

InternetNZ

Cabinetisation and Local Loop Unbundling- The Way Forward

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1. Executive Summary

The issues surrounding Unbundled Copper Local Loop (UCLL) and cabinetisation have been highlighted by recent developments in the telecommunications industry, including the release of the first Standard Terms Determinations (STD's) by the Commerce Commission, the deal struck with the government which will involve Telecom cabinetising a large part of its network, and the announcement by Telecom of its plans generally.

Now that this new information is available, there are grave fears amongst the potential new entrants to the UCLL market, and InternetNZ, that the new market environment, which they support in principle, may not be workable, and that the government's legislated objective to "promote competition in telecommunications markets for the long-term benefit of end-users" (we term this LTBE) will not be met.

A raft of new issues is more readily apparent, now that more details are known for the first time. The potential for the incumbent to control the new services market and marginalise the investment of the new entrants is now more evident. A round of arguments on specific issues has commenced, with the new entrants claiming anti-competitive outcomes, and the incumbent claiming legitimate commercial and engineering intent. The specific detailed arguments are mostly difficult or impossible to resolve, and point to a fragmented and reactive regulatory environment. Some areas stand out for further action though, such as Telecom eliminating the copper circuits it no longer wants from its exchanges, or why Telecom can roll out cabinets at about ten times the speed it can deploy UCLL enabled exchanges.

The rapid cabinetisation and rollout of DSL based broadband by Telecom (at the behest of the government) will deliver early broadband on a near national scale and ensure a reasonable level of capital investment, and has support in many sectors. However, more in depth analysis shows that this may re-establish Telecom's monopoly via the broadband market and may impede competition in the long term, counter to what is required by the legislation. The establishment of the regulatory environment will take many years yet, and Telecom will have moved far ahead by the time the new entrants can see adequate stability in the market.

The regulatory environment must be made to work, and quickly. A proactive and holistic approach to regulation is required, not a reactive approach. Constant cycles of regulatory creep and unwinnable technical arguments must be avoided. Investors for the new entrants and the incumbent must have investment certainty.

We recommend that some of the steps to help break the emerging logjam and ensure the environment delivers to end users are:

- Regulation must be more proactive, and not reactive. A closer focus on outcomes is required
- LTBE must be defined and seen to occur
- Copper that is being removed by Telecom should be offered to new entrants on reasonable terms, or some other compensation should be available
- Anti-competitive outcomes must be treated as anti-competitive intent
- The process must proceed quickly, but with a more holistic approach. To ensure LTBE outcomes there must be equivalence for accessing Telecom facilities in the

exchange, and in the node in FTTN and FTTC environments ('Equivalence of Aggregation Point')

- The government must quickly quantify the implications of direct investment in telecommunications infrastructure development, and how this can bring greater penetration of FTTH, and improve LTBE.

Notwithstanding that the telecommunications environment is rapidly evolving, and has a long way to go, there are still significant gaps in the environment that need to be plugged quickly so that new entrants may have early commercial certainty and the long term benefits for end users can be quickly established and measured. There is a fear of regulatory failure in the new entrant community, and that even strong tools like operational separation, accounting separation and the STD process, may already be outflanked.

The above recommendations should be used as the basis to redirect and focus the policy environment to ensure success. Failure to re-evaluate the regulatory direction in light of recent concerning developments is not an option.

2. The Competition Framework

The government's intentions as they affect cabinetisation, UCLL and competition in general are clearly stated in the Telecommunications Act 2001.

“The purpose.....is to **promote competition in telecommunications markets for the long-term benefit of end-users** of telecommunications services within New Zealand by regulating, and providing for the regulation of, the supply of certain telecommunications services between service providers.”¹

The words in the Act are clear. We must measure everything that is happening in the market against this statement:

It seems fair in summary to say that there is an expectation that the current course of action by government will see the entry of new competitors in the local access market, using UCLL and cabinetisation. To meet this expectation there must be actual competitors who are commercially viable and who have some realistic market share. The market will have failed if new entrants degenerate into '*strong dwarfs*' where the monopoly controls its competitors, allowing them to subsist in the market and not go broke (that would look bad for the monopoly), but never letting them become truly effective in the market.

In the competitive environment, a range of benefits should flow in a balanced way to all the principle parties involved.

The principle driver of benefits for all parties is innovation, which should lead to the delivery of better services for end users. Innovation may include new technology, capital investment, marketing investment or other improvements in services.

