

## **Executive Summary**

In its 2015 European Broadband Scorecard, Ofcom described a UK fixed broadband industry that, relative to large European peers, ranked first in eight out of ten coverage/ usage benchmarks and first or second in seven out of nine pricing benchmarks.

The atmosphere today is rather different, investors and operators who want to deploy capital at scale have been frustrated. The DCMS call for evidence refers to “the needs of consumers and businesses, today and in the future”. Ofcom’s statutory duties, set out in the 2003 Communications Act, constrain it from adopting a long-term approach in our view: currently regulation actively increases uncertainty, drives up the cost of capital and inhibits the long-term investment required to serve customers in the future. We believe Ofcom’s statutory duties, already notably different from other UK regulators, need to be updated to match the stated policy goal.

### **Question 1: will the current framework deliver?**

We share DCMS’s concern that it will not. Investors want to deploy capital to make a return and company directors must comply with their fiduciary duties. At present, there is very significant uncertainty over investment returns, much of that driven by whether/when any effective demand will materialise. On top of that, certain decisions, such as the unexpected proposed cut to GEA pricing actively undermine not only the demand required to justify investment but also the visibility for such a long duration project.

### **Question 2: Barriers to long term investment**

Broadly the uncertainties can be grouped as demand, cost and regulation. These factors work in a self-reinforcing cycle either positively or negatively. For example, the lower the cost of capital or roll out costs, the lower end prices become and the volume demanded is likely to rise. We believe there to be a general lack of clarity for investors, three-year regulatory price reviews are a good example.

### **Question 3: What can the UK learn from deployment of fibre networks in other countries?**

First, we note that BT *has* been deploying fibre widely for 8/9 years. On comparability, like many others including Ofcom, we agree that conditions for infrastructure investment vary widely and severely limit the usefulness of international benchmarks. However, we do think the *experience* of other investment programmes can be informative, particularly where problems have been encountered and solutions found. A review of the Australian NBN highlighted the importance of the capability of operators when faced with such uncertain engineering conditions. In New Zealand, a regulatory pricing intervention ultimately led the government to conclude that regulation in a similar form to the UK was “designed for a different era”. In short, we believe the lesson to be learned is to deal early on with factors which inhibit the growth of available bandwidth.

### **Question 4: market models and network migration**

Current Telecom regulation is extraordinarily complex and not well understood; many see regulation as a three-yearly revaluation of the asset base and/or a reset of allowable returns. A market model that is stable, open and based on actual costs could lower perceived risk. We see network migration as vital: the cost/price cycle can work in favour of customers and investors here; illustrative numbers suggest pricing could be materially lower with switchover.

### **Question 5: Government’s role**

We believe the UK would maximise economic and societal benefit by getting the most bandwidth to the largest number of customers at the lowest price in the shortest possible time: we agree with the research for the NIC that there should not be a dogmatic approach to technology. We think the most effective role for Government is to deliver stable investment conditions (which will also have wider FDI benefits as the UK leaves the EU). We see the two key areas as i) stable, balanced and clear regulation (to reduce risk) and ii), efficient and low-cost build processes, addressing for example: wayleaves, street works, rates.

## 1. What is the existing UK telecoms and policy framework able to deliver?

- When will it deliver, and how certain can we be that it will fulfil the Government's ambitions for full fibre networks and 5G deployment?
- What will this mean for roll-out of these technologies and for competitive models in different geographic locations?

1.1 The UK Government published a statement<sup>i</sup> on 30 March 2016 responding to Ofcom's strategic review in which the Government "urges Ofcom to confirm a clear and speedy timetable for decision-making on the necessary changes to resolve the issues identified."

1.2 We support the assertion in the Ministerial Foreword to this Call for Evidence<sup>ii</sup> that market participants should consider "the needs of consumers and businesses, today and in the future". We believe the main cause of the apparent impasse is the contradiction between the fiduciary duties of company directors and the statutory duties which define Ofcom's approach and, in our view, lead to an overly short-term focus. We discuss this further in answering Question 2 and Question 4 below but argue that infrastructure investment is already becoming disorderly and, without a realignment of Ofcom's statutory duties, will be later and slower than the Government would like. As we discuss below, it is incorrect to presume that investors do not want to deploy capital, quite the opposite, it is that the terms for doing so are far too uncertain at present.

