FIXED ACCESS MARKET REVIEW

CONSULTATION RESPONSE BY COLT TECHNOLOGY SERVICES

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1 About Colt

Colt is Europe's information delivery platform, enabling its customers to embrace the changing landscape of IT and communications so they can deliver, share, process, and store all of their vital business information.

Colt aims to inspire customers to think differently about the way they tackle their core business and technology issues. Colt's information delivery platform combines high performance, end-to-end control of integrated compute and network solutions with an agile and responsive approach that delivers an integrated experience across Europe and beyond.

Today, Colt runs a 22-country, 43,000km network that includes metropolitan area networks in 39 major European cities, with direct fibre connections into 18,000 buildings and 20 Colt data centres.

Colt enables its customers to deliver, share, process and store vital business information by bringing together 3 key elements:

- Pioneering European Ethernet and IP networks that seamlessly connect over 100 cities and achieves the industry's highest standards in performance, latency and security.
- Significant IT infrastructure and services across Europe, with 20 state-of-the-art data centres with tens of thousands of devices under management.
- Extensive expertise in creating integrated IT managed services, networking and communication solutions.

Colt is continuing to invest heavily in its ability to deliver integrated network and IT managed services. Colt is also helping to lead industry standards and certification for cloud services.

2 Introduction

As we argued in our responses to the BCMR in 2012, there are serious questions about whether the form of regulatory controls currently deployed by Ofcom can genuinely be said to represent a viable model for the future. The recent criticism by the Public Accounts Committee of the DCMS for awarding the entire £1.2bn of public money set aside to fund rural broadband to BT, is illustrative of the weaknesses in the current approach. In our view, part of the underlying cause of this is a failure to secure the right investment incentives and to take account of how investment incentives between adjacent markets interact with each other.

Because of the growing linkages between market segments previously considered separate, and because of the growing diversity in end usage models, we believe it will be increasingly difficult for Ofcom to continue with its current approach to market analysis and wholesale obligations. In the long term, we believe that both the business and residential markets will be best served by simpler and more generic remedies, based primarily on infrastructure access and dark fibre without Ofcom taking a view on the downstream purpose of upstream access.

Ofcom's approach to the FAMR (and by implication, also the BCMR) appears to be based on at least two material confusions, which are that:

- There is a meaningful distinction between "leased lines" and other forms of NGA; and secondly that
- The distinction between "access" and "backhaul" is to a large degree static and the classification of any given network element into one or the other is defined according to its location relative to BT's network architecture.

Of course, where a fundamental difference in regulatory approach is based on a distinction that is qualitatively invalid or economically meaningless, the scope arises for distortions in investment incentives with material re-percussions on the market.

Unfortunately, both of these confusions appear to be particularly convenient for BT because they allow it to segment the market (and thus maintain its price discrimination strategies) without fear of substitution or competitive entry from adjacent markets.

With regard to the distinction between leased lines and other forms of NGA, Ofcom's segmented approach introduces several market distortions that operate against the public interest. First of all, it prevents complementarities at the network level between leased lines and consumer NGA from being exploited. This prevents business oriented CPs from rolling out networks that can be used to reduce the cost of alternative (to BT) residential NGA investments. Secondly, it denies business oriented CPs the means of competing effectively against the growing array of substitute products arising from residential NGA deployments. This effectively leaves the market for marginal customers (marginal in the sense that they require higher bandwidth services with business oriented SLAs but do not require the higher quality characteristics of products that Ofcom defines as "leased lines"), almost entirely to BT.[1]

Overall therefore, our view is that Ofcom's approach amounts to a recipe for a static market in which there is no meaningful challenge to BT's enduring stranglehold, either at the network level, or at the market segmentation level.

With regard to the distinction between "access" and "backhaul", the approach whereby "backhaul" is defined with reference to BT's existing network architecture and whereby regulatory conditions facilitate entry in one segment but not the other, Ofcom's approach prevents CPs from rolling out alternative network architectures that may, (depending on local conditions) offer something better, cheaper or different from that which BT can provide. Colt's local ring architecture, which it is actively rolling out over Europe using passive infrastructure access is in our opinion, all three. A workable form of passive

[1] http://business.bt.com/broadband-and-internet/fibre-optic-broadband/pricing-and-plans/?msgtype=02&s_cid=btb_ppc_maxus_bing_g_btb_business_infinity_(broad)_business_infinity_broad_business_infinity . We acknowledge that in theory, VULA provides a means of competitive entry into the SOHO (Small office Home Office) and lower-end SME customers, but it is far from clear that VULA is at all suitable for serving small business customers on any significant scale, and is not sufficient to allow disruptive entry from service providers wishing to offer a different type of product with a different pricing structure.

infrastructure access in the UK would allow Colt and others to invest similarly in the UK market which, we believe, would stimulate a cascade of complementary investments and market entry, benefitting residential and business customers alike.

[**Confidential**.

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Although – largely due to action by Ofcom – the UK Electronic Communications Market has been mainly (and in some cases conspicuously) successful to date, the UK market does exhibit some notable drawbacks, some of which are as follows:

- A relatively static market with a lack of infrastructure investment by parties other than BT. The extent of infrastructure deployment by carriers besides BT since the early 2000s has been very limited;
- Relatively weak infrastructure competition in most other UK cities besides London; and
- Weak competition in backhaul

In our view, these weaknesses will become increasingly stark over the next few years.

As we stated in our response to the BCMR – and our comments also apply here – Ofcom's current approach appears to be an effort in micromanaging the market around BT's own products and network. This allows BT to retain its firm grip on the market at the wholesale level (and by extension also at the retail level) by controlling other CPs' deployment of infrastructure around its own network, by exploiting and gaming the complex rules regarding products, pricing and service delivery, and by restricting the services that it provides to wholesale customers to a limited subset of the services that it provides to itself.

In our ensuing comments we have used examples from the French market and the recent approach by ARCEP, to illustrate our points. Colt has deep and long-standing experience of operating and investing in the French market and working with the regulatory regime. For clarity, we do not by any means intend to suggest that the approach by ARCEP is superior to that of Ofcom. For the majority of its existence Ofcom's approach has been held up as an example to the rest of Europe and in our view, rightly so. Ofcom's approach was particularly suited to the capital-constrained times of the early-to-mid 2000s.