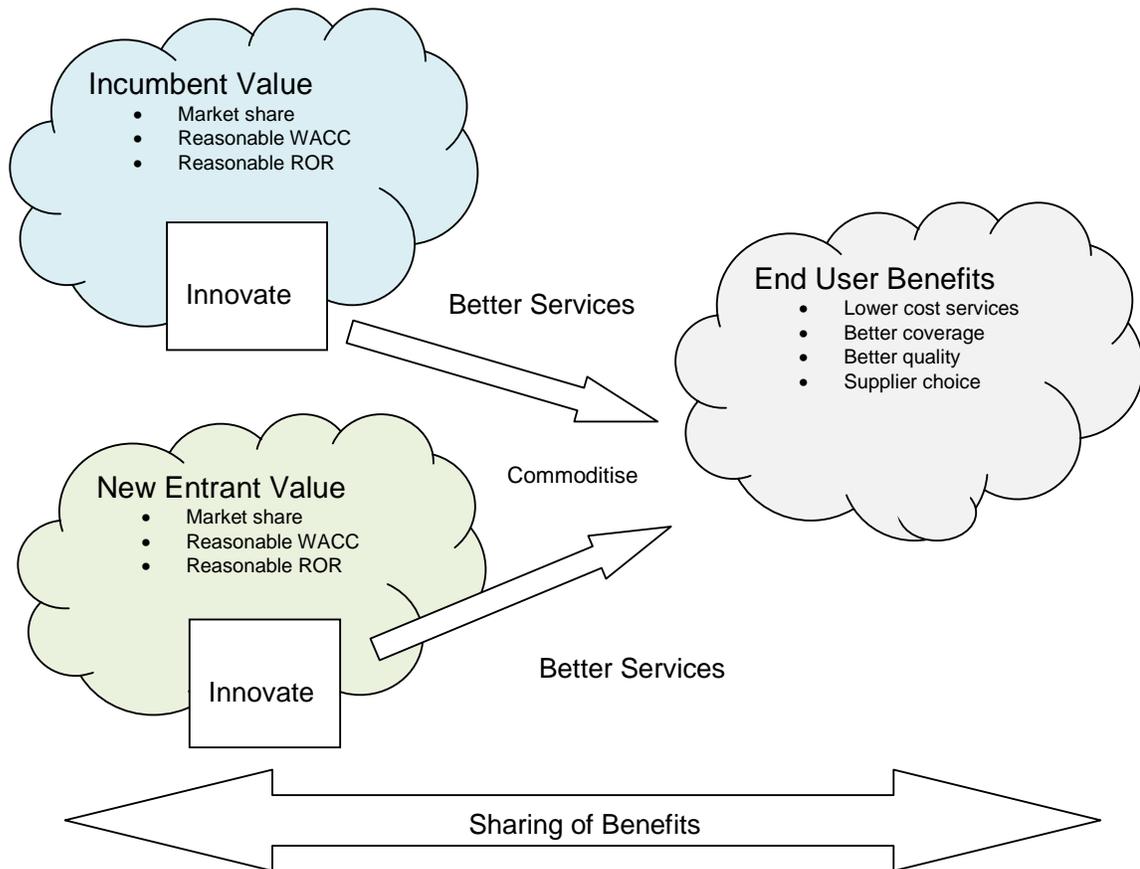
The benefits for both the incumbent (Telecom) and the UCLL new entrants flow from innovation - they win market share, and generate returns on their business investment (Rate of Return - ROR). All companies aim to maximise their ROR. If the market is highly competitive the companies are likely to be forced to ROR's in the range of about 10-15%. This reflects delivery of a commoditised service. If the company is in an uncompetitive market, or has been highly innovative, much higher returns can be expected (say 30%+ ROR).

To build out their networks and services both sets of parties (incumbent and new entrants) must raise money for the investment. The cost of that money is the weighted average cost of capital (WACC) which carries a premium for risk. If the risk is low, WACC will typically be of the order of 12%. If the risk is high, WACC can be easily double this figure.

If the regulatory proposition is not good for the UCLL new entrant, then they are unlikely to do well against an incumbent whose WACC is much lower.

The government's regulatory aim is to create long term benefit for the end user. This means that the WACC and ROR seen by the service providers must be at an appropriate level, otherwise the benefits are being transferred to the service providers and not the end user.

¹ Section 18 Telecommunications Act 2001

Figure 1 Competition Drivers

3. Brief Overview of the NZ Regulatory Environment

The telecommunications environment is moving rapidly from the light handed regulation scheme put in place around 1990, to one of rapidly developing and strong government regulation. The changes in earnest started when the government decided a couple of years ago that it had had enough of a market that was dominated by Telecom, and that it was time to implement a stronger regulatory environment in line with many overseas countries. New Zealand was seen as falling behind, and it was time to catch up. Much of the focus has been on providing better broad band, but other telecommunications services will also benefit.

The regulatory reforms are wide ranging, but one of the main thrusts is UCLL, made possible by ensuring new entrants have access to Telecom's copper local loop infrastructure.

The current government rapidly changed the telecommunications legal environment, first with the Telecommunications Act in 2001, but then with even stronger amendments in 2006. Changes included the creation of a telecommunications regulator in the Commerce Commission, requirements for Telecom to undergo operational separation into three independent and arms length companies, and unbundling of the copper local loops that currently go from Telecom's telephone exchanges to virtually every building in NZ.

At the same time the government has a raft of other supply and demand side initiatives under consideration. The government is also cajoling the existing operators into making the market

more competitive. The cellular operators have been 'encouraged' to release spectrum and to make roaming on their networks available to a new entrant.

The government also set targets for the national rollout of broadband:

- Towns with greater than 10,000 residents (representing approximately 76% of telephone lines) will have access to broadband at speeds of at least 20Mbps; and
- 90% of New Zealand's lines will have access to broadband at speeds of at least 10 mbps²

These are speeds based on DSL to the premises, not optical fibre to the premises.

As part of its 'deal' with government, Telecom has promised an intensive build out programme, bringing 20 Mbps to 80% of the country. It has pledged to spend \$1.4 billion on the rollout of DSL and its NGN. This deal with the government will be legally binding.³ Note that the full nature of the arrangement between government and Telecom is not fully public at the time of writing, so it's standing as a 'deal' is not totally clear.

What has been missing to date from the government's approach is a pledge of significant government money. The NZ government claims to have spent \$400m on ICT in the past four years⁴, but not much of this has gone on new infrastructure. However, the government appears to have recently recognising this issue and has begun an industry consultation process with a focus on government and industry investment to close infrastructure gaps⁵.