1.3 It is equally incorrect in our view to infer that Openreach has not invested in the past: it has deployed more than £12b since its inception in 2006<sup>iii</sup>. In the future Openreach and BT Group are expected to continue to invest heavily: based on broker forecasts reviewed in December 2017 BT is expected to have capital spending of approximately £3.5b in the UK compared with £0.6b by Sky, £0.9 by Vodafone and £0.1b by Talk Talk. Given the scale of the potential investment (Openreach suggests £3-£6b for 10m premises<sup>iv</sup>, Prism suggests £26.5b -£34.5b<sup>v</sup>, and before that, Analysys Mason suggested £24.5 - £28.8b for nationwide roll outs<sup>vi</sup>) the practical ability to invest is at least as important as any claimed desire to do so in our view.

1.4 The current situation is a deterioration from the recent past: Ofcom's 2015 European Broadband Scorecard<sup>vii</sup> showed how a seemingly reliable framework had delivered a strong position relative to peers. Ofcom's report focussed on the UK's position relative to the other EU5 (Germany, Italy, France, Spain) as factors affecting broadband development "geography, population size and density, and legacy infrastructure differ significantly between the 28 Member States" – i.e. Lithuania is not relevant. The UK ranked first in all benchmarks except two. These were: Standard broadband coverage (first equal), Broadband coverage of NGA connections, Fixed Broadband connections per 100 households, Broadband connections with a headline speed of 'more than or equal to' 30 Mbit/s per 100 people, Percentage of individuals accessing the internet at least once per week, Percentage of individuals who have never used the internet (i.e. lowest), Percentage of individuals who have bought goods or services online within the last 12 months, Percentage of fixed lines operated by the incumbent (i.e. lowest). In the other two benchmarks (Fixed broadband connections per 100 people and Percentage of people who had interacted online with public authorities within the last 12 months the UK ranked second equal and third equal respectively). Specifically, on NGA coverage, Figure 23 shows the UK at 85-90% NGA coverage ahead of Germany (80-85%), Spain (70-75%), France (40-45%) and Italy (35-40%). The pricing analysis was complex but, the UK ranked 1<sup>st</sup> or 2<sup>nd</sup> in seven of the of the nine bundles that appear to relate to fixed service alone.

1.5 Within Government ambitions for infrastructure development we see an implicit, and in our view correct, understanding that societal benefits are maximised when as many as possible have effective access to the maximum possible bandwidth. (There is a virtuous circle here which we discuss

in answering Question 4 below). Many have highlighted that costs rise with reach, and dramatically so towards 100%: Prism notes that “The last 5% of premises have Capex costs on average 4 times higher than the premises around the median”<sup>viii</sup>. We believe it is widely accepted too that 100% FTTP coverage is extremely unlikely due to cost and this consideration drove Frontier/Prism’s use of five different roll out scenarios in its report for the NIC. Like any other investor, BT is capital constrained so we believe it sensible for the Government to take note of this reality in considering its ambitions for future infrastructure. Rather than presuming FTTP to be “the best” in all circumstances (e.g. loop lengths, density etc. vary) we think a more societally and economically beneficial approach would be to consider how to incentivise investment to get the most bandwidth to the largest number of customers at the lowest price in the shortest possible time. In support of that argument we note that in the moderate evolution scenario, Frontier concludes 100% FTTP has the lowest direct economic output of the five scenarios and the second lowest in the ambitious innovation scenario.<sup>ix</sup>

1.6 As an aside we believe it important that Government take a realistic view of allocation within capital budgets. Investors want to deploy capital and require management to be good stewards of that capital – to deliver on fiduciary duties management are expected not only to reconcile overall constraints with total investment but to *rank* projects according to risk/reward. More stable and visible regulation would be likely to move network investment even higher up the priority list.

1.7 One of the key drivers of the relatively low benefits of FTTP noted by Frontier is that G.Fast can be rolled out more quickly than FTTP: “Therefore G.Fast... would generate larger benefits than FTTH networks with longer rollout profiles”<sup>x</sup>. This is not short-termism – Frontier looks out to 2050 – but highlights that both FTTP and coverage per se will take time and require patience. Prism/Frontier highlight that 100% FTTP could take circa 14 years<sup>xi</sup> to 2034 which suggests more than 2m premises added per year. Openreach cited considerably slower roll out rates in the UK and France<sup>xii</sup>, and we understand that, at best, Openreach would expect to be able to add 1.25m premises per annum. We note that even with immediate action, many customers are likely to have to wait a very long time to be able to access FTTP if ever whereas Openreach has already announced plans to reach 10m premises by 2020 with G.Fast and a further 2m with FTTP.

