respondents recommended that we look to the OTA / LLU adjudicator market breakthrough executive as useful model.

#### **Membership / representation**

- A.31 BT, UKCTA, Intellect and others emphasised importance of having clarity over membership, and various respondents called for different stakeholder groups to be represented:
- All communication providers including services providers
  - Equipment suppliers
  - Consumers / end users, including business users.
  - Government
  - Application developers
  - Content providers
- A.32 Several respondents said we should be aware of the resource imbalance between BT and industry in attending industry meetings, particularly for smaller
- A.33 Many wanted a clearly defined scope and remit for the new body and noted potential overlap with Consult 21. The common theme was that there was a need to address 'commercial' and 'policy' issues. Specific issues that respondents believed should be within scope included:
- Consumer interest.
  - Commercial negotiations
  - Contractual issues
  - Policy issues

- Interconnect principles / architecture (although NICC and others expressed concerns that technical architecture work would be responsibility of NGN body rather than NICC).
- Network intelligence
- Interoperability arrangements
- Bottlenecks on fixed and mobile networks other than BT's
- Principles for emergency calls and Number portability

### Co-ordination of NGN planning and implementation

A.34 Responses were split on this question:

- In broad *agreement* that there was a need to co-ordinate NGN planning on an industry wide basis were BT and a few others including equipment manufacturers.
- In *disagreement* were most of the alternative network operators who are likely to implement an NGN: C&W, Energis, Kingston, Easynet, MCI, UCKTA, Telewest. They thought that planning and implementation of most NGNs can be done a bi-lateral basis.

A.35 One respondent believed that Ofcom would be best organisation for NGN planning should any organisation be needed.

A.36 Several alternative network operators called for improvements in the management of BT's 21CN impact on other providers. Kingston recommended improving the existing Consult 21 Implementation & Migration working group, eg developing its terms of reference further, providing escalation routes, and clear plans. In contrast some other providers thought that a new NGN industry body should take over project management and communications for BT's migration to 21CN.

A.37 ENA believes that if NGN migration is going to cause disruption to electricity industry and need additional funding, co-ordination and planning supported by Ofcom and Ofgem will be fundamental to its success.

### 11. Is there a need for a process to address the wider consumer protection issues arising from the move to NGNs?

A.38 The need for this was agreed by several respondents. However some considered that although there was a need for an industry wide co-ordinated communications plan for consumers, they had not identified consumer issues that needed to be addressed by a new process. This was because they were either addressed by regulatory obligations (eg emergency access) or commercial drivers (eg call quality).

A.39 Intellect and others noted that similar services will be provided by different providers utilising different core NGNs or the Internet. As a result similar services may have wildly different qualities, grade of service, security attributes etc. Therefore important that processes are in place to ensure that consumers fully appreciate the characteristic of numerous offerings and can make informed trade-offs.

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- A.40 ISPA believed Ofcom should consult with Consumer Panel and other consumer representatives.
- A.41 One respondent to our June 2005 consultation emphasised that most social alarms use DTMF tones for signalling and control information and for many products the tone duration is critical.

### **12. Has Ofcom identified all the correct industry processes that will be needed to deal with move to NGNs?**

- A.42 Many respondents agreed with this question, with several additionally expressing the need for flexibility and monitoring to address other issues as they arise in the future.
- A.43 BT believes it is important to debate the participants in the NGN industry rather than projecting current industry structure into future, eg does it include VoIP operators, mobile operators, virtual operators, equipment suppliers?
- A.44 ENA referred to their general comment that the fundamental problem with the consultation is that addresses the interests of other communications providers, but not corporate companies with private legacy networks.
- A.45 NICC (supported by Marconi and Kingston) stated that a commercial framework is required for its work. Ideally this framework should come from a single body to avoid the current conflict of priorities it is currently presented with.