Other governments have accepted that major infrastructure build outs need some government money, especially if optical fibre to the premises is the objective. In Australia the government is putting up billions of dollars to get extensive optical fibre throughout the country, on the basis that industry must spend a similar amount. This demonstrates that to really get things to happen, the scale of government investment needs to be quite large. The future success of alternative infrastructure may depend largely on the scale of government investment.

Another downside of heavy government intervention is 'regulatory creep'. Interventions create distortions in the market and as the anomalies become apparent (and the technology advances), the regulations must be changed. The process of intervention then may never stop, the government is constantly re-regulating and investors are left with such a constantly moving target (high risk and high WACC for new entrants) that they may give up and take their money to another market.

It is noted that NZ has adopted a de-averaged regulatory regime, and accepted that different prices will be charged for certain services (eg UCLL MPF monthly charge) in urban versus non-urban areas. The advantage of de-averaging is it typically allows a lower price to be struck in urban areas, and gives new entrants a potentially more viable urban business case, but it means the government is potentially left to make special provisions for rural areas (such as its current investigations of rural telecommunications needs, and TSO provisions). De-averaging however, potentially removes what has been one of the prime advantages of the Internet, distance and location independent pricing. It also appears to increase the potential for gaming by the incumbent.

² Minister Cunliffe Speech to Digital Summit 2.0 28/11/07

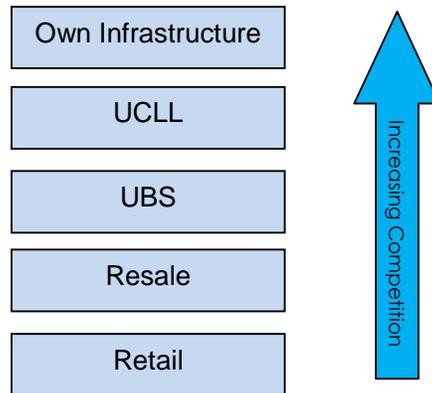
³ The Dominion Post, Saturday, 27 October 2007, <http://www.stuff.co.nz/4251771a13.html>. The latest detail at the time of writing is available in the Telecom Separation Undertakings, 19 Dec 2007.

⁴ Minister Cunliffe Speech to Digital Summit 2.0 28/11/07

⁵ Ministers letter to the industry, and 'Industry Guidelines – Facilitating Increased Investment in Broadband Infrastructure', 21 December 2007

To place UCLL in context, it must be noted that the government is following a ladder of investment structure, which encourages enhanced competition outcomes and investment by encouraging new entrants to enter and climb the ladder. The government has ensured a range of opportunities exist, and a range of bit-stream services (bundled and unbundled, regulated and unregulated) are available from Telecom below the UCLL opportunities. Some new entrants have elected to work in the UBS space (at least initially) rather than UCLL space.

Figure 2 - Ladder of investment



Sitting alongside this is operational separation, which commences implementation during 2008. Operational separation aims to ensure that Telecom delivers critical wholesale services to all service providers (including itself) on equivalent terms, and reduces Telecom's ability and incentives to discriminate against its wholesale customers. While operational separation is a powerful regulatory mechanism, it can be defeated (see discussion end of Section 4).

It is arguable that NZ has a reactionary rather than a forward looking regulatory system, with the government preferring to measure outcomes rather than setting goals. AAS believes that this type of regulatory regime is easily confounded by the incumbent bringing highly technical arguments and complexity into commercial decisions and to what should be mostly service delivery challenges for all competitors, not just the incumbent.

Until now the government has been able to employ light handed reform. The recent reforms have been popular, even if in part only because correcting excesses of the incumbent monopoly sits well with the electorate after so many years of neglect. The speed of change has been remarkable. This is partly thanks to good work by the participants (via the TCF), but also a reflection of the fact that much of this work has been done before overseas. Further, the strong mandate the government has created has helped, so nobody (especially Telecom) dares to drag the chain.

NZ is at a critical juncture in its regulatory process. If the rules are not set properly, government can potentially scare away more investment than it locks in through the deals it makes. If the rules are not set properly they can wind up stalling competition instead of increasing it, or it may even reduce competition. The government action unchecked has the potential of creating new monopolies or enhancing old ones. The government can set the targets too low, and in a decade's time much of the rest of the western world may have a substantial penetration of FTTH and NZ may continue to have only DSL to the home (DSLTTTH).

4. Background on Cabinetisation and UCLL

This section deals with commercial and technical aspects.

UCLL deals with copper access loops that run between the active network equipment in Telecom exchanges (exchange node) and customer (end user) premises. Once the active network equipment is supported outside the exchange (in an active cabinet node or curb node), the copper loop becomes a sub-loop, and sub loop unbundling (SLU) becomes the issue.

Because many exchange copper circuits are too long to support high speed broadband, it is necessary to move the active equipment and the aggregation point out beyond the exchange, into cabinets in the field. The closer the active network is to the customer, the shorter the copper loop, the higher the broadband speed that can be supported.

Referring to Figure 3, in the conventional situation the copper circuit is driven by active equipment in the exchange (a DSLAM, MSAN and/or conventional circuit switched POTS exchange – currently a NEAX 61 in NZ). There is corresponding active equipment on the customer premises (CPE), this may be a DSL modem and/or a conventional POTS telephone.