1.8 As noted by Frontier, DCMS and others, the UK has a “relatively strong” position in the digital economy; proportionately Frontier ranks the UK 4<sup>th</sup> behind Ireland, Korea and Japan.<sup>xiii</sup> We agree with Frontier’s analysis that is very difficult to know the which way the causation runs: does investment in digital infrastructure cause development in the digital economy or vice versa? It is probably both ways. There are a number of problems with over-simplistic approaches here: it is easier to talk about killer apps and single drivers of development but examples like the UK and USA (low FTTP deployment, good digital economy) highlight the problems of this approach. It is risky to presume a single causal factor.

## **2. What barriers exist to *long term* investment in the UK telecoms market (beyond work underway by the Local Full Fibre Networks programme to stimulate demand, and by the Barrier Busting Taskforce to reduce build costs)?**

- What effects do existing revenue streams have on investment plans?
- What effect do visibility and predictability of returns have on investment plans?
- What is the effect of current infrastructure deployment models?
- What impact do current infrastructure sharing arrangements have on investment?
- What is the impact of the existing relationship between wholesale and retail markets?
- What changes to spectrum licensing and sharing could foster greater innovation and investment in 5G?

2.1 There are currently a myriad of concerns but we can group them into three barriers or risks to long term investment. The three are regulation, costs and effective incremental demand. The three risks are interconnected and reinforcing. For example, uncertain regulation drives up the cost of capital making investment more expensive. Higher costs drive higher prices which then caps demand at sub-optimal levels. We address demand, costs and regulation in turn below.

## Demand

2.2 There is a temptation to assume all available bandwidth gets used today. This is unlikely: a 2013 study for the Broadband Stakeholder Group argued that the “edge network”, at busy hour, perhaps had average utilisation of 0.8% of its capacity<sup>xiv</sup>. This statistic is a valuable reminder but, to look at consumer utility, we need to look at peak brittle demand. Openreach noted the variability of demand by household size and referred to the same BSG forecast citing that the median household would require 19Mbps by 2023.<sup>xv</sup> Given the average download speed of average connections continued its steady rise to 44Mbps in 2017, that 91% had access to average download speeds of 77Mbps and compression technology continues to deliver effective gains each year there would seem to be little evidence to justify the counterproductive intervention we have seen.<sup>xvi</sup> This is perhaps what led Frontier to conclude on FTTP that “with significant demand uncertainty a “real options” view would indicate there could be value in waiting for more information, even if the central case suggested there were benefits in investing now”<sup>xxvii</sup>

2.3 Despite selective media coverage there is considerable evidence too that many consumers are satisfied with their broadband: In 2017 Ofcom surveys found that 82% were fairly or very satisfied with broadband today<sup>xviii</sup>, that 46% did not “see the need for superfast broadband and a further 15% felt superfast broadband was too expensive for their needs”<sup>xxix</sup>. On top of that we note two other indicators that suggest *current* prices and speeds offer very high customer utility and optionality: first, OTT subscriptions were forecasted to have grown from close to zero in 2009 to 14m by the end of 2017<sup>xx</sup> and second, Sky plc which has traditionally offered TV via satellite, announced in January 2017 that it would offer its highest tier product, SkyQ over broadband.<sup>xxi</sup> In January 2018 Sky went further: “We will launch Sky without a satellite dish, with all its channels and content streamed over IP.”<sup>xxii</sup>

2.4 We note the various comments on forecasting demand from Frontier’s comprehensive study of only parts of total demand. In our view, the utility of bandwidth is only evident via its use in applications running on devices. It is extremely unclear whether and how long it will take for such devices and applications to emerge which will justify the incremental bandwidth of FTTP, and, as Frontier notes, it is unwise to presume current networks are not able to comfortably cope with many future applications: “if new uses of fixed broadband are primarily to support an explosion of Internet of Things (“IoT”) devices then these applications may be able to be supported on existing broadband networks”<sup>xxiii</sup>.

