
Taking the initiative: lessons from New Zealand's experience with the ultra-fast broadband initiative

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Abstract: Many governments are considering, or have begun to implement, plans to facilitate the roll-out of high speed broadband. This paper considers New Zealand's ultra-fast broadband initiative, a global leader in government-assisted fibre-to-the-premise networks. It describes how the New Zealand Government addressed the numerous challenges involved with next generation access networks, including funding, demand-side and supply-side risk and the involvement of the incumbent and other private operators. New Zealand's experience offers valuable lessons for countries considering a similar initiative, and this paper extracts and summarises these lessons.

Keywords: broadband; ultra-fast broadband; next generation access networks; fibre to the home; fibre to the premises; FTTH; FTTP; internet; New Zealand; Chorus; UFB initiative; ultra-fast broadband initiative.

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1 Introduction

High speed broadband has recently received considerable attention from governments looking to build on the transformative effects that broadband has had on the economy, culture and society to date (Ministry of Science Technology, Energy and Mining and Office of Utilities Regulation, 2012; Council of Ministers, 2012; Yunis et al., 2012). Although the potential benefits of faster broadband are widely accepted, governments have found themselves in the gap between the investment necessary to promote these benefits and the commercial willingness of the private sector to undertake these investments (Sadowski et al., 2009).

The New Zealand's Government policy (Ministry of Economic Development, 2010) has been led by the ultra-fast broadband initiative (*UFB initiative*), a form of public-private partnership which has seen the New Zealand Government commit to investing NZ\$1.35 billion (US\$1 billion) of public funds into or alongside the private sector to deploy a FTTP network. This network, which will ultimately reach 75% of the New Zealand population, will offer downlink speeds of at least 100 Mbps and uplink speeds of at least 50 Mbps. Deployment in the first six years is focused on priority broadband users such as businesses, schools and health services, plus green field developments and certain tranches of residential areas. Services are supplied, on an open-access wholesale basis, to retail service providers who then on sell to end users.

From its genesis as a 2008 election policy and following an extensive process to develop commercial arrangements with private partners, as well as policy and legislation, a fibre access network is being rolled out across New Zealand and initial customers are already receiving UFB services.

NGA plans can be compared between countries on the easily-quantifiable metrics of speed, coverage and cost (Cave and Martin, 2010). The UFB initiative compares respectably on all these measures, without leading any one metric (Beltrán and Gómez-Torres, 2011). This article looks beyond the headline figures and considers the lessons that can be observed from the UFB initiative, particularly given the UFB initiative's success in attracting substantial private sector co-investment in response to relatively modest public funding. The article highlights four main factors of particular interest:

- the competitive tender process, which helped to mitigate the inherently strong position of the incumbent both in the tender process itself and the ongoing market structure (including the landmark structural separation of the incumbent – voluntarily)
- the targeted nature of the UFB initiative, which does not include the least urban (and therefore most expensive) 25% of New Zealanders

- the government's shouldering of demand risk, which alleviates one of the dominant private sector concerns which would otherwise be factored into their pricing and drive costs up accordingly
- innovative funding mechanisms that allow the government to 'recycle' its funds multiple times, and in doing so save on upfront funding obligations.

New Zealand's success to date with the UFB initiative may offer some insight to governments considering how best to prepare for the advent of high speed broadband, at a time when many governments are considering how best to:

- facilitate high speed broadband deployment, given the typically slow progress by the private sector to date
- maximise the results using relatively low levels of funds, given the global strains on public purses
- promote competition on the new fibre networks, given historical difficulties with appropriately regulating the legacy copper networks.

2 Policy drivers

The UFB initiative was developed in the context of four issues (Ministry of Economic Development, 2009b; Key, 2008):

- economic concerns about New Zealand's international competitiveness and the global financial crisis
- confidence in UFB's potential to transform New Zealand
- scepticism that the private sector would, without government involvement and funding, undertake the necessary investment itself
- governmental belt-tightening and the need to ensure public funding was targeted and designed to secure value for money.

The UFB initiative came at a time of rising concern that New Zealand's international competitiveness was "slipping behind the rest of the world" (Key, 2008). New Zealand is highly dependent on trade, and UFB was seen as a way of improving New Zealand's links with the world while at the same time improving productivity. These concerns were compounded by the effects of the global financial crisis; the New Zealand Government, like so many others, was forced to respond to a substantial, but uncertain, recession.

