TELSTRA CORPORATION LIMITED

Trade Practices Act 1974 – Section 152AT

Application for exemption from standard Access Obligations in respect of the SingTel Optus HFC Network

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This is Schedule A to Telstra's exemption application

Contents

Executive Summary

Infrastructure-based competition delivers the most efficient outcomes – diversity of choice, innovation, quality of services and competitive prices to consumers. Where infrastructure-based competition exists, the shackles of regulatory intervention should be removed.

Regulated access is an imperfect proxy for the efficient outcomes delivered by market forces, especially in areas where efficient investment in competitive infrastructure can and does occur. Unnecessary regulation results in unnecessary costs, market distortions and inefficient outcomes. Importantly, it discourages innovation and investment in competitors' own infrastructure.

The negative impacts of unnecessary regulation are heightened in areas where competitive end-to-end infrastructure already exists but where access regulation is nonetheless permitted to subsist side by side. This type of superfluous regulatory intervention is distorting efficient investments and choices. This is to the detriment of consumers

Unfortunately, this perverse situation is occurring in Australia.

This exemption seeks to remedy this problem. Specifically, Telstra seeks to redress the incongruity of SingTel Optus continuing to utilise regulated access to Telstra's network to supply services customers who could be served using their own, end-to-end competitive network.

The SingTel Optus network is a significant, competitive network

SingTel Optus has deployed a hybrid fibre coax (HFC) network passing over 2.2 million premises in the metropolitan areas of Australia's three largest cities. This network is of comparable scale to overseas cable networks: were it in the US, the largest cable market in the world, it would be the 11th largest network.

When rolled out in the mid 1990s, with Telstra and SingTel Optus racing each other cabling up streets in Sydney, Melbourne and Brisbane, the SingTel Optus HFC network carried the promise of genuine head-to-head infrastructure-based competition. This kind of competition is universally recognised as the ultimate goal for this industry because it achieves the best outcomes for consumers in terms of price, service quality and innovation.

However, that competition did not emerge and the SingTel Optus HFC network is now hidden in the basement of Australian telecommunications. It is the invisible network. Access regulation is applied uniformly inside and outside the competing cable footprint, as if the SingTel Optus HFC network did not exist.

Excuses offered by SingTel Optus imply its HFC network is somehow technologically defective or competitively hamstrung. However, where SingTel Optus chooses to compete using its HFC network, it is doing as well as or better than comparable cable networks:

- the SingTel Optus HFC network has a 37% penetration rate of its 1.4 million serviceable homes compared to the 35% penetration rate of Virgin Media's comparable cable network in the UK, suggesting that the smaller scale of the SingTel Optus network, while significant in international terms, is no barrier to success;

- SingTel Optus has nearly a fifth more cable modem customers than Telstra although it has only around half the number of homes its treats as serviceable, which suggests that the substantial overbuild between the two HFC networks is no barrier to success;

- SingTel Optus has achieved a broadband penetration rate of 28% compared to an average of 27% for US cable operators, suggesting that the lack of a ubiquitous cable TV base is no barrier to success; and

- SingTel Optus has achieved a bundling rate on its HFC network of 77% compared to only 52% for Starhub, Singapore's only cable operator, suggesting that the presence of competition from Telstra PSTN services is not a barrier to success.

The constraints on SingTel Optus' HFC network appear to be largely of its own making.

SingTel Optus treats as unserviceable 36% of the homes passed by its HFC network compared to the 7% of homes passed which Telstra treats as unserviceable by its HFC network and the 6% of homes passed which Virgin Media treats as unserviceable. SingTel Optus, in effect, deals its HFC network out of more than 750,000 homes.

At least some of the unserviced homes appear to be multi-dwelling units (MDUs), which SingTel Optus claims are too difficult to connect; that there are space constraints and technical complexities. In the US, the FCC rejected similar arguments mounted by cable operators opposing withdrawal (forbearance) of Unbundled Local Loop Service (ULLS), saying that these were "hurdles that must be crossed by most, if not all, facilities-based providers of telecommunications service." In Australia, Telstra and Austar have comfortably met these challenges in wiring up large numbers of MDUs. Overseas, the success of cable overbuilders targeting MDUs shows that being "third-in" is no barrier to success.

However, SingTel Optus continues to utilise regulated access to Telstra's network

In NSW, Victoria and Queensland, almost 80% of the ESAs through which SingTel Optus has deployed its HFC network have SingTel Optus DSLAMs and only 35% of the ESAs in which SingTel Optus has deployed DSLAMs do not have HFC network.

While SingTel Optus had some early success with cable telephony, its subscriber numbers have slowly sunk from a high of 500,000 to around 460,000. Yet, in its latest financial report, SingTel Optus reports that ULLS-based telephony grew by 355% year-on-year. Its HFC broadband growth was 23% in the last year, but even this was outstripped by ULLS broadband growth of 675%. SingTel Optus added 66,000 ULLS broadband lines and 70,000 ULLS telephony services alone in the last quarter. During the same quarter, SingTel Optus added only 6,000 new connections to its HFC network.

Based on Virgin Media's performance, though, the SingTel Optus HFC subscriber base could be expected to be nearly 50% higher for telephony services and nearly 100% higher for on-net broadband if SingTel Optus was not using regulated access services and instead achieving similar penetrations of homes passed within its cabled areas as Virgin Media.

This incongruity is the result of perverse regulatory settings

As Professor Martin Cave says, "[this behaviour]... is highly unusual. I am not aware of any historical precedent of a network owner choosing on an apparently permanent basis to serve customers in its own area on this scale using the incumbent's unbundled loops".

This cannot have been an intended outcome of the Commission's access policies. The Commission has been guided by the "stepping stone" or "ladder of investment" theory which is intended to provide the opportunity and incentive for competitors to progressively deploy more of their own infrastructure where that is efficient.

SingTel Optus had already completed deployment of its HFC network before the Commission declared ULLS – it was already at the top of the ladder of investment in its cabled areas. Yet, SingTel Optus has taken the opportunity presented by the declaration of ULLS on a

nationwide basis to climb *down* the ladder of investment and compete via access means in areas where it has its own network.

Telstra believes that a significant contributing factor to this climb down the ladder by SingTel Optus has been the availability of ULLS at prices which are significantly below both Telstra's actual costs and SingTel Optus' own marginal costs of self-provisioning. These prices have been ratcheted down the by the ACCC by around 60% in the last 5 years at a time when key inputs into those costs such as the prices of copper, labour and fuel have been rising. ULLS prices are not only low having regard to Australia's population density, but they have fallen faster than equivalent prices in the US and EU over the last 7 years.

That being said, fixing the price error would not be sufficient to remove the problem. Even if access prices are adjusted to properly reflect costs, SingTel Optus would still have both the *incentive* and the *ability* to selectively fall back on Telstra wholesale services at regulated prices. Put simply, an operator with their own network such as SingTel Optus should not be in a position where they can also have the option to "cherry pick" between self-supply on their own network and regulated access to Telstra's network. They should not need to nor be entitled to acquire a regulated service.

Professor Cave, the founding theorist behind the ladder of investment, believes – as does Telstra – that this "unique outcome" of the ladder's application in Australia thwarts its objective of infrastructure-based competition:

> *…the current regulatory regime has the effect of curtailing the scope of competition in current generation broadband, and is likely to diminish the scope for the duplication of next generation access networks in areas with existing duplicative structures.*

The best means of ensuring that SingTel Optus does not continue to slip down the ladder of investment is to remove its option to do so. That is, the rungs beneath it should be removed in respect of customer premises which can be reached from the cable network by a standard subscriber drop.

Accordingly, Telstra is now applying to the Commission seeking exemption from access regulation with respect to SingTel Optus in those areas where SingTel Optus has its own HFC access network. Overseas experience confirms the obvious of withdrawing access: this will light the competitive flame and incent investment in subscriber connections to customers passed by its cable. In the US, when the FCC granted forbearance from access regulation, the competing cable company aggressively wired up premises not yet connected to its cable network. In Hong Kong, the removal of ULL led to an increase of nearly 50% in the number of buildings connected by alternative infrastructure.

What SingTel will need to do to make up for the loss of ULLS and other kinds of regulated access will be modest. The exemption takes the SingTel Optus HFC network as it currently stands. The only additional infrastructure SingTel Optus will have to build, where it has not already done so, is individual subscriber drops to connect premises which are not more than 75 metres from the nearest point on its existing cable network. This is the standard connection policy for the FOXTEL network: Telstra is asking SingTel Optus to do no more than Telstra itself does.

SingTel Optus may need (or more likely, choose) to upgrade its HFC network to support higher grade services suitable for the limited number of business customers within its network footprint, which are likely to be mostly SMEs. Many overseas cable operators have already made these upgrades and are winning significant market share amongst business customers. These upgrades will also allow SingTel Optus to provide wholesale services if it chooses to do so. Telstra's US cable expert estimates that the total cost would be no more than a few million dollars.

Importance of infrastructure based competition in an NGN world

This exemption will have long term benefits for the development of competition in an NGN world. Professor Cave observes that "[i]n my opinion, [the transition to NGNs] places greater emphasis in the future on the importance of promoting competition between end-to-end networks, as against the access-based model" because traditional forms of unbundling, such as ULLS, will not be viable given the necessary architecture of the NGN.

Overseas, it is recognised that the cable networks provide the best opportunity for NGN competition. Yet in Australia, regulated access allows SingTel Optus to let its HFC network technologically atrophy.

While overseas cable operators are engaged in a "race for speed" with incumbent telcos offering services up to 100Mbps, SingTel Optus' services have languished at significantly lower download speeds. SingTel Optus continues to use an outdated 1990s cable telephony solution and its telephony subscriber numbers have been flat-lining. Overseas cable operators have deployed voice over broadband (VoB) services and are racing ahead with annual growth in subscriber numbers of 50% or more.

In short, this exemption application is about what Professor Cave calls "tough love": providing the incentive to compete will deliver better outcomes than continually offering the soft option of easy access. As the Dutch regulator OPTA noted in relation to the ladder, "there is a danger that, as a result of regulatory error, the industry becomes stuck in a state of service based competition." Removing the rungs below Optus' investment level will unleash the competitive process.

