

WHOLESALE HIGH SPEED ACCESS SERVICES

Lessons from the UK and around the globe

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A note on terminology: terminologies typically used in the UK to describe the services which are the subject of this report differ in some important respects from those used in Canada. (In fact, there is not always even consistency of approach in the UK.) For this reason we have adopted a consistent terminology based generally on common UK usage and included a full glossary at the end of the report.

SUMMARY

- Towerhouse Consulting LLP has been asked to provide international context on the regulation of wholesale broadband services outside North America.
- This study deals primarily with the situation in the UK but also provides a selection of further international benchmarks
- There is ample reason to believe that the UK approach to regulation - particularly with regard to functional separation - is now regarded as orthodox rather than innovative; and that a functional separation remedy should form part of a toolkit of remedies available to national regulators.
- There is every reason to believe that functional separation, together with the right level of product-specific regulation, enhances the investment environment and boosts broadband markets more generally.
- There are some specific lessons which can be drawn from the UK's experience in the regulation of next generation access networks.
- The UK approach renders debate about matters like speed-matching obsolete and removes the need for the regulator to concern itself with them.
- In relation to wholesale DSL services, BT has been designated as having significant market power in the 2 of the three markets defined by Ofcom in the UK. It therefore has obligations to provide services to alternative carriers on regulated terms in those areas.
- BT's Next Generation Access services are subject to functional separation and so-called "equivalence of input" obligations whereby the Openreach division is obliged to provide BT's retail arms and other providers with equivalent services.
- Ofcom has also required Openreach to offer both active and passive¹ wholesale access products.
- Ofcom is currently undertaking a review of so-called Wholesale Local Access and Wholesale Broadband Access Markets. We predict that Ofcom will find SMP in respect of BT's NGA services, thereby supplementing existing equivalence of inputs obligations with formal regulation.

¹ Broadly, a passive product is one which does not have electronics attached - e.g unbundled loops; an active product is one which does have electronics as part of the service e.g. a bitstream or other wholesale broadband product. Passive products, by definition, tend to be closer physically to the end user. Passive products are also by definition uncontended. Ofcom's vision of a GEA product displays characteristics of both - being close to the end user and uncontended but also employing electronics. It is intended to be a decent proxy for a passive input in the world of next generation access.

- The overall regulatory structure is one which focuses regulation only where it is necessary. The approach is adaptable and is applied in relation to other access products such as wholesale leased lines and ethernet. The UK approach to these other services supports the approach taken for wholesale broadband.
- There has been much debate both at UK and EU levels about the best way to ensure that Europe is not left behind in the race for next generation access networks. Incumbents have argued that they need protection from intrusive regulation if they are to generate an adequate return on their investments. The UK approach takes cognisance of the need for returns on investment but also the need to ensure that NGA investment does not re-establish the monopolies or duopolies of the past. The UK approach is robust and adaptable for other countries; it has been received enthusiastically elsewhere in Europe and the wider world;
- In particular, functional separation has now been formally adopted by the European Commission as a remedy for national regulators throughout the EU² and elsewhere.
- The UK approach has been successful in encouraging investment in access infrastructure and bringing benefits to business and residential end-users. It also allows a measured approach to deregulation³ and has permitted re-regulation where necessary.
- Investment has not stopped despite regulatory obligations to provide wholesale access services - in fact, quite the contrary. Investment in next generation access network rollout has increased despite the UK experiencing a time of unprecedented economic crisis. This has allowed government to focus its intended public sector intervention on those parts of the country where there is little immediate likelihood of the private sector rolling out next generation access network (in the UK, generally accepted as being around one third of the population).
- The UK approach is broadly technology neutral and is driven by the likelihood of and scope for market entry, as well as the current state of competition. Local access tends to be treated as an economic bottleneck whether it consists of copper networks (and services) or fibre-based services.
- The UK (and the EU) have avoided much of the net neutrality controversy because consumers are able to choose from a wide range of service providers and can

² <http://europa.eu/rapid/pressReleasesAction.do?reference=MEMO/09/491>

³ See for example Ofcom's statement on fixed narrowband retail markets, which eliminated BT's SMP designations in those markets, removing regulation from BT for the first time. The implementation of Functional Separation and other wholesales remedies were specifically cited by Ofcom as leading to the deregulation programme. (Ofcom statement: Fixed Narrowband Retail Services Markets, Identification of markets and determination of market power, 15 September 2009)

migrate easily should a service provider restrict their access to a particular web site or service.

1. INTRODUCTION: THE UK APPROACH IN OUTLINE

Ofcom's approach to regulation of network access is driven by a wide variety of duties and powers under UK and European law. Taken together, the framework gives Ofcom a wide discretion to regulate as it sees fit. Ofcom has put considerable work into creating a coherent policy structure from the legal framework. This policy approach can be summarised quite neatly in this quotation from Ofcom (2005):

***"Attributes of a well-functioning telecoms market.** Our market research and consultation suggested that businesses and consumers want much more than basic, reliable telecoms services at low prices: they also want choice, and rapid innovation and introduction of new services. Our assessment was that the most effective way of delivering this is through competition at the deepest level of infrastructure where competition will be effective and sustainable." [emphasis added]⁴*

This headline approach has driven Ofcom's work ever since. For example, years after the statement above, it still remains Ofcom's guiding principle:

"We continue to believe that competition at the deepest level that is effective and sustainable... is the right approach."⁵

Applied in practice, this means that Ofcom identifies where competition is likely to be viable under its own steam; and, where it is not viable, it regulates wholesale inputs from SMP providers - chiefly BT. Ofcom believes that regulated inputs which constitute enduring economic bottlenecks are particularly worthy of attention and are likely to need special treatment.

"Regulation must support investment by the private sector, while at the same time promoting competition wherever there are potential barriers to competitive delivery of services. This is especially true for fixed next generation access networks that are likely to display the characteristics of enduring economic bottlenecks."

Again in March 2009, on its statement on next generation access⁶, Ofcom re-iterated its commitment to this approach, citing equivalence as a core principle and indicating that:

"in order to deliver effective competition, we must ensure all players have equal opportunities to access wholesale services at the levels where competition can be effective and sustainable"

⁴ Final Statement in Ofcom's strategic review of telecoms, 22 September 2005

⁵ Ofcom Consultation, 23 September 2008

⁶ Ofcom Statement, Delivering super-fast broadband in the UK - Promoting investment and competition, 3 March 2009

In practice, this means that enduring economic bottlenecks benefit from particularly careful regulatory attention and are often regulated comparatively heavily.

The UK has adopted a broadly technology neutral approach which recognises that local access in general needs to be regarded as an economic bottleneck. This applies both to copper networks (and services) and to fibre-based services. The approach is driven by the likelihood of and scope for market entry, as well as the current state of competition rather than any consideration of the technology employed. Thus access to unbundled copper pairs is mandated because the copper local access network is not economically replicable. Likewise, access to wholesale broadband services both using copper based bitstream services and in the newer fibre based next generation services is mandated because the network used to deliver them is not economically replicable.

The UK approach is extremely flexible. It allows for different approaches to different markets and geographies, depending on their characteristics. This means that in some other areas there is progressive de-regulation, and on those occasions where the anticipated competition does not take hold, re-regulation (for example Ofcom's 2009 decision to impose leased line price controls in the PPC trunk market⁷). This is also consistent with Ofcom's approach to wholesale broadband markets (see below). This balanced approach is focussed on regulating where necessary and only where necessary.

In the context of the current proceeding, it is important to note that the UK approach – founded on functional separation, equivalence and competition as deep as possible in the network – removes the need for the regulator to engage in issues like speed matching. Rather, it accepts implicitly that equal treatment for downstream players is essential when it comes to bottleneck services. Indeed, this conceptual simplicity is one of its great strengths⁸.

In the rest of this report we provide a detailed review of the regulation of wholesale broadband services in the UK; we describe how the UK approach remains consistent across other electronic communications markets (such as Ethernet and traditional leased lines) but delivers flexible outcomes; we assess whether the approach is successful; we review the robustness of the approach for other markets and set it in an international context; and we analyse the toolkit of remedies used in the UK approach.

⁷ See also Ofcom's ruling on PPC trunk in case number CW/00992/06/08

⁸ In addition, competition as deep as possible in the network implies that contention and speed control are within the ambit of the competitive operator, rather than the incumbent.

2. UK ACCESS REGULATION – BROADBAND SERVICES

This chapter describes the provision of wholesale broadband products in the UK and their regulation.

Wholesale DSL and the treatment of cable networks

The UK has taken a carefully nuanced approach to the regulation of wholesale DSL. In assessing the state of competition in wholesale DSL markets, Ofcom was able to take account of the significant competitive entry at that wholesale level which resulted from Ofcom's impressive regulatory approach to local loop unbundling. This meant that competing retail ISPs were using unbundled local loops and co-location, losing BT wholesale customers. This meant that - in geographies where LLU was successful - BT had lost market share significantly in wholesale DSL to those operators using LLU. New entrants using LLU naturally focused their roll-out in the more populous areas and this give rise to geographic differences in market characteristics. Ofcom reached a view on this in May 2008⁹ and ultimately defined four geographic markets in wholesale DSL:

- Market 1; those areas covered by central offices where BT is the only operator providing broadband services. This market covered 16.4% of UK premises.
- Market 2; those areas covered by central offices where there are 2 or 3 operators (defined as including BT, cable and LLU-based operators) providing broadband services. This market covered 13.7% of UK premises. This was possible because there were more market entrants than just BT and the cable operator Virgin media operating in this market.
- Market 3; those areas covered by central offices where there were 4 or more Operators (defined as above). This market covered 69.2% of UK premises.
- the Hull area (de minimis for our purposes)

BT was found to have SMP in Markets 1 and 2 but not in market 3¹⁰.