Today however, the needs of the market have moved on. The increasingly fragmented and complex array of IT services to support different models of remote access and cloud-computing, require an increasingly specific range of business connectivity solutions and pricing models. A situation in which the market's ability to support those needs is primarily determined by the action (or inaction) of one supplier cannot be ideal. Meanwhile at the residential end of the market, the move towards super-fast broadband infrastructure requires investment of an unprecedented scale. The current approach appears to be characterised by a desire to "get it in as quickly as possible and sleepwalk towards a monopoly". Instead,

we believe a better approach is to consider how to harness the potential of investment from multiple sources and in particular, to recognise the joint role of business and residentially oriented suppliers working in partnership to deliver the infrastructure required. This is exactly what the French have done. Their approach already appears to have been successful in stimulating the investment required – from Colt and others – to serve the long term interests of businesses and consumers.

By way of summary, Colt considers the single most important change to the existing regulatory regime, in terms of its role in facilitating the investments that the UK requires, would be for Ofcom to institute a form of passive access that is a) invariant to the part of BT's network in which any given facility may exist; and b) does not distinguish between the use to which any instance of access is put.

3 Linkages between Business Connectivity Market Review and Fixed Access Market Review

Ofcom's current approach towards the Fixed Access Market Review (FAMR) and the Business Connectivity Market review (BCMR) does not appear to us to pay adequate heed to the linkages between them. De facto, the FAMR has become the "residential market review", as distinct from the "business market review" (the BCMR). As such, the FAMR does not take account of the joint role played by business oriented and residential oriented CPs in delivering the radical changes that the UK market needs in the move from an access infrastructure environment predominantly based on copper to one based on fibre.

The siloed approach to market reviews definition could make sense in a world where different market sectors are conveniently organised by access technology (e.g. copper and fibre). But the communications industry is evolving towards a state where products and markets operate on a basis that is closer to a continuum. The substitutabilities and complementarities between markets is altogether more complex than in the past.

For precisely this reason the French NRA, ARCEP, has decided to review Markets 4, 5 and 6 together and Colt believes Ofcom should do the same. In justifying its decision to delay the Market 6 review to coincide with its Markets 4 and 5 reviews, ARCEP stated (translated from French) "Markets 4,5 and 6 are being reviewed for the first time in a synchronous manner because the underlying wholesale products cannot be separated between business and residential markets" (I.e. it is impossible to analyse the business market on its own). It further explained in February 2013 that "Markets 4, 5 and 6 cover all wholesale markets used by alternative operators to provide data services to residential and non-residential customers. It was possible to consider Market 6 products relatively independently from market 4 and 5 products in the past. However, recent changes in the market require a global approach." Indeed they noted many services, which used to be reviewed separately, serve closely related needs through the same network components and some upstream products needed to be assessed under both market reviews given the interactions at the downstream level.

By strictly separating those two markets, Ofcom misses some benefits of considering them together, particularly the changes in the upstream markets (which are mostly considered in the BCMR) to facilitate a competitive market in residential NGA.

3.1 Potential benefits of Leased Lines competition on NGA deployment

Ofcom has considered the possibility of using PIA for leased lines and "concluded that, in general, the contribution made by leased line deployments to an NGA business case was likely to be weak". This is precisely the opposite conclusion to that reached by ARCEP. One of the approaches must clearly be wrong.

We are aware the BT considers that the existence of functional separation in the UK is the fundamental difference between the UK and other markets. A difference moreover from which any number of policy implications apparently flow. Today's principle challenge has nothing to do with the problem that functional separation is intended to solve (the conflict of interest between being an internal supplier and a supplier to competitors). It is only about how to stimulate the right investment in the right places. Furthermore, even if we were to accept that the UK's functional separation model is relevant to this discussion (which we do not), functional separation is more a matter of degree than of kind. Most European countries have implemented a form of separation (e.g. accounting separation) which carries many of the same putative benefits. One factor, however, that conceivably hampers the implementation of the right policies in the UK is the bright line between Openreach and the rest of BT. It happens too often, in our view, that the right policies are discouraged simply because of the arbitrary constraint imposed by the current structure of Openreach.

Regarding the strength of the contribution of leased lines deployments to NGA development, we disagree with Ofcom's position. There are two broad reasons for our disagreement, as follows:

- First is the contribution to NGA deployment of an effective market for backhaul (as currently understood by Ofcom). Unfortunately, being defined as "leased lines", services provided in the backhaul segment are only explicitly considered in the BCMR. By considering these strongly interacting markets in separate market reviews, Ofcom runs the risk of missing opportunities to align regulatory intervention to secure desired outcomes in adjacent markets. The state of competition in the backhaul market has a significant bearing on NGA deployment that has not adequately been considered, either in the BCMR or in the FAMR.
- Secondly, it is not clear why Ofcom believes there is such a stark, qualitative distinction between "leased lines" and NGA deployments, such that they qualify for such fundamentally different regulatory treatment. It appears to Colt that Ofcom has developed an approach based on a curious and highly artificial distinction.

In reality, there is no clear definition of NGA that is meaningful in any economic sense, nor indeed any such clear definition of leased lines. Indeed, in a world where underlying technologies and patterns of demand are constantly changing, any attempt to pin down a meaningful definition of these terms will rapidly become obsolete as market evolve. This is precisely why Colt has recommended in the past – and continues to recommend – that rather than developing a bifurcated approach based on stylised distinction between technologies and/or usage models, Ofcom focuses on the upstream inputs in a manner that is completely agnostic to downstream use.

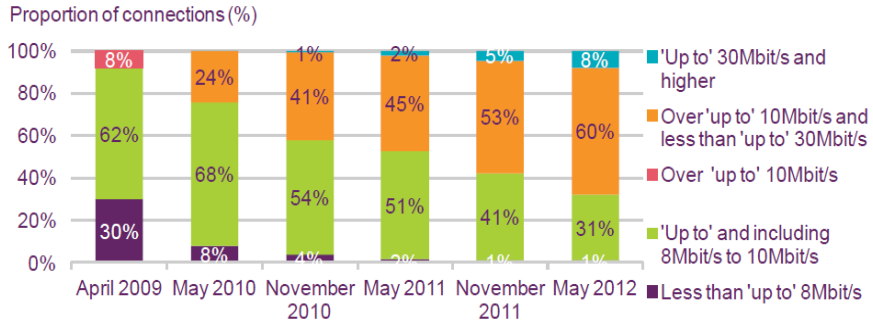
3.1.1 Linkages between access and backhaul networks

CPs need an efficient market in backhaul in order to provide the products they wish to sell. Price, quality, bandwidth and location are among the important dimensions of the backhaul market that are important to CPs. Indeed, with the explosion in access bandwidths we are seeing today (e.g. FttC and 4G), an efficient market in backhaul is arguably more important than it has ever previously been, to secure the right incentives to develop the right products. Such backhaul is clearly complementary to access and therefore an example of the type of complementarity discussed elsewhere.