Because access to regulated services by SingTel Optus is unnecessary in those areas where it has its own HFC network, continuing to allow regulated access to ULLS and other declared services will only result in unnecessary costs and inefficiencies, distort the competitive process, and continue to discourage the efficient investment in and use of alternative infrastructure.

On the other hand, granting this exemption application will result in more investment, better incentives for Telstra to respond, more vigorous competition across the whole value chain, and a better price, quality and choice proposition for end users. As Professor Cave says, "it is not hard to envisage circumstances where this would be in the long term interests of end users."

A Introduction

1 This submission sets out Telstra's case for an exemption from having to supply regulated access services to SingTel Optus within the footprint of its existing HFC network.

2 The exemption application would apply to all existing declared services. LCS, WLR and PSTN OA are currently the subject of separate exemption applications by Telstra. There will be a significant overlap between the exemptions areas under those applications and the exemption area under this application in respect of LCS and WLR because SingTel Optus has deployed DSLAMs in so many ESAs in which it also has HFC network. However, there may be some areas in which SingTel Optus has HFC network which fall outside the ESAs comprising the requested exemption area for the LCS and WLR exemptions. As Telstra does not have complete information about the footprint of the SingTel Optus HFC network, Telstra has included LCS and WLR within this exemption to the extent not covered by any other exemption granted by the ACCC.

3 The balance of this submission is structured as follows:

(a) In section B, we discuss the universally accepted view that competition between end to end facilities based networks represents the best form of competition for end users. We also discuss how the theory of the ladder of investment has been used to justify access regulation to incrementally reach that goal and the evidence which suggests that network operators in Australia seem to be moving in the wrong direction down the ladder;

(b) In Section C, we examine the extent of deployment of the SingTel Optus HFC network and, compared to overseas cable operators, the poor take-up of services on that network and SingTel Optus' poor record of investment and innovation. We also compare SingTel Optus' utilisation of access services within its network footprint with the approach of overseas cable operators not to use access services within their cable footprints;

(c) In Section D, we discuss why the litany of excuses put forward by and on behalf of SingTel Optus for the performance of its HFC network are not credible. We show how the SingTel Optus HFC network is comparable in scale, reach and technology opportunity to cable networks in other countries. We review how the evidence of comparatively high take-up rates of HFC broadband services amongst the 64% of homes SingTel Optus treats as serviceable can only mean that its HFC network is 'fit for purpose' as a competing network. Finally, we consider possible inter-relationships between the two stand-out features of SingTel Optus' behaviour compared to cable operators internationally – its uniquely low percentage of serviceable homes and its uniquely high level of usage of access services in its cable footprint;

(d) In Section E, we address the economic issues. We discuss why the current access regime might be incenting SingTel Optus to use regulated access within its HFC footprint to avoid connecting higher cost premises and delay investment in network upgrades. We discuss the adverse effects of SingTel Optus' underutilisation of and underinvestment in its HFC network and the incompatibility of SingTel Optus' behaviour with the ladder of investment theory. We also review why withdrawal of regulated access for SingTel Optus represents the best way of correcting these distortions;

(e) In section F, we outline how the proposed exemption would work, providing some case examples. We also discuss how overseas regulators are withdrawing regulated access (removing the ladder of investment) in areas where alternative end to end networks have been deployed. We show that while our proposed approach is consistent with this trend, we have taken a more conservative or incremental approach in limiting the exemption to SingTel Optus;

(f) In section G, we show how our proposed exemption is consistent with the LTIE test. We discuss how the LTIE needs to be applied when competing end to end networks are already in place (i.e. once the top of the ladder has been reached), again drawing on the approach of overseas regulators considering similar head to head competition between overlay customer access networks; and

(g) In section H we discuss the information which Telstra proposes the Commission should require SingTel Optus and Telstra to provide for the purposes of considering this exemption application.

(h) **Attachment 1** sets out a straight forward financial model of the costs and payback period for SingTel Optus connecting up single dwelling units (**SDUs**) and multiple dwelling units (**MDUs**); and

(i) **Attachment 2** contains a table of ESAs in which HFC network has been deployed.

(j) **Annex 1** sets outs Professor Cave's statement.

(k) **Annex 2** is a technical report by M.G. Harris.

B Infrastructure competition is the first-best competition

4 In this section, Telstra outlines:

- why infrastructure-based competition should be the goal;
- how the ladder of investment is meant to be used by entrants to climb towards that goal; and
- why the full potential of infrastructure–based competition is not being realised in Australia because SingTel Optus is sliding down the ladder by using regulated access in its cabled areas.

B.2 Infrastructure-based competition delivers better outcomes than access-based competition

5 As Professor Cave points out, "almost everyone believes that competition is the best regulator".[1] And the form of competition that almost everyone believes will produce the best outcomes is between end-to-end facilities-based providers:

(a) infrastructure-based competitors have made significant and largely sunk investments in their own network facilities, enabling them to provide services at relatively low marginal cost. As owners, they control virtually all aspects of their networks, including their technology migration path – hence they compete over the whole value chain and can closely align their network and services, product innovation and network upgrades with their marketing strategies and customer needs.

(b) In contrast, access-based competition enables entrants to compete whilst making smaller investments, or even none at all. This enables competition to occur in downstream retail markets, even if there are no competing investments made in upstream networks. Access-based competition can range from pure resale – where entrants invest in no network facilities whatsoever – to quasi infrastructure-based competition where access seekers invest in facilities of their own yet still rely on access services.

6 Around the world, regulators, economists and industry participants all recognise that, where it can be feasibly achieved, infrastructure-based competition is clearly preferable to access-based competition, and that regulatory settings should be directed towards attaining this goal:

(a) The peak group of EU national regulatory authorities, the European Regulators Group (ERG), has stated that:[2]

> *Competition over competing infrastructure has many advantages. The pressure to minimise costs is exerted over the whole value chain. This will induce greater scope for innovation, process innovation, etc which creates a downward dynamic for costs. Consumers also benefit from more diversified offerings, which correspond more closely to their*

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1 Prof. Cave, *Encouraging infrastructure competition via the ladder of investment,* 2006 Telecommunications Policy 30: 223-237.

2 European Regulators Group, *ERG common position on the approach to appropriate remedies in the new regulatory framework*, 23 April 2004, page 67.

individual needs. There is general agreement that a great potential harm to welfare occurs when replication is feasible but not promoted.

(b) Similarly, Canada's competition authority, the Competition Bureau, recently declared that[3]:

> *In the Bureau's view, effective competition is most likely to come from independent, facilities-based providers that control their own networks. These service providers have the incentive, ability and capacity to discipline the exercise of market power by the incumbent at both the retail and wholesale levels of the industry. This in turn allows for the eventual removal of both retail and wholesale regulation, letting market forces drive service and investment considerations. In addition, service providers that control their own end-to-end networks have greater incentives for investment, innovation and cost efficiency than do those that rely on the ILECs' networks to provide retail services (for example, resellers and providers that rely on unbundled ILEC network elements).*

(c) Most importantly, in the current context, the Commission has also recognised the inherent superiority of outcomes delivered by infrastructure-based competition[4]:

> *We've long recognised that the essence of competition in telecommunications is to encourage competitors to build their own facilities. Where it is economically viable, competition and the benefits of it, is more sustainable in the long term.*
>
> *Competing forms of standalone infrastructure allow different providers to have greater control over their costs and supply chain as well as greater ability to improve services and differentiate service offerings. In turn this is more likely to lead to sustainable competition and improved services over time.*

(d) This view has also been endorsed by the Competitive Carriers' Coalition[5]:

> *[it] is efficient investment in infrastructure that should provide the basis for sustainable, effective competition and which regulation should seek to encourage.*

B.3 Why infrastructure-based competition delivers superior outcomes

7 There are a number of reasons why infrastructure-based competition is thought to deliver superior outcomes, compared to those delivered through access-based competition. Infrastructure-based competition necessarily ensures competition across a greater range of services and over a greater variety of product attributes (price, features and product quality) than access-based competition, which unavoidably operates within the physical or technology envelope of the access provider's network. Infrastructure-based competition succeeds in delivering

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3 Canadian Competition Bureau, Evidence of the Commissioner of Competition before the CRTC in *Review of regulatory framework for wholesale services and definition of essential service*, 15 March 2007 at para. 17.

4 ACCC (2007), *The regulation of Australia's broadband market,* Mr Michael Cosgrave, Group General Manager, Communications Group. Speech given at AFR Broadband Australia 2007 Conference, 21 August 2007.

5 Competitive Carriers' Coalition, *Revitalising Competition in Australian Telecommunications*, Proposals for Policy Reform Discussion Draft, January 2005.

greater long term consumer benefits because it promotes dynamic efficiency. As William Shepherd said in his address to the 2004 ACCC Conference[6]:

> *The public interest involves many important goals. Innovation is probably the biggest one. For over two centuries, innovation has been the great source of rising productivity, progress and welfare.*

8 It is recognised that competition often involves duplication in circumstances where competing infrastructures operate at less than full capacity. However, the costs of that duplication are more than outweighed by the benefits of competition (provided the duplicated investment is efficient), which can take three forms. In the present case, it is reasonable to expect all three to be present, and for these to vastly outweigh any short-term productive inefficiency that may arise from infrastructure duplication:

(a) the rivalry effect, where the threat of displacement makes firms perform (for example to innovate, or to pass on cost savings in the form of price reductions);

(b) the portfolio effect, where differing investments create diversity of processes and products, enabling the best and most efficient to be discovered. This is especially present in innovative industries where technical development is proceeding rapidly; and

(c) the information effect, where the process of competition leads to information being revealed (for example, marginal cost is revealed when prices approach marginal cost).

B.4 Market evidence supports the view that infrastructure-based competition is superior

9 Market evidence overwhelmingly supports the theoretical economic and policy position that, wherever feasible, infrastructure-based competition delivers the first best outcome compared to access-based competition.

10 Figure 1 plots a selection of OECD countries by their levels of infrastructure-based competition and access-based competition[7]. While a handful of countries have little in the way of either form of competition, most have either high levels of infrastructure-based competition and limited access based competition or vice versa. As is shown in Figure 1, those countries in the former group are found to have superior outcomes to those in the latter group, as measured by broadband penetration.