This approach applies the basic principle elucidated in Chapter 1 of this report. The purpose of regulation is to encourage competition at the deepest infrastructure level possible. In relation to wholesale DSL, Ofcom was able to achieve that outcome by focusing regulation on the upstream LLU market which resulted in competitive conditions

⁹ Review of the wholesale broadband access markets - final explanatory statement and notification - 21 May 2008

¹⁰ Cable market share in market 3 was 28%; compared with 13.5% in market 2; and 1% in market 1

across much of the UK (Market 3). In other areas - Market 2 - it resulted in nascent competition or at least the possibility of competition.

Crucially, when we talk about competitive conditions in this context it means at least four competitors. Arguably this definition is arbitrary; in practice, it seems quite sensible.

Cable networks form part of this analysis. Cable networks are not directly regulated in the UK; there is no finding of market power in relation to the cable network operator, Virgin Media. That said, the treatment of cable in market analysis is instructive. Cable alone is not deemed a sufficient competitor to BT to undermine the finding of market power in relation to BT's services in the relevant market.

We expect Ofcom to undertake further work in these markets in the course of 2010 - probably entailing a formal consultation to be issued in February or March¹¹. Our current prediction is that Ofcom will find their May 2008 analysis still to be largely sound. We predict that Ofcom maintain SMP designations on BT in markets 1 and 2; and that they will seriously consider the imposition of a price control on BT's wholesale DSL for the first time (at least in so-called Market 1). We also anticipate Ofcom will give serious consideration to the regulation of next generation access services. This aspect is discussed further in the sections on BT's FTTC and FTTH rollout below.

The UK approach is flexible and can be applied in other markets

The above analysis relates to the regulation of DSL and Next Generation Access Networks but the approach taken by Ofcom in these markets is consistent with the approach it adopts elsewhere. We have provided in Annexes 2 and 3 a detailed analysis of the regulation of leased lines and ethernet based services which confirms that the regulator has adopted a similar approach in those markets.

The role of functional separation

Functional separation is now embedded and allows for the flexibility required by geographic regulation. The most recent Ofcom review of functional separation reveals that average prices for broadband are falling at 16.3% per annum while average speeds continue to increase, and the takeup of LLU lines has grown from less than 200,000 lines prior to functional separation to more than 6.3 million lines at the end of 2009. Investment by LLU operators doubled the number of unbundled exchanges in that same period.¹²

Complications have encountered in the course of introducing functional separation - some are simple procedural matters; some are unintended consequences; some of which have

¹¹ In fact we expect two consultations - one considering wholesale broadband markets, and another considering wholesale local access markets.

¹² http://www.ofcom.org.uk/telecoms/btundertakings/impact_srt/impact_srt_fulldoc.pdf at page 4

been characterised as potentially preserving or even regaining the advantages of vertical integration (which functional separation was intended to reduce). Rather than justifying abandonment of functional separation, this has rightly been viewed by the Regulator as an imperative for greater improvement and enforcement of the approach. Indeed Ofcom continues to work to make functional separation better, for example it directed improved Openreach service level commitments and automatic compensation payments from Openreach and is continuing to monitor Openreach's performance and Service Level Guarantee payments. There is no consideration of reversing the functional separation policy, only of continued improvement and adaptation to new developments in both technology and the market.

So in the UK there is no move to condemn functional separation or undermine it and indeed BT now actively chooses to put new products in the Openreach division (cf NGA FTTC). The UK experience has been followed with interest in mainland Europe and as part of the reforms of telecoms framework regulations in November 2009, the European Commission formally adopted functional separation as a remedy to be made available to national regulators in all member states of the European Union¹³. Functional separation has also been adopted in New Zealand, a development which did not deter Telecom New Zealand from embarking on a very ambitious programme of rolling out fibre to the node (see below for more detail on this).

¹³ The reforming Directives and Regulations were printed in the Official Journal of the European Union, Volume 52, 18 December 2009. As part of the package, Directive 2009/140/EC of the European Parliament and of the Council amends the existing Access Directive (Directive 2002/19/EC of the European Parliament and of the Council) to introduce an additional SMP remedy available to National Regulatory Authorities ("NRAs") (New Article 13a Directive 2002/19/EC). Appropriate existing remedies must be tried first, i.e. transparency, non-discrimination, accounting separation, access to network facilities, and price control / cost orientation. The recitals suggest that as few as one may be appropriate. (Recital 61 Directive 2009/140/EC.) Where these "have failed to achieve effective competition and... there are persisting competition problems and/or market failures identified in relation to the wholesale provision of certain access product markets", then as an "exceptional measure" the NRA may impose an obligation of functional separation. The recitals are keen to impress that functional separation is intended purely as a measure of last resort, justified where "there has been persistent failure to achieve effective non-discrimination in several of the markets concerned, and where there is little or no prospect of infrastructure competition within a reasonable time-frame after recourse to one or more remedies previously considered to be appropriate." (Recital 61, Directive 2009/140/EC.)

3. THE UK APPROACH HAS BEEN SUCCESSFUL AND WIDELY COPIED AROUND THE WORLD

The UK has continued to enjoy investment in the consumer and business markets, and has also seen investment by a number of new, disruptive market entrants. This is despite the predictions of some doom-mongers who claimed the UK approach would discourage investment. Investment has delivered benefits for consumers in terms of greater choice of services and lower costs.

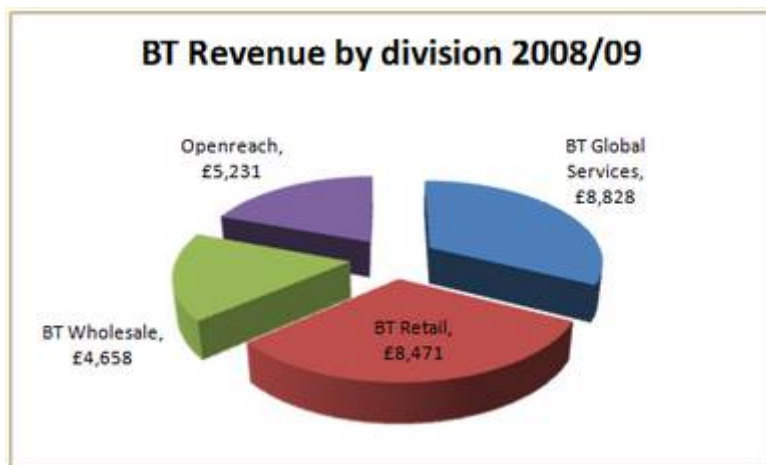
The unbundling process allows operators to offer downstream speeds greater than those offered using BT's current generation DSL products. BT has responded by refocusing its investment in its next generation network (both core and access) away from voice and into broadband services. BT's ADSL2+ based broadband products (using a next generation core and ADSL2+) were launched in mid 2008 and now reach 40% of the population with plans to reach 55% by April 2010¹⁴.

This competitive reaction mirrors that which took place in the earliest days of broadband. At that time BT dismissed DSL broadband, choosing instead to promote ISDN internet access. However, they were forced to reverse this position when NTL (now Virgin Media) started to roll out a competitively priced cable broadband product.

Importantly, the creation of Openreach can be seen as a success story for BT too. It has highlighted the financial stability of this part of BT, and its importance to the BT Group performance. Based on 2008/9 data, of BT's 4 divisions Openreach has been the largest contributor to (operating) profit for each of the last 3 years - despite being one of the smallest in terms of revenue. Figure 1 below shows the relative size of the four BT divisions in terms of turnover. Its percentage returns (23% relative to revenue) are almost double that of the next best performing division (BT Retail).

¹⁴ <http://www.silicon.com/technology/networks/2009/06/04/bt-doubles-broadband-speeds-to-20mbps-39438300/>
This story is matched by that on NGA - of which more later

Figure 1 BT revenue by division - 2008/09



In 2008/2009, Openreach reported a profit of £1,218 million on revenues of £5,231 million, matching their performance from the previous two years. The BT Annual Report¹⁵ also notes that Openreach made significant improvements in operational performance during the year. For example, there has been a 65% reduction in the number of customers waiting more than 3 days for a fault to be fixed, and a 20% reduction in fault rates due to investment in proactive monitoring. With Openreach operating as a functionally separate unit its staff are now incentivised to improve both operational and financial performance. Clearly, these improvements in performance benefit BT's external customers, (i.e. their competitors), but they also benefit Openreach's largest customers: BT's downstream divisions.