As described in the 2013 BCMR statement: "The demand for leased lines bandwidth has increased steadily in the last few years, driven by sustained increases in both the penetration and the speed of business and consumer data services. Adoption of remotely hosted computing applications (often known as 'cloud computing'), growing consumption of video content, and the rapid growth of e-commerce and of internet applications have all added to businesses' bandwidth demands. At the same time, providers of consumer broadband services, both fixed and mobile, have required steadily increasing bandwidth to support the growth in traffic from their end-users."[2]

The need for consumer providers to be supported by backhaul capacity can also be shown more by the growth in higher-speed connections provided. The chart taken from Ofcom's review of UK fixed-line broadband performance in May 2012[3], illustrates this.

Figure 1.3 UK residential broadband connections, by headline speed



Source: Ofcom, based on data provided by the UK's largest ISPs by retail market share (representing over 90% of the total market)

A further factor that must be taken into account is that the evolving market may require changes to the structure and architecture of backhaul networks. In constructing a backhaul network, a CP would do so for its own needs, with a structure and architecture that matches its own requirements. A CP would plan its routes, locations and breakout points strategically in order to optimise the availability of capacity in locations that it serves (both present actual and future potential). However, given that under the present

[2] http://stakeholders.ofcom.org.uk/consultations/business-connectivity-mr/final-statement/

[3] http://stakeholders.ofcom.org.uk/binaries/research/broadband-research/may2012/Fixed_bb_speeds_May_2012.pdf

framework, often the only realistic option open to a CP is to purchase a backhaul service from BT, a CP's ability to optimise its backhaul service in a way that meets its needs, is severely restricted.

Put another way, CPs seek to construct their networks such that the routing and architecture allows economies of scope to be exploited between adjacent access zones. This may involve some ambiguity in the classification of a given network segment (ie it may perform as "access" for one zone, while the same segment performs the function of "backhaul" for another zone).

Colt's preferred ring architecture allows networks to be constructed very efficiently. Unlike BT, Colt deploys rings instead of hub-and-spoke networks when accessing customers' premises. We believe that this is superior to BT's hub and spoke network architecture both in terms of efficiency (because it allows more customers to be accessed from any given trench or cable length) and in terms of resilience. An added efficiency benefit of the ring architecture is that it allows a CP to build rings upon rings. In other words, it allows the easy extension or expansion into an adjacent zone, simply by deploying a second ring that interlocks with the first. Following this, a third can be added, then a fourth, and so on. It should be clear that this type of architecture results in a breakdown in the distinction between access and backhaul. A ring that is "access" for one customer may be "backhaul" for another. It would also result in the locations of such backhaul having no geographic relationship to the backhaul parts of BT's network.

Colt views the ring architecture as only true "NGA" configuration. BT's version of NGA is constrained by its legacy hub-and-spoke structure that was optimised primarily around the distance and bandwidth limitations of copper. We further believe that, in basing its SMP obligations around a distinction between the "access segment" and the "backhaul segment" (where such terms are defined according to the structure of BT's legacy network), and further by preventing passive access from being used for leased lines, Ofcom risks forcing other CPs to deploy their networks in a way that matches BT's legacy architecture. This prevents any real innovation in network architectures and the concomitant benefits thereof, which include (inter-alia) improvements in efficiency, quality of service and the economics of incremental network rollout. It also strengthens BT's position as wholesale provider of last resort – a position that we believe Ofcom should seek to discourage.

3.1.2 ARCEP Approach

In other European countries in which Colt operates, the situation is quite different. For example, ARCEP stated that although the European Commission has not referenced the backhaul segment in its definition of relevant markets, since 2005 ARCEP has explicitly addressed this segment as being an essential factor contributing to the extension of the unbundling coverage.

In consideration of the linkages between access and backhaul, ARCEP has mandated Orange to provide a dark fibre offer for backhaul purposes (through the "LFO" offer, i.e. Lien Fibre Optique). Moreover, Orange is also required to provide civil engineering infrastructure in the backhaul segment when the MDF is not connected with fibre and Orange cannot set its existing LFO fibre free. Precisely in order to encourage CPs to construct their networks according to their own specific needs, ARCEP has chosen not to mandate access to active services for backhaul purposes. Nevertheless, this does not prevent competitive wholesale offers being available. Indeed, the availability of primary inputs seems to have

been a spur to a vibrantly competitive market for wholesale services in this segment. Several players now have commercial wholesale offers in this segment, including Orange.

In France, residential NGA networks (i.e. FttH or as ARCEP calls them: Shared Local Loops, as opposed to FttO being Dedicated Local Loops), are being deployed by five different operators (SFR and Bouygues Telecom together, and Orange, Free and Numericable (FttLN)) and even more if we consider FttO. As shown by Figure 11 and 13 of Wik Consult's "NGA progress report" and Figure 1 of Cullen International's study "Build, Buy or Share: regulatory options for broadband network deployments" (see relevant charts paragraph 3.3), France seems to be a leading country in terms of NGA deployments.

In the UK by contrast, CPs' options for backhaul are relatively limited. In principle the following options could exist. CPs could:

1. Deploy their own backhaul network by:
    a. Digging and installing their own ducts
    b. Using duct access from BT or other suppliers
2. Buy active services from BT or other suppliers
3. Buy passive links such as dark fibre from BT or other suppliers.

Yet in most cases the only practical option is to buy active services from BT. The very limited range of regulated products and services available from BT means that CPs are highly restricted in the structures, architectures and locations that are available to them.

The lack of choice regarding backhaul options may indeed be a factor limiting CPs' incentives to deploy NGA networks. For example, only BT and Virgin Media have deployed NGA on any significant scale (see paragraph 11.6 of this current market review: "the retail breakdown of superfast broadband subscribers is: 63% Virgin, 33% BT Retail and 5% others" and Table 11.1: BT and Virgin net superfast broadband subscribers).

3.1.3 Blurred boundary between NGA and Leased Lines deployments

There is no robust definition of NGA. In the 2010 Wholesale Local Access market review[4] Ofcom presented the NGA concept in the following way: "In this market review, a forward look is particularly relevant because the next few years will be the early roll-out period for **NGA networks, which will enable the delivery of 'super-fast' broadband services**. Super-fast broadband is generally taken to mean broadband products that provide a **maximum download speed that is greater than 24 Mbit/s**. This threshold is commonly considered to be the maximum speed that can be supported on current generation (copper-based) networks. Of course, the actual speed experienced by consumers depends on factors such as distance from the local exchanges. To achieve higher speeds than 24 Mbit/s, CPs would need to use alternative technology, based on providing a **connection over optical fibre** some or all of the way to the customer".