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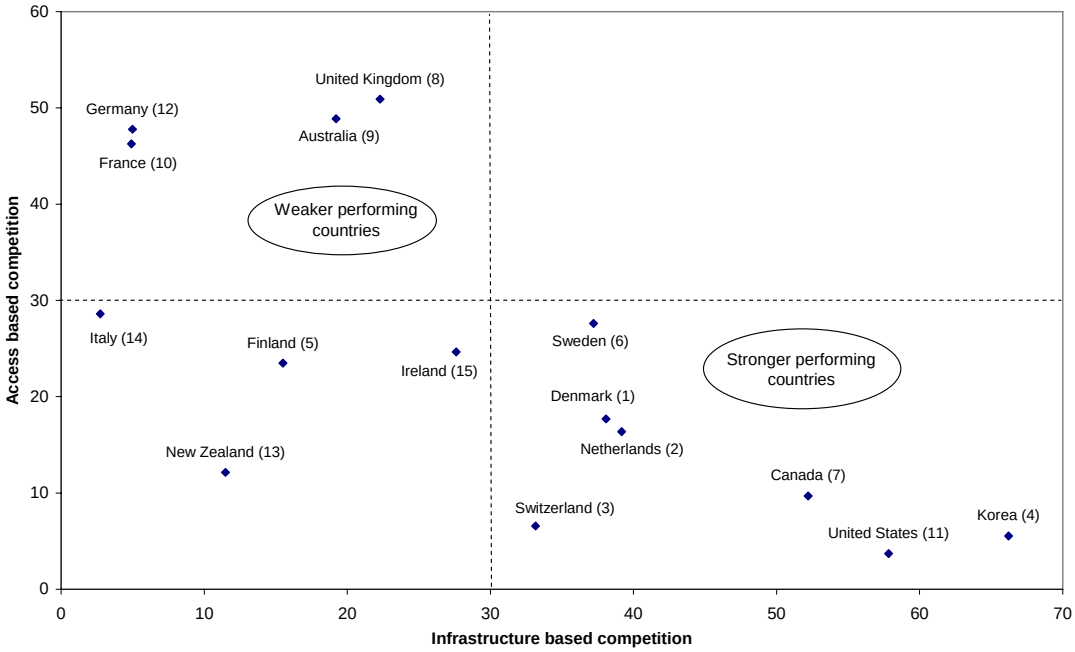
[6] Prof. Shepherd, (2004) *Access pricing, innovation and effective competition*, address to ACCC Regulatory Conference, 29 July 2004.

[7] For the purposes of this analysis, we measure two variables:

(a) the degree of infrastructure-based competition, based on the share of broadband connections provided over alternative infrastructure (ie not provided over the incumbent's PSTN lines). In North America, where competition from cable operators is strong, and in South Korea, where both cable and fibre operators compete, this measure of infrastructure-based competition is high. In countries such as France, Germany and Australia where cable operators have lower penetration, this share is low.

(b) the degree of access-based competition, measured by the share of the incumbent's DSL lines not retailed by the incumbent. This measure is high in countries that rely on ULLS, LSS and resale products to provide the main form of competition.

Figure 1: Access-based and infrastructure-based competition in selected countries

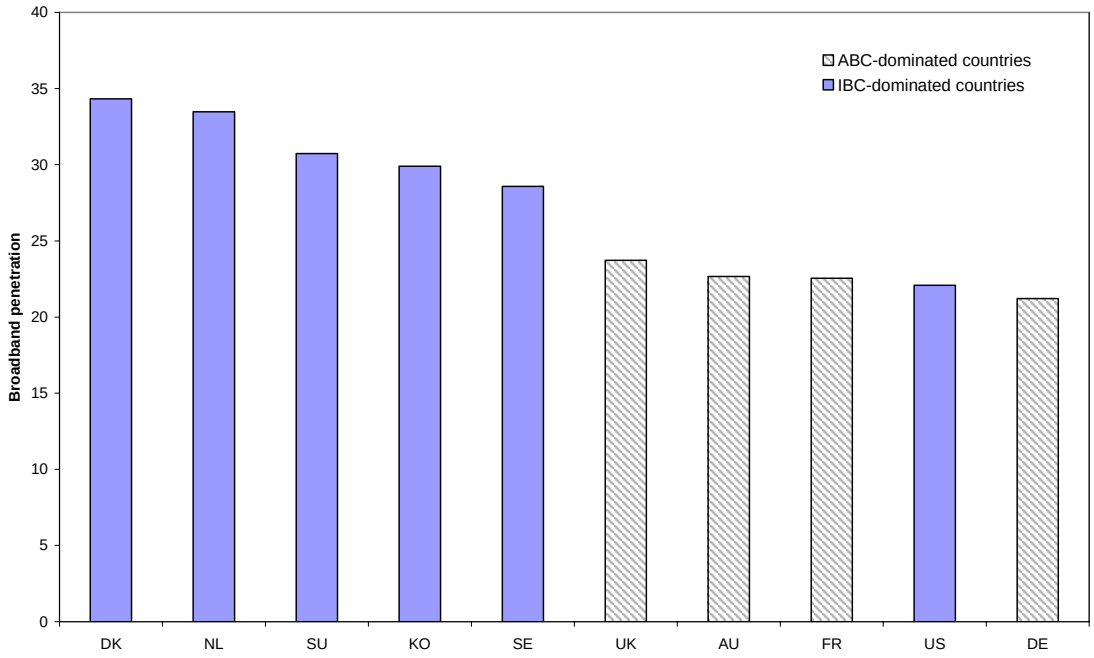


Source: CRA International analysis

Note: Numbers in brackets are the respective countries' ranks out of the 15 countries charted in terms of broadband penetration

11 Figure 2 compares high infrastructure-based competition and high access-based competition countries. Figure 2 clearly demonstrates that infrastructure-based competition (IBC) correlates with significantly higher broadband penetration than access-based competition (ABC).

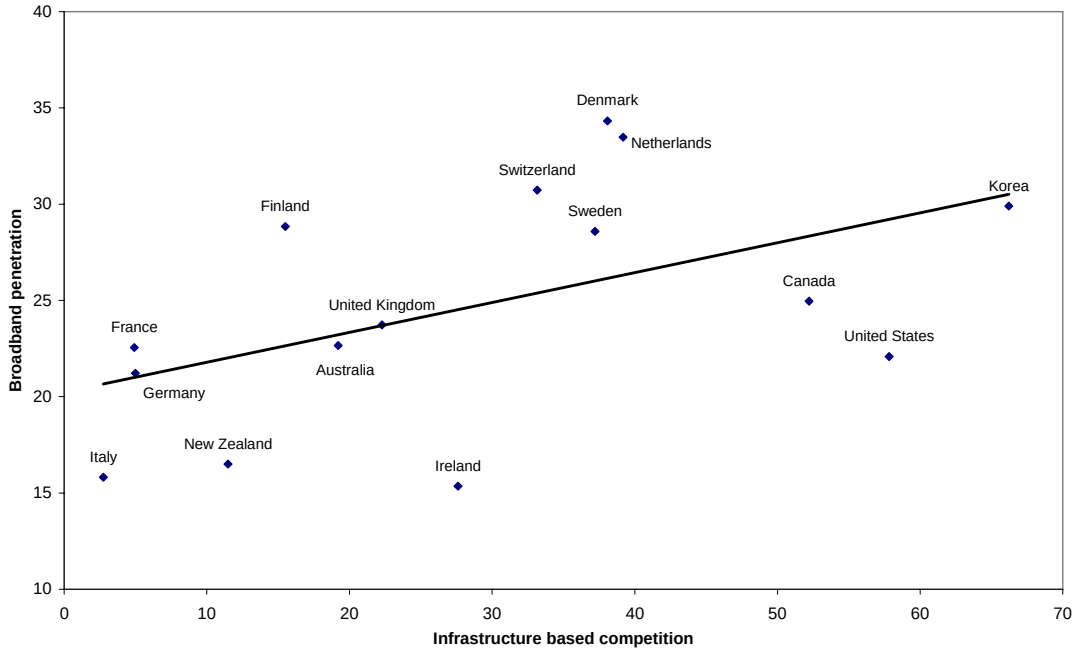
Figure 2: Infrastructure-based competition and broadband penetration



Source: OECD 'Broadband statistics to June 2007', online at http://www.oecd.org.

Note: countries where infrastructure-based competition dominates access-based competition are shaded.

Figure 3: Infrastructure-based competition and broadband penetration



Source: OECD; CRA International analysis

12 When plotted, the line of best fit illustrates this correlation. Figure 3 shows that in countries with high levels of infrastructure-based competition, broadband penetration is strong. The weakest penetration outcomes are observed in countries such as France, Germany, Australia and New Zealand where the extent of infrastructure-based competition is lower.

13 In the above analysis, the extent of infrastructure-based competition in each country is assessed on a national basis. However, the benefits of infrastructure-based competition appear somewhat evident in countries like Australia and the UK which are characterised by large "pockets" of infrastructure-based competition. As we discuss below, regulators, including the Commission itself, are recognising that competition between end to end networks is most appropriately viewed on a sub-national basis. Australia's goal should be to make the best of those pockets of infrastructure. Infrastructure-based competition in Sydney, Melbourne or Brisbane should be as effective as in Toronto, The Hague, Manchester, Anchorage or Omaha.

B.5 Access regulation as a ladder, not a menu

14 If a market does not already have extensive infrastructure-based competition, how should regulators and policy makers set their regulatory frameworks to encourage its development?

15 The ladder of investment theory is based on the idea that "competitors challenge an incumbent by offering services which rely, as their market share rises, less and less on the incumbent's assets and more and more on their own."[8] As such, firms will enter telecommunications markets progressively, starting in areas where the least investment is required, and making larger investments

[8] Prof. Cave, (2007) *Applying the ladder of investment in Australia*, Annex 1, p. 1.

once they have become more established. Firms progress up the ladder from access-based competition to build their own networks, and engage directly in infrastructure-based competition.