2.5 In conclusion therefore we believe that to justify FTTP investments, and to satisfy fiduciary duties, company boards must consider the *incremental* revenue for the *incremental* costs in each investment scenario. For example, if incremental demand above G.Fast is very unclear we would expect operators to invest sufficient capital to meet more a certain demand level: a real options approach as presented by Frontier. We agree with much of Frontier’s analysis of S-curves (and the problems of applying them reliably) in estimating volume demand. However, S-curve penetration growth is often enabled/accompanied by rapidly falling prices with a commensurate effect on revenue. We note the recent media coverage on the measurement of the telecoms sector by the ONS: “Official data show the prices of telecoms good and services were flat between 2010 and 2015” but ONS data did not reflect bundling on fixed and mobile networks which

would imply prices had fallen by 35%. Were the ONS to include calls and texts to be data the price per bit “would be recorded as having fallen by as much as 90% between 2010 and 2015”<sup>xxiv</sup>

## Costs

2.6 Openreach<sup>xxv</sup> and numerous others have highlighted that costs are high, primarily fixed and vary considerably across geographies. Factors affecting cost are housing type, housing density, underground/overground mix, topography, the proximity and quality of existing infrastructure. Local and international benchmarks vary widely driven by these factors.

2.7 These costs are neither stable nor certain. Excluding FTTP, telecom infrastructure suffered a fourfold increase in rateable value announced in late 2016<sup>xxvi</sup>; such actions raise questions as to the durability of the FTTP exclusion. Further, whilst proponents argue new techniques such as micro-trenching ought to significantly lower cost a), local authorities do not have consistent approaches to assessing suitability of new techniques and b), there can be compensations for example narrower trenches may require more expensive material to backfill. It is dangerous therefore for investors to assume such variability away and so contingencies are added. This is an inexact task and can undermine confidence in the attractiveness of the investment.

2.8 Even the data assessing cost variability is uncertain. In its report on lowering barriers to deployment, Analysys Mason noted “Given the variations in responses from telecom operators and local authorities, there is a level of uncertainty with some of the findings...”<sup>xxvii</sup>. We don’t think it helpful to reproduce the specific findings but believe the report is very important in highlighting that it is the practical problems which can very quickly destroy the economic incentive to invest or de-rail programmes once underway.

2.9 Cost over-runs are common on large capital projects. Perhaps the most vivid recent example in telecom infrastructure is the NBN rollout in Australia. In 2007 the Labor party manifesto included a commitment to build a national broadband network in a five-year period after a competitive tender: “The future prosperity and competitiveness of the Australian economy will require world class infrastructure... Labor will revolutionise Australia’s communications industry by facilitating the construction of a new fibre to the node National Broadband Network.”<sup>xxviii</sup>

2.10 In 2010 the NBN peak funding was assessed at AUD40.9b, this rose to AUD44.1b by 2012. “Given delays in deployment and consumer take up of the NBN, and lower than planned average revenue per user” peak funding rose to AUD72.6b by 2013. A new government moved the project from FTTP to a multi-technology mix and lowered the peak funding estimate to AUD41b. By 2016 this had risen again to AUD 49b.<sup>xxix</sup>

2.11 Today there is significant evidence that the expected return on the investment continues to fall “Mr Turnbull said the company was expected to deliver a 3% return on investment...” It is enough to keep it on the Government’s balance sheet, as a government asset, but it certainly isn’t a commercial return that the stock market would respect<sup>xxx</sup>. NBN CEO Bill Morrow is quoted as saying: “There are these small circles who say ‘I want more fibre and I want it faster’. My reply is that it’s not just about you, it’s about everybody in the country. If everybody in the country had 25 megabits we would be far better off than you having a gigabit”. In response to the suggestion that FTTP would have been cheaper in the long run because of lower running and maintenance costs “It craps me up. You’ve got to remember we are talking millions of homes you have to spread the cost of electricity and extra technicians over. It’s nothing. You would never be able to spend enough money on operations and maintenance to make up the cost difference, not over 50 years, not over 100 years”.<sup>xxxi</sup>

## Regulation

2.12 The Ministerial foreword to the Call for Evidence cites the Government's wish to "promote.. a stable environment for investment.." and to "ensure that the UK has the conditions in place to maximise investment". We agree that both states are required but believe it to be self-evident that the UK has not yet achieved either.

2.13 We would draw attention to the rhythm and regularity of regulatory intervention. We have highlighted the very long roll out periods above, the payback periods for investors are also very long, often assumed to be 20 years or so. Currently Ofcom reviews prices over 3 year cycles which suggests 7 opportunities for the goal posts to move before payback. Ofcom also conducts more in-depth DCR-like reviews once every ten years. This adds further risk as the reviews can prompt material and sometimes unexpected interventions which undermine investment confidence. We note longer review periods in other highly regulated industries in the UK.