[4] http://stakeholders.ofcom.org.uk/binaries/consultations/wla/statement/WLA_statement.pdf

Another way for Ofcom to define NGA is in the Glossary provided in Annex 12 of the current present consultation:

- *NGA:* **new or upgraded access networks** that will allow substantial improvements in broadband speeds and quality of service compared to today's services.
- *CGA:* a copper-based access network that can support a maximum download **speed of 24 Mbit/s**.

Despite the lack of clarity of those definitions, Colt understands that for Ofcom, the key characteristics necessary for defining NGA networks are the following:

- A new or upgraded access network;
- Providing a fibre connection;
- Enabling delivery of 'super-fast' broadband services over 24 Mbit/s.

Looking now at Ofcom's definition of a Leased Line in the last BCMR statement[5]: "A leased line is a service that provides **dedicated symmetric transmission capacity to carry voice and/or data traffic**. Dedicated in this context means uncontended, and symmetric means there are identical transmit and receive data rates. They are mainly used to provide enterprise networks to carry inter-site and inter-company traffic". Further in the statement, Ofcom presents some of the key characteristics of a leased line: availability, bandwidth, contention, latency, resilience, security, etc.

Comparing those two definitions, it is not clear whether there is a genuine distinction between "NGA" or "Leased Lines" that is qualitatively or economically meaningful. Indeed, it appears that "Leased Lines" belong to Ofcom's NGA definition. A leased line can and typically does use fibre, provide a bandwidths over 24 Mbit/s and be deployed in the access segment as a new or upgrade network significantly improving current broadband speeds and quality of service.

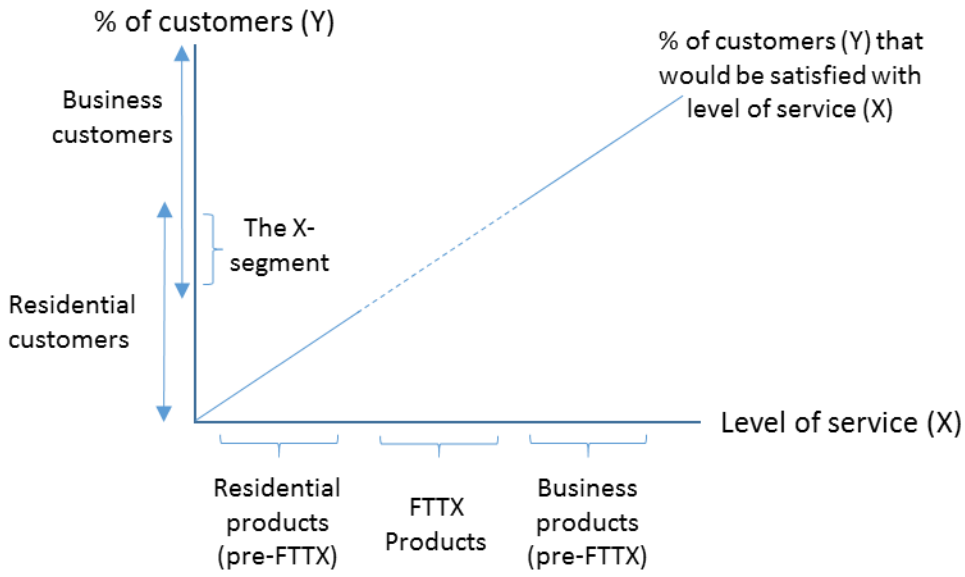
We understand the term of 'NGA' was introduced in the context of describing local loop fibre deployments, aimed at replacing historic copper loops. The term 'FttX' ('Fibre to the X') is often used to describe this phenomenon as well. Different sub categories of this term can be used such as: FttH (Fibre to the home), FttC (Fibre to the curb), FttO (Fibre to the office), FttLA (Fibre to the last amplifier).

Rather than considering there to be a bright line distinction between residential NGA and leased lines, we argue that the market is evolving towards a continuum. Conceptually, this might be expressed in the following way. The chart below depicts a notional cumulative distribution of customers by their requirements in terms of level of service. I.e. the line depicts the proportion of customers (vertical axis) that would be satisfied by an equal or better level of service shown on the horizontal axis. "Level of service" is an amalgam of different service metrics, including QoS as traditionally understood, and bandwidth.

In a pre-FttX environment, the products are quite clearly defined as "business" or "residential". Customers sort themselves into each category – residential customers buy residential products and pay less, while business customers buy business products and pay more. FttX fills in the gap between business

[5] http://stakeholders.ofcom.org.uk/binaries/consultations/business-connectivity/statement/Sections1-4.pdf

and residential products, blurring the distinction between them. The chart below is drawn so that the requirements of some business customers and some residential customers overlap. The "X-Segment" is used to denote the segment of customers at the lower end of the business market and the upper end of the residential market, whose preferences lead them to buy the same products. FttX in the residential segment greatly increases the extent of this overlap. Products in this category may well bear some resemblance to "leased lines" but without strictly meeting Ofcom's definition of such.



Furthermore, by restricting a product to be used for Leased Lines, Ofcom appears in fact to be making a distinction primarily on the identity of the end-user, which appears to run counter to the spirit of technology neutrality enshrined in the Framework Directive.

3.2 Potential demand for PIA

Ofcom partly justified its decision to impose restrictions on the downstream use of PIA, by asserting that it does not consider that Leased Lines could significantly contribute to NGA deployment. We believe that Ofcom is seriously mistaken in this view.

Part of our objection is on principled grounds. Denying access to a particular wholesale service because it is not seen to foster an outcome that Ofcom considers desirable, appears to us to be a perversion of the purpose of economic regulation. As we understand it, the purpose of economic regulation is to secure access to the inputs that cannot be economically replicated, and then to allow the market to do what it will. In contrast to this aim, Ofcom's approach appears to be more focused on managing regulation to a market outcome (and fails to do so correctly, even if we accept that this is the role the regulator should adopt). By denying a form of entry based on a particular facility just because Ofcom cannot see how it would facilitate the achievement of an outcome considered desirable, Ofcom is proactively preventing a potential source of disruptive entry that has been such a powerful source of innovation in the UK market to date.

Notwithstanding the above, there is a long history of business-only CPs providing the infrastructure platform over which residential service providers are able to provide their services. Freeserve, for example, was a disruptive entrant that launched a revolution in the dial-up Internet business model. Its backbone infrastructure was provided by Energis. Likewise, AOL was a pioneer in bringing the Internet to UK homes. Its backbone was provided by MCI WorldCom. UK Online was the residential arm of Easynet, which was later acquired by Sky. There is no reason to expect that this would not continue in an NGA world.