16 The Commission has broadly endorsed the ladder of investment theory in its access decisions, but has also recognised that it should not be left in place indefinitely[9]:

> *In its June 2006 position paper, the Commission supported the 'stepping stone' approach to competition, but with the very important caveat that 'full facilities-based competition is the end goal in all circumstances'. Further, the Commission notes that the stepping stone hypothesis does not necessarily suggest that multiple forms of mandated access at different network layers should be left in place indefinitely.*

17 However, the ladder comes with some "use with care" caveats from its makers. Professor Cave, who originally postulated the 'ladder of investment' theory, cautions[10]:

> *The normative component of the 'ladder of investment' has been adopted by a number of regulators and governments: by the European Regulators Group (ERG) and by many national regulators in Europe, and by the New Zealand Government in its 2006 stocktake of telecommunications regulation and subsequent legislation. The ACCC has also written of the benefits of maximising economically efficient infrastructure competition and the role of the ladder of investment in achieving that outcome. This is despite the fact that it remains no more than a hypothesis, as scientific testing of an imprecise proposition of this kind remains problematic.*

18 Similarly, the Dutch regulator, OPTA, which has applied the ladder of investment in setting access policy, has remarked[11]:

> *There are a number of objections to [the ladder of investment]. In particular, there are major problems in setting supply conditions along the ladder so that there are sufficient incentives for entrants to climb from one rung to the next. So there is a danger that, as a result of regulatory error, the industry becomes stuck in a state of service based competition. There is limited empirical evidence to show that this ladder of investment process works. In the USA, where it was first implemented, most CLECs have ended up using simple resale and few have migrated to local loop unbundling*

19 Telstra has previously criticised the validity of the ladder of investment theory as a basis for setting access regulation and we repeat our concerns here[12]. However if the ladder is to be used to justify access regulation, the regulator must remain faithful to the theory. As the central organising principle of the ladder is upwards movement by access seekers, regulators must, as Professor Cave says, take a "…rigorous approach …to prevent implementation of the 'ladder' approach relapsing into a policy of 'easy access', thereby denying

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9 ACCC Position Paper (2007), *Fixed services review: A second position paper*, April 2007 at p.21.
10 Prof. Cave, (2007) *Applying the ladder of investment in Australia*, Annex 1, p. 21
11 OPTA, *Regulating Emerging Markets*, Economic Policy Note, No.5, April 2005, at p. 20.
12 See for example pages 15-17 of Telstra's response to the Commission Proposal "A Strategic Review of the regulation of fixed network services", February 2006.

consumers the benefit of infrastructure competition".[13] This requires three things of the regulator.

20 First, as the European Commission has explicitly stated, access regulation should be a transitional state of affairs, and fall away once infrastructure competition exists[14]:

> *Regulation mandating access to existing networks serves as a transitional measure to ensure services competition and consumer choice until such time as sufficient infrastructural competition exists. Investment in new network infrastructure will hasten the day when ex-ante regulation can be withdrawn from this market.*

21 Second, it is a ladder, not a menu: entrants are intended to actively climb in a sequential manner, not simultaneously consume multiple services on offer nor come to regard them as staples in their business plans. Put another way the ladder requires a shifting, rather than a settled access policy and needs to be actively managed by the regulator to ensure that there is upwards movement by entrants[15]:

> *Where an NRA finds an asset which is already or imminently replicable, it can withdraw or plan to withdraw from regulation. This can be achieved by ceasing to make access mandatory or by allowing access prices to rise, possibly rising to a level consistent with real options - i.e. incorporating the benefits which accrue to a competitor from having access to an asset rather than taking the risk of making sunk investments.*

22 As Professor Cave also says[16]:

> *[the ladder of investment] is not an argument for providing access at low prices on a carte blanche basis. Instead the proper approach seeks to restrict mandatory access to a limited period – after which it ceases to be available, or becomes subject to commercial agreement, or rises in the regulated price.*

23 However, actively managing the ladder is not a straightforward exercise and requires constant attention by the regulator. As Eisenach and Singer point out[17]:

> *The need for such ongoing adjustments [to regulated access requirements], combined with the existence of lags between investment decisions and infrastructure deployment, forces both incumbents and entrants to make decisions on the basis of their* expectations *about* future *regulatory policy. For example, if entrants believe that regulators will adjust wholesale prices "too slowly," they will be reluctant to move to the higher rungs of the investment ladder - even if prices have been set at the economically correct levels to begin with.*

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13 Martin Cave, *Making the Ladder of Investment Work*, November 2004, at p.30.

14 European Commission, Explanatory Memorandum to *Commission Recommendation 2003/311/EC of 11 February 2003 on relevant product and service markets within the electronic communications sector susceptible to ex ante regulation in accordance with Directive 2002/21/EC of the European Parliament and of the Council on a common regulatory framework for electronic communication networks and services*, 11 February 2003 ,at p.25.

15 Prof. Cave, M, (2006) ,*Encouraging Infrastructure competition via the ladder of investment*, 30 Telecommunications Policy, p. 236.

16 Prof. Cave, *Making the Ladder of Investment Work*, November 2004, at p.29

17 Eisenach, Jeffrey A. and Singer, Hal J., "Irrational Expectations: Can a Regulator Credibly Commit to Removing an Unbundling Obligation?" (December 2007), AEI-Brookings Joint Center Working Paper No. 07-28, online at http://ssrn.com/abstract=1065161 at p 3.

24 Third, the ladder of investment should be grounded on a test of replicability of the incumbent's assets. The ladder should not be put in place in the first place, and certainly should be taken away, if the regulator considers that the incumbent's network can feasibly be replicated. As the ERG has commented[18]:

> *…where…replication of the incumbent's infrastructure is viewed as feasible, the available remedies should assist in the transition process to a sustainable competitive market. Where there is sufficient certainty that replication is feasible these markets should be treated in an analogous manner to those markets where replication is known to be feasible. In other cases with more marked uncertainty the NRA should keep an open mind and engage in on-going monitoring to continually re-assess their views. In these circumstances, no action should be taken that might delay or otherwise stop investment in competing infrastructure where this is efficient. In coming to these views on the feasibility of replication the NRA will need to be mindful of the possibility of inefficient investment.*

25 As Professor Cave notes, this may mean that in those countries which are characterised by a "patchwork quilt" of infrastructure-based competition that a different ladder (or no ladder at all) may need to be applied within the pockets with competing infrastructure compared to the ladder which applies outside those pockets.[19]

B.6 The ladder is failing to encourage infrastructure-based competition in Australia

26 In Sydney, Melbourne and Brisbane, the same ladder, with the same number of rungs, applies uniformly[20] regardless of whether Telstra's network is replicable and even where it has actually been replicated. This mismatch between the configuration of the ladder and the existence of competing networks has encouraged infrastructure-based competitors to utilise access services rather than investing in expanding the breadth and depth of competition on their own networks. They are sliding *down* the ladder of investment, instead of climbing *up*. While this exemption relates to the SingTel Optus HFC, as the largest of the end to end networks which have been deployed in Australia, Telstra believes that this same pattern of behaviour can be seen across other infrastructure-based competitors.

27 SingTel Optus had fully deployed its HFC network – that is, it was already at the top of the ladder – several years before the Commission declared ULLS, LSS, LCS and WLR and issued the wholesale DSL competition notice requiring supply of a layer 2 bitstream service. When the Commission originally declared the ULLS service in 1999, the Commission seems not to have contemplated that SingTel Optus would be a heavy user of ULLS in its HFC network footprint. Instead, the Commission seems to have had in mind that ULLS would allow entry of *other* operators which would dilute the risk of a SingTel Optus-Telstra duopoly[21]:

> *Even where end-users could be served by the Cable & Wireless Optus HFC network, there are likely to be benefits from access to the unconditioned local loop service. In some areas there could be capacity constraints which limit the ability of Cable & Wireless Optus to satisfy demand. Moreover, the presence of*

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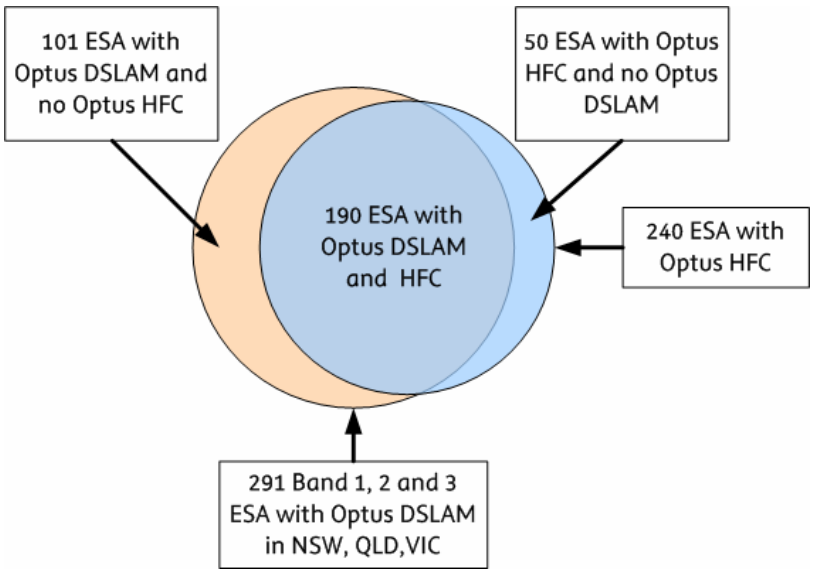
18 ERG Common Position on the Appropriate Approach to Remedies in the New Regulatory Framework (2004), at para 4.2.1.
19 Prof. Martin Cave, (2007) *Applying the ladder of investment in Australia*, Annex 1, p. 6
20 Apart from some banding at the urban fringe.
21 ACCC, *Declaration of local telecommunications services, July 1999, at 76.*.

*high barriers to entry and high market concentration provide scope for coordinated (or accommodating) action by network operators. Enabling **other service providers** to supply high bandwidth carriage services by means of the unconditioned local loop service minimises the scope for this to occur.* [emphasis ours]

28 But, things have turned out differently. As Figure 4 illustrates, there is a high level of overlap between ESAs in which SingTel Optus has deployed both DSLAMs and HFC network. Almost 80% of the ESAs in which SingTel Optus has deployed HFC it has also deployed DSLAMs. Every ESA in which SingTel Optus has 100% HFC coverage has DSLAMs deployed by SingTel Optus. This probably underestimates the extent of the overlap because SingTel Optus is continuing to deploy DSLAMs.