From the conventional exchange node the copper circuit runs in large **feeder** cables of hundreds of copper pairs between the exchange and a passive cross connect **cabinet**. From the cabinet to the **pillar** the cable reduces in size to a **distribution** cable of the order of 50 or more copper pairs. From the pillar to the customer premises is the **drop** cable, generally of two copper pairs. There may be multiple cabinets and pillars along the way, and the topology will generally be a complicated tree structure.

Telecom practice with field plant has been to lay bigger cables in ducts, meaning the cables can be more cheaply replaced, especially with optical fibre. Generally, existing Telecom cross connect cabinets are fed by feeder cables in ducts, and there will be extensive use of ducting on the distribution side as well, especially on cabinets installed since the 1960's. This means that Telecom is well positioned in many areas to move beyond FTTN and forwards to FTTC.

As the cables get smaller, they tend to be laid directly in the ground and therefore replacement requires trenching, and becomes more expensive.

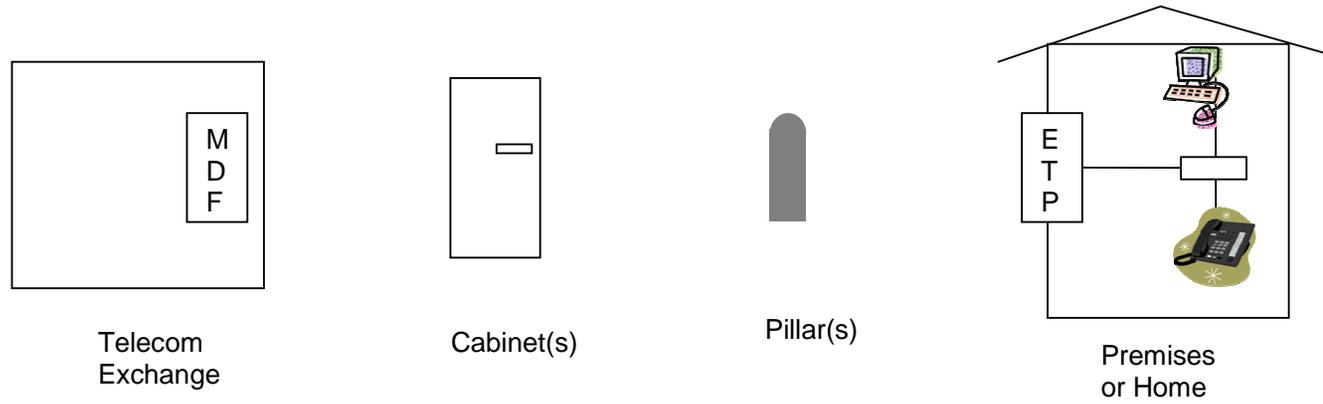
There are wide variations in Telecom's field installation practices, depending on when the area was reticulated. This adds to the complexity of regulating this environment.

Copper circuits in the local loop support a wide range of frequencies:

1. Direct Current (DC) – is very important for power feeding CPE, and potentially the smaller cabinets for FTTC.
2. Voice – Generally supported in the range 300 Hz to 3,400 Hz.
3. DSL – the frequencies above voice are used, up to tens of megahertz depending on the technology (30 MHz is used by VDSL2)

It is noted that Telecom says it intends to use local AC powering for its FTTN node cabinets, meaning they will need to contain standby batteries, and that they are uncertain if CPE off the NGN will use local AC power or line powering, again meaning the CPE will need to contain standby batteries if line powering is not used. The use of internal batteries in CPE usually results in a lower reliability than line powering; this is important with emergency services. It is noted that optical fibre runs are often overlaid with copper (Siamese cable) to provide line powering.

Figure 3 Topology of Different UCLL and SLU Options



Conventional	<p>Active Equipment</p> <p>200 pairs+</p> <p>Feeder Cable</p> <p>50 pairs+</p> <p>Distribution Cable</p> <p>2 pair</p> <p>Drop Cable</p>
Cabinet Node FTTH	<p>Optical Fibre</p> <p>Active Equipment</p> <p>2 pair</p>
Curb Node FTTC	<p>Optical Fibre</p> <p>Active Equipment</p> <p>2 pair</p>
FTTH	<p>Optical Fibre</p>

A range of architectural options offer different copper aggregation points, circuit lengths and performance.

Table 1 – Technologies that move the aggregation point

Abbreviation	Description
Exchange node UCLL	Copper runs from the 'exchange node' to the customer, usually via passive cross connect cabinet(s) and pillar(s). This is existing Telecom practice in about 90% of cases.
FTTN	<i>Fibre To The Node</i> – fibre from exchange to cabinet node(s), copper to end user via pillar(s). This is existing Telecom practice in about 10% of cases.
FTTC	<i>Fibre To The Curb</i> – fibre from exchange node to curb, copper node to end user.
FTTH/FTTP	<i>Fibre To The Home/ Fibre To The Premises</i> – fibre runs all the way to the customers home (or premises).

These four options (and other permutations that may arise) make it clear that there are many steps in moving the aggregation point progressively nearer to the customer. In the absence of any regulatory correction, the effect is to make the commercial environment progressively less and less viable for the new entrant (Table 2 below). Note: Table 2 has used hypothetical figures to illustrate the economic trends, setting the exchange to customer distance at a nominal 5km.

If providing the services from the exchange node is the starting point, then as the backhaul becomes longer the cost of this is likely to have to be met by the new entrant. As the node size becomes smaller, the possibility of there being space for the new entrant reduces, and the possibility of them having to provide their own auxiliary (parasitic) cabinet becomes greater. With smaller cabinets, it is more likely they will be 'line fed' with power using copper overlay pairs.