The story of investment, innovation and competitive reaction continues: like all other operators, BT must continue to invest to upgrade its network and to develop new or improved services in order to remain competitive. On 15 July 2008 BT announced plans to invest in rolling out fibre to the Remote (in the UK, known as fibre to the cabinet or "FTTC") in order to provide faster broadband services (up to 40 Mbps), primarily to residential users, using VDSL over the sub-loop. This investment is being made via BT's Openreach division. As part of their launch of FTTC-based broadband services, Openreach has agreed to provide a wholesale service for other communications providers to connect end users. This service uses VDSL between the remote and the customer and is backhauled

¹⁵ <http://www.btplc.com/Sharesandperformance/Annualreportandreview/Annualreportandreview.htm>

by Openreach from the remote to the Central Office, at which point it is picked up by the other communications provider¹⁶.

At the same time as the July 2008 FTTC announcement, BT also said that, for new-build developments, they would use fibre-to-the-home (FTTH) rather than copper in the local network. BT indicated that they would invest £1.5bn in the period up to 2012, which would enable them to provide high speed services to around 40% of UK homes, the majority of which would be served by the VDSL network, but around 1 million homes would be able to receive services of up to 100 Mbps using FTTH.¹⁷

At the time of the announcement industry and analysts alike were sceptical that BT would provide a high quality service which would provide the UK with the next generation services which were increasingly being called for in the public policy debate about the need for “super fast broadband”.

Contrary to expectations BT has in fact made a good start on delivering its promises. The Openreach division announced in October 2009 that the proportion of FTTH was to more than doubled in order to reach 2.5 million homes because BT now believed the costs of rollout were much lower than they had originally believed. This did not represent an overall increase in the number of homes served by NGA but rather was an increase in the proportion to be served by FTTH as opposed to FTTC.¹⁸

The Government estimates that, left to its own devices, the market will provide NGA-based broadband services to around 70% of the population¹⁹. It is therefore planning to introduce a new tax on existing copper and fibre links (of £6 per line per year) in order to help fund investment in network upgrades to deliver higher speed broadband beyond the commercially attractive areas, and therefore extend coverage to at least 90% of UK households by 2017.²⁰

The FTTC/FTTH developments are interesting for a number of reasons.

1. BT has continued apace to productise and launch these FTTC- and FTTH based products despite not only the regulatory environment but also the most challenging economic conditions in half a century. They began with trials in North London which got underway in July 2009 involving 16 separate internet service providers. Before the trials had even begun Openreach announced, in March 2009, that 29 central offices

¹⁶ The specification for the ethernet handover can be found here:

<http://www.openreach.co.uk/orpg/products/nga/fttc/downloads/STIN494v1p0.pdf>

¹⁷ <http://www.silicon.com/technology/networks/2009/05/15/bt-to-expand-2010-fibre-rollout-39431374/>

¹⁸ It is worth noting that in the UK the term NGA is often used to refer specifically to these FTTC and FTTP plans (together with Virgin Media's DOCSIS3 roll-out) rather than more broadly to, for example, wholesale ethernet.

¹⁹ <http://www.berr.gov.uk/files/file54154.pdf> at page 13

²⁰ <http://www.berr.gov.uk/files/file54154.pdf>

would be enabled, with the first services being made available in November 2009. In July 2009 a further 69 central offices were added to the list and on 5 January 2010 Openreach announced that by Summer 2010 an additional 63 central offices would be enabled for FTTC services. This makes a total of 161 out of nearly 5600 central offices. By March 2010 1 Million homes will be covered, by Summer 2010 Openreach predicts 1.5 million will be able to use these services and 10 million homes (or 40% of the UK population will have access by 2012).

2. Ofcom has not felt constrained by the lack of a formal market review and analysis. This is required before formal regulation can be imposed. Ofcom has already opened regulatory consideration in relation to wholesale regulation of these services and is currently analysing the wholesale broadband access and wholesale local access markets. We expect Ofcom to issue a consultation dealing with these matters in February or March 2010, with final rules to be imposed later in the year. Our current expectation is that Ofcom will rule that BT has nationwide SMP in relation to its NGA services; and that Ofcom will propose a remedy consisting of mandating access to a product known as Generic Ethernet Access or "GEA"²¹. It is also possible that Ofcom will set some parameters for the key characteristics for the service. Despite this, it is nevertheless instructive that Ofcom began consideration of the economic characteristics of the markets concerned; the scope for competition; and what regulation will be required in advance of their formal review.

All the indications are that when formal regulation does come, Ofcom will be relatively light-touch in relation to these specific FTTC-based services - in part because they believe that access to the sub-loop, coupled with cost-oriented wholesale ethernet backhaul from the remote to the CO, will enable competition²². However, we anticipate that they will be subject to obligations of non-discrimination and, in addition, to ongoing "equivalence of inputs" obligations: in June 2009, Ofcom agreed to vary the voluntary undertakings which govern much of BT's conduct, in order to allow Openreach to control and operate electronic equipment in the BT access network. This was necessary in order to allow the FTTC deployment to take place. The variation includes commitments by BT to ensure it provides

²¹ The GEA product allows alternative providers to connect with BT's NGA network using an ethernet feed. The product will use FTTC+VDSL (over copper) or FTTH for the last mile. Interconnection points will be at or near BT's local exchanges.

²² On 3 March 2009 Ofcom issued a series of papers on future access networks. This was prompted by BT's proposal to invest in fibre to the remote and VDSL technology between the remote and the customer. It is notable that, while Ofcom does not currently intend to regulate the price of these FTTC-based services, the services will be provided on a so-called "equivalence on inputs" basis. Ofcom also emphasised that their policy was to "to promote passive access [e.g. through sub-loop unbundling] wherever this is economic and sustainable.

- “fit-for-purpose wholesale FTTC active products on the basis of equivalence of inputs (“EoI”); and
 - options for Communications Providers (“CPs”) to invest in their own active solutions using BT’s passive inputs.”²³
3. Finally, the fact that BT’s FTTC- and FTTH- based services will be provided as wholesale services by BT’s Openreach division has important implications: it means that Openreach will provide them to all communications providers - including its own downstream divisions - on the same terms. (This is indeed borne out by experience of the trial process so far).

Indeed, the fact that BT has actively chosen to provide these services through Openreach indicates that it is happy for these services to be provided on a wholesale, equivalence of inputs basis; and implies strongly that BT itself believes it will be subject to limited competition (if any) from other providers.

Of course, network investment is not confined to BT and other players continue to invest. Significant investment has been made by LLU based operators and the cable operator Virgin Media has commenced its roll-out of DOCSIS3, delivering broadband at up to 50Mb/s (and with the potential to go even faster). Virgin Media’s cable network already makes high speed broadband services available to around 50% of UK households²⁴.

This clearly demonstrates that the regulatory environment is not discouraging investment in network infrastructure. The incumbent, BT, continues to ramp up its investment in super fast broadband services and is doing so on the understanding that it will make wholesale equivalent products available to its rivals.

Even before NGA, UK policy had already transformed broadband and network investment

The rollout of broadband has been one of the most significant developments in UK communications in recent years. Having initially lagged behind rival countries, the UK has advanced rapidly up world league tables. Between 2003 and 2007 the UK saw rapid growth in broadband penetration. While this was initially led by cable broadband, the incumbent BT was spurred into action, as a result of which the rate of increase in DSL penetration between 2003 and 2007 was the highest in any comparable country²⁵. At the end of June 2009 there were 17.7 million UK residential and SME broadband connections,

²³ <http://www.ofcom.org.uk/consult/condocs/fttc/statement/statement.pdf> Ofcom statement on a variation to BT’s undertakings relating to FTTC 11 June 2009. We expect similar measures on FTTP following Ofcom’s consultation of October 2009.

²⁴ <http://www.berr.gov.uk/files/file54154.pdf> DIGITAL BRITAIN Consultation on proposals for a Next Generation Fund

1.1 million (6.9%) more than there had been a year previously.²⁶ Analysis by Point Topic estimates that the UK will have over 21 million connections by 2012. As at December 2009 the number of LLU enabled lines stood at 6.3 million.²⁷ A comparison with the latest figures available from the European Commission reveals just how rapidly this progress has been made. According to the Commission's 13th Implementation Report

"Local loop unbundling (LLU) continued to make strong progress during 2007, with the number of LLU lines approaching 4 million in January 2008 compared to about 1.5 million in January 2007."²⁸

The same report also noted that BT's 25.8% share of the retail broadband market, though slightly higher than a year previously (23.7%), remained among the lowest of any incumbent in the EU.

One concern often raised by incumbents is that a requirement for regulated access to broadband networks will result in lower levels of investment in the network. The experience from the UK suggests that this is not true. Network investment in the UK has continued despite the introduction of functional separation, alongside relatively strict requirements to provide local loop unbundling and wholesale broadband services. As noted above, BT has recently announced plans to invest significantly in access network upgrades, and this follows a variety of investments replacing and upgrading equipment in the core network to build a DWDM and Ethernet capability, upgrading from ADSL to ADSL2+, and improving a variety of IT systems.