More specifically, it is possible to envisage a scenario where a business oriented CP would seek to connect several MSAN sites in a ring, providing a platform on which a partner CP would access the customer via VULA or PIA. This would currently be prevented by the restriction on PIA being used for the purposes of leased lines, and by the restriction on its use in the backhaul segment. Another possibility would be that a business CP would deploy a ring architecture in the access segment, which either it or other CPs could extend by means of spurs or additional rings to serve specific customers, using PIA or SLU. The ring architecture favoured by Colt would undoubtedly be deployed in geographies in which both business and residential customers coexist, making the connection of specific additional customers relatively efficient and straightforward. This form of entry is currently prevented by the current restriction on PIA's use for leased lines.

The majority of Colt's business is undertaken through local franchise partnerships who use Colt connectivity to provide a suite of IT and related services to local customers. It is possible – indeed likely – that Colt would strike up relationships with franchisees seeking to provide access to residential customers. This would not only foster competition at the local level, but would also potentially provide an FttH alternative to BT's FttC solution.

Ofcom could comprehensively address the lack of demand for PIA by removing the myriad restrictions on the manner in which it is used. The present demand for PIA is low because there are too many restrictions on the product, which collectively make it unworkable. Ofcom has mandated access to PIA but under the following restrictive usage conditions:

- For the purpose of deploying NGA networks;
- To serve multiple premises;
- Not for deploying Leased Lines.

BT translated those restrictions by preventing the use of PIA for:

- leased lines;
- Broadband Network Infrastructure specifically designed to replace point to point customer connections (i.e. directly between two Customer Sites);
- carrying Infrastructure directly between CP POPs;
- backhaul, with the exception of Sub Loop Unbundling backhaul;
- core network deployment;
- distances less than 100m;
- mobile backhaul; and
- wireless services.

In our view, BT's restrictions on the use of PIA are designed very strategically to prevent the form of disruptive entry that we consider beneficial to the UK market as a whole. Given these restrictions (both in the obligation and the implementation), it is hardly suprising that PIA has failed to make an impact.

Without any restrictions regarding the network level for which it is used (access, backhaul or core network deployments), or the bandwidth characteristics of the service (ie "leased line" or not), PIA would provide a significant spur for business oriented CPs to invest.

Business CPs' demand often varies from one customer to another, implying bespoke requirements that cannot be provided by buying an active service from BT. Also, business customers' demands are in a continual state of evolution. For example, a customer can require more capacity, a better QoS or a different technology on which its service is provided. For this reason it is important for CPs to be able to respond as flexibly and cheaply as possible offering a pricing structure that is responsive to the customer's particular needs. Flexibility implies control over the:

- SLA;
- layer 2 and 3 technology;
- bandwidth/capacity provided (including factors such as symmetry, scaleability and burstability)
- pricing structure;
- QoS

None of the above are possible when buying an active service from BT. BT offers specific SLAs, technologies, bandwidths and QoS, as well as an underlying cost structure that sets the floor for the downstream service. When customers demand changes, CPs need either to ask BT for changes in the existing wholesale service provided and then bear the applicable set-up or change charges, as well as BT's provisioning lead-times. The process of responding to customers' changing demands relying on BT's underlying active inputs can be expensive and involve delays, preventing business providers from operating as flexibly as would be possible if they were to deploy network using their own infrastructure.

3.3 Benefits of On-net versus Off-net access

One of the problems of applying traditional regulatory models to an NGA world is that NGA world requires fundamental changes to the nature of the network. This is why we believe that Ofcom should be primarily focused on incentives for CPs to invest in deploying their own fibre, in order to allow innovation to occur at the higher layers and in other dimensions such as pricing, location, capacity and SLAs.

As described by Martin Cave in the foreword of 'Infrastructure versus Service-based Competition: the Case of Mobile Telecommunications'[6]: *"regulators should not resign themselves to the view that a next generation access network is necessarily a monopoly, and that the best we can aspire to in future is* ***service competition or a very attenuated version of infrastructure competition****. To the contrary, regulators should first promote end-to-end competition between fibre networks and the alternative NGA networks represented by upgraded cable companies, and consider opening up passive assets such as ducts to promote competition. The growing potential for broadband deliver of wireless networks, which are*

[6] http://vbn.aau.dk/files/14850300/Book_20infrastructure_20versus_20service.pdf

inherently naturally competitive) should also be taken into account. If these forms of end-to-end competition are deployed, the need for regulation may even disappear."

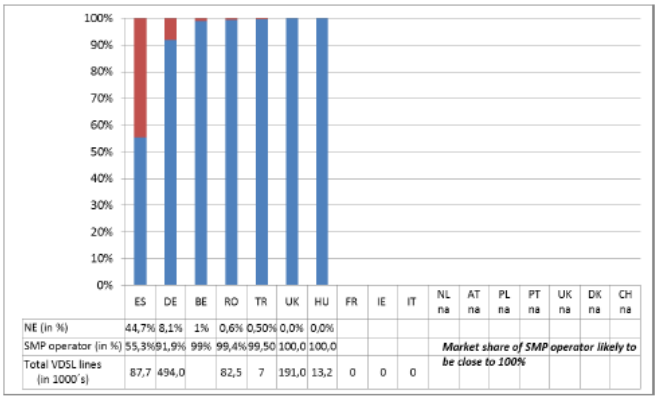
To some extent, the argument expressed by Martin Cave "the need for regulation may even disappear" can be shown by the backhaul market in France. As described above, the only regulated products are dark fibre and duct access, with no need for further regulation (ie mandating access to active products). Thanks to the right input products being regulated, wholesale providers besides the incumbent can provide competitive backhaul offers. This creates scope for a simpler regulatory framework preventing unnecessary complexities for the NRA in implementing the detailed conditions for active products.

Besides, according to Martin Cave's assessment above, a focus primarily on VULA, with only a secondary focus on PIA would appear to amount to a **service competition strategy including a very attenuated version of infrastructure competition**. Colt struggles to understand why Ofcom has adopted this approach, especially given the European Commission's emphasis on access to civil engineering infrastructure, made in the 2010 NGA recommendation[7].

A reverse example can be found in France where ARCEP emphasised infrastructure-based competition by insisting on regulating access to France Telecom's civil infrastructure, both for FttH and FttO deployments.

As show the charts below from Wik Consult, 'NGA Progress report'[8], this strategy has enabled more competition in France for FttH/B connections than in the UK for VDSL connections.