In the face of these economic concerns, New Zealand was ripe for a 'nation-building' infrastructure project. In his speech announcing the policy, political leader (and soon to be Prime Minister), Key (2008) highlighted economic growth as the primary justification for the UFB initiative. He also mentioned benefits for health, education, work-life balance (through telecommuting) and carbon reductions. The term most favoured was 'step-change': the concept that a sufficiently transformational broadband investment would allow New Zealand to drive economic growth by streamlining and reinventing established processes.

Despite widespread acceptance of the importance of NGA, it was not clear who would be building – and paying for – the new network. The concern was that New Zealand was a broadband straggler; prices were high, speeds were low, investment in NGA networks was minimal. Telecom, the recently functionally separated incumbent, had plans for some network upgrades, but not on the scale of the UFB initiative. As one commentator (Given, 2011) described it: “the big ones were not consistently aggressive enough; the aggressive ones were not big enough.”

After the election, with only a vague but ambitious election policy to go on, the government found itself needing to develop and implement an affordable policy initiative that would address these overarching concerns. Enter the UFB initiative.

3 The policy

The framework of the UFB initiative was developed by the Ministry of Economic Development¹, which already had a communications and IT policy group. The primary output of this policy development was the release of the comprehensive invitation to participate (*ITP*) (Ministry of Economic Development, 2009b) – a detailed description of the UFB initiative (later refined and re-issued) that invited responses from private sector partners and set out the tender process.

3.1 The partner selection process

The success or otherwise of a tender process such as this depends on the degree of competitive intensity between potential operators. If the incumbent does participate in the project – as Telecom did – governments face delicate questions of balance. On the one hand, there are advantages to the government (including the use of existing assets, ease of migration from copper to fibre, cost savings and improved demand) from incumbent involvement. On the other hand, the government are wary of effectively transferring the incumbent’s power in the copper market to the new fibre market (Key, 2008). Governments may want the incumbent on board, but not driving the train.

When electricity lines companies comprised the majority of the shortlisted bidders, it became clear that electricity lines companies would be the most likely competitor to Telecom (Crown Fibre Holdings, 2010). Electricity lines companies had two major advantages:

- cheap deployment capabilities, through their ability to string fibre cables along their existing overhead power lines and avoid costly undergrounding where possible; and
- in some regions, existing fibre access network assets.

But there was one substantial hurdle: the lines companies operated on a regional basis, but the government wanted a nationwide fibre network. The solution was to segregate the tender itself on a regional basis, with the country being split into 33 different bidding regions. This division was mitigated by strict interoperability requirements in the ITP. Firms could submit country-wide bids if they wished, and Telecom did, but they could also bid for a single region or a group of regions. Firms could also form consortia to bid, and some lines companies formed a joint venture to bid as one across a number of regions.

The regional basis was crucial in introducing competitive tension into the partner selection process. It allowed smaller players – the electricity lines businesses – to put together credible bids against Telecom’s nationwide proposal. Under a national bid process, it seems likely that Telecom would have effectively run unopposed; the only other nationwide bid (from Axia NetMedia) was rejected early in the process for including certain elements in its proposal that were not part of the government’s UFB policy (Crown Fibre Holdings, 2010).

On the government’s side, the early stages of the commercial tender and negotiations process were conducted by the MED, who had also prepared the policy as set out in the ITP. Crown Fibre Holdings, a government-owned investment vehicle, took over negotiating duties once it was established and operational.

The tender process was run as a beauty contest, rather than an auction. While the level of public co-investment sought by the bidders (effectively the ‘price’) was clearly a major consideration, the process required substantial and comprehensive negotiations regarding the legal, technical, regulatory and financial form of the partnership. As a result, the beauty contest approach had a number of consequences:

- It allowed the government to take into account a broader set of considerations than just the dollar figure sought. Many of these factors are fundamental: the time frame for completion, the services and speeds to be offered, the technical model for deployment and the regulatory relief sought (if any).
- The negotiation process facilitated the government’s emphasis on contractual mechanisms for establishing and enforcing the boundaries and obligations of the bidders and the government under the UFB initiative.
- It allowed bidders and government to consider alternative commercial models, where appropriate. As will be seen below, this was particularly useful for involving the incumbent, where a bespoke funding mechanism was adopted instead of the initial policy put forward.
- By engaging the government and bidders in ongoing discussions (rather than fixing set terms to take effect on conclusion of an auction), the precise details of the UFB initiative were able to evolve as the negotiations progressed.