2.14 Variations and complexities in LRIC-based regulation mean clarity and visibility is beyond the reach of many investors. Anecdotally, some describe LRIC as a revaluation of the asset base (and/or the allowable level of return) every three years – a process plainly incompatible with incentivising long-term investment.

2.15 A regulatory proposal that serves well as an example is GEA. Ofcom proposed to cut the monthly price of the 40/10 product from £88.80 per month (at 31 March 2017) to between £38.70 and £69.90 by 2020/21, a range of 20% to 60%.<sup>xxxii</sup> We would make three observations. First, BT and Ofcom clearly have very different views of the "fair bet" but, as a signal to investors considering the next wave of infrastructure investment, such an *unexpected* cut, and in *year 8/9* of an investment programme, massively undermines confidence given long paybacks. Second, Telecom regulators today tend to allow higher rates of return than other highly regulated industries in order to reflect higher risk, not least substitutability. Cellular, copper and all other network products are, at least to some degree, substitutes. The threat from substitution varies with geography and time but in general, lowering the cost of substitutes lowers the likely revenue from new infrastructures (and higher speed products on existing infrastructures) and disincentivises investment. Last, the complexity in the proposal from Ofcom and subsequent submissions from various stakeholders is very off-putting to would-be investors. If providers of capital struggle to understand the rationale and application of 'the rules' this drives up the cost of capital and lowers the attractiveness of investment opportunities.

2.16 As described in paragraph 1.2 above, we believe the UK's policy goals have evolved but Ofcom's statutory duties have not. As a result, the UK is in the unfortunate position where there is very limited visibility on returns and low trust in regulatory stability over the required payback periods. Indeed, BT argues that the proposed GEA cut would "drive returns below Openreach's cost of capital".<sup>xxxiii</sup> As a result, regulation based on CA2003 has reduced the likelihood of investment at the same time as the Government's goal has evolved towards incentivising investment.

2.17 To try to understand the constraints placed on Ofcom by its statutory duties, we have reviewed the statutory duties of other regulators in the UK, namely Rail, Electricity/Gas and Water.<sup>xxxiv</sup> In all cases except Telecom, regulators must consider the 'ability of operators to finance their activities'. In all cases other than Telecom, regulators must consider 'sustainable development'. Only Ofcom and Ofgem have 'principal duties' which are the "interests of consumers" for the former and the "interests of existing *and future* customers" for the latter (our italics). In short, we believe the statutory duties laid out for Ofcom i) compel it to be rather short-term focussed to the detriment of future customers and ii) do not reflect the aims of the Government today.

2.18 Ofcom's stated aim to see a third FTTP network covering 40% of premises is an example of how CA2003 shoots at the wrong goal in our view. Whilst a third network seems a theoretically logical attempt to lower prices in the short term, over the long term we doubt the viability of this industry structure. This is a view shared by others including Analysys Mason which modelled a third network using PIA: "Our results show that it is highly unlikely that an operator will be able to reach 40% coverage on a commercially viable basis".<sup>xxxv</sup> Whilst attractive academically we think having an unstable market where operators are likely to exit, perhaps in a disorderly way, does not serve the Government's stated aims. We would add three additional points here. First, based on publicly available numbers we estimate that Gigaclear, Hyperoptic and Cityfibre pass less than 500,000 homes offering FTTP *service* today and from the same data estimate 100,000 subscribers. These numbers are small both in relation to FTTC *service available today* from BT and also BT's *funded* proposals around G.Fast and FTTP<sup>xxxvi</sup>. Second, investors, regulators and Government must take their own view on the viability and fundability of the Cityfibre/Vodafone announcement and other announced plans for further investment. Third, details around the *actual* effect of PIA on roll out costs are extremely vague but, on our estimates, a roll out at sufficient scale to be attractive is beyond the balance sheets of the largest CPs due to the equity contribution that would be required.

### 3. What can the UK learn from the widespread deployment of fibre networks in other countries?

- What factors have led to higher full fibre investment in other countries and how applicable are these to the UK?
- What have been the impacts of fibre roll-out models in other countries on competition dynamics, consumer bills, and risk allocation?
- To what extent can the fibre that has been rolled out internationally be used for mobile backhaul, and what lessons can the UK learn?

3.1 The FTTP debate is peppered with references to international benchmarks. These references often ignore very significant differences in the conditions in which roll outs take place and are not always apples-to-apples comparisons (rural vs. urban, active vs. passive remedy markets etc.). For example, most commentators agree that, for a variety of reasons, Iberian countries start from a completely different infrastructure position than the northern Europeans and are not a suitable benchmark. Overall, we think the key point is that it is more productive to focus on what is *relevant* to the UK question.