Figure 13: Share of retail VDSL connections of the Market 4/5 SMP operator (%), July 2011

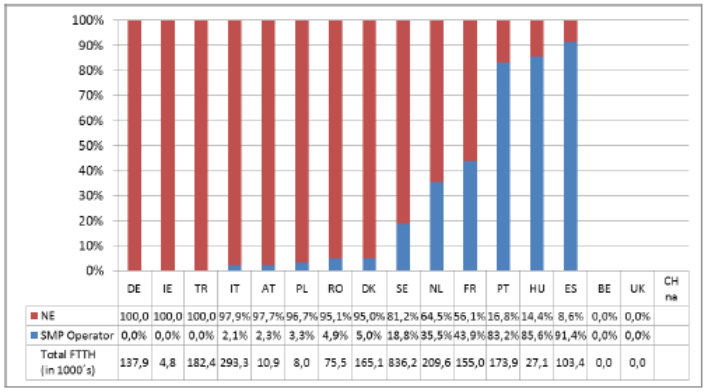


	ES	DE	BE	RO	TR	UK	HU	FR	IE	IT	NL	AT	PL	PT	UK	DK	CH
NE (in %)	44,7%	8,1%	1%	0,6%	0,50%	0,0%	0,0%				na	na	na	na	na	na	na
SMP operator (in %)	55,3%	91,9%	99%	99,4%	99,50	100,0	100,0										
Total VDSL lines (in 1000's)	87,7	494,0		82,5	7	191,0	13,2	0	0	0							

Note: VDSL lines of ANOs are partially based on local loop unbundling and provision of VDSL from the MDF (hence, strictly speaking, they may not be considered as based on NGA). The retail VDSL market shares in Germany and, in particular, Spain are likely to be closer to 100% if only VDSL over FTTN networks is considered.

Source: WIK-Questionnaire, own estimates

Figure 11: Share of retail FTTH/B connections of the Market 4/5 SMP operator (%), July 2011



	DE	IE	TR	IT	AT	PL	RO	DK	SE	NL	FR	PT	HU	ES	BE	UK	CH
NE	100,0	100,0	100,0	97,9%	97,7%	96,7%	95,1%	95,0%	81,2%	64,5%	56,1%	16,8%	14,4%	8,6%	0,0%	0,0%	na
SMP Operator	0,0%	0,0%	0,0%	2,1%	2,3%	3,3%	4,9%	5,0%	18,8%	35,5%	43,9%	83,2%	85,6%	91,4%	0,0%	0,0%	
Total FTTH (in 1000's)	137,9	4,8	182,4	293,3	10,9	8,0	75,5	165,1	836,2	209,6	155,0	173,9	27,1	103,4	0,0	0,0	

Note: Belgium without fibre to the office (1.900 lines)

Source: WIK-Questionnaires; COCOM (2011); own estimates

[7] http://eur-lex.europa.eu/LexUriServ/%20LexUriServ.do?uri=OJ:L:2010:251:0035:0048:EN:PDF

[8] http://ectaportal.com/en/upload/File/Press_Releases/2012/NGA_Progress_Report_final.pdf

The chart below from Cullen International 'Build, Buy or Share: regulatory options for broadband network deployments'[9] also shows that France is well-placed across european countries both in terms of annual growth and broadband penetration.

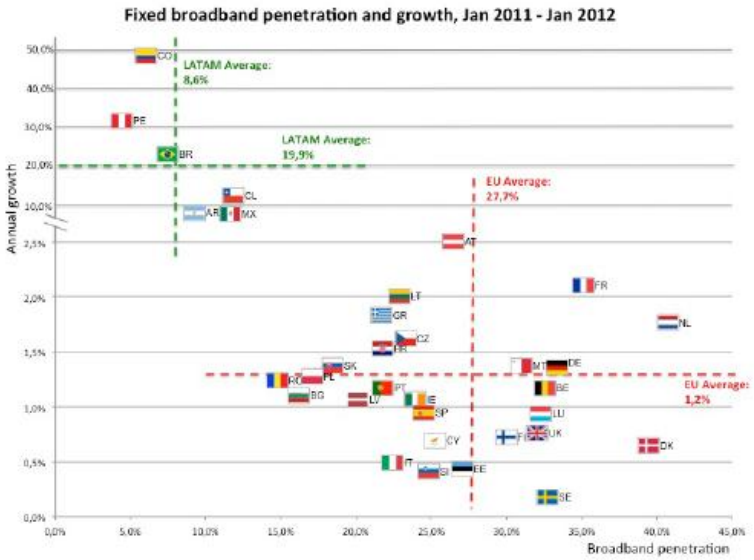


Figure 1 – Fixed broadband penetration and growth. Source: Cullen International based on data from the European Commission's Digital Agenda Scoreboard 2012 and national offices of statistics

As stated above, on-net connectivity provides benefits over and above off-net connectivity in that it allows greater control over several parameter including the, the choice of Layer 2 and Layer 3 technologies, the bandwidth/capacity provided, the pricing structure and the QoS (including the prioritisation rate). These factors are important for business customers.

Where a CP relies on an input from another supplier it is necessarily constrained in what it can offer to its customers by the underlying wholesale product. If the supplier is the only party able to make changes to a service but requires two weeks to make a change, the CP and its customer will have no option but to accept that.

With passive access CPs would have substantially more ability to develop and offer different service levels and combinations of features as part of their overall product offerings. They would only be constrained by BT's service offering to the extent of issues in relation to the passive elements purchased from BT, for example problems with the duct itself. Thus, CPs could compete by offering quicker changes to products or by scheduling maintenance downtime with regard to the specific needs of their customers. They would not be dependent on BT to put in place these customer benefits.

Similar considerations also apply to the commercial offering. The components of a commercial offering can be broadly categorised along the following lines:

[9] http://www.cullen-international.com/report/3294/t2456

- tariffing structures - how much is charged to whom and elements of price discrimination for different customer groups;
- contractual elements and terms of service, such as service level guarantees, payments for breach of service level commitments, minimum contract terms, rights of cancellation; and
- charging models - different methods of rating services (per transaction, by volume, hours of day, flat rate, fixed charge) and means of payment - in advance, in arrears, monthly, quarterly, annually.

A CP that is reliant on BT as a supplier for a particular element is constrained in what it can offer its customers by the terms BT offers to the CP. Thus, for example, if BT requires a minimum commitment of 12 months for any capacity that is ordered, the CP could not offer its customers a shorter period of commitment without running a risk of being out of pocket.

Having the ability to offer customers varying commercial terms and pricing structures is a point of competitive differentiation and passive access provides CPs with greater flexibility in this regard.