A dramatic effect of moving to smaller and smaller cabinets is that the addressable market is reduced for the new entrant (see Table 2).

The overall trend of moving the aggregation point closer to the customer tends to be one of rising per customer costs and lowering market opportunity, placing the new entrant in a more and more untenable position.

Further, because there are potentially multiple steps (4 shown but many more permutations are possible), the potential for stranding of the new entrants investment at each stage is compounded. Stranding of assets or investment occurs when the investment is made by the new entrant at a node assuming a certain cost structure and availability of copper, and then the incumbent moves the aggregation point and removes some or all of the copper (fibre substitution). The new entrant is left with an uneconomic deployment from which he cannot withdraw, and paying a high rent (for the full footprint) to Telecom.

There is a strong compulsion for the incumbent to move the aggregation point progressively, leaving the new entrant in a progressively worse position. The incumbent can cite well intended technical or commercial reasons for doing this, but the anti-competitive effect is evident.

This example also defeats the gains of operational separation, as it does not provide the access seeker with sufficient economic protection.

Table 2 Impact of moving the aggregation point

Note - Figures used are hypothetical till further analysis done for NZ conditions.

	Backhaul Length	Copper Length	Addressable Customers	New Entrant Customers 10% market share	Economic Return for New Entrant
Exchange ULL	0	5km	5,000	500	Best, but can be stranded
FTTN Cabinetised	2km	3km	500-1,000	50-100	Worse, and potentially stranded
FTTC Cabinetised	4.5km	500m	50-100	5-10	You go broke
FTTH	5km	0	1	1	Don't even think about it

5. Analysis of the Issues

For new entrants to be successful in a rapidly changing environment there needs to be regulatory certainty for them to invest in the evolving market. Certainty in this sphere involves also technical certainty and it is here that the cabinet investment strategy from Telecom, as proposed, has the most anticompetitive effect.

By moving rapidly to deploy active cabinets in an FTTN environment Telecom places its UCLL competitors in an untenable position. Telecom is also well positioned to move forward to FTTC or change the rules in other ways, compounding the uncertainty for new entrants.

Telecom has indicated the type of cabinets it will use in the immediate future, but it is unknown at the time of writing if the number to be deployed (3,500 to 3,700) or the dimensions will form solid commitments with specific time guarantees⁶.

Telecommunications line plant assets have for many decades been constructed with the expectation that the economic lifetime will be sufficient to offer a reasonable depreciation rate and thus a cost benefit that can be passed on to the benefit of end users with competitive cost related pricing.

Here the underlying voice service remains intact with the incumbent operator and provides a solid ongoing revenue base. But where there may initially be competition at the overlay service level (UCLL) unless there is equivalence of the type described in Section 6.6 then that overlay service will likely revert due to economics to monopoly supply.

Unbalancing the technical certainty between incumbent and new entrant by allowing the incumbent to change the technology rules at will means that the new entrant not only has to deal with the market power issues of interconnect but also an increased risk factor from technology gaming and that risk translates directly into higher cost of capital and thus a less effective competitor.

⁶ "Telecom's Cabinetisation Plans Dec 2007" – briefing paper Dec 2007. Single bay cabinets described as 1,660w x1, 550h x 600d, with 40% of equipment space available to new UCLL entrants. Further details are emerging in "Telecom Separation Undertakings – 19 Dec 2007"

The options left for the new entrant are to seek solutions that reflect the service delivered and not how it is delivered, and certainty on investment from technology gaming by the incumbent. The solution is the simple provision of a clause ensuring equivalence of supply for all copper centres that are “upgraded” as part of the national upgrade or cabinetisation (see Section 6.6).

5.1 Current Issues

A range of information relevant to UCLL and cabinetisation has been released recently by Telecom and the government. A public debate and intra-industry debate has followed that seems to be typical of highly regulated markets.

1. Telecom is planning to commission cabinets at approaching 10 times the rate it committed to roll out UCLL enabled exchanges (15 per quarter). At the end of the 15 month implementation period specified in the UCLL STD, Telecom must have unbundled up to 75 exchanges, provided Access Seekers have placed firm orders.⁷

Comment – Rolling out UCLL enabled exchanges is bad for Telecom; rolling out cabinets is good for Telecom as it gives the chance to rapidly dominate the broadband market and lower its copper support costs. The discrepancy (approx 10 times rollout rate) is just too great and should be reconciled by government.

2. The available market for exchange based UCLL has been nearly halved by Telecom removing copper circuits (MPF's) from its exchanges as it cabinetises the circuits.

Comment – The ability to retain circuits should be at the discretion of new entrants (see Section 6.4), or other compensation should be provided.

3. Telecom has suddenly declared (and agreed with government as part of the operational separation agreement) a rapid rollout of cabinetisation. This appears superficially good for NZ as it promises more broadband more quickly without government investment.

Comment – On one side it can be argued that Telecom is simply responding to the wishes of the government to deploy broadband quickly. On the other side it can be argued that Telecom is outspending its competitors and entrenching its monopoly. This is a difficult conundrum and needs to be justified by government when it is viewed against the aims of the Telecommunications Act.

4. Telecom is using very conservative design and performance figures, insisting that this is simply good engineering practice. For instance, Telecom is arguing that only 50% of existing lines will allow greater than 10Mbps, whereas iiNet experience in Sydney indicates 75%.⁸ Further, Telecom argues that interference caused by dual feeding may prevent it being able to deliver its DSL speed commitments to government.