These investments and the future plans are, at least in part, driven by similar investments by competitors and the requirement not to be left behind. Such market-based investment incentives are strengthened by competition, which in turn is supported by a strong regulatory regime. In fact the first year after functional separation saw an increase of investment by companies such as Sky, Orange and Carphone Warehouse in new infrastructure.²⁹

Nor does the UK appear to be materially disadvantaged in comparison with the US. In the UK, investment has continued to increase, while US investment declined more rapidly than anywhere else. (OECD data shows that over the period 2000 to 2005 US incumbents cut CAPEX by just over 50% while the UK incumbent, in common with most other major

²⁵ "The Next Phase of Broadband UK: Action now for long term competitiveness" page 29

²⁶ Source: Ofcom quarterly telecoms update

²⁷ <http://www.offta.org.uk>

²⁸

http://ec.europa.eu/information_society/policy/ecommm/doc/library/annualreports/13th/country_chapters/sec2008_356_dts_uk.pdf

²⁹ <http://www.independent.co.uk/news/business/news/bt-network-arm-aims-for-broadband-boost-by-doubling-unbundled-lines-431514.html>

European incumbents, has broadly maintained fixed network expenditure).³⁰ Indeed the OECD data reveals that, while the UK and most other EU states do lag behind the US levels of investment in absolute terms, those levels have continued to increase, while US levels have dropped sharply. In other words, the gap has continued to close since unbundling and functional separation were introduced. In all this, it is important to remember that the UK is widely recognised as having the most nearly complete “open access” regime.

Coverage has also increased to the point where 99.6% of homes are connected to an ADSL-enabled central office (5,564 central offices are DSL-enabled from a total of 5,592) and work is underway to implement alternative access solutions for those not yet connected, though this will involve a degree of government led intervention. Clearly speeds available to end users will vary due to factors such as line quality and length but coverage has now become so close to universal that the latest government report (“Digital Britain”) can seriously contemplate imposing a universal broadband service obligation³¹.

These figures mean that the UK now ranks 5th in the OECD in terms of coverage. As availability and take-up have increased, the UK has also seen a corresponding drop in prices, to a point where the average UK subscription price is the 5th cheapest in the OECD.

The success of broadband rollout has in turn increased the pressure on operators to offer faster services and this shows no sign of reducing. The issue has captured the imagination of public and politicians alike and assumed a greater importance than anyone had previously imagined. The UK’s regulatory regime has taken the country to a point where it is now approaching the next major transformation, the move to ‘super-fast’ or very high speed broadband in the consumer market.

As detailed above, the two big consumer facing network providers, have each announced significant investments in their access networks. BT is planning to invest £1.5 billion in a programme that will give around 10 million homes access to up to 40Mbps VDSL-based services, and in some cases 100 Mbps fibre-based services, by 2012. The announcement was no doubt spurred by a desire not to be seen as having been left behind by Virgin Media which is already offering a 50Mbps broadband product.

Virgin Media launched their 50Mbps service in December 2008. This followed investment in the network to upgrade to DOCSIS 3 technology. The roll-out of this new technology was largely complete by July 2009 meaning that the new product was available to roughly 50% of UK homes. DOCSIS 3 technology used in their network is already capable of

³⁰ <http://www.oecd.org/dataoecd/34/36/42037713.pdf> at page 37 . The OECD time series data on the US is supported as an ongoing trend by ETI’s analysis, to be submitted alongside this report.

³¹ http://www.culture.gov.uk/what_we_do/broadcasting/5631.aspx

running at speeds in excess of 100 Mbps. Virgin Media CEO Neil Berkett has indicated that they will increase speeds further as the competitive nature of the market develops³². DOCSIS 3 theoretically enables much higher speeds by using some of the bandwidth on the cable network currently used for TV channels. Virgin Media is currently running a field trial of a 200Mbps service³³, and has hinted that this could be rolled-out relatively quickly if there was sufficient demand. In addition to the new top tier service, Virgin Media has recognized that not all consumers will need or be prepared to pay for such speeds, and has offered free speed increases (for example from 4 Mbps to 10 Mbps) for customers on their lower priced packages³⁴.

Market developments - UK in European context

The development in the UK of functional separation has been followed with interest in Brussels and following its adoption by the European Commission as a remedy in November 2009, it is now being introduced in other member states such as Italy and Sweden. In Sweden a law has been passed allowing the regulator to impose functional separation on the incumbent when approved by the European Commission³⁵. In Italy, the incumbent voluntarily proposed undertakings in 2008 to separate its wholesale and retail operations³⁶. Similar moves have occurred in Poland³⁷.

Research³⁸ published by ECTA, the European Competitive Telecommunications Association revealed that whilst new market entrants dominate in offering high broadband speeds, this is done primarily through regulated access to the local loop, Incumbents still control 65% of the lines over which broadband services are provided. Incumbents share of the market taking into account both retail and wholesale access remained at 80% of all lines across the EU, with a share of more than 90% in France, Germany and Italy.

This supports the picture that regulation is an essential part of encouraging innovation and ensuring that consumers benefit from the fastest speeds.

Incumbents throughout Europe lobbied regulators hard to grant them concessions or “regulatory holidays” in return for making the investments required in order to deliver next generation networks. The pattern was not universal however, with France Telecom, which has considerable experience of the benefits of competition calling for a more open and competitive model to be adopted. However regulators appear to have rejected the concept

³² <http://www.thinkbroadband.com/news/3378-virgin-media-announces-free-4-to-8-meg-upgrade.html>

³³ <http://www.silicon.com/technology/networks/2009/05/08/virgin-media-trials-200mbps-broadband-39428131/>

³⁴ http://allyours.virginmedia.com/html/existingcustomers/faster/current_service.html

³⁵ http://ec.europa.eu/information_society/policy/ecommm/doc/implementation_enforcement/annualreports/14threport/commen.pdf

³⁶ http://ec.europa.eu/information_society/policy/ecommm/doc/implementation_enforcement/annualreports/14threport/it.pdf

³⁷ See for example:

http://www.en.uke.gov.pl/ukeen/index.jsp?news_cat_id=61&news_id=800&layout=1&page=text&place=Lead01

and it is now clear that the Commission's policy direction is now to try to maintain the so called "ladder of investment" concept and balance the needs of incumbents to generate a return on investment and the needs of access seekers.

Of course it would be wrong to regard Europe as one entity and the underlying statistics reveal a wide disparity of broadband provision access across Europe. The Scandinavian countries and the Netherlands boast more than 30% take-up while Greece, Poland Slovakia, Romania and Bulgaria lag with less than 15%.

Across the continent the figures also reveal that incumbents' market share of broadband services has increased to 45.5% on average across Europe. Incumbents in those countries whose Governments have heeded calls to pursue 'deregulatory' broadband policies have seen a marked strengthening of their position. ECTA's research also shows that despite well publicised 'regulatory holidays' for incumbents in countries such as Germany and Spain, there is little evidence of increased fibre deployment in those countries³⁹. Sweden remained Europe's fibre leader with 7.5% of the population benefiting from high speed modern access lines compared with an average of just 0.4% across the EU. All of this suggests that refraining from regulating does not lead to greater investment by incumbents, it merely protects them from competition and allows them to invest the minimum in terms of developing networks and services.

The benefits which can flow from adopting an open access model are further highlighted by KPN's announcement⁴⁰ in December 2009 that it will roll out FTTH to 1.1-1.3 million homes in the Netherlands by the end of 2012. KPN expects 30-60% FTTH penetration between 5-10 years in the Netherlands. KPN is deploying FTTH using an open access model in a joint venture with Reggefiber. KPN and Reggefiber set up a joint venture company known as Reggefiber ftth in which KPN took a 41% stake, leaving Reggefiber with the majority 59% shareholding.⁴¹

We understand from discussions with KPN executives that their motivation for the move is a combination of fierce competition that is eroding their margins on copper services together with limited public sector interventions in local projects. Together these factors persuaded KPN that investing in an innovative open fiber network will give them a more profitable and sustainable model in the years ahead. In other words, it was not regulation that caused this development, merely an understanding of the benefits which an open and competitive market could deliver. This of course mirrors the approach adopted by KPN in relation to both copper and DSL services in recent years. KPN's CEO explained their rationale thus;

³⁸ <http://www.ectaportal.com/en/REPORTS/Broadband-Scorecards/Broadband-Scorecard-2009/>

³⁹ http://www.ectaportal.com/en/upload/File/Broadband%20Scorecards/Q109/Broadband_Scorecard_Oct_7_2009_final.pdf

⁴⁰ <http://www.kpn.com/Artikel/KPN-will-proceed-with-fiber-on-a-regional-basis.htm>

⁴¹ <http://www.kpn.com/corporate/nl/pers/persber.htm?contentid=4270>

"If you allow all your competitors on your network, all services will run on your network, and that results in the lowest cost possible per service. Which in turn attracts more customers for those services, so your network grows much faster. An open network is not charity from us, in the long run it simply works best for everybody"⁴²

The benefits to incumbents of adopting a KPN style approach are underlined in a recent report by the respected WIK institute⁴³. In comparing the major European incumbents, WIK found that Deutsche Telekom (which of course had the benefit of so called regulatory holidays) performed the most poorly, while KPN returned the strongest performance. BT's performance was dragged down not by its regulated business units but by its unregulated IT services division, BT Global Services.

WIK summed up the situation as follows; Finally, we do not find support for the frequently stated claim of incumbent operators, which says that those of them, which are obliged to carry out business in a heavily regulated environment show worse performance than other incumbents, which operate in regimes characterised by light regulation."