A further factor that must be considered is the obsolescence of LLU and the lack of any commercially viable replacement (SLU is technically viable as a replacement for LLU but the economics of rolling out SLU on a large scale are challenging). Currently, business customers receive leased line services via EFM (using LLU), yet VULA offers no direct substitute. Therefore, VULA cannot be considered an adequate substitute to LLU. Colt has noted and welcomes the efforts that Ofcom has taken to ensure VULA emulates LLU's characteristics/benefits such as:

- **Service agnostic access** enabling the product not to be confined to specific downstream services.
- **Uncontended access** emulating a dedicated capacity provided to the end user through a PR (ie Prioritisation rate introducing packets treated as "should not drop" which allow sensitive applications to have greater protection under congestion).
- **Control of access** permitting CPs to provide different types of services by varying QoS parameters. Indeed, BT offers three different types of profiles for its FttC-based GEA products implying a trade-off between line speed and line stability.

However, no method of emulation is perfect and while welcome, the initiatives described above essentially amount to retrofitting the service features of LLU to VULA. In many cases VULA is not designed to support them. Ofcom itself has acknowledged that the service features of LLU cannot be entirely replicated by VULA. A further factor of VULA as currently implemented, is that it is based GPON as the underlying access technology. GPON broadcasts all packets to all terminals, which are filtered out and distributed to the relevant address. For many business customers, this is unacceptable for security reasons and furthermore, significantly increases the scope for congestion to affect network performance.

The upshot of this is that in many ways, VULA provides an inferior level of performance to that available through LLU. This is a further reason why passive access should be permitted for leased lines (i.e. it would allow CPs to deploy a genuine alternative to LLU).

4 Treatment of PIA in the FAMR and BCMR

As we have argued above, the UK Communications market is in need of significant infrastructure investment. We also argue that the primary means by which such infrastructure investment may be fostered is for Ofcom to introduce a passive infrastructure access remedy that makes no distinction between the nature of the downstream use and the part of BT's network in which it is deployed. Furthermore, we argue that if Ofcom were to consider more explicitly the linkages between markets covered in the FAMR and the BCMR, it would be able to take a clearer view of the interactions between actions in one and outcomes in the other.

In this section we refer to some of the inconsistencies in the reasoning between the FAMR and the BCMR that in our view further highlight the need for these reviews to be conducted in a synchronous manner.

One clear inconsistency is the fact that:

- In the BCMR when describing potential risks of allowing PIA for the deployment of Leased Lines Ofcom chose to restrict its use for this purpose;
- Yet in the FAMR Ofcom requested evidence of demand (which would presumably strengthen the risks identified in the BCMR)

We have no further remarks on this apparent inconsistency, other than to note it here and to stress the need for Ofcom to consider the interactions between market reviews more explicitly.

We would also like to comment on the risks that Ofcom has identified for allowing PIA to be deployed for leased lines. Although these were covered in the BCMR, they are nonetheless highly relevant here because PIA is a remedy made pursuant to the FAMR.

4.1 Risks described in the BCMR

Ofcom's main reasons for restricting the usage of PIA (see restrictions above) are the following:

1. Inefficiencies brought by a risk of duplication of investment;
2. Inefficiencies due to the possible undermining of existing remedies.

Colt believes that Ofcom has:

3. Substantially overstated those risks;
4. Not adequately taken account of offsetting benefits;
5. Specifically introduced a form of price control that (in theory) creates the risk that Ofcom uses to justify the exclusion of leased lines from the PIA remedy.

4.1.1 Duplication of investment

Ofcom considers that "Extending the use of PIA to leased lines markets could lead to duplicated costs, when compared to the cost of using BT's regulated wholesale products". The risk of duplication of investment is a reality when mandating access to civil engineering infrastructure (and with competition in

general). However, Ofcom's interpretation of this risk and approach to addressing it appears to be inconsistent for the following reasons:

1. *The risk is overestimated given the current status of infrastructure-based competition in the UK market,*

   As presented under the current consultation, the only CPs committing substantial investments in NGA (as Ofcom understands the term) are BT and Virgin Media. Other important residential CPs such as TalkTalk and BskyB rely on BT's infrastructure. Therefore, when considering the NGA market (as Ofcom understands it), the UK market is close to a duopoly (and indeed is a monopoly in some areas). It is unlikely this duplication of investment reaches such a level where the inefficiencies imply a substantial additional cost for the industry, such that it undermines the benefits of infrastructure competition. Moreover, it is unclear why Ofcom referred to this risk under the BCMR but it did not appear to be a material factor in the FAMR. There is no obvious reason why, if it is a concern in the BCMR, it is not so in the FAMR. If Colt clearly understands Ofcom's logic, the only way to make this risk disappear is to mandate PIA only in areas where BT has not yet deployed its NGA network. Of course, Colt is not advocating this as a solution.

2. *Infrastructure based-competition cannot occur without a risk of investment duplication*,

   The simultaneous availability of an NGA active remedy (VULA) and passive remedies (PIA and SLU), it is clear that Ofcom recognises the benefits of competition at deeper levels of access but nonetheless, also recognises the benefits of maintaining a less capital intensive entry route by means of VULA. We wholeheartedly agree. But it is also clear that this being so, Ofcom is willing to tolerate a degree of network duplication in return for a deeper level of competition. It must not be forgotten that passive forms of access may even reduce duplication where for example, a CP deploys fibre where otherwise it would have to dig. Given that digging is more common in the leased lines market, the potential for passive access is arguably greater than with residential NGA.

   As illustrated above, restricting the usage of a remedy is not an effective way of managing a risk. The better way is to implement a regulatory framework designed to mitigate the risk. For example, in France, in the last market 4 review conducted in 2011, ARCEP mandated Orange to implement engineering rules aiming at two objectives:

   - Minimise constraints for the deployment of shared fibre networks (ie In France, for **FttH networks**, there is a part of the network which is shared between operators (symmetrical regulation). This part is between the 'mutualisation point' (ie concentration point covering 12 dwellings in dense areas) and the end-user point).

   - Distinguish other types of deployments (connection of mutualisation points and connection of business customers or network elements) by implementing additional constraints to **ensure those deployments don't pre-empt FttH deployments**.

   To implement those objectives ARCEP brokered multilateral discussions between CPs. This resulted into different rules depending on the type of deployment. Eg:

- Deployments of shared networks between the mutualisation point and the customer: The operator doesn't need to leave an available space equivalent to the size of its own occupied space ("1+0" rule),

- Deployments between the optical MDF and the mutualisation point: The operator needs to leave an available space equivalent to the size of its own occupied space ("1+1" rule),

- Deployments to connect business customers and network elements: "1+1" rule,

- Deployments using overhead infrastructures: The operator needs to leave an available space equivalent to twice the size of its own occupied space ("1+2" rule).