Figure 4: ESAs with SingTel Optus DSLAM presence, shown against SingTel Optus HFC and non-HFC areas



Source: Telstra

29 Professor Cave says in his annexed statement this is not the outcome which would be expected if the ladder was working correctly[22]:

...the competitive environment for broadband in Australia exhibits what I believe is a unique feature: the decision by end-to-end competitors to supply a significant number of their customers on the basis of loops rented from the incumbent, in preference to relying on their own loops. This conduct, which can be described as a partial stepping down from the pinnacle of the ladder of investment – full end-to-end competition – coincides with the conduct of ISPs without end-to-end networks making early attempts to gain broadband customers, also using Telstra's loops.

30 Clearly, current access policy in Australia is distorting outcomes. While the ladder theory has been used to justify regulation we are not seeing the outcomes expected of a successful application of the ladder. Having achieved actual replication of Telstra's network in substantial swathes of Sydney, Melbourne and Brisbane before the ladder came along, SingTel Optus now seems to be using

[22] Prof. Cave, (2007) *Applying the ladder of investment in Australia*, Annex 1, p. [10].

it to step down to access based competition. The access regime has been applied in a way that distorts the incentives to progressively invest.

B.7 What this exemption is about

31 A number of conclusions can be drawn:

(a) infrastructure-based competition clearly provides superior outcomes to those derived from access-based competition. This means that access policy, consistent with the Commission's own expressed views, encourages infrastructure-based competition wherever feasible. Infrastructure-based competition on its own is a much stronger factor than access based competition in delivering superior market outcomes, and regulated access by itself is insufficient to "close the gap" between those countries that have limited infrastructure-based competition, and those that have a lot;

(b) the ladder of investment is considered by many regulators, including the Commission itself, as a key means of achieving infrastructure-based competition, but it requires active management to avoid entrants squatting on the ladder (an outcome contrary to the ladder's purpose);

(c) in Professor Cave's view, the empirical evidence in Australia shows that the ladder is not functioning in accordance with the expectations of the theory.

C The benefits of infrastructure-based competition are not being realised in Australia as they are elsewhere

32 In the previous section, Telstra outlined why infrastructure-based competition should be the goal of regulators. In this section we discuss how, despite the presence of a large alternative local network, Australia is not reaching that goal. We:

(a) describe the extent of the HFC network deployed by SingTel Optus;

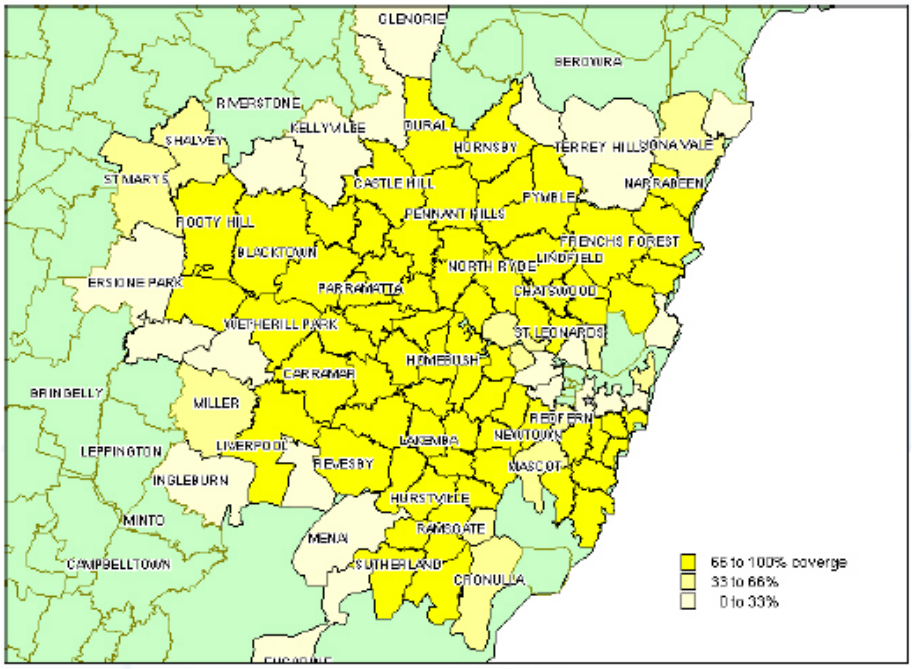
(b) examine the poor take-up of services on the SingTel Optus HFC Network compared to the overseas cable networks; and

(c) compare the high level of usage of regulated access services by SingTel Optus within its network footprint to overseas cable operators and discuss how that relates to its poor performance.

C.2 SingTel Optus' HFC network has a significant footprint

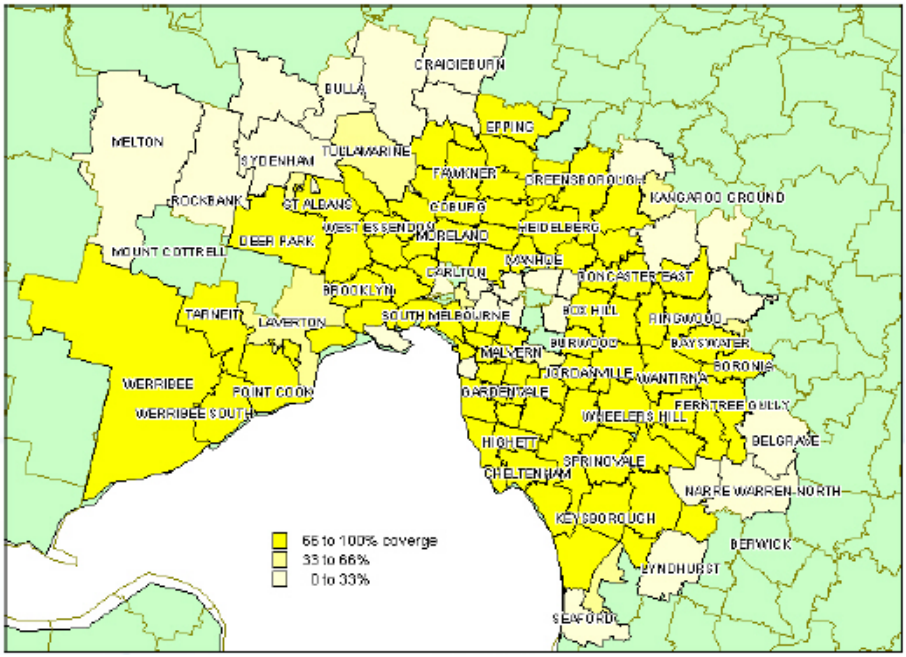
33 SingTel Optus has an extensive HFC network within Australia's three largest cities, Sydney, Melbourne and Brisbane, as depicted in Figure 5, Figure 6, and Figure 7 which show the extent of its HFC coverage in Telstra's ESAs.

Figure 5: Sydney Optus HFC Coverage



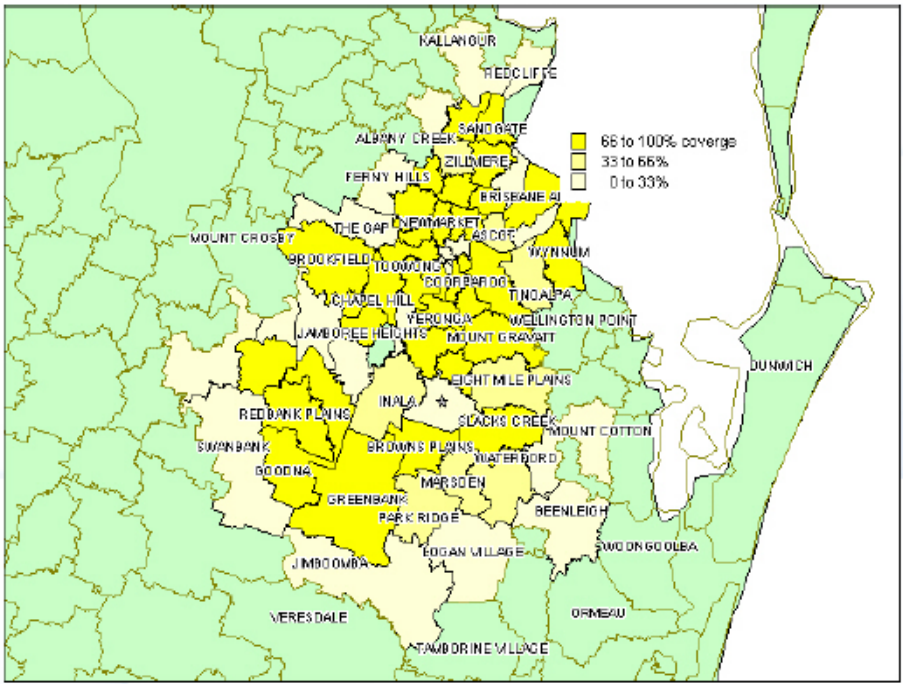
Source: Telstra

Figure 6: Melbourne Optus HFC Coverage



Source: Telstra

Figure 7: Brisbane Optus HFC Coverage



Source: Telstra

C.3 The SingTel Optus HFC network "punches below its weight" in contrast with comparable overseas networks

34 SingTel Optus provides only limited public information on the performance of its cable network. In Attachment 2, Telstra sets out a list of information which we request the Commission obtain from SingTel Optus. However, we have been able to derive some information from public sources which show both the underperformance of SingTel Optus HFC cable network and its much higher reliance on regulated access services compared to overseas cable operators.