The Commission has repeatedly stated that there will be no regulatory breaks for telecoms operators rolling out high speed consumer access networks. The Competition Directorate of the Commission has stated that the use of new technology in a network does not eliminate the requirements for dominant players to give competitors access to those networks.⁴⁴ The Commission has conceded that dominance rather than incumbency gives rise to the obligation to provide access to the network since they regard new network build as augmentation of an incumbent's existing network and therefore as something which must continue to be subject to regulation.

So at national level, regulators appear to be trying to find ways to be seen to be delivering ever faster consumer access networks, while the European Commission pushes the message that Competition is the best thing for the consumer. As Commissioner Reding put it,

"I want regulation to encourage investment in future networks. Regulatory holidays are not the solution, what we need is "appropriate" regulation that safeguards competition whilst creating new incentives for investment."⁴⁵

National regulators need to take care not to overstep the mark and implement measures which are in breach of European Community law. Already the European Commission has

⁴² Translation from Fibre Evolution (<http://www.fiberevolution.com/2009/02/quote-of-the-day.html>) of an original article in Dutch from the Netherlands newspaper Trouw (http://www.trouw.nl/nieuws/economie/article2023373.ece/KPN__Glasvezel_delen_is_slimmer_.html)

⁴³ http://www.econbiz.de/archiv1/2009/95108_telekommunikation_entwicklung.pdf at page VIII

⁴⁴ Cecilio Madero Villarejo, director, competition directorate speaking at roadband World Forum Europe on Tuesday 30 September 2008

⁴⁵ <http://europa.eu/rapid/pressReleasesAction.do?reference=SPEECH/07/755>

issued warnings to both Germany and Spain that their domestic proposals are non compliant. In the case of Germany, the Commission has gone so far as to take legal action to overturn domestic legislation⁴⁶.

In essence, the Commission's stance is that investment incentives must be right, but for both the incumbent and alternative operators. A delicate balance has to be struck between the needs of those making the investments and those seeking wholesale access to new networks. If the correct balance is not struck, the regulators risk setting competition back twenty years and recreating the monopolies which they have spent so long trying to dismantle.

The Commission also notes that European approaches to regulation have led to ongoing investment in the sector: their 2009 Implementation Report also notes that investment in telecoms across the EU had reported 6 years of annual growth⁴⁷. An October 2009 report from SPC Network suggests that every 1% improvement in market openness could raise investment per capita by up to 0.6%⁴⁸. In both the UK and the Netherlands fibre deployment is accelerating under open access arrangements while in Spain where the incumbent was granted a regulatory holiday, the deployment of fibre appears to have stalled. These examples support the contention that well regulated markets have performed, and will continue to perform, better in terms of attracting investment than those where a light touch approach on access regulation is adopted.

In short, there is every reason to believe that a properly targeted regulatory regime is a spur to investment rather than the contrary.

The market depends on investment not just by incumbents but by all players and it is vital that regulators grasp this point. Just as incumbents worry about the impact of regulation on their rate of return, new entrants need consistent and effective regulation focussed on the real bottlenecks in the market in order to allow them to plan their continued investment.

Without certainty that they will continue to enjoy access to facilities controlled by dominant operators on fair terms throughout the investment cycle, the new investments made to date by new entrants in network infrastructure are undermined. In the longer term this

⁴⁶ <http://europa.eu/rapid/pressReleasesAction.do?reference=IP/07/237&format=HTML&aged=0&language=EN&guiLanguage=en>

⁴⁷ "In 2007 investment increased by around 1.5%, thus marking the sixth consecutive year of growth. This trend is likely to continue in 2008 although with a flattening trend as a consequence of the financial crisis. The market capitalisation of the telecom sector has declined since the beginning of 2008, but less markedly than that of other sectors. The Dow Jones SXXP7 index, which captures the performance of the whole sector, has declined by 20%, which compares to 25% for the wider economy."

⁴⁸ Regulation and investment: <http://www.spcnetwork.co.uk/uploads/20091007Investment2007Note.pdf>

restricts consumer choice, innovation and possibly even the take up of higher speed services themselves.

With this in mind late in 2009 the European Commission consulted on its draft "Recommendation on regulated access to next generation networks" the purpose of which is to foster the application of consistent ex ante regulatory remedies to operators with significant market power in relation to access to Next Generation Access (NGA) markets. It is still a draft Recommendation, and is therefore not yet binding on European Member Countries. The Commission stressed the need to maintain and promote the 'ladder of investment' approach which allows competitors to make efficient and step-by-step investment decisions by being able to choose from a range of wholesale offers and perhaps in time to invest in their own network infrastructure. The proposals also provide for an effective migration process from copper to fibre and to require advance provision of wholesale access by dominant firms all of which are designed to prevent market foreclosure by dominant firms.

The draft guideline also suggests that a co-investment model might be one solution to the scarcity of funding, though this has prompted concern that what might emerge is not a scenario where operators collectively manage an open network for the benefit of all but rather arrangements which involve collusion, exclusion and gaming by a dominant firm. It remains to be seen whether the final version of the recommendation tackles this difficult issue.

The response submitted by the UK government to this consultation was of particular interest. It made the following points:-

1. UK believes the key (and difficult) issue to getting regulation right in this area is striking right balance between promoting competition and encouraging investment.
2. A consistent approach across the EU 27 is needed or barriers to pan EU services needed by businesses will result. (i.e. business customers are multinational and need their communications to be multinational too)
3. The UK strongly cautions against the authorities automatically presuming that a co-operative investment model removes the need for regulatory scrutiny - there is a risk of segmenting market between 2 or 3 players. Duopoly or oligopoly would not be a good outcome for customers or the economy. A thorough market analysis should still lead to regulatory intervention.

The UK response is interesting because it strongly criticises the EU draft and suggests that it may lead to a re-emergence of monopolies, duopolies or oligopolies, none of which are seen as optimal outcomes. This is much the same as the pro competition bodies have

said. The EU normally takes note of what is said by the UK regulator because it has so much more experience of liberalisation and is seen as a leading light of EU regulation.

Australia

We cite the case of Australia to illustrate the point that responsible governments and regulators around the world are seriously considering functional separation alongside issues relating to next generation access investment. Australia has a similar population size and density to that of Canada⁴⁹ and it is perhaps particularly instructive in the current case. The Australian Government has identified Telstra's vertical and horizontal integration as "the primary cause of competitive problems in Australia's telecommunications industry"⁵⁰.

The Government of Australia has committed in April 2009 to the roll-out of a new fibre-based "National Broadband Network" within the next eight years.⁵¹ They proposed an FTTH network covering 90 per cent of the Australian population at a speed of up to 100 Mbit/s. The remaining population, in remote rural areas more difficult to reach with a fibre network were to be served with a connection of 12 Mbit/s delivered over alternative technologies. The Government estimated that the cost of the network will be \$43 billion and has established NBN Co. to fund the network build. It is intended that NBN Co. will be financed jointly by the Government and private investors and will build and operate the network. So far the Government has invested \$60 million of an initial announced \$4.7 billion investment.

Implementation of the NBN comes amidst substantial reform of the Telecoms sector in Australia. Currently before the Australian Parliament is a bundle of legislation which would see the possible compulsory functional separation of the incumbent, Telstra and reform of the existing access regime, in part to aid the transition to NBN.

⁴⁹ UN population density statistics:

Country	Surface area km ²	Population 2007	Density pop/km ²
Australia	7,692,024	21,072,000	3
Canada	9,984,670	32,976,000	3
UK	242,900	60,975,000	251

⁵⁰ Australian Government Discussion Paper 'National Broadband Network: Regulatory Reform for 21st Century Broadband' April 2009

⁵¹ Australian Government joint press release by the Prime Minister, Treasurer, Minister for Finance and Minister for Broadband 7 April 2009 http://www.minister.dbcde.gov.au/media/media_releases/2009/022

Given the uncertainty surrounding possible structural or functional separation, it is not clear at this stage how a divided Telstra might fit into the NBN build. The Government has been quoted as saying:

“The government’s clear preference is for... structural issues to be addressed on a voluntary basis... The government retains an open mind on the best model for structural separation as we transition to the NBN. It may, but does not need to, involve the creation of a new company by Telstra and transfer of its fixed-line assets to that new company. Alternatively, it may involve Telstra progressively migrating its fixed line traffic to the NBN over an agreed period of time and under set regulatory arrangements and for it to sell or cease to use its fixed line assets on an agreed basis. This approach will ultimately lead to a national outcome where there is a wholesale only network not controlled by any retail company - in other words, full structural separation in time. Such a negotiated outcome would be consistent with the wholesale only, open access market structure to be delivered through the National Broadband Network.”⁵²

The Australian Government is undertaking a general reform of the access regime with a view to improve existing arrangements, in particular allowing the regulator (the ACCC) to set up-front terms for access to Telstra’s network. In addition, the Discussion Paper addresses the transition to NBN and the appropriate access arrangements for the new network. The Government’s Discussion Paper outlines a vision of a wholesale-only, open access regime:

1. NBN Co. will be required to offer services on a wholesale-only basis. It will be prevented by law from providing retail services
2. The NBN will operate on an open access basis. The network operator must provide fair and non-discriminatory access to all wholesale customers
3. Access to the NBN will be provided to all retailers on an equivalent basis
4. The ACCC will oversee NBN Co.’s operations.⁵³

⁵² Hon. Anthony Albanese, Minister for Infrastructure, Transport, Regional Development and Local Government. Speech at the second reading of Telecommunications Legislation Amendment (Competition and Consumer Safeguards) Bill 2009, 15 September 2009

in ‘Fundamental Reforms to Telecommunications Regulation in Australia’, Peter Leonard and Shreeya Muthusamy, Computer and Telecommunications Law Review, Issue 1 2010.