3.2 Rather than rehearse the literature, we would highlight two documents which make the point well. First, published 2015, the Analysys Mason international survey for Ofcom which, in our reading essentially argued that the most important factor to consider for FTTP was 'where do you start from?' This includes a consideration of regulation alongside all of the other factors mentioned in our answer to Question 2 above. Second, the Prism report for NIC considers a number of international benchmarks.

3.3 Even where the benchmark definition seems clear there can be variability in reported numbers. We have seen a variety of assessments of the York JV for example. Talk Talk has referred to a "build cost of £417 per home passed"<sup>xxxvii</sup> whereas Prism refers to "circa £500 per premise passed" for the same roll out.<sup>xxxviii</sup> The accounts for the JV are available via Companies House should DCMS want to make its own assessment of the per premise cost and its wider applicability.

3.4 If benchmarks are not instructive there are perhaps other lessons to be learned in terms of regulation and effectiveness of operators. In 2013 a Strategic Review of Australia's NBN Co included a redacted list of operating problems: "A lack of deep internal experience in complex infrastructure, construction projects and project management;...A frequently changing program of

works;...Significant issues with the fibre network detailed designs;”<sup>xxxix</sup> It is easy to criticise with the benefit of hindsight, we prefer to take these points as a reiteration of just how difficult these projects are when faced with at least somewhat unknown engineering conditions as discussed in paragraph 2.6 above.

3.5 Equally as instructive are the responses to shocks. From its peak in 2013, New Zealand operator Chorus saw its share price fall 53% by the end of 2013. There are a few moving parts but much of the fall was driven by regulatory pricing decisions on copper which investors believed seriously undermined Chorus’s ability to successfully invest in fibre – a clear parallel to GEA in our view. As suggested by the share price, the decisions put the company’s future in jeopardy: “Prime Minister John Key said yesterday the Government was considering how it would respond to the situation but would not rule out legislating over the top of the Commerce Commission’s decision, lending money to Chorus or even taking an equity stake in the company.”<sup>xl</sup>

3.6 These events led to a government review which fundamentally adjusted New Zealand’s Telecom regulation from LRIC to a RAB or BBM to support investment rather than hinder it. The government review concluded that “Telecommunications regulation was designed for a different era”, that “the TSLRIC price-setting process is inherently complex and contentious and is likely to lead to ongoing challenges”, and that “The ‘ladder of investment’ theory may no longer be the best basis for our communications regulatory systems – particularly for fixed line regulation”.<sup>xii</sup> It is clearly our interpretation of the facts but we believe that international investors were so shocked by events that Chorus became the focal point of a wider risk for New Zealand’s politicians – that the experience could deter foreign inward investment more broadly.

3.7 As an aside we note that the review also concluded that “Fixed networks still have natural monopoly characteristics. They have very high barriers to entry, and we do not expect total bypass or overbuild of the UFB network by another fixed network... Whilst structural separation in fixed networks has reduced the incentives to inhibit or delay competition, it has not removed the incentives or the ability for Chorus and LFCs to charge monopoly access prices”<sup>xlili</sup>. Given the focus on the potential (degrees) of separation of Openreach we think this conclusion is very relevant: whilst the incumbent is the most likely to have the balance sheet scale and operational expertise to drive network investment, separation does not, as is sometimes implied, solve all the potential competitive issues nor address any disincentives to invest. In New Zealand, under new regulation, Chorus continues to be heavily regulated, just in a way that incentivises investment in pursuit of a clear societal goal. In our view, the New Zealand example shows how separation is irrelevant to the investment discussion.

#### **4. The Government wants to consider all market models that will facilitate the next generation of technologies.**

- What different market models might work in the UK in the longer term, and what risks and opportunities do they present?
- What should Government consider when assessing the potential for migration from copper to full fibre networks?

4.1 There are two timescales to consider here. In the medium term, we see current regulation as a poor fit for the policy goal. But, any shift in regulation will take time and, to enable progress in the short term requires immediate action to boost confidence: a return to the relative clarity and stability of regulation pre-2015 is required. From the non-specialist investor perspective, a major problem with the current approach is that every three years the asset is effectively revalued. This is inherently unattractive as noted above. We believe a stable RAB model which comprises (audited) actual costs



and understood returns over longer periods offers investors the opportunity to rationally assess attractiveness. Although apparently basic, visibility and predictability are vital.