### **13. Do you agree that it appropriate for Consult 21 to continue to take responsibility for developing detail of SMP product migration and development of new products?**

There was support for this approach from BT, UKCTA and others, although with caveats from some that:

- if this does not deliver Ofcom should act swiftly to ensure it is put back on track
  - Need to clarify responsibilities and avoid overlap with existing BAU product groups (eg CPS, WLR)
  - Ofcom guidance and advice will be almost certainly needed and active involvement at this stage (for SMP services) may prevent disputes and problems later.
  - Recommended debating wider membership criteria, for example because some smaller providers may wish to have their interests represented by their solution provider partners
- A.46 However there were a few raised more substantive objections, including:
- Consult 21 is not appropriate forum for development of new products
  - The process is very BT centric and does not represent the whole of industry.
  - It focuses on individual products, but does not give 21CN bigger picture context making planning/investment impossible for others.

**14. Do you agree that Consult 21 combined with bi-lateral commercial negotiation and backed-up by Ofcom dispute resolution is the best approach to the agreeing the commercial aspects of new and migrated products?**

- A.47 Although several providers agreed with this, a common caveat was that Ofcom must remain engaged in process, provide guidance and intervene swiftly if needed. Other respondents disagreed with the proposal for various reasons:
- C&W thought that although Consult 21 coupled with existing (eg CPS) groups was probably appropriate to initiate commercial discussions, to reach agreement on terms by many parties will need dispute resolution or guidance from Ofcom.
  - Kingston and Telewest noted that Consult 21 had been slow on commercial negotiations, with little progress made so far and so it remained to be seen whether it will be effective in this role.
  - UKCTA considers there is a need for policy/commercial input into the development of new and migrated products, but Consult 21 cannot provide this input – refer to creation of a new NGN industry body.

**15. Do agree that NICC should continue to be responsible for standardisation of NGN interconnect, but needs to be re-constituted as an independent industry owned body?**

- A.48 Nearly all that responded on this point agreed that NICC should remain responsible for standards. The only two comments on this were that:
- Industry needs to rethink its approach to standardisation - access to network intelligence is as important as standardising interconnect, but NICC is not qualified to deal with commercial discussions on network intelligence.
  - THUS are not convinced that NICC has a role in standardising NGN interconnect and believe this is a role for the international standards bodies and through commercial agreement.
- A.49 Some respondents supported Ofcom's proposals to for reconstitution, however, more saw no compelling reason why NICC needed to be re-constituted as an independent industry owned body, although Vodafone thought NICC would benefit from a wider industry involvement. The objections and reservations raised were:
- NICC is fully capable of developing UK standard technical documentation
  - Some responsibilities proposed for NICC are those of the NRA and not appropriate to an independent industry body.
  - Raises concerns about liability and copyright ownership of its technical output, which to date has been the responsibility of the NRA. Hence, if the NICC were constituted as an independent industry owned body it is unclear where these responsibilities would lie.
  - Current arrangement is efficient, alternative could increase costs while not delivering advantages.

- Although there are outstanding technical issues to be resolved, moving the responsibilities to another body would not change this.
- A.50 Some respondents, whether or not they supported re-constitution, said they would be supportive of any changes NICC chooses to carry out. If it is to be reconstituted, then it should be done speedily, and the following issues addressed:
- **Transparency.** Given that it will be part of a process for discharging Ofcom's statutory duties, its work must be open and transparent.
  - **Fees and membership criteria.** BT and other respondents believed that membership of NICC should remain free so that there is no barrier for stakeholders
  - **Indemnity / legal liability.** It will almost certainly need to be provided with some form of indemnity to potential litigation.
  - **Intellectual Property Rights / Copyright**
  - **Continued involvement from Ofcom.** Several respondents called for Ofcom to remain a key stakeholder to ensure 'fair-play' and prevention of anti-competitive behaviour.
  - **Commercial / policy direction.** NICC will need commercial policy direction, to ensure the correct focus. Some suggested this should be from an NGN industry body.