⁵³ Australian Government Discussion Paper ‘National Broadband Network: Regulatory Reform for 21st Century Broadband’ April 2009

New Zealand

New Zealand's Telecommunications Act 2001 required Telecom New Zealand to implement functional separation. This was achieved on 31st March 2008⁵⁴ but the advent of separation did not hinder the company's plans to roll out next generation access infrastructure.

In 2008 Telecom New Zealand launched ADSL2 services and announced detailed network roll-out plans.

"We are busy deploying 3,600 roadside cabinets and 2,500 kilometres of new fibre optic cable as part of our commitment to enable the delivery of broadband connections between 10Mbps and 20Mbps to 80% of New Zealanders by the end of 2011"⁵⁵.

In January 2009 Telecom New Zealand went on to announce that it would be deploying VDSL cards which would allow customers within 1km of the remote or central office to access services of up to 50Mb/s download speeds. Beyond the 1km limit the cards operate in ADSL2 mode providing speeds of up to 20Mb/s:

"Already 57 per cent of New Zealand lines can take advantage of Telecom's next generation access network and this grows to 84 per cent on completion of the fibre-to-the-node roll out in 2011."⁵⁶

It is important to remember that this NGA investment is being made in a country which, like the UK, has implemented functional separation.

As in other countries, the clamour for ever faster broadband continued however and in September 2009, the Government finalised its plans for the establishment of a national, part public funded, fibre to the home network. The process is about to take a step further towards implementation stage with interested parties requiring to respond to the invitation to participate by 29th January 2010⁵⁷.

Under the scheme, the New Zealand government will contribute half of the cost (1.5 billion NZ Dollars) of building out an open access FTTH network to 75% of the population. The network will cover 33 areas though it is worth noting that 29.5% of all homes are in Auckland). The priority in the first six years will be to extend the network to schools,

⁵⁴

http://www.med.govt.nz/templates/MultipageDocumentTOC____34436.aspx?&MSHiC=65001&L=0&W=operational+separation+&Pre=%3cb%3e&Post=%3c%2fb%3e

⁵⁵ <http://www.chorus.co.nz/enhancing-the-broadband-network>

⁵⁶ Telecom NZ press release: http://www.telecomwholesale.co.nz/f554,333421/333421_VDSL2_media_release_FINAL.pdf

⁵⁷ <http://www.beehive.govt.nz/release/ultra-fast+broadband+investment+proposal+finalised>

businesses, the health industry and greenfield sites with a secondary aim of reaching all homes in the target area within 10 years.

In stark contrast with the approach taken in Australia, the New Zealand Government has taken great care to work out the policy and regulatory dimension in advance of inviting others to bid to participate in the scheme.

The vehicle for investing the subsidy will be publicly owned - "the Crown Fibre Investment Co (CFIC)." Both public (i.e. the CFIC) and private companies will invest in Local Fibre Cos (LFCs) with up to 50% of the shares of the LFCs being held by the CFIC

Open access is fundamental to the scheme and the policy intent is expressly to avoid re-establishing old monopoly positions and to avoid entrenching the position of existing providers.

"LFCs will not provide retail services. However, the government will not exclude partners that own or operate telecommunications retail operations, but such partners may not have the majority of voting control on the board of LFC (unless they divest themselves of any retail business). Telecom, and other telecommunications operators with retail operations, will therefore be able to participate in the contestable selection process, subject to the above requirement."

"The government investment will be in fibre networks that will operate only at the wholesale level, selling dark fibre based services enabling telecommunications providers to design and specify their own downstream services. This approach will ensure that all decisions regarding active network technology options are left to private sector investors."

"By keeping the new fibre business out of retailing, it will have no incentives to act anti-competitively, and there will be little need for regulation of its prices. In fact, there will be considerable initial incentives for it to keep the fibre rental prices low to facilitate use by downstream providers."

"The new network will provide dark fibre services to any ISP or telecommunications service provider, and will operate as an infrastructure 'utility' at the passive level of the market. The aim is to provide a new fibre platform upon which service providers can develop their own services and create unique, innovative offerings."⁵⁸

The announcement has led to speculation⁵⁹ that Telecom New Zealand will in fact *structurally* (as opposed to merely functionally) separate itself in order to participate in the project but as yet there is no indication as to how the incumbent will react.

The Government has set a condition that any party investing must either have no retail telecoms business or take only a minority shareholding should it wish to invest in the

⁵⁸ <http://www.med.govt.nz/upload/63958/Final-broadband-initiative-consultation-document.pdf>

⁵⁹ For example http://cio.co.nz/cio_nsf/str/4E73F6BAD03EA3BECC25767E000F776E and <http://telcommunicator.blogspot.com/2009/03/control-of-subsidised-ftth-will-bring.html>

passive infrastructure (in the same way that Dutch incumbent KPN hold only 41% in Reggefiber fthh in the Netherlands⁶⁰). So TNZ has a choice of voluntary structural separation or taking a minority share in the new network business. The Government has been quite clear that it does not seek to influence TNZ's decision and that the same provision applies to any party investing in the scheme.

It remains to be seen whether or not the Government's plans will succeed but it is clear that by setting the regulatory and policy framework in advance New Zealand has taken steps to support competition while at the same time fostering investment in NGA.

⁶⁰ <http://www.kpn.com/corporate/nl/pers/persber.htm?contentid=4270>

Conclusions

In short, as will be apparent from the foregoing, the UK example has shown that it is possible - indeed essential - to adopt a coherent, flexible approach to regulation which is likely to involve tough wholesale regulation of bottleneck markets including wholesale ethernet, in order to encourage competition. To suggest that this discourages investment is wrong; the UK example proves that the contrary is in fact true. The UK approach is sufficiently flexible to apply to non-UK jurisdictions and is in fact now being adopted in other parts of Europe.

ANNEXES

ANNEX 1 - GLOSSARY

“CO” or “Central Office” means a BT local exchange.

“DOCSIS3” means Virgin Media’s new superfast consumer broadband services.

“FTTC-based services” means BT’s new superfast consumer broadband services delivered over fibre as far as the remote.

“PPC” means a partial private circuit - a traditional interface wholesale leased line product, provided by BT

“Remote” means a street cabinet.

“Wholesale DSL” means asymmetric broadband access and backhaul and includes BT’s Datastream and IPStream products.

“Wholesale ethernet service” means an ethernet service delivered over fibre, provided by BT to other communications providers, which is suitable for delivering services to businesses but may also be used for backhauling traffic from central offices to (or towards) core networks. For details of BT’s current wholesale ethernet products, see chapter 3.1.

ANNEX 2 THE REGULATION OF TRADITIONAL LEASED LINES (PPCS)

The case of the regulation of wholesale leased lines (known as PPCs) is instructive because it demonstrates Ofcom's approach in relation to another access product where there is more (though still limited) competition; and also their approach to markets which were deemed potentially susceptible to competition but where it has not, in fact emerged⁶¹.

The approach, in outline, is to deregulate in the geographic pockets ("central and east London zone") where there is network competition; but in trunk markets, where competition was hoped-for but never actually emerged, Ofcom now plan to recognize this by introducing price controls for the first time.

Ofcom's findings in this review were as follows:

- a) BT was found to have significant market power for traditional interface wholesale lines at low, high and very high bandwidths (subject to point b. below);
- b) Ofcom defined a separate market for a limited area of the London business district, (the Central and East London Area or "CELA") and found that no communications provider has SMP in high- or very high-bandwidth traditional leased lines (34/45 Mbit/s and 155 Mbit/s). The high density of business customers has encouraged extensive network coverage from several companies and a non-BT provider has the largest share of the market. The newly deregulated "central and east London area" was defined by postal sector and encompasses an area where there are at least three network operators within 200 metres of each large business site in the sector.
- c) There will be detailed charge controls for both termination and for trunk segments (which work is now ongoing). This is particularly important because Ofcom had previously expressed the view that the trunk market was prospectively competitive; it was for this reason that prices were not controlled more closely at the last review. It now being clear that competition would not emerge, Ofcom has moved to impose tighter price regulation.
- d) Ofcom's approach is to recognise that they may have to revisit such decisions should they not produce the anticipated outcome in terms of competition. A recent example of this has been Ofcom's decision to re-regulate the PPC trunk market as described above ("Section 3, Remedies")

⁶¹ Ofcom BCMR Statement January 2009

Ofcom's approach to wholesale DSL markets (see section 3.2) is a classic case where Ofcom has deliberately reserved for itself the possibility of re-regulation. In this case Ofcom has not directly regulated the prices of wholesale bitstream even in those geographic areas where BT has been found to have SMP. Ofcom's rationale for this approach is that it is keen to encourage investment upstream (in LLU) by competitive players. Ofcom believed - rightly or wrongly - that aggressive price regulation in downstream markets might change the incentives for this investment. Accordingly, they chose to leave prices in wholesale bitstream unregulated while investment in LLU continued and, eventually, stabilised. Once that process has completed, Ofcom will review regulation of wholesale bitstream in geographic areas where BT has SMP and is likely to impose price regulation.