Those rules are removed once a first FttH network is deployed.

4.1.2 Undermining the existing active remedies.

In the 2010 WLA, Ofcom stated: *'PIA charges are set at levels which might encourage investment in NGA, then this could mean that CPs would have an incentive to use PIA rather than the regulated leased lines to selected large businesses, not because it is more efficient to do so, but simply because of differences in the way the charges have been set'*.

Although we understand this argument, it is not an adequate reason for denying passive access for leased lines. Colt does not, and has never, sought to arbitrage the regulated pricing of active access. Indeed, this is not the reason why Colt uses passive access in the countries in which it is available. If it is true that the price of PIA for residential NGA is set at a level that undermines the pricing of leased lines, it is entirely possible to institute another price (for leased lines), which does not.

Regarding the current risk of undermining exiting remedies, Ofcom's reasoning is understandable. Passive remedies may not be compatible with the kind of charge control Ofcom chose to implement in the BCMR because of the way BT recovers its common costs. Indeed it is sometimes stated that, compared with a cost recovery mechanism based on (for example) cross sectional area, BT recovers a greater proportion of its common costs from very high bandwidth services. However, it is surely correct to regard this problem as a function of the specific form of price control that Ofcom has introduced. It is not a problem per se. This fact is amply demonstrated by the widespread coexistence of active and passive remedies, both in the UK and elsewhere.

It is also important to bear in mind that, even if Ofcom's concern were material, the process of undermining BT's price controls would at worst be a slow process. It is hard to envisage this happening to any appreciable degree before Ofcom next has a chance to revisit the price controls. In practice, CPs deploy a mixture of access strategies – either buying active services or passive access, depending on the situation.[**Confidential.**

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4.2 Demand for PIA

As we noted above, in the FAMR Call for inputs, Ofcom requested evidence of PIA demand including changes that would facilitate NGA investment (ie:"What changes might be made to the PIA product that could increase NGA investment by other CPs? Please provide reasons supporting your views, and in particular any specific business plans which could be made viable by such change"). In the present consultation, Ofcom states: "We specifically asked in the 2012 FAMR Call for Inputs for evidence of specific business plans which could be made viable by changes to PIA (including leased lines). However, no such evidence was forthcoming. We note, for clarity, we do not consider that a lack of use of PIA to date is in and of itself 'evidence' that usage of PIA should be expanded to leased lines. Without such evidence – e.g. in the form of business plans or a specific intention to invest – then it is difficult to assess whether this change might be appropriate and the ways in which this may be facilitated."

Colt provided Ofcom with evidence of its proposed usage of PIA in its submissions to the BCMR. It appears to us, however, that Ofcom has been "moving the goalposts" by requesting ever more specific evidence from CPs, and by increasing the threshold that each supposed piece of evidence must reach. Ofcom appears to have shifted its initial plan for a global assessment using CPs' views (April 2011) to a very narrow and specific request (November 2012) of business plans provided by CPs themselves:

- In the BCMR:
    1. *Call for inputs (April 2011)*: Ofcom asked for potential benefits of passive remedies and possible impacts on active remedies.
    2. *Consultation (June 2012)*: Ofcom believed that the risks are too high compared with the potential benefits from passive access.
    3. *Statement (March 2013)*: Ofcom argued they have seen no evidence that CPs would invest significantly in Leased Lines infrastructure based on passive remedies.

- In the FAMR:
    1. *Call for inputs (November 2012)*: Ofcom sought input on the changes to be made to PIA to increase NGA investment, and for reasons supporting the view (in particular business plans).
    2. *Consultation (July 2013)*: Ofcom said they had not seen evidence of demand because of the absence of any concrete business plan.

Colt does not consider it reasonable for Ofcom to require specific business plans. It appears to us that Ofcom is underestimating the cost for a CP to build a robust and specific business plan. When investing in a specific network deployment, CPs have to go through a formal process which can take several months before reaching any meaningful output. Depending on the importance of the business plan, this process can require Business Development and Carrier Relationship teams to allocate the majority of their time in assessing the market environment. It is unreasonable to place such a high reliance on "concrete busisness plans" based on a state of affairs that does not exist.

The evaluation of available products from potential providers is an **input** to a business plan, not the other way around. It is not even clear how any given business plan would be of use to Ofcom. Indeed the product Colt is interested in is quite different from PIA. Colt is interested in a form of PIA that:

- Allows deployment in all network segments (e.g. to connect a point A to a point B regardless of the defined network segment);
- Includes a business class SLA in terms of delivery and faults;
- State of the art provisioning systems and processes.

Those differences are such that they are better considered as real modifications than merely improvements. The modifications that we consider are necessary, are so far removed from the actual PIA product provided by BT that it is very difficult to justify the time and resource required to develop a business plan based on a scenario that is so clearly speculative.

Colt has conducted a detailed benchmarking exercise to identify the key characteristics of a workable duct access offer. In our experience, there are four:

1. The fewer restrictions we have (e.g. availability for all parts of the network), the more useable is the offer and the higher the level of demand;
2. The greater the involvement of the access provider in identifying suitable routes and installing the fibre, the more usable is the product and the greater is the level of demand;
3. The existence of an accurate online tool showing maps of the access provider's network, facilitates take-up and increases demand.
4. The inclusion of a SLA in the offer, or at least a committed process in case of faults is a driver of demand.

[**Confidential.**

Amongst other things, these results demonstrate the number of dimensions that need to be addressed when creating a functioning product. This in turn illustrates one part of the problem that we have when building a fictitious business plan – the number of unknown factors. We are therefore not convinced that any CP would be able to create a hypothetical business plan that they could be confident would bear a close resemblance to reality. For these reasons, we believe the strongest predictor of likely usage is what CPs have done with passive access in comparable situations, in other countries.

Nevertheless, if Ofcom are indeed serious about improving the quality of passive remedies and in particular, to evaluate the benefits that would flow from allowing their use for Leased Lines, Colt would be happy to undertake all reasonable endeavours to provide Ofcom with the supporting evidence it needs. (For the avoidance of doubt, while (as we argue above) we do believe that there are synergies between "leased line" and NGA deployments, this is not a point on which Colt is able to provide any specific evidence in the form of a "concrete business plan". This is because the majority of our business is conducted through partnerships. Nevertheless, it is not unreasonable to expect that residential ISPs would seek to avail themselves of Colt's infrastructure when planning their higher-speed broadband rollouts). [**Confidential.**

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5 Confidential Annex

[**Confidential.**

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