**17. What are your views on the establishment of a NGN operational dispute adjudicator, its terms of reference and governance arrangements?**

**18. Would your organisation be prepared to sign-up to such an adjudication scheme and abide by the adjudicator's decisions?**

- A.51 Most respondents who commented on this question supported this concept in principle, although nearly all said that they would need further detail before deciding whether they could commit to it.
- A.52 Several respondents raised concerns that the proposed scope of the adjudicator is very narrow, as few operational issues do not give rise to commercial or policy issues. Kingston were particularly sceptical for these reasons saying that they "remain to be convinced that there is sufficient scope for an "OTA" like scheme to be effective". UKCTA believed that upfront and careful planning and preparation could minimise the scope and volume of disputes.
- A.53 Potential models for adjudication suggested by respondents were:
- ACSP endorsed the use of the established industry scheme Communication Providers Adjudication Scheme (CPAS).
  - LLU OTA model, although UKCTA recognised that the OTA had gone beyond pure adjudication. ISPA saw no reason why the current OTA process could not be broadened in scope to tackle NGN issues.

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- Centrica and UCKTA suggested dialogue with Chartered Institute of Arbitrators (CIARB) (they were involved in setting up scheme for UKCTA members)
- NTL propose this should be done by a new single body 'NewCo' with early reference to Ofcom if required

A.54 Other characteristics of the adjudicator/ adjudication process suggested were:

- Need for transparency of the adjudication process
- Flexible enough to accommodate adjudication on multi-lateral basis
- Should be an expert with knowledge of telecoms industry as well as understanding the adjudication process

## Annex B Response to comments on policy principles

### Introduction

- B.1 Many of the NGN policy principles proposed in our June 2005 consultation were implemented by BT's undertakings in lieu of a reference under the Enterprise Act 2002. Our conclusions on these were published as part of our final statement on the Strategic Review of Telecommunications.
- B.2 Therefore, this statement does not consider those policies which were addressed by BT's undertakings. The other policies raised in the June consultation, Ofcom proposed to address through its existing regulatory powers, and there was no corresponding undertaking from BT. These were:
- Holistic approach to next generation voice interconnect
  - Continuity of existing SMP products for interim period
  - Principles for NGN consumer protection
- B.3 The sections below set our response to the main comments received on each of those proposals.

### Consumer protection principles

- B.4 In our consultation we proposed that:
- The services offered to consumers on NGNs should at least be equivalent to their existing services. Ofcom believes that this is anyway a fundamental premise of operators move to NGNs and that NGNs will also allow providers to offer many improved and innovative services.
  - Consumers should suffer no detriment during the transition to NGNs, for example due to loss of access to emergency services, or degraded call quality.
  - Any changes to end user services are fully explained to consumers.
- B.5 Most respondents agreed with the principles and thought it important that the consumer protection issues and the communication programme in particular were addressed on a wider basis by the whole industry. Specific comments on these principles are considered below.

*Ensuring that services on NGNs are at least equivalent to existing services is impractical and inconsistent Ofcom's policy on new voice services.*

- B.6 Ofcom does not believe that all services offered to consumers using NGNs should be equivalent to existing services, indeed that would negate the many potential benefits of NGNs for consumers. Our policy on new voice services explicitly recognises that new services might be different (both due to new features and some technical feasibility issues), and emphasises the role of consumer information to allow consumers to make an informed choice.
- B.7 The intention of this policy is that where a consumer is currently receiving an existing service (ie analogue telephony, broadband) that this should not be degraded as a result of the migration to NGNs.

*Important to give consumers the ability to trade off price versus quality*

- B.8 This is essentially the approach that is possible with new voice services, where a set of guidelines has been developed for the information VoIP providers should supply to their customers to ensure they are informed and protected. Ofcom is consulting on these guidelines in its consultation on VoIP regulation.

*Need to explicitly consider large business customers as their needs / technical competency are different from residential consumers and small businesses*

- B.9 Ofcom agrees with this view. Large business customers often have much more demanding and complex requirements than residential consumers and small businesses. They are also likely to be able, and want, to engage in a more detailed dialogue about future network changes to ensure their business needs can continue to be met.

*Principles should apply to all BT products*

- B.10 ENA and Scottish & Southern would like these principles to apply to all BT products and not just those mentioned in document (presumed to be SMP and universal service products). As discussed below, Ofcom believes that the best way of dealing with these concerns is through dialogue between the energy industry and BT about the particular requirements of the energy industry.