Comment – Such engineering arguments are extremely hard if not impossible to resolve, especially as the outcomes are dependent on the particular characteristics of Telecom's copper plant, and that varies from place to place. They also reflect the different mindsets of the parties – a prudent incumbent won't do anything it is not sure will work

⁷ Commerce Commission UCLL STD Decision 609 – 7 Nov 2007

⁸ Cabinetisation Analysis ihug Vodafone 3 December 2007

and a new entrant will often try anything and see if it works. This often reflects the different pressures on the parties to innovate.

In summary of the 4 points above, some of the arguments that have arisen recently are clear cut and should be resolved quickly. Many of arguments are difficult or impossible to resolve. Such arguing is normal in highly regulated environments, and is a sign of gaming, lobbying and jockeying for position by the parties. The scale of such infighting may also reflect a poorly considered regulatory environment or even capture. If more pro-end user and decisive regulations were in place, we would expect the level of debate to be less, and a better competitive environment to prevail.

5. We believe that Telecom may already be positioning for the introduction of FTTC services beyond cabinetisation (FTTN). Telecom has extensive ducting on the distribution side of its copper access network (ie between cabinets and its customers), into which it could pull optical fibre at low cost. FTTC nodes could then be installed, these are typically small in-ground pits in which a ONU (optical network unit) is installed serving 8-12 copper circuits. The ONU is typically withdrawn from the pit for servicing.

Comment - It is noted that further work is needed to establish the extent and implications of the current configuration of the Telecom access network. Coupled with the established practice of installing ducting in the distribution network, Telecom seems positioned to rapidly move to FTTC, potentially rendering new entrant exchange node and FTTN (SLU) deployments redundant or stranded.

6. Conclusions and Recommendations

The following conclusions are drawn, and where appropriate, *recommendations are shown in italics.*

6.1 Telecom is still in a very strong position

Our assessment is that Telecom will still in a very strong position, despite the government having a very strong political mandate to regulate its monopoly. Key reasons for this are the broadband deal the government seems to have done with Telecom, the reluctance of government to spend its own money, a potential change of government and/or lead minister in the next 12 months, and the technical and commercial complexity of the business providing infinite opportunities for incumbent gaming.

Under its broadband deal with the government Telecom will spend \$1.4 billion on its NGN and broadband access over the next 5 years. This could potentially see it outspend its competitors (especially in the short term before the regulatory environment is fully developed), strand new entrant existing assets and plans, and then effectively repurchase its access monopoly at a bargain price. While the rapid rollout of broadband is highly attractive in the short term, unless under a competitive model it is potentially against the best long term benefit of end users (LTBE) as it may significantly reduce competition at the end user service level.

International experience is that even without the factors above, due to the significant market power (SMP) the dominance of the upstream incumbent monopoly can take years to erode, and the market share of UCLL competitors can grow slowly or stall.

The regulatory reforms in NZ are using internationally accepted models and should deliver benefits for end users, but they are not guaranteed and there is a risk the reforms could easily stall or fail.

Telecom appears to be executing technical gaming with great skill, is appearing superficially to be a good corporate citizen, and rapidly satisfying the short term desires of government and many defocused user groups of apparent progress to a high speed broadband service. However, faster delivery of DSL speed broadband by Telecom in the short term may come with increased dominance in the access market and poorer coverage, quality and higher broadband prices in the long term from reduced competitive pressure and service innovation.

Recent NZ history with Telecom is a reasonable guide and the reforms of 2001 and 2006 arose from NZ falling behind other nations with no sustainable competitive model arising after over 10 years of deregulation. Accepting a broadband Telecom Trojan horse only a year or so from significant reforms required due to Telecom underperformance would seem unwise unless it was accompanied with clear pro competitive undertakings to ensure competition is available at each step of moving the aggregation points closer to the end user. Given the need to meet shareholder demands it would be unusual to expect Telecom to encourage a fair competitive model that facilitates competition on Capex or that it may significantly modify its behaviour of the last decade in seeking to capture the benefits of innovation.

6.2 Regulatory governance – government must define and demonstrate LTBE

The long term benefits for end users (LTBE) must be defined and demonstrated by keeping benchmarks that show quantitatively the success or failure of the telecommunications environment, both generally and specifically for ULL. It is incumbent on the government to benchmark progress and demonstrate that it has truly achieved long term benefits for end users and a level playing field for new entrants.⁹ Targets need to be set.

Simplistic measures of price or penetration against OECD figures are being used now, and they will continue to be useful, but a range of other measures are required such as:

- *market share achieved by new entrants (a minuscule market share could mean regulatory failure)*
- *viability of new entrants (a small number of 'strong dwarfs' will not be a good outcome)*
- *level of capital investment, especially 'productive capital investment' (provides new services), versus 'tactical capital investment' (done simply to block competitors)*
- *the level of unnecessary duplication of facilities (if this is too high it indicates an economically inefficient regulatory environment; and stranding of (access seeker) assets)*

⁹ This would be an expansion of the work by the Commerce Commission under Section 9A of the Telecommunications Amendment Act (No 2) 2006

- *indications that a reasonable proportion of the benefits are flowing to end users*
- *identification of areas where Telecom still has market dominance*

It is accepted that there is a resource issue for the Commerce Commission, with so much work being done currently to develop the telecommunications environment.

The above work would go hand in hand with the monitoring of accounting separation¹⁰.