4.2 Take or pay models have been suggested as an option. Theoretically we think these are worth exploring but note that in recent years these models have failed to gain funding as investors have been uncomfortable with the level of risk associated with the build cost, the long wait to be repaid and also the quality of the counterparty. In effect, the would-be network owner has retained considerable retail risk in such models and has been unwilling or unable to supply a sufficient equity cushion to satisfy lenders.

4.3 Migration from copper networks plays a key role in enabling investment in our view. As discussed in paragraph 2.1 above we see demand, costs and regulation as inter-linked. Take up by customers is a key issue here. If we assume purely illustrative numbers of £450 per home passed and £150 to connect then network capex for 100 homes at 0% take up is £45,000 but only 33% higher if take up is 100%. Adopting rough FTTC take up after 8 years (c.30%) and assuming an illustrative incremental *wholesale* ARPU of £10 per month and a 50% margin then cash payback period is an uninvestable 28 years even ignoring any other costs such as tax.

4.4 If we assume the same illustrative capex costs, margins and take up but require that payback must be over 10 years then the incremental *wholesale* ARPU rises to an unfeasible £28 per month. Adding a 20% margin for the retailer suggests a £33 incremental *retail* ARPU – highly unattractive for customers given the c. £37 per month Ofcom believes the average household spends on fixed voice and data.<sup>xliii</sup>

4.5 FTTP networks are claimed to exhibit fewer faults and therefore be cheaper to run. If we assume a gain in *margin* then the prices required to pay back over the same period are clearly lower. If we also assume that we migrate all customers from copper to FTTP then “old” revenue on the new network higher generates a higher margin. Assuming a 70% expansion in margin and 100% take up of FTTP (i.e. the copper is switched off) then on these illustrative numbers, for a 10-year payback the required *wholesale* ARPU increment falls to £7 and *retail* ARPU to £9 some 75% lower than without migration.

4.6 We re-iterate that all of these numbers are purely illustrative (a 10-year cash payback is NPV negative) but believe they are useful in demonstrating that migration allows the greater presumed efficiency of FTTP networks to be amortised for the benefit of customers which, in turn, de-risks the investment for operators. In reality, there are welfare considerations (not all customers will use or value the available higher speeds), practical considerations around communication (as there were around Analogue TV switchover) and the detail of these issues requires careful planning. We also note Frontier’s comments on the likelihood of customer faults being in the premise vs. in the network.

## **5. The Government wants to achieve its digital infrastructure goals at the least additional cost. How should new digital infrastructure be paid for?**

- Are consumers (residential and business) willing and able to pay for new digital infrastructure, given its expected benefits?
- What could incentivise investors and shareholders to make long-term investment decisions in telecoms infrastructure?
- What is the potential role of government in stimulating demand or otherwise de-risking new infrastructure investment?

5.1 Our response to this section is brief as we have addressed most of these questions above. In summary, we believe that to achieve its goals, the Government's most effective actions would be to help to lower per subscriber cost and therefore price as this boosts incentives for investors. This would include a) re-set Ofcom's statutory duties such that they are more supportive of policy goals; b) ensure that Telecom regulation offers visibility and clarity, and c) actively lower roll out costs via addressing upward pressure on costs (street works etc.)

5.2 We reiterate that investors want to deploy capital. With clear, stable and balanced regulation operators and investors could focus on and manage the two remaining groups of risk in the normal course of business.