The partner selection process required a balancing between the desire for openness and transparency of government and the unavoidable need to protect the confidential and sensitive nature of commercial negotiations. Many documents were made available publicly, including the government’s ITP to prospective partners that would form the foundation of the UFB initiative (Ministry of Economic Development, 2009b). The accompanying legislation [the Telecommunications (TSO, Broadband and Other Matters) Amendment Act 2011], which was necessary to setup some of the regulatory framework, was also public, with an open call for submissions (which were also published after a relatively brief consultation period) and a public hearing.

At the same time, the negotiations themselves were held in private. This was unavoidable to an extent, given that the government was conducting multiple negotiations simultaneously. Public notice of progress was limited to short listing announcements, where the names of bidders selected for negotiations (and later those selected for ‘priority negotiations’) were announced (Crown Fibre Holdings, 2010). The bidders themselves also disclosed some information; Auckland electricity lines company Vector undertook a

multi-platform advertising campaign, including television spots, to garner public support for its bid against Telecom (Keall, 2011).

3.2 *Initial regulation through contract*

UFB services will not be subject to standard price and non-price regulation from the commencement; UFB services have not been added to the list of regulated services that currently includes a number of legacy copper services (although New Zealand's competition authority, the Commerce Commission (*Commission*) could, at any time, begin an investigation and recommend this regulation). Instead, prices are capped contractually with CrownFibre Holdings to begin with. This use of contracts is relatively unique across publicly-funded NGA projects, but has a number of benefits:

- The government could agree a bespoke set of obligations with each private sector partner that incorporated, for example, the perceived willingness to pay, uptake rate and coverage requirements of the area in question. Centrally-set price regulation may have had difficulties addressing these complex factors.
- Given the uncertain nature of NGA services, the input and involvement of private sector partners was key. Although standard regulation does involve a consultation process, the private sector does not sit at the main table.
- It recognised that in many respects the interests of the private sector partner and the government were aligned, through their co-investment. The government could negotiate on each bidder's proposed price book, and take this pricing into account when choosing its partner in a particular area.

The agreements with Crown Fibre Holdings prescribe a maximum price that the provider can charge retail service providers. This includes an initial cap, the cap that will apply at 31 December 2019 and (in some cases) a glide path setting out how and when the cap will move over this time. For some services, the cap will increase slightly, but for most there will be significant drops. From 1 January 2020, the contractual price caps will no longer apply.

Different wholesale access prices apply to consumer and business connections. This allows some cross-subsidisation and reflects the greater value businesses are likely to place on broadband access (Ultrafast Fibre, 2012; Chorus, 2011).

It is important to remember that the price caps apply to wholesale prices only. Once a retailer acquires a service, they are free to sell it at any price the market will accept; the retail market is intended to be sufficiently competitive to drive efficient prices. Early experience supports this expectation: Orcon, the largest ISP to announce retail prices so far, is offering an entry-level home fibre plan for NZ\$75 – in line with its current copper/DSL plan (Keall, 2012).

The use of contracts as a regulatory tool was subject to some criticism. In particular, critics (Wigley & Company, 2011) highlighted:

- the initial proposal for a 'regulatory forbearance' period, in which the Commission would be sidelined, unable to recommend regulation of UFB services until 2020
- the perceived conflict of interest between Crown Fibre Holding's dual roles as the negotiator and enforcer of these contracts (essentially acting as a quasi-regulator) and Crown Fibre Holding's objectives to obtain a commercial return

- New Zealand's international obligations, which require an independent telecommunications regulator.

The government initially proposed legislated regulatory forbearance for 10 years, which would prevent the regulator from recommending the regulation of wholesale services over new fibre networks (a necessary prerequisite for traditional regulation). It believed that the contractual price caps would prevent over-charging. Following strong criticism from some industry players and the political opposition, statutory regulatory forbearance was ultimately removed by the government (Joyce, 2011a). The result is that at any time the Commerce Commission may choose to investigate and recommend regulation of any fibre services.²

This introduces an additional dynamic into pricing: the contracts can set a price cap, but these caps may become subject to regulation. If the Commission recommends – and the relevant Minister accepts – regulation of a UFB service, the provider will be bound to follow that regulation; even if it sets a price beneath the contractually agreed price cap. This retains the Commission's important role as an independent regulator and the backstop of traditional regulatory mechanisms.

To offset this reintroduction of regulatory risk, the government agreed to a compensation mechanism to apply if any future regulatory intervention sets a mandatory wholesale charge below the contractually-set maximum charge (see Joyce, 2011a). If this occurs, the government will provide compensation for the difference between the contractual cap and the regulated price from the date regulation takes effect until 31 December 2019 (the date that the contractual price caps expire). This mitigates the risk of price regulation from the private sector partner's perspective – any revenue lost through regulatory intervention will still be recovered, at least in part.