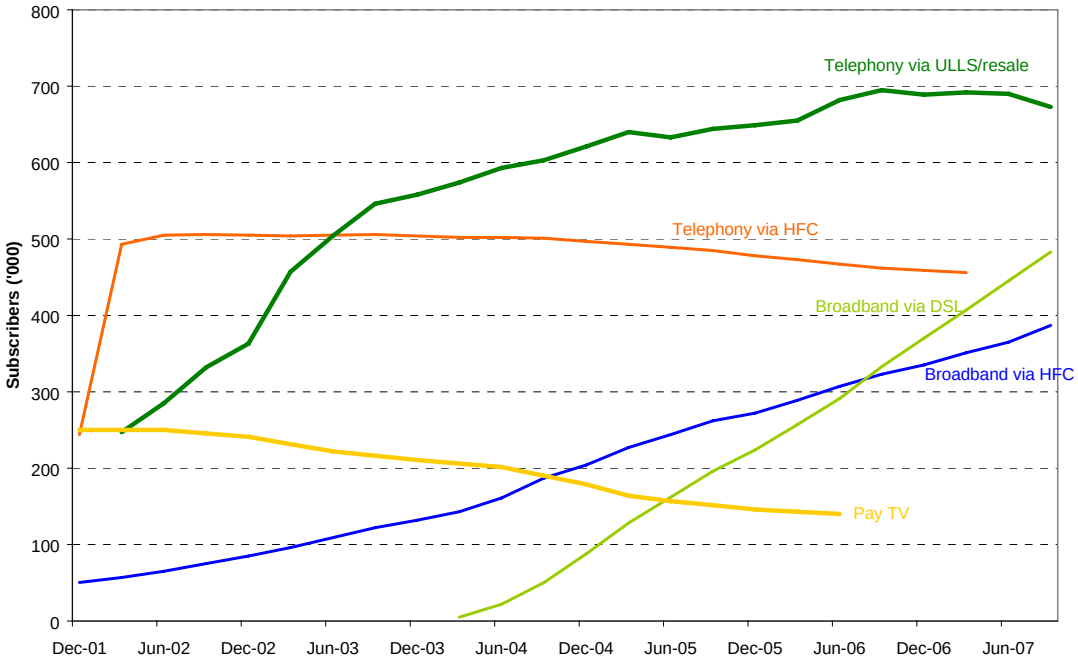
35 As Figure 8 shows:

(a) HFC telephony subscriptions have fallen, while access-based telephony has grown;

(b) pay TV subscriptions have plummeted, despite overall industry growth and SingTel Optus gaining access to all of the best content; and

(c) HFC broadband subscriptions have grown, but have been overtaken by broadband provided by SingTel Optus over Telstra local loops.

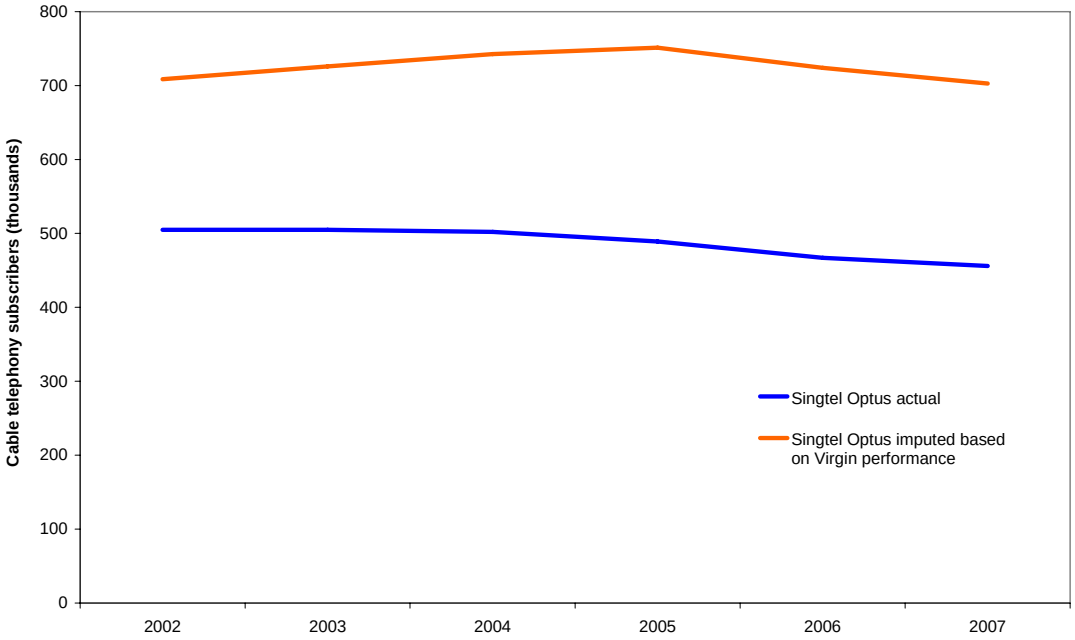
Figure 8: SingTel Optus' use of HFC versus wholesale products



Sources: CRA International; SingTel, 'Management discussion and analysis of financial condition, results of operations and cash flows' for periods 2002-2007; IBISWorld.
Note: Pay TV and HFC telephony numbers not available for the most recent periods.

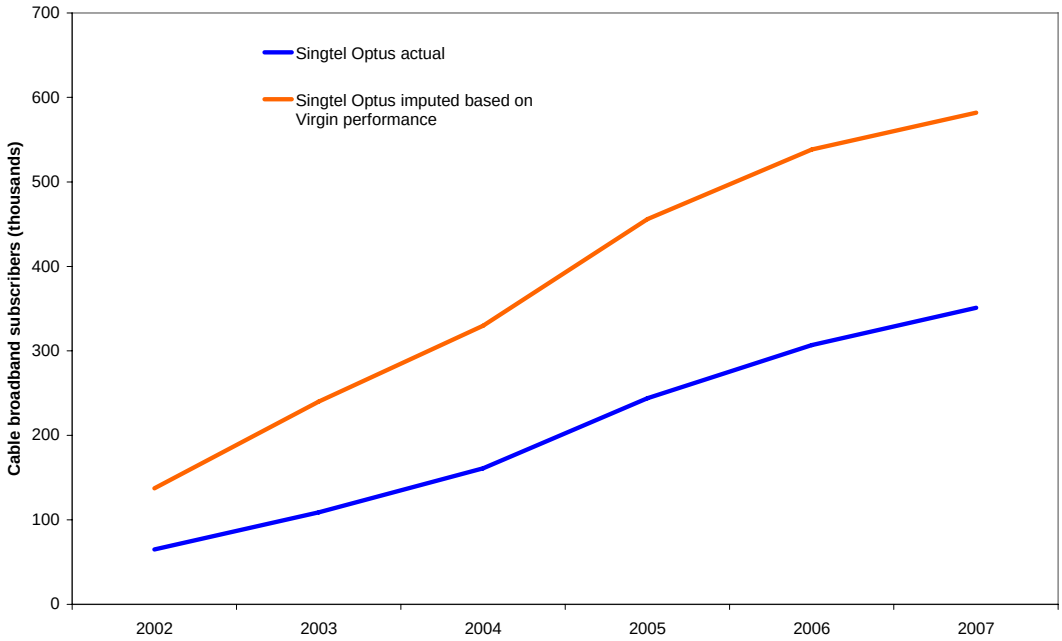
36 The relative poor take-up of services on the SingTel Optus HFC network can be seen from a comparison with the take-up of services on the Virgin Media HFC network in the UK. If SingTel Optus' HFC network was performing as well as the Virgin Media network in the UK, it would have a substantially higher on-net telephony and broadband subscriber base. As Figure 9 and Figure 10 illustrate, the SingTel Optus subscriber base would be nearly 50% higher for telephony services and nearly 100% higher for on-net broadband if SingTel Optus was achieving similar penetrations of homes passed within its cabled areas as Virgin Media.

Figure 9: Actual and imputed SingTel Optus cable telephony subscribers



Source: SingTel Optus and subsidiary companies, Management Discussion and Analysis of Financial Condition, Results of Operations and Cash Flows for the Second Quarter and Half Year ended 30 Sept 2007; Virgin Media
Note: Virgin Media was formed in March 2006 as a result of conglomeration of NTL and Telewest. All references in this document to subscriber numbers of Virgin Media prior to March 2006 are based on NTL and Telewest information.

Figure 10: Actual and imputed Optus cable broadband subscribers



Source: SingTel Optus and subsidiary companies, Management Discussion and Analysis of Financial Condition, Results of Operations and Cash Flows for the Second Quarter and Half Year ended 30 Sept 2007; Virgin Media

37 While SingTel Optus had some early success with its cable telephony service, its performance is stagnating while overseas cable operators are experiencing rapid growth. SingTel Optus was much earlier to market with a cable telephony service than most overseas cable operators, with the exception of the UK cable operators. However, since launching Voice over broadband (VoB) [23] based telephony services in the last 3-4 years, the overseas cable companies have experienced rapid and accelerating growth in telephony subscribers, while SingTel Optus' HFC telephony have slowly sunk. Table 1 shows the growth in cable telephony services on Canadian HFC networks:

Table 1: Number of cable telephony subscribers in Canada

	No. of subscribers (telephony)		
Network	2006	2007	Growth
Rogers[24]	270,800	590,500	118.1%
Videotron[25]	165,000	574,000	142%
Shaw[26]	172,650	385,000[27]	123%

38 As Figure 11 shows, the growth of cable telephony subscribers in the US has been accelerating, growing by 61% in the last year.

[23] VoB services can be offered on an access independent or access dependent basis. Access independent means that the VoB service is offered separately from the broadband connection usually by a third party without the knowledge of the underlying broadband provider and without any network-based management of the voice service. Access dependent services are offered by the broadband provider which, as the network operator is able to identify and manage the packet stream comprising the voice service. This allows an access dependent broadband service to have quality of service provided and managed on an end to end basis. For this reason it is often said that access dependent VoB is "carrier-grade" which is also the description used for PSTN services. Many overseas regulators now treat access dependent VoB and, increasingly access dependent VoB, as a close substitute for PSTN voice services. See the discussion in Section F.3.2 below.

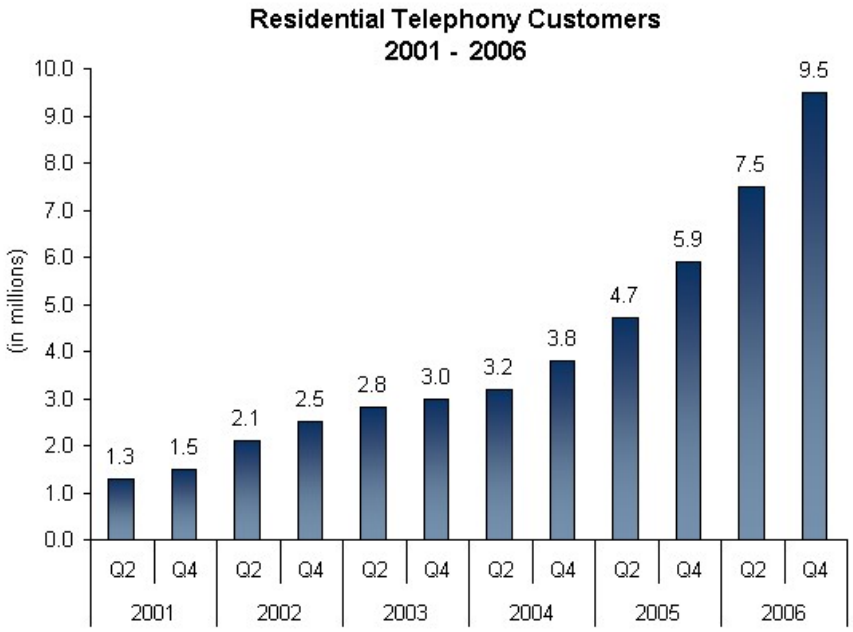
[24] Rogers (2007) *Annual Report*, 3rd Quarter, http://library.corporate-ir.net/library/80/800/80028/items/267686/Q307%20RCI%20Release_final.pdf. These figures comprise subscription growth in the first three quarters of 2007.