Another example of Ofcom's openness to a flexible approach is in relation to BT's charges for call termination on non-geographic number ranges. Having originally concluded that these charges should be outside the scope of regulation in 2003, Ofcom were prompted to reconsider their approach by pricing changes introduced by BT in May 2004. Ofcom undertook a consultation on introducing a new finding of significant market power on BT (Ofcom consultation of 22 October 2004). Although the price changes of May 2004 were subsequently reversed, Ofcom also opened an investigation into potential breaches of competition law; which resulted in a non-infringement finding on 1 August 2008. Subsequent to this, BT took action to seek to re-introduce the charges originally complained of. At the time of writing no final result is in place. Ofcom were reluctant to pursue their review of 22 October 2004 while an investigation under competition law was ongoing. However, the reintroduction of the charges makes further regulatory action extremely likely, either by a further consultation or statement following from the October 2004 review, or possibly by the submission of a dispute to Ofcom by one or more interested parties.

It is clear from these examples that there is a clear pattern of flexibility from Ofcom in relation to re-regulation.

e. Cost-orientation continues to apply in all wholesale SMP markets. (However, BT's compliance with cost orientation obligations has always been controversial and is subject to an ongoing dispute).

f. The approach to SLGs that has been implemented for wholesale ethernet will now apply to PPCs - this covers measurement of performance and proactive payment

ANNEX 3 WHOLESALE ETHERNET REGULATION

This chapter describes the provision of wholesale ethernet products and the approach to their regulation adopted in the UK.

Wholesale ethernet products are provided by BT's Openreach division to other communications providers including BT Retail to allow those companies to provide service to end users. It is recognised that in the local access and backhaul segment there is an enduring access bottleneck which prevents alternative providers deploying their own ethernet services. This necessitates significant regulatory intervention. Access has been mandatory since 2004, on regulated and transparent terms and a cost-oriented, non-discriminatory basis. Having allowed the emerging market to develop over four years, Ofcom found further regulation to be required and consequently broadened the SMP conditions to include related accommodation services and a proposed price control as well as introducing regulatory requirements for wholesale ethernet service level agreements and automatic compensation payments. Further supporting the regulatory regime are BT's voluntary Undertakings which commit it to providing these services to alternative communications providers on the equivalent operational and functional basis as it does for its own downstream businesses.

Ethernet services are increasingly relied upon by UK businesses to fulfil their broadband requirements. A recent survey of businesses undertaken by Ofcom indicates that since the regulation of wholesale ethernet five years ago, there has been a broad sectoral shift to wholesale ethernet in preference to traditional leased lines.⁶² It is notable that this shift is not a simple switch from traditional leased lines to the new wholesale ethernet services, but in many cases businesses have taken on additional connectivity in the form of wholesale ethernet leased lines whilst maintaining their existing traditional analogue or digital services.

Wholesale ethernet products

Alternative communications providers are able to tailor wholesale ethernet products from the regulated product set to suit their customer requirements, choosing to provide retail services using its own network to a greater or lesser degree. "Wholesale Ethernet Services" connects a customer premises and the communications providers' network with a dedicated, symmetric transmission. The customer's local end is connected by fibre-optic with ethernet transmission and often there will be a dedicated fibre-optic pair connecting the Central Office and the communications provider's network. This service is also available as an end-to-end product, connecting two of the customer's sites with a

⁶² Business Connectivity Market Review: Review of the retail leased lines, wholesale symmetric broadband origination and wholesale trunk segments markets, Statement and Consultation, 8 December 2008

dedicated symmetric transmission using ethernet technology. Both products are available at a range of bandwidths. Alternative communications providers can also use "Backhaul Ethernet Services" to connect between themselves and the Central Office to backhaul broadband traffic back onto their networks. These are high-speed, permanently connected data circuits.

Ethernet is an enduring economic bottleneck

The UK approach is underpinned by an assumption that there are certain elements of the network which constitute a natural monopoly. Placing such monopoly assets into the Openreach division of BT and making available wholesale products, eliminates the need for alternative network operators to try to replicate these natural monopolies. This avoids non viable network replication, and ensures that investment flows to those elements of the network where competition is sustainable and can deliver the maximum economic benefit.

Infrastructure in the access segment (for example ethernet circuits) is generally not economically replicable since it requires large, upfront, sunk investments in fibre and duct. Compared with traditional leased lines, a high proportion of ethernet circuit costs consist of building fibre and duct. Alternative communications providers are worse off in this respect since the incumbent has a significant cost advantage given the ubiquity of its network. The cost to an alternative network operator nets of replicating the BT network would be so high that they render full end to end network replication economically non viable

Remedies

The classic European SMP remedies have been applied by Ofcom to wholesale ethernet services during the first five years of regulated access. These are designed to enable alternative communications providers to compete in the retail leased lines market. BT has been identified as having SMP in the national market for wholesale ethernet origination and as a consequence is subject to a range of obligations including:

- to provide network access on cost-oriented terms and
- not to discriminate unduly.
- Access must be on a transparent basis: BT is required to publish a reference offer,
- give notification of price changes and technical information
- to publish quality of service information.

Initially, Ofcom refrained from imposing a price control in order to allow the emerging wholesale market to develop. However, in spite of SMP remedies and the increased

popularity of ethernet services, the incumbent's market share has remained persistently high (at around 73% in 2006⁶³) and BT's returns have been exceptional (BT's ROCE on wholesale ethernet services was 31% in 2007/08⁶⁴). Consequently, Ofcom concluded in the 2008 market review that not only should the existing remedies be maintained but, in recognition of the continuing obstacles to competition in retail leased lines, a price control should be introduced for services in the wholesale market. Ofcom dismissed concerns from BT that a charge control could discourage investments in alternative infrastructure: during the five years during which these services were not subject to a charge control, BT earned high returns on these services but very limited alternative infrastructure was deployed in the market. This makes it 100% clear that, even in a time of economic boom and with the monopolist pricing excessively - theoretically the perfect conditions for entry - these markets were still uncontestable. Ofcom are similarly unconcerned that a charge control may stifle innovation; on the contrary, they note that, in this respect, a charge control may be preferred to other means of controlling prices as it is a mechanism that encourages efficiency and therefore innovation.⁶⁵

In addition to the existing cost orientation obligation, the proposed price control will take effect from October 2009 and incorporates initial one off price decreases to align charges more closely with costs. This includes upfront price cuts for wholesale ethernet backhaul, which Ofcom anticipates will encourage investment from alternative communications providers in services that in turn support local loop unbundling. The initial price cuts are substantial and the resulting saving to industry is estimated at £80 million per annum in connection and rental fees.⁶⁶ The control itself is based on 'baskets' of wholesale ethernet services; for each basket, prices will be constrained to an inflation-linked control and BT must bring them below the estimated 'Distributed Standalone Cost' ceilings within 12 months⁶⁷. This is a measure intended to further encourage cost-orientated charges from BT.

The largest basket contains the main wholesale ethernet products (including "Wholesale Ethernet Services" and "Backhaul Ethernet Services" described in section 3.1 above). Ofcom are consulting on a price control of between RPI-3.25% and RPI-11.50% for these products; the final figure will be determined by the final input values for each of the parameters in their costs model such as volume forecasts and anticipated efficiency gains. Sub-caps apply within the basket to limit BT's scope for balancing higher and lower prices

⁶³ Business Connectivity Market Review: Review of the retail leased lines, wholesale symmetric broadband origination and wholesale trunk segments markets, Consultation, 17 January 2008

⁶⁴ Ofcom Business Connectivity Market Review, Statement, 8 December 2008, Footnote 97 at page 231

⁶⁵ As above: Business Connectivity Market Review, Statement and Consultation, 8 December 2008, page 236, para 8.272

⁶⁶ Ofcom Leased Lines Charge Control: A new charge control framework for wholesale traditional interface and alternative interface products and services, Consultation, 8 December 2008

⁶⁷ Ofcom Leased Lines Charge Control: A new charge control framework for wholesale traditional interface and alternative interface products and services, Consultation, 8 December 2008

within the basket. These in apply certain named services as well as connections and rentals, each at a level of RPI-0%.

In addition to the services themselves, accommodation in Central Offices is subject to the proposed price control. Accommodation services enable alternative communications providers to aggregate access and backhaul products in the Central Office and the SMP conditions require that this be done on fair and reasonable terms and conditions. As the revenue from accommodation services is comparatively low and a price control as part of the larger basket would have been ineffective. Ofcom propose to introduce a control of RPI-0% for this basket. Similarly, stand-alone charges that BT levies when construction work is required to provide a new circuit form a basket of their own and will be subject to a price cap of RPI-0%.