## References

- 
- <sup>i</sup> Government response to the Ofcom Digital Communications Review, paragraph 9
- <sup>ii</sup> DCMS Future Telecoms Infrastructure Review: Call for Evidence, 19<sup>th</sup> December 2017
- <sup>iii</sup> Openreach: Upgrading the Access Network with FTTP 17<sup>th</sup> July 2017, page 3
- <sup>iv</sup> Openreach: Upgrading the Access Network with FTTP 17<sup>th</sup> July 2017, page 21
- <sup>v</sup> Prism: Costs for Digital Communications Infrastructures for NIC, December 2017, paragraph 1.3.1
- <sup>vi</sup> Analysys Mason: The costs of deploying fibre-based next-generation broadband infrastructure, 8 September 2008, page 8
- <sup>vii</sup> Ofcom: The European Broadband Scorecard 2015 – Update, 4<sup>th</sup> March 2016
- <sup>viii</sup> Prism: Costs for Digital Communications Infrastructures for NIC, December 2017, paragraph 1.3.5
- <sup>ix</sup> Frontier Economics: Future Benefits of Broadband Networks, for NIC, 12 December 2017, Figure 2 and Figure 3
- <sup>x</sup> Frontier Economics: Future Benefits of Broadband Networks, for NIC, 12 December 2017, page 13
- <sup>xi</sup> Frontier Economics: Future Benefits of Broadband Networks, for NIC, 12 December 2017, Figure 14
- <sup>xii</sup> Openreach: Upgrading the Access Network with FTTP 17<sup>th</sup> July 2017, page 22
- <sup>xiii</sup> Frontier Economics: Future Benefits of Broadband Networks, for NIC, 12 December 2017, Page 23
- <sup>xiv</sup> Chambers Communications: Domestic demand for bandwidth 2013-23 for BSG, page 13
- <sup>xv</sup> Openreach: Upgrading the Access Network with FTTP 17<sup>th</sup> July 2017, paragraphs B10 to B11.
- <sup>xvi</sup> Ofcom: Connected Nations report 2017, 15 December 2017, page 8
- <sup>xvii</sup> Frontier Economics: Future Benefits of Broadband Networks, for NIC, 12 December 2017, page 14
- <sup>xviii</sup> Ofcom CMR 2017, Figure 4.16
- <sup>xix</sup> Ofcom: Connected Nations report 2017, 15 December 2017, page 14
- <sup>xx</sup> Ampere Analysis
- <sup>xxi</sup> Wired: Sky Q without a dish: web-only service to launch in 2018
- <sup>xxii</sup> Sky plc Results press release for the 6 months ended 31 December 2017, page 5
- <sup>xxiii</sup> Frontier Economics: Future Benefits of Broadband Networks, for NIC, 12 December 2017, page 6
- <sup>xxiv</sup> Financial Times: ONS's crossed telecoms wires raise questions over inflation figures, January 18<sup>th</sup> 2018
- <sup>xxv</sup> Openreach: Upgrading the Access Network with FTTP 17<sup>th</sup> July 2017, paragraphs D2 to D11
- <sup>xxvi</sup> Analysys Mason: Lowering Barriers to Telecoms Infrastructure deployment for BSG, May 2017
- <sup>xxvii</sup> Analysys Mason: Lowering Barriers to Telecoms Infrastructure deployment for BSG, May 2017, page 2
- <sup>xxviii</sup> National Platform and Constitution 2007, Australian Labor
- <sup>xxix</sup> National Broadband Network, Impact on the Budget, Report no. 04/2016
- <sup>xxx</sup> ABC News: NBN Co is a 'calamitous train wreck' that may never make a profit, Malcolm Turnbull says, laying blame with Labor 23 October 2017
- <sup>xxxi</sup> The Sydney Morning Herald: NBN Co chief Bill Morrow says under Labor connections cost it up to \$40,000, October 22 2017
- <sup>xxxii</sup> Ofcom Wholesale Access Market Review - Volume 1, 31 March 2017, page 10
- <sup>xxxiii</sup> BT's response to Ofcom's consultation document "Wholesale Local Access Market Review" 19 June 2017, page 3
- <sup>xxxiv</sup> Analysis of the Communications Act 2003, the Electricity Act 1989, the Gas Act 1986, the Railways Act 1993, the Water Act 1991 and the Competition Act 1998.
- <sup>xxxv</sup> Analysys Mason: Comparative analysis of outcomes in the UK broadband market: coverage, connections and competition, 3 October 2016
- <sup>xxxvi</sup> Gigaclear shareholder briefing, 20<sup>th</sup> September 2017, Cityfibre 2017 H1 results, 28<sup>th</sup> September 2017, our estimates.
- <sup>xxxvii</sup> Talk Talk investor call 15<sup>th</sup> November 2016
- <sup>xxxviii</sup> Prism: Costs for Digital Communications Infrastructures for NIC, December 2017, page 103
- <sup>xxxix</sup> NBN Co Strategic Review 12 December 2013, page 13
- <sup>xl</sup> New Zealand Herald: Broadband price cut sees Chorus shares tumble, 6<sup>th</sup> November 2013
- <sup>xli</sup> New Zealand Government, Regulating communications for the future: Review of the Telecommunications Act 2001, September 2015, various pages
- <sup>xlii</sup> New Zealand Government, Regulating communications for the future: Review of the Telecommunications Act 2001, September 2015, page 43
- <sup>xliii</sup> Ofcom: Pricing trends for communications services in the UK, 15 March 2017, Figure 1.1