6.3 Regulation of local loop unbundling must proceed at all speed, but with a more holistic approach

NZ is committed to the path of UCLL and SLU as well as a high level of regulatory intervention, and this must proceed at all reasonable speed, and must be made to work for the sake of NZ's end users. Delays in the development of the regulatory environment will delay the competitive pressure on Telecom for the provision of broadband services.

There has been a tendency to fragment issues (noting that some of this fragmentation is inevitable) for example:

- treating exchange node UCLL separately from FTTN (SLU), and potentially treating FTTC as a separate issue again
- splitting of Telecom's designated UCLL backhaul into two types¹¹ (with the exclusion of duct sharing),
- de-averaging of urban and non-urban pricing.
- the involvement of multiple government entities (MED, the Commerce Commission, DPMC etc)

The regulatory environment is highly complex and consists of many components, including operational separation, accounting separation, a range of complicated STD's, TSO's, demand and supply side initiatives, direct government involvement (KAREN, GSN, Kordia etc).

A more holistic approach to regulation needed to ensure the big picture is not lost in the extensive detail. Many in the industry fear this has already happened. The arrival of Telecoms cabinetisation plans when the process was well underway has greatly compounded industry concerns.

It is now evident that focusing on getting exchange based UCLL in place has made good progress, but the broadband deal between Telecom and government shows the rules can change more quickly than anticipated.

The other elements that now need even more intensive focus include:

- *Access seeker entry to Telecom cabinets (FTTN, FTTC etc).*
- *Sub loop unbundling (SLU).* The first stages towards preparing the SLU STD are currently underway with the Commerce Commission

¹⁰ Telecommunications Amendment Act (No 2) 2006 Part 2B Section 69ZB

¹¹ Telecommunications Amendment Act (No 2) 2006 Schedule 1

- *Line spectrum sharing (LSS)*. Allows different parties or services to share the different copper frequencies (see Section 4) using band-pass filters. LSS would potentially give new entrants access to new commercial opportunities
- *Dual feeding of UCLL lines*. The customer is fed from the exchange and/or the cabinet and two parties can share the line (usually requires LSS above). Telecom is dual feeding lines, so that they can provide broadband from a DSLAM in the cabinet & POTS from the legacy NEAX PSTN switch in the exchange. Dual feeding was not pushed initially as new entrants preferred full unbundling, but it now appears more desirable as other options appear more limited. Eg Telecom offers broadband from the cabinet while new entrant offers POTS from the exchange. Dual feeding arguably raises additional interference issues if the DSLAM is located in the exchange.
- *Co-location rental based on the opportunity, and (at least partially) immunised against stranding* – eg there could be a rebate on co-location costs pro-rated to the portion of lines in the exchange that are being cabinetised.

6.4 Retention of copper loops from exchanges

The plans Telecom has declared, to eliminate feeder copper loops (MPF's) that will be cabinetised (replaced by optical fibre) must be immediately investigated with a view to allowing new entrants to retain for their own use the exchange copper loops that might otherwise be eliminated. This copper is a national resource that should not be lost, even if it is currently the property of Telecom. New entrants will clearly need to pay for this facility.

If retention of the copper is not an option, some other form of compensation should be available, in line with the practices in other countries.

Giving new entrant's access to the MPF's that Telecom will otherwise remove, will give Telecom a powerful incentive to focus on cabinetising longer loops elsewhere, and counter claims it is intentionally cabinetising shorter loops for tactical reasons.

6.5 Anti-competitive outcomes

There has already been a lot of recent debate between Telecom and the prospective UCLL new entrants that Telecom is acting anti-competitively. Arguments cited by the new entrants include:

- Telecom is focusing on cabinetising short loops, in a way that reduces the market opportunity for new entrants
- Telecom is rolling out cabinets at about 10 times the speed it is rolling out UCLL enabled exchanges
- Telecom is using interference management arguments to block configurations that are good for new entrants.

Telecom has responses to these arguments, based on a huge range of interrelated engineering, economic and logistical arguments. Without trying to resolve these particular arguments (each argument could consume many pages), it is noted that the arguments becomes complex, and very difficult to resolve.

*The key test must be whether Telecom is acting with **anti-competitive outcomes**. Anti-competitive intent (or purpose) should not be the test, the outcome is usually more self evident and implies intent or purpose. An independent arbiter is clearly required; this is ultimately the Commerce Commission (who can change the regulatory rules if required), assuming the TCF cannot resolve the issue first.*

6.6 Equivalence of supply for all copper centres

It is apparent that the regulatory environment has already degenerated into a set of complex technical and commercial debates that seem likely to go on interminably. It seems that NZ has only just scratched the surface of these issues, and that as we head down the path of SLU the disagreements will multiply and delay the competitors by removing certainty.

A basic economic analysis of SLU and cabinetisation (Section 4) shows that this path is likely to deliver a worse outcome than exchange based UCLL, which is itself already under considerable pressure for change.

Further, Telecom has the ability to change the technology rules at will, and requirements that it state its intentions some years ahead only offer limited comfort to new entrants. Technology gaming is a powerful weapon that is difficult to counter. It is too difficult to develop long term technology strategies and use them as the basis for regulation, as the technology changes and has too many ways to be adapted to counter regulatory controls.

There needs to be greater regulatory and technology certainty for those who invest in the evolving market.

The following recommendation is designed to short circuit the current process, provide investment certainty and bring the focus on to delivering services rather than how they are delivered.