To further assuage claims of regulatory uncertainty, the Minister also promised to undertake a review (now mandated in the Act) of the policy framework for regulating telecommunications services in New Zealand (Telecommunications Act 2001). This may seem counterintuitive – promoting regulatory certainty by promising to review the entire regulatory framework from scratch – but this has been welcomed by operators (Telecom New Zealand, 2011).

For the review, the Minister must, by 30 September 2016, commence a review of the policy framework for regulating telecommunications services in New Zealand. The policy review is required to take account of the market structure and technology developments and competitive conditions in the telecommunications industry at the time of the review, including the impact of fibre, copper, wireless, and other telecommunications network investment. This is intended to be completed by 31 March 2019 (Telecommunications Act 2001).

3.3 LFCs

The local fibre companies (*LFCs*) – the joint venture companies formed between Crown Fibre Holdings and the private sector partners – are subject to a range of further restrictions and obligations. Some of these have been set out in the contracts with Crown Fibre Holdings, while others are provided for by legislation (Telecommunications Act 2001). The key aspects include that the LFCs must:

- not provide retail services
- provide layer 2 services
- provide certain layer 1 services (point to point) on the fibre network, more suitable to business customers or any end-user seeking premium quality services (up to 1 Gbps)
- prior to 31 December 2019, supply all of their services to a ‘non-discrimination’ open access standard and after 31 December 2019 supply layer 1 input services to an equivalence of inputs (*EOI*) standard (while continuing to provide layer 2 services to a non-discrimination standard)
- after 31 December 2019, LFCs must provide unbundled access to point to multipoint layer 1 services on the fibre network
- from the beginning of the LFC’s operation, ensure network capability to support the requirement to provide *EOI* for fibre services from 31 December 2019, by ensuring:
 - 1 there is enough space in ducts or additional dark fibres for additional access seekers
 - 2 that LFC business and operational support systems will support *EOI*
- provide financial information on a regular basis to the Commerce Commission.

3.4 *The role of the Commerce Commission*

The Commerce Commission, the telecommunications regulator, has been tasked with relatively limited monitoring and enforcement functions, to begin with at least, compared to its more interventionist role in regulating the legacy copper network (Telecommunications Act 2001). This can be seen as a consequence of fibre’s nascent status; with fibre in its infancy and minimal evidence of a problem in need of regulation, imposing disproportionately heavy regulation would be unnecessary and potentially detrimental.

LFCs and Chorus must disclose specific information to the Commission. This information relates to:

- the non-discrimination undertakings given by the LFCs and Chorus, which require disclosure of information to the Commission
- the information disclosure regime: LFCs and Chorus must provide information to the Commission to allow it to record over time the operational and capital costs associated with the construction, use and maintenance of their networks.

The Commission can enforce breaches of these obligations (and any other breaches of the Telecommunications Act 2001). The Commission is not, however, an enforcement agency. It is up to the Court to decide whether a breach has occurred and, if so, the appropriate remedy.

The Commission also has, as discussed above, the power to investigate and recommend regulation of services on the UFB network at any time (except unbundled point-to-multipoint layer 1 services before 31 December 2019). It has not indicated its

predilection for fibre service regulation, but this is an issue that will be closely monitored (Patterson, 2012).

3.5 Ensuring the open playing field

The importance of open and non-discriminatory access was a foundation principle of the UFB initiative, and the accompanying policy, legislation and commercial arrangements contain a number of measures designed to promote this principle (Ministry of Economic Development, 2009a). These compulsory measures, while crucial, are somewhat dwarfed by the significance of a voluntary outcome: the structural separation of Telecom.

Chorus' to structurally separate into Telecom (sometimes referred to as 'New Telecom' to avoid confusion) and Chorus was one of the headline outcomes of the UFB initiative. Telecom (New Telecom that is) is largely retail-focused, along with some infrastructure such as mobile, domestic backhaul and international. Chorus is a network infrastructure business: it has the copper access network and fibre network assets.

Partners were faced with a choice after a ten year concession period, all partners must either: not provide retail services, or not have the right to appoint the majority of directors to the board of the relevant LFC, with an independent Chair.

As part of the alternative model proposed by Chorus and accepted by the government, it voluntarily offered to structurally separate immediately, rather than wait out the concession period or lose the right to control the board.

The line between retail and wholesale is further reinforced with 'line of business' restrictions. Chorus is statutorily prohibited from offering retail UFB services (Telecommunications Act 2001); the LFCs' Shareholder Agreements (Enable Networks Limited, 2011; Northpower Limited, 2010; Ultrafast Fibre Limited, 2010). Provide a similar blanket prohibition on the LFCs supplying retail services (excluding limited high-spec services aimed at business users).