### **Continuity and withdrawal of existing SMP products**

- B.11 In our June consultation we set out our view that whilst there initially needs to be continuity of existing SMP products (those products that BT is obliged to offer in markets where they have Significant Market Power), this should only be for an interim period during which both legacy and next generation products are available. To ensure a timely move to next generation interconnect we proposed that the requirement for existing SMP products reviewed if:

- there was evidence that BT no longer had SMP in the relevant market; or
- there were no longer reasonable demand for the existing SMP product; or
- it is reasonable to move to alternative next generation SMP products.

- B.12 Nearly all respondents agreed with this principle, but offered a number of comments on the criteria for when withdrawal should be considered. The key points raised in response are considered below.

*More clarity and detail needed on the criteria for withdrawal to create investment and business planning certainty*

- B.13 The requirements to provide access products under the Communications Act are subject to a number of legal tests (for example whether there is a reasonable request under Network Access Condition) and therefore any assessment of whether or not they should continued to be regulated will need to apply those. Ofcom cannot fetter its discretion in relation to any specific application of those criteria. The criteria outlined are intended to provide guidance about when Ofcom would seek to review the relevant regulation. We appreciate providers' need for certainty and clarity over this



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process, so will ensure that any proposals for withdrawals are made with significant advance notice, a clear timetable, and suitable migration arrangements.

*Vital to consider cost of migration when considering whether to withdraw regulation from existing products*

- B.14 Ofcom agrees that this would be a relevant consideration when assessing whether the new products were an adequate replacement for existing products.

*Continuation of private wire services*

- B.15 The Energy Networks Association (ENA) and Scottish and Southern Energy did not agree with the proposal. They wish BT to continue to support private wire services for protection and control services, with sensibly priced existing or fully equivalent services continued for at least a further 25 years.
- B.16 Ofcom appreciates that there are complex technology issues and uncertainties with regard to the provision to the electricity industry of fully equivalent services on NGNs. In light of these uncertainties, Ofcom believes that the most appropriate way forward is for BT to commit to a review of future options, and to continue to provide existing services until this review is complete. BT has already made this commitment. In addition there needs to be effective commercial engagement between BT and the electricity industry to ensure a workable technical solution, which fully addresses the concerns of the electricity industry, is developed.

### **Holistic approach to next generation voice interconnect**

- B.17 The approach we proposed for next generation narrowband voice interconnect was that where Significant Market Power (SMP) is found, reasonable charges should take account of the need to avoid creating artificial arbitrage opportunities by taking a holistic approach to cost recovery that avoids distorting incentives, and the need to allow an appropriate return on BT's investment in NGNs. Many respondents thought the overall approach seemed reasonable. The key points raised in response are considered below.

*Need to clarify its implementation and further develop the NGN charging regime*

- B.18 Ofcom agrees that the proposal in our consultation was a high level principle and that there will be many other aspects to consider for NGN charging. Some of these are expected to be considered by the new NGN industry body, whilst we would expect to address more detailed implementation aspects in context of considering specific charges.

*Elimination of arbitrage is not a justifiable objective in its own right. It could be a natural consequence of different technologies and cost basis.*

- B.19 Ofcom agrees that arbitrage, ie profiting from a price discrepancy, can be beneficial as it tends to place pressure on prices to reflect costs more closely, which is an important function of markets. For example, arbitrage has occurred in trading of international minutes, due to differences between

agreed international accounting rates and efficiently incurred cost<sup>10</sup>. The aim for this policy is to ensure that charges for NGN and NCC products enable recovery of relevant costs in a consistent way. An inconsistent treatment could distort usage patterns and possibly undermine overall cost recovery.

*There is a tension between penalising operators who want to move straight to new technology, and not taking account of investments by players who invested on the basis of existing regulation.*

- B.20 Some operators may be concerned about recovering the costs of investments in PSTN technology whilst others will want to get the lowest possible charges for NGN interconnection as soon as possible. Ofcom's view is that there should be a technology neutral approach. Whilst charges should send the pricing signal to use more efficient technologies where appropriate, this should not be used to artificially promote new technologies such as NGNs.

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<sup>10</sup> Once competitive entry was allowed on international routes, arbitrage took place exploiting the difference between the costs of the underlying transmission and the artificially high "accounting rates" which formed the basis for payments between operators for international calls. This rapidly led to lower prices for customers on these routes.