[25] Videotron Press release 20 February, 2007, (2006 figures) http://www.videotron.com/services/static/en/pdf/com_bilan2006_20fev07.pdf. 2007 figures from TeleGeography, "Videotron Reports 3Q Growth", TeleGeography, 7 November, 2007, http://www.wireless-watch.com/2007/11/07/videotron-reports-3q-growth/ ".Growth rates are measured over first three quarters.

[26] Shaw 2006 Annual Report, http://www.shaw.ca/NR/rdonlyres/9FC9A219-011B-4396-BBF1-54A776EF528A/0/ShawAr2006New.pdf.

[27] Shaw 2007 Annual Report, http://www.shaw.ca/NR/rdonlyres/AECBE943-943C-474B-A1D0-12B860BD6073/0/SCIAIF07.pdf

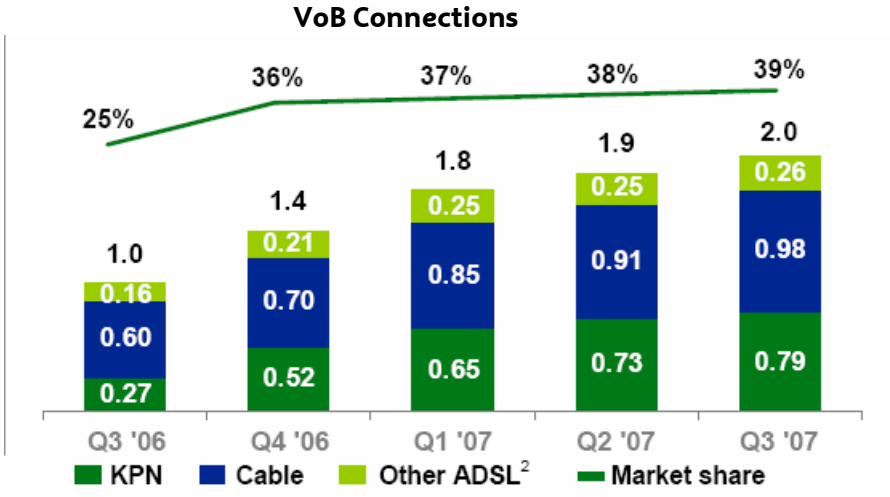
Figure 11: US residential telephony customers 2001 to 2006



Source: National Cable & Telecommunications Association, www.ncta.com

39 In the Netherlands, voice over broadband (VoB) services have captured substantial market share from the incumbent telco, KPN. As Figure 12 illustrates, while VoB has been offered by competitors over ULLS and cable, cable accounts for most of the VoB connections:

Figure 12: VoB connections in the Netherlands



Source: KPN, Q3 financial report, 30 October 2007.

40 SingTel Optus' record of innovation in broadband services is also poor compared to overseas cable operators. In the intense competition between cable operators and fixed network incumbents, cable often has been the innovator in overseas markets. For example, in December, 2006, Singapore became the first country in the world to commercially launch a 100Mbps residential broadband service nationwide when StarHub upgraded its cable network using pre-DOCSIS 3.0

technology[28]. In the UK, cable provider Virgin Media is conducting a DOCSIS 3.0 technology trial of 50Mbps services (with 1.5Mbps upstream). Virgin Media proposes to launch these high speed services next year. BT's DSL service is reported to provide, at best, speeds of up to 22Mbps.[29]

41 SingTel Optus presently offers a broadband speed on its HFC network with a maximum of only 9.9Mbps. Table 2 compares the maximum down channel speed of services offered by SingTel Optus with those offered by cable operators.

Table 2: Maximum download speeds offered by various cable operators

Operator	Maximum Speed
Starhub (Singapore)	100 Mbps[30]
Shaw (Canada)	40Mbps[31]
Telstra HFC	30Mbps
Virgin Media (UK)	20Mbps[32]
UPC (Netherlands)	20Mbps[33]
Multikable (Netherlands)	20Mbps
Videotron (Canada)	16-20Mbps[34]
Rogers (Canada)	18Mbps[35]
Cogeco (Canada)	16Mbps[36]
Eastlink (Canada)	15Mbps[37]
Comcast (USA)	12Mbps[38]
Time Warner (Roadrunner Internet) (USA)	10Mbps[39]
SingTel Optus	9.9Mbps[40]
Wide Open West (USA)	6Mbps[41]
TransACT	2Mbps[42]

42 SingTel Optus has also lagged on other fronts:

(a) **Cable roll out and homes passed:** While Telstra had commenced its own rollout program in June 1994, eight months ahead of SingTel Optus, it was anticipated that, since SingTel Optus was using the cheaper 'aerial cabling' , the network would be constructed faster and more cheaply than Telstra's underground cabling. SingTel Optus appears to have "downed

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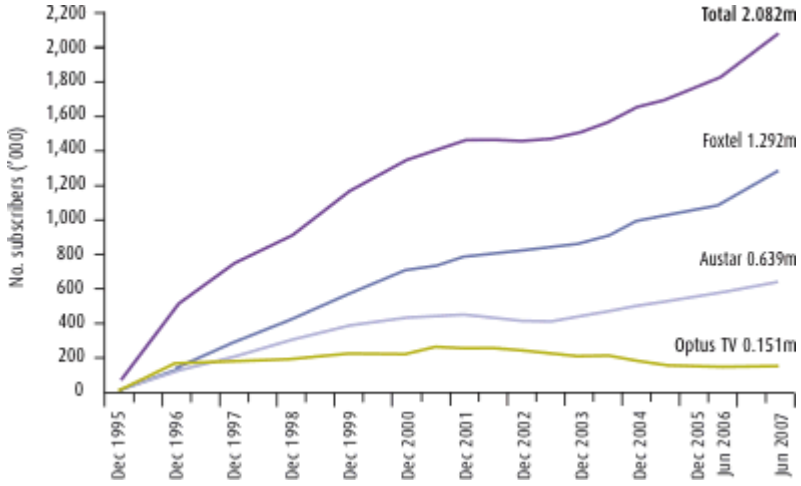
28 DOCSIS is Data Over Cable Service Interface Specifications. See further information in para 77.
29 *Virgin Media to test 50Mb broadband in Kent*, ITPro, 19 September 2007
30 Starhub Website, accessed December 6, 2007, http://www.starhub.com/portal/site/Online/menuitem.935dac8c897c3fb7eaaf3b608324a5a0/?vgnextoid=333928043c6ef010VgnVCM100000464114acRCRD
31 Shaw 2007 Annual Report, http://www.shaw.ca/NR/rdonlyres/AECBE943-943C-474B-A1D0-12B860BD6073/0/SCIAIF07.pdf
32 Virgin Media Website, accessed 7 December 2007, http://allyours.virginmedia.com/websales/service.do?id=2
33 Liberty Global 2006 Annual Report, http://www.lgi.com/annual.html.
34 Media Release, 20 February, 2007, http://www.videotron.com/services/static/en/pdf/com_bilan2006_20fev07.pdf
35 Rogers website, accessed 12 December 2007, http://www.rogers.com/web/link/hispeedCompareBegin?_removePackage=1
36 CoEco Website, accessed December 6 2007, http://www.cogeco.ca/en/high-speed-internet-_o.html
37 Eastlink website, accessed December 6 2007, http://www.eastlink.ca/internet/highspeed/index.asp
38 Broadband Information Website, accessed December 7 2007, http://www.broadbandinfo.com/cable/comcast/default.html
39 BrightHouse Networks Website, accessed December 7,2007, http://tampabay.mybrighthouse.com/products_and_pricing/internet/compare_plans/road_runner_compare.aspx
40 SingTel Optus website, accessed 11 December 2007, http://www.optus.com.au/broadband
41 Wide Open West Website, accessed December 7, 2007, http://www1.wowway.com/internet/internet.aspx?ConIdent=1003&RCView=MAIN
42 TransAct Website, accessed 7 December 2007, http://www.transact.com.au/broadband/default.aspx.

tools" on its network rollout in mid 1997, whereas Telstra continued to invest in "infill" coverage within its existing footprint, adding another 400,000 premises passed since 1997.

(b) **Pay-TV:** FOXTEL was launched in Melbourne and Sydney, a month after SingTel Optus launched Optus Vision pay-TV.[43] While initially SingTel Optus' subscription numbers were equal or greater than those of FOXTEL's, they have since dwindled. As Figure 13 shows, the gap has continued to widen.

Figure 13: Pay TV subscriber numbers, total and by operator, 1995-2007



Source: Australian Film Commission, http://www.afc.gov.au/gtp/wptvsubsxops.html

(c) **Digitisation of services**: SingTel Optus has lagged behind Telstra in transitioning to digital television. Telstra launched its digital service in March 2004,[44] while SingTel Optus only offered its digital service to its cable customers in November 2005. From 2002 SingTel Optus had access to the best-available content via its content-sharing deal with FOXTEL.

C.4 SingTel Optus' use of regulated access within its footprint is unique

43 As noted in Section B, SingTel Optus appears to be a heavy user of regulated access services, including ULLS, within the footprint of its HFC network. By contrast, even though theoretically available to them in many countries[45], overseas cable operators generally have not used regulated access within their network footprints.[46] Their use of regulated access is typically confined to obtaining coverage nationally outside their network footprint:

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43 Meredith,H., *Optus Pay TV On Air Tonight*, Australian Financial Review, 20 September 1995, p 16.

44 Media Release: *Foxtel Digital Release*, http://www.foxtel.com.au/209_1471.htm.

45 As the Commission has done to date, most overseas regulators have tended to adopt national markets notwithstanding local infrastructure based competition in some geographic areas. This has meant that regulated access services are available for cable operators within their network footprints.

46 There are some limited exceptions. In Singapore, the cable operator, Starhub, inherited an agreement between its Government owned predecessor, SCV, and the Government owned telco incumbent, SingTel, which prevented Starhub utilising its cable network to serve business customers. Starhub therefore serves business customers within its cable footprint uses unregulated bitstream services supplied on a commercial basis by SingTel because Starhub regards the regulated ULLS offering as unviable on a price and non-price basis. While Singapore ranks well internationally in residential broadband services, it performs relatively more poorly in price and speed terms for business services: http://www.yawningbread.org/arch_2005/yax-482.htm. In the US, the FCC has begun to forbear UNE access requirements, including ULLS, in areas where there is significant alternative infrastructure-based competition, which is mainly in the form of cable networks. In the first forborne market, Omaha, the cable operator did not use UNE within its footprint: *Petition of Qwest Corporation for Forbearance Pursuant to 47 U.S.C. §160(c) in the Omaha Metropolitan Statistical*

(a) Virgin Media states that:[47]

> *We provide television, internet (broadband and dial-up) and fixed line telephone services under the Virgin Media brand to residential customers in the UK... distributed principally via our own wholly-owned, cabled local access communications network. ... In addition, we provide broadband and telephone services to residential customers outside of our network via access to other telecommunications networks...*

(b) in its decision to withdraw (forebear) ULLS in Omaha, the FCC noted that the cable operator, Cox, did not use any access services, regulated or commercially available, from the incumbent[48];

(c) in its decision to forebear ULLS in Anchorage the FCC noted that the cable operator, GCI, utilised regulated access services to supply no more than 7% of its customers within its network area[49],; and

(d) in the current wholesale review being conducted by the CRTC in Canada, it has been noted that no cable operator uses regulated access services within its cabled areas to connect restricted customers, with the exception of Rogers which had recently acquired a ULLS operator and was migrating its ULLS customers to its cable network[50].

44 Again, this can be illustrated by comparing Virgin Media's use of access services with SingTel Optus'. As Figure 14 shows, use of the Virgin Media's cable network has grown in recent years while use of wholesale products on BT's copper network has remained minimal.[51] This clearly shows the importance of retail provision over its own facilities to the cable operator's business.

Area, WC Docket No. 04-223, Memorandum Opinion and Order, 2 December 2005. However, in the next forborne market, Anchorage, the cable operator, GCI, utilized ULLS within its cable footprint, accounting for approximately 7% of its customer connections: *Petition of ACS of Anchorage, Inc. Pursuant to Section 10 of the Communications Act 1934, as amended, for Forbearance from Sections 251(c)(3) and 252(d)(1) in the Anchorage Study Area*, WC Docket No. 05-281, Memorandum Opinion and Order, 30 January 2007. The FCC considered that removal of ULLS would provide GCI with an incentive to make the investment in its own network to replace its use of ULLS, which has turned out to be the case: see discussion in section E.5. In Canada, cable operators do not use ULLS within their footprint for residential customers. The exception is Rogers, which acquired a ULLS-based operator and is migrating ULLS customers to its cable network. Bell Canada also alleges that Rogers uses ULLS as a "stop gap" to connect customers for 2-3 months until Rogers can get field staff out to install the subscriber connection to its HFC network. Bell Canada has identified this use of ULLS as a basis for its withdrawal in the current wholesale inquiry by the CRTC: Evidence of Bell Canada and others, 15 March, 2007, at p.89, CRTC PN 2006-14

47 Virgin Media, (2006) *Annual Report*, p. 8, online at http://media.corporate-ir.net/media_files/irol/13/135485/reports/AnnualReport06.pdf. Virgin Media cable network provides a reasonable comparison to the SingTel Optus HFC because the two networks were not historically the monopoly distributors of PayTV and free-to-air television (unlike in North America) and both operators have pursued a combined telephony/cable services market entry strategy to compete against the incumbent telco in local network services.

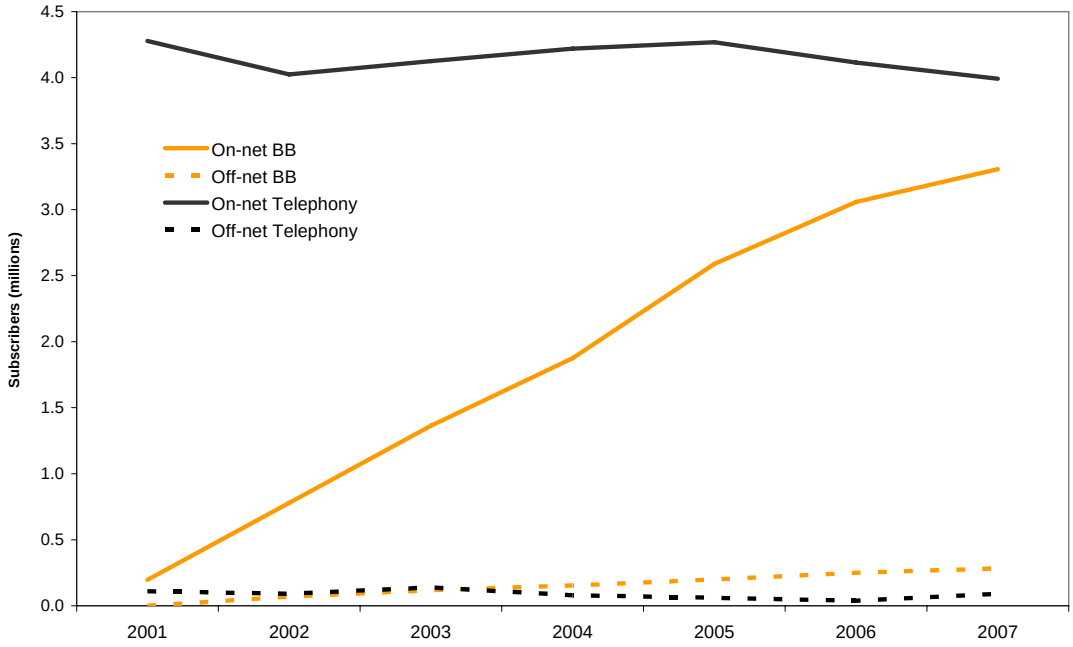
48 Federal Communications Commission, *Petition of Qwest Corporation for Forbearance Pursuant to 47 U.S.C. §160(c) in the Omaha Metropolitan Statistical Area*, WC Docket No. 04-223, Memorandum Opinion and Order, 2 December 2005.

49 Federal Communications Commission, *Petition of ACS of Anchorage, Inc. Pursuant to Section 10 of the Communications Act 1934, as amended, for Forbearance from Sections 251(c)(3) and 252(d)(1) in the Anchorage Study Area*, WC Docket No. 05-281, Memorandum Opinion and Order, 30 January 2007.

50 CRTC, *Review of Regulatory Framework for Wholesale Services and Definition of Essential Service*, Evidence of The Commissioner of Competition, 15 March 2007.

51 Virgin Media, 'Virgin Media reports third quarter 2007 results', press release, 7 November 2007, London.

Figure 14: Virgin Media subscriber numbers for various services



Source: Virgin Media; NTL; Telewest Annual Reports

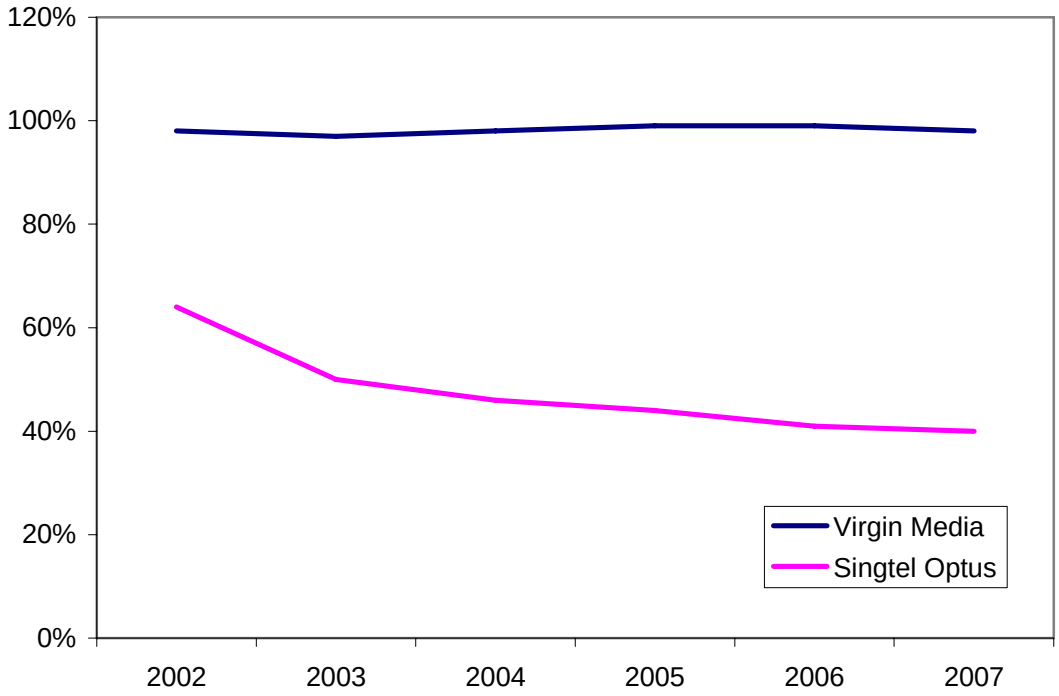
45 Table 3 and Figure 15 compare the proportion of the SingTel Optus and Virgin Media telephony subscriber bases which are on-net. While Virgin Media has remained more or less constant, SingTel Optus' proportion has dropped by around 40%.

Table 3: Share of on-net telephony subscribers on cable

	SingTel Optus subscribers on-net as a % of total subscribers (%)	Virgin Media subscribers on-net as a % of total subscribers (%)
2002	64	98
2003	50	97
2004	46	98
2005	44	99
2006	41	99
2007	40	98

Source: SingTel Optus; Virgin Media

Figure 15: Share of on-net telephony subscribers on cable