The UFB initiative also incorporates so-called 'behavioural' remedies to promote competition: to stop firms from discriminating, make them promise not to discriminate, then monitor and enforce compliance (Ministry of Economic Development, 2009b).

This was an important element of the UFB initiative from an early stage: one of the earliest principles was to:

ensure that any fibre network that the Crown takes a stake in is open-access. We want to ensure that many service providers can compete to provide services over that fibre network, because we believe this will result in the best and cheapest services for consumers (Key, 2008).

New Zealand has implemented this through statutorily-required open access undertakings, in which Chorus and the LFCs must undertake to meet various obligations on non-discrimination and equivalence of supply. Chorus and the LFCs will sell access to a range of fibre services on a wholesale, open access, basis to all retail service providers.

New Zealand's form of non-discrimination permits a limited degree of differential treatment, but only where the difference in treatment is objectively justifiable and does not harm competition in any telecommunications market (Telecommunications Act 2001).

4 Funding

4.1 *Attracting private sector co-investment*

In a time where many governments are facing financial constraints, New Zealand being no different, value for money has emerged as a critical factor.

Ideally, governments would be able to achieve a high quality NGA network with low levels of public funding and high levels of private investment. Realistically, however, the private sector has been reluctant to commit funds toward a NGA network, and the specifications of the NGA may suffer accordingly (Cave and Martin, 2010).

New Zealand's success in obtaining substantial private co-investment, despite the relatively modest public funds on offer, is instructive. The government committed NZ\$1.5 billion (US\$1.1 billion) to fund the UFB initiative. NZ\$150 million was set aside early in the process, to make schools 'fibre-ready', leaving NZ\$1.35 billion for distribution to private sector partners – who would be co-investing substantial amounts (50% or more) themselves (Joyce, 2011b).

Four main factors contributed to the government's success in achieving considerable private sector co-investment:

- the competitive tender process
- the targeted nature of the UFB initiative, which does not include the least urban (and therefore most expensive) 25% of New Zealanders
- the government's shouldering of demand risk, which alleviates one of the dominant private sector concerns
- innovative funding mechanisms that allow the government to 'recycle' its funds multiple times.

The competitive tender process played an important part in this success by forcing potential players to show their hands – to bid now or forever hold their peace. Since fibre is often a natural monopoly, it comes with a considerable first mover advantage. The public funding on offer meant that potential operators could be confident that someone *would* be building a fibre network, and it was in their interests to compete for the funding.

This has not always worked elsewhere; the Australian Labor Government abandoned its original FTTP plan in 2009 after receiving no acceptable bids, despite the A\$4.7 billion of public funding on offer (Swan, 2009). Other factors must be considered, including the existing regulatory environment and the involvement of the incumbent in the plan.

In Australia, the relationship between Telstra and the government was generally considered hostile (Global Telecoms Business, 2009). This culminated in Telstra submitting a non-compliant bid for the A\$4.7 billion plan, leaving the government with a FTTN/FTTP plan dependent on the then-excluded incumbent.

By contrast, relations between the New Zealand Government and Telecom were improving by the time of the UFB initiative, following the 2006 low point of forced functional separation. Telecom was able to participate constructively in the partner selection process. Further, it had strong incentives to do so, given that a FTTP network did not rely on the use of Telecom's legacy copper network and the regionally-oriented selection process allowed credible competition to Telecom.

Including the remaining 25% of population in the UFB initiative would have been prohibitively expensive, given the cost of deploying FTTP in remote and rural areas, so these New Zealanders will be covered by a separate wireless rural broadband initiative. At the other end of the competitive spectrum, the government considered that core networks and national backhaul will be deployed and supplied commercially, so the UFB initiative does not cover these services. These means the government's capped contribution can be aimed at the bottlenecks where its contribution is most valuable.

4.2 Reducing demand risk

An innovative aspect of the UFB initiative is that government funding is used to roll out fibre down the street and the private sector partner funds the fibre drop to the premise on request from customer (i.e., once demand from that customer has been confirmed). This feature addresses one of the key concerns among bidders that demand risk was uncertain and would need to be priced into their bids. LFCs can deploy fibre down their streets without fearing that no one will want it, as Crown Fibre Holdings will be funding this deployment.

The alternative model that applies to Chorus also provides that dividend and interest payments to the government can slow down if take-up is lower than a certain defined amount. Again, this addressed demand risk.

Where government funding is not available, an equivalent technique may be to relax roll-out obligations on the licensee if demand fails to meet certain pre-defined expectations.

As almost a *quid pro quo* to the government assuming demand risk, the Chorus arrangement allows Crown Fibre Holdings to realise some of the upside if there are superior cumulative returns.

The risk around build cost overruns falls on the private sector partner, who commits to the government to build the specified network in the required time; the costs are its own issue.

4.3 Private sector partner selection

Crown Fibre Holdings entered into two types of agreements:

- the first was with Chorus, the network business which emerged from the structural separation of Telecom New Zealand and retains ownership of New Zealand's copper local loop³
- the second was with private partners forming LFCs with Crown Fibre Holdings.

Crown Fibre Holdings selected Chorus as its partner in areas that included roughly 70% of the total population covered by the UFB initiative, including the largest city, Auckland, and the capital, Wellington.⁴ The remaining 30% of the population covered by the UFB initiative are distributed between three LFCs:

- NorthPower Fibre. The private partner for NorthPower Fibre is NorthPower, the electricity lines company in Northland. Northpower Fibre will provide UFB services in the Whangarei coverage area.

- Ultrafast Fibre Limited. The private partner for Ultrafast Fibre Limited is Waikato Networks Limited, itself a joint venture between WEL Networks Limited (the electricity lines company in the Waikato region) and Waipa Networks Limited (the electricity lines company in the town of Te Awamutu). Ultrafast Fibre Limited will provide UFB services in the Hamilton, Cambridge, Te Awamutu, Tokoroa, Tauranga, New Plymouth, Hawera and Wanganui coverage areas.
- Enable Networks Limited. The private partner for Enable Networks Limited is Enable Services Limited, a fully owned subsidiary of Christchurch City Holdings Limited – the investment arm of the Christchurch City Council. Before partnering with Crown Fibre Holdings, Enable Services Limited operated a localised fibre network in Christchurch. Enable Networks Limited will provide UFB services in the Christchurch and Rangiora coverage areas.

4.4 *Chorus*

Crown Fibre Holdings will invest up to \$929m into Chorus directly, rather than into a joint venture such as an LFC. This represents a significant change from the original UFB initiative policy; Chorus will have considerably more control over its UFB network than private partners under the LFC model, including at Board level. Chorus began deploying fibre in August 2011, with an agreed completion date of 31 December 2019.

The agreement between Crown Fibre Holdings and Chorus provides for a 50:50 debt/equity instrument as the mechanism for Crown funding. Essentially, Crown Fibre Holdings is funding Chorus by acquiring shares in Chorus (with special characteristics, including no voting rights and no dividends until 2025) and by making non-interest bearing loans to Chorus that will only be redeemed from 2025 onwards. Once Chorus passes a premise, it is entitled to request its funding (via these equity and debt mechanisms) – worth NZ\$1,118 per premise – from Crown Fibre Holdings.

As discussed earlier, Chorus also issues warrants to Crown Fibre Holdings along with the debt and equity securities, permitting Crown Fibre Holdings to share in any upside if Chorus generates cumulative returns in excess of 16% per annum.

Given that Chorus already owns the copper local loop, the issue of migration of users from copper to fibre is key. End user migration to the new fibre services delivered under the UFB initiative is voluntary. In addition, the wholesale provision of copper services (including UCLL) remains mandated indefinitely. Crown funding for LFCs is tied to roll-out targets based on the number of premises passed, and not the number of premises connected (although Chorus is subject to fibre uptake incentives: if Chorus does not exceed 20% fibre uptake by 30 June 2020, its repayment schedule to Crown Fibre Holdings will be accelerated).

Chorus has given undertakings in its agreement with Crown Fibre Holdings to minimise investment in copper assets and to offer only fibre services in green field developments with more than 20 lots, subject to some conditions.

Migration will also be affected by the Commission's regulation of copper services, which act as a substitute for fibre. Prices for copper services have both supply-side and demand-side consequences for migration: a lower copper price would make the provision of copper services less attractive to Chorus, and expedite the fibre network roll-out. Conversely, a low price for copper services could make fibre services less attractive to

end users, who may prefer to continue purchasing the cheaper copper services (Commerce Commission, 2012b).

4.5 LFCs

The LFC model follows closely the government's original policy for the UFB initiative (Ministry of Economic Development, 2009b). It is a form of public-private partnership, with Crown Fibre Holdings partnering with a private sector partner to deploy, own and operate the network in a specified coverage area.

The co-investment model used by the LFCs is intended to ensure the government carries the risks associated with an immature market (particularly demand risk). The LFC repays Crown Fibre Holdings' investment as each customer is connected, by acquiring a 'per user portion' of shares in the LFC. This establishes a natural exit mechanism for Crown Fibre Holdings from the LFC; as end user take-up increases, the partner will progressively buy Crown Fibre Holdings out of its interest in the LFC.

This also allows Crown Fibre Holdings to 'recycle' funds: as Crown Fibre Holdings is repaid, it can use those funds to meet its obligations for funding fibre down other streets (either for the same LFC or another – or Chorus). In this way, the government's relatively modest investment is stretched out across multiple deployments.

The LFC model also provides for a ten year 'concession period', during which Crown Fibre Holdings and the partner play very different roles in the LFC:

- During the first ten years of the LFC's operations, the partner will receive all of the dividends paid by the LFC from its operating profits, but will have no voting rights. In contrast, the shares held by Crown Fibre Holdings will have voting rights, but no rights to dividends. After the ten year concession period, the shares held by Crown Fibre Holdings and the partner will convert to ordinary shares.
- During the concession period, the LFC will be governed by a board made up of seven directors: three from the partner, three from Crown Fibre Holdings and a mutually agreed independent chair. By the time the concession period ends, the partner is likely to have a majority interest in the LFC and can appoint directors accordingly.

Finally, the Crown will retain a 'Kiwi share' which has no voting rights or rights to dividends, but has veto powers over any adjustments to the provisions in the LFC constitution regarding open access requirements, pricing adjustments and other key features. This provides a baseline level of stability and compliance with the LFC framework, without impinging on the LFC's commercial operations.

Crown Fibre Holding's investment into the LFCs is confidential and has not been publicly released (either in aggregate or on a per LFC basis). Taking the overall ceiling of NZ\$1.35 billion however, less the NZ\$929 million for Chorus, suggests that Crown Fibre Holdings is investing no more than NZ\$421 million across all three LFCs.

5 Lessons from New Zealand

Now that the contracts have been signed, and ground broken, a look back suggests the lessons that may be taken from the UFB initiative's progress to date.

What has the UFB initiative done well? First, the engagement and involvement by the industry has been strong, though by no means united. All major existing telecommunications operators have participated in the process in some form: whether as a bidder, a retail service provider, or a potential competitor. The UFB initiative sparked strong debate within the industry and beyond – its prominence as an election policy in 2008 is almost unprecedented in New Zealand.

The structural separation of Telecom is a landmark outcome, and would be unlikely to have occurred voluntarily without the incentives offered through the UFB initiative (Heatley and Howell, 2010). The 2006 functional separation of Telecom, which was less substantial though more detailed, was difficult, compelled and contentious. Structural separation, by contrast, was offered voluntarily by Telecom and approved by 99.8% of its shareholders. Particularly when judged against the relatively modest size of public funding on offer, this is a significant accomplishment.

New Zealand stretched its relatively modest public funding. The innovative funding mechanism, which allows funds to be ‘recycled’ multiple times, was attractive to private partners and meant that this public funding is complemented by significant private investment as well. The funding mechanism also offers a solution to the problem of private partners being unwilling to undertake fibre deployment (or, alternatively, to price the risks of low uptake into their bids), although it ultimately apportions demand risk rather than removes it.

Another important factor in obtaining value from this funding was the decision to limit the scope of the UFB initiative to only 75% of the population. In the context of New Zealand’s difficult terrain and pockets of isolated rural population, a more extensive coverage objective would likely have required either a downgrade to the services offered, or an increase in public funding. The separate rural broadband initiative will see a wireless solution supply broadband peak speeds of at least 5Mbps to 86% of rural New Zealanders.

The involvement of the electricity lines companies in the partner selection process was critical to ensuring competitive pressure, particularly against Telecom’s incumbent position. This involvement, and the benefits it facilitated, is strongly linked to the decision to split the UFB initiative into regional coverage areas, while permitting consolidation or nationwide bids.

The importance of political will should not be underestimated. Despite widespread (but not unanimous) industry and public support for the UFB initiative, it still required substantial work to drive the commercial, policy and legislative mechanisms necessary for implementation. The government was criticised politically (particularly on the regulatory forbearance proposal and perceived close ties to Telecom) (Curran, 2011), with one notable result being the removal of the proposed forbearance. Overall, however, it should be recognised that a policy as significant as the UFB initiative requires commitment to implement.

On the other hand, what could have been done differently? The government perhaps underestimated the consultation process. Submissions on the implementation bill were subject to tight timeframes; in particular, a 77-page amendment to the bill was proposed only seven working days before submissions on the bill were due. Although an extension was belatedly granted (and announced two days before the original due date) (House of Representatives, 2011), this was still considered insufficient by many. When the public hearings on the bill were held, each submitter received limited time (TelstraClear, 2011).

The regulatory forbearance proposal may also have been a misjudgement; it received the strongest criticism of any substantive part of the UFB initiative, and the ultimate result (the removal of forbearance, with a compensation mechanism for private partners) is somewhat patchwork. The government's decision to use public funds to insure its partners against the decision of an independent regulatory authority is largely a consequence of investor expectations going into negotiations (and pricing accordingly), rather than a principled aspect planned from the beginning of the policy.

6 The future for the UFB initiative

Considering the original driver of the UFB initiative – the desire for international competitiveness through growth, innovation and increased productivity – the UFB initiative is an important step towards enabling these outcomes. One study (Miller, 2012) suggests that the economic benefits of the UFB initiative will total nearly \$33b over 20 years. These benefits, which include consumer surplus (gains to consumers that aren't directly reflected in higher incomes or GDP), are spread widely, including:

- \$14.2 billion to businesses, through improving productivity, reducing travel expenses and making better use of cloud computing services
- \$9.1 billion to agriculture
- \$5.9 billion to health
- \$3.6 billion to education.

Demand issues loom as one potential obstacle. While Crown Fibre Holdings will fund the deployment of fibre down the street, it will be up to users to request a fibre connection. The funding model apportions this demand risk, but it cannot reduce it. The Commerce Commission has taken an active role in this issue, conducting a study into issues that might affect the uptake of high speed broadband in New Zealand. The final report (Commerce Commission, 2012a) concludes that that:

- The costs related to connecting to the network, and using high speed broadband services, have been identified by many parties during our study as a critical factor. As these costs (non standard connections, re-wiring, upgrading equipment and subscribing to the services) appear to be significant, they are likely to reduce the initial uptake of high speed broadband services for both consumers and SMEs.
- Video content is likely to be the primary driver of consumers' uptake of high speed broadband services over the next few years. The rate of uptake is likely to be higher if there is a diverse range of video on demand options available to consumers. Currently, there are limited online video on demand services in New Zealand compared with many other comparable countries.
- Potential issues relating to data caps, backhaul capacity and IP interconnection are likely to be resolved by market forces.
- Rural users have the same appetite for fast broadband as urban users, but have a more fundamental need, which is to be connected to basic broadband. They are concerned that they could be left behind as New Zealand moves forward with

high speed broadband services. This issue has been recognised in the RBI initiative and in the five point government action plan for faster broadband.

The Commission's report is a review, and did not make any recommendations. The Commission and the government are being watched with interest in relation to what further actions, if any, are taken in relation to these issues.

Early update figures support the view that the UFB initiative has been largely successful in ensuring roll-out of high speed broadband, despite some demand issues remaining unresolved. After the first year of roll-out, the Minister for Communications and Information Technology, Adams (2012) announced that the year one deployment target for the UFB initiative had been exceeded. UFB services were available (i.e., the network had been deployed past the premise) to roughly 76,000 schools, businesses, hospitals and households. This was more than 6,000 premises ahead of forecasts.

Actual take-up of UFB services, however, was considerably lower: only 1,200 end users had subscribed to a UFB service. The Minister noted that this was in line with expectations, and that demand was anticipated to be slow initially, before rising substantially as more attractive products are developed by retail service providers.

In our view, New Zealand's approach to funding and deployment of fibre represents an innovative public/private partnership designed for today's tight fiscal environment. The UFB initiative will provide a strong infrastructure base to promote the online adoption and innovation necessary for growth and increased productivity.

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Notes

- 1 Following public sector restructuring, the Ministry of Economic Development now forms part of the Ministry of Business, Innovation and Employment.
- 2 Except unbundled point-to-multipoint layer 1 services before 31 December 2019.
- 3 While Chorus' bid did not reflect the government's proposed model for the businesses delivering UFB, parties were permitted to propose alternative models.
- 4 Chorus will provide UFB services in the Ashburton, Auckland (including Pukekohe, Waiuku, Waiheke), Blenheim, Dunedin, Fielding, Gisborne, Greymouth, Invercargill, Kapiti (including Paekakariki, Raumati, Paraparaumu, Waikanae), Levin, Masterton, Napier & Hastings, Nelson, Oamaru, Palmerston North, Queenstown, Rotorua, Taupo, Timaru, Wellington (including Hutt City, Upper Hutt and Porirua) and Whakatane coverage areas.