Equivalence of Aggregation Point - *It is recommended that a regulatory provision be sought for the supply of services from all copper centres (copper aggregation points) regardless of how they are provided or upgraded by Telecom.*

This implies a solution that covers the full range of architectural options including exchange based UCLL, FTTN, FTTC etc. The same pricing would be set at any of these copper centres. The problem is thus simplified and made more technology independent.¹²

This will limit the possibilities for technology gaming and help ensure a more competitive environment for the delivery of long term benefits for end users (LTBE).

Note:

If this recommendation is not followed, then priority must be given to making exchange based UCLL work (over SLU)

¹² The current telecommunications legislation supports this (Telecommunication Amendment Act (No 2) 2006), which defines UCLL and SLU as:

“A service (and its associated functions, including the associated functions of Telecom's operational support systems) that enables access to, and interconnection with, Telecom's copper local loop network (including any relevant line in the exchange or distribution cabinet)”

Exchange based UCLL is hard, but cabinetisation and SLU make the game even harder and more risky for new entrants. In fact, the business case for SLU and sharing of cabinets may be negative for new entrants, and the timeframe unacceptably lengthy.

Without the 'equivalence of aggregation point' provision detailed above, the regulatory process must attempt to make both exchange based and cabinet based UCLL (SLU) viable as quickly as possible, but exchange based UCLL must be the priority.

6.7 Government Investment

NZ has not to date pledged significant government funding; instead it has expected private enterprise to fund most of the infrastructure development. Recently the government has indicated its willingness to engage with industry, and indicated more strongly that it is prepared to invest. The government focus seems to be on infrastructure investment, at the top of the ladder of investment¹³. However, the government is clearly aware that the rapid rollout of Telecom's cabinet network may not be compatible with "government's long term vision...for fibre-to-the-home."

We must ask whether future competitive FTTH infrastructure is achievable, given the level of investment (potentially from both government and the private sector) to achieve acceptable FTTH penetration, and the impetus achieved by Telecom with its aggressive FTTN and DSL rollout. This may mean NZ will never have significant FTTH outside the CBD's of the main cities.

Past experience of infrastructure investment (on roads, railways, ports etc) and current FTTH/FTTP initiatives in other countries, indicates that governments must invest heavily if telecommunications infrastructure development is to take place in the form desired.

Government must urgently begin policy development to set objectives for government and industry investment, demonstrate how this will support LTBE, and what penetration of FTTH can be achieved for what investment.

¹³ Ministers letter to the industry, and 'Industry Guidelines – Facilitating Increased Investment in Broadband Infrastructure', 21 December 2007

7. Appendix 1 - InternetNZ

The role of Internet NZ is specified as follows:

InternetNZ is a non-profit organisation dedicated to protecting and promoting the Internet in New Zealand and fostering a coordinated, cooperative approach to its ongoing development.

Our objective is “high performance and unfettered access for all” so the Internet continues to operate in an open environment that cannot be captured by any entity or individual for their own ends.

Through consultation with its membership of Internet service providers (ISPs), web designers, academics, public information groups and Internet users, InternetNZ provides comment and advice to politicians, industry influencers and the media.

8. Appendix 2 - References

The following references provide background reading on the UCLL issues in NZ

Telecom Site – www.ucll.co.nz/

Commerce Commission Site –
<http://www.comcom.govt.nz/IndustryRegulation/Telecommunications/Overview.aspx>

Telecommunications legislation can be viewed at www.legislation.govt.nz/

Operational Separation

www.med.govt.nz/templates/ContentTopicSummary_____26310.aspx

9. Appendix 3 - Glossary

Term	Definition
Access provider	In the context of the STD's, Telecom NZ
Access seeker	The party seeking access to Telecoms infrastructure
CBD	Central Business District
CPE	Customer premises equipment
de-averaged prices	Charging a different price for the same service in an urban area as opposed to a rural area.
DSL	Digital Subscriber Line
DSLAM	Digital Subscriber Line Access Multiplexer
EOI	Equivalence of Inputs - Telecom must provide the access seeker and Telecom itself with the same service; on the same timescales and on the same terms and conditions(including price and service levels)
DPMC	Department of the Prime Minister and Cabinet
ETP	External Test Point
FTTN	Fiber to the Node
FTTC	Fiber to the Curb
FTTH (or FTTP)	Fiber to the Home (or Fiber to the Premises)
GSN	Government Shared Network
KAREN	Kiwi Advanced Research and Education Network
LSS	Line Spectrum Sharing
LTBE	"...promote competition in telecommunications markets for the Long-Term Benefit of End-users..." ¹⁴
MDF	Main Distribution Frame
MED	Ministry of Economic Development
MPF	Metallic Path Facility
MSAN	Multiservice Access Node
NEAX 61	NEC telephone exchange used by Telecom (provides POTS service)
NGN	Next Generation Network
OECD	Organisation for Economic Co-operation and Development
ONU	Optical Network Unit
POTS	Plain old telephone service – the standard telephone
SLU	Sub loop unbundling – effectively UCLL from cabinets.
STD	Standard Terms Determination. The determination published by the Commerce Commission specifying service terms (eg UCLL and co-location).
TCF	Telecommunications Carriers Forum
TSLRIC	Total Service Long Run Incremental Cost - is a forward-looking cost based methodology.
UCLL	Unbundled copper local loop (refer ULL)
ULL	Unbundled local loop (refer UCLL)
WACC	'Weighted average cost of capital' is used in finance to measure a firm's cost of capital

¹⁴ These words are from s18 of the Telecommunications Act 2001