Service Level Agreements

Service level agreements comprise a fundamental element of the contract for each of the wholesale ethernet products; they inform communications providers about the level of performance that they can expect from BT as well as the amount of compensation where that level is not met. BT's wholesale ethernet service level agreements have been regulated since March 2008 under an arrangement designed to incentivise better and more efficient service performance from its Openreach division.⁶⁸

Where BT fails to provide the contracted level of service, Ofcom has directed that BT must:

- provide for compensation based on a pre-estimate of an average communications provider's loss. This is intended to provide the right financial incentive on BT to meet the agreed service level;
- ensure that communications providers are not precluded from making a claim for any additional loss suffered above the pre-estimate of loss. In practical terms this means that BT must state explicitly in its wholesale ethernet contracts that communications providers are entitled to bring an additional claim for damages even where they have accepted the pre-estimated compensation payments;
- ensure that the structure of compensation payments means that the communications provider is compensated for every additional day it is late, or hour that a fault continues. Prior to this compensation was calculated on an aggregate level of failure over the communications provider's total usage of each product meaning that

longer duration faults received the same rate of compensation as those of a short duration;

- pay the communications provider any compensation payment pro-actively on failure instead of requiring communications providers to submit a claim.

Geographic regulation

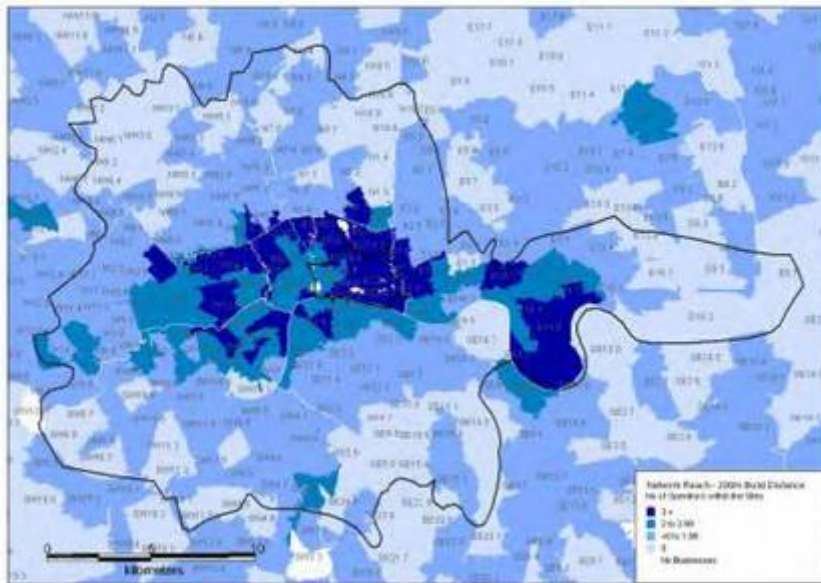
BT has argued that it faces effective competition in the wholesale ethernet market in certain areas of the UK, but without success. As part of the 2008 market review of leased line products, Ofcom considered whether geographic regulation (and conversely geographic deregulation) would be appropriate by analysing four elements of the market:

1. An analysis of service shares by operator in each postal sector of the country. This demonstrated only a limited variation in competitive conditions on a geographic basis.
2. An analysis of network reach that did demonstrate a potential for differing competitive conditions. This was based on the number of alternative operators' networks within an economic build distance of each UK business site belonging to a business with over 250 employees, averaged over postal sectors. However, Ofcom noted that the limited variation in network shares across the UK indicated that this potential was not being borne to fruition. Although there has been a significant amount of alternative network deployed across the UK, no one believes that any of those operators will ever be in a position to seriously challenge the ubiquity of BT's network
3. An examination of BT's pricing policies which could indicate the extent to which there exists a common pricing constraint across geographic areas and which indeed revealed that BT continues to price services on a uniform basis across the UK.
4. The degree of interconnection between alternative network operators' networks.

In conclusion the analysis pointed clearly towards a national market for wholesale ethernet in the UK and the market definition, analysis and remedies apply accordingly. It is notable that Ofcom reached this conclusion despite the fact that there is a comparatively high number of networks in the UK with the potential to compete with BT in certain geographic areas.

In contrast, Ofcom simultaneously deregulated traditional leased lines in the geographic areas which it found to be insufficiently competitive in the wholesale ethernet market. However, even that decision does not encompass the whole market, either in terms of services or geography; rather, it applies only to high-bandwidth services in a unique urban pocket as shown in the figure below (that decision is examined in more detail in the following chapter).

Figure A6.2: Number of operators in the CLZ, assuming 200m build distance



ANNEX 4 THE DEBATE ON CONSUMER BROADBAND

In reviewing the regulation of wholesale ethernet (and indeed any other business connectivity product or technology) it is important to bear in mind that most of the public and press debate in this area is concerned with the provision of consumer broadband, with the interests of business oriented communications providers and their customers receiving only marginal consideration. So public statements about the regulation of “next generation access” in the UK are primarily concerned with that consumer market. This section analyses some of these statements and, likewise, deals primarily with consumer broadband.

First generation consumer broadband services had no sooner begun rolling out than theories about a potential digital divide between the digital haves and have-nots began to take hold. These theories gained fresh momentum as awareness of still faster speeds has grown. Politicians of all political hues have vied with each other to be seen to be helping to deliver faster broadband in order to ensure that their constituents are not left behind. The UK is not unique in this regard and similar patterns of behaviour have been seen worldwide. Indeed the global aspect of the discussion is important since politicians and policy makers often use international comparators to support their case. Since no one wants to see their country languishing at the foot of such league tables the calls for something to be done continue.

The consistent public policy message has been that universal broadband availability is now regarded as being almost as vital to the modern consumer as water, electricity and gas. The interim Digital Britain report has turned universal broadband availability into the latest high profile topic but it is perhaps worth pointing out that the concept is not new, and in fact both the Northern Ireland Executive and the Scottish Government have pushed ahead with their own plans which have delivered, or are on the cusp of delivering, 100% broadband coverage at the 2 Mbit/s level proposed by Lord Carter. More recently, on 3 March 2009, Ofcom issued a series of papers on future access networks. This was prompted by BT’s proposal to invest in fibre to the remote and VDSL technology between the remote and the customer. It is notable that, while Ofcom does not currently intend to regulate the price of these FTTC-based services, the services will be provided on a so-called “equivalence on inputs” basis. Ofcom also emphasised that their policy was to “to promote passive access [e.g. through sub-loop unbundling] wherever this is economic and sustainable.

Different arms of Government have also launched successive initiatives seeking to deliver the ultimate consumer high speed broadband solution. In the last year alone there have been reports and or initiatives from: The Broadband Stakeholder Group, the Government commissioned “Caio Review”, Lord Carter’s Digital Britain report, a report by Ofcom’s

Consumer Panel⁶⁹, as well as broadband initiatives by the Scottish Government⁷⁰, the Northern Ireland Executive⁷¹ and the Welsh Assembly Government⁷².

The Broadband Stakeholders' Group report said the market could probably justify investing in dedicated fibre to about two thirds of the UK population who live in densely populated urban areas but that it would cost almost £29bn to deploy a 1Gbit/s new fibre optic line to every home and business in the UK; this caused renewed anxiety that a new digital divide would emerge, harming rural consumers.

The Caio review, commissioned by the Department for Business Enterprise and Regulatory Reform concluded that the UK is **not** lagging behind competitor nations. Caio came out against state subsidies for fibre, suggesting rural areas might be better served by wireless technologies. Perhaps because the review suggested that there was no need for radical public sector intervention (heresy among those who regularly call for something to be done), it has not received as much attention as for example the Digital Britain report, even in interim form. In recent months, the Government has increasingly been seen to be turning to investment in Communications infrastructure as one of the key tools to help pull the country out of the current economic troubles. For example the Prime Minister has stated that

"We have looked at how, just as many years ago investment in road and rail and infrastructure was a powerful stimulus to the economies then, so too in this new age we can invest in the digital infrastructure for the future."⁷³

One factor which both the Caio and Carter reviews agreed upon is that much of the cost of new broadband networks will stem from digging up roads and other civil engineering costs. Ironically in the last five years the motoring lobby has successfully persuaded Government to push through legislation which makes it more bureaucratic and expensive for companies to dig up the roads in order to install fibre, and this despite extensive lobbying efforts by the industry warning of the risks to future broadband deployments.

So the public policy debate has generated much heat and light, but little of any real substance in a business context. The fact that the most frequently cited need for investment in high speed networks is the need to deliver high definition TV speaks volumes. To date, official debate on policy has concentrated almost exclusively on the consumer market and is therefore of limited importance in any analysis of the wholesale

⁶⁹ <http://www.communicationsconsumerpanel.org.uk/smartweb/news-releases/consumer-panel-calls-for-communities-excluded-from-current-broadband-to-leapfrog-to-fast-next-genera>

⁷⁰ <http://www.scotland.gov.uk/Topics/People/BroadbandforScotland/SEBroadbandInitiatives/LatestNewsAnnouncements>

⁷¹ <http://www.northernireland.gov.uk/news-detail-130109-high-speed-broadband>

⁷² <http://wales.gov.uk/topics/businessandconomy/broadbandandict/initiatives/ribs/?lang=en>

⁷³ http://news.bbc.co.uk/1/hi/uk_politics/7770701.stm

Wholesale high-speed access services



ethernet market. This consumer debate is largely irrelevant to the debate on business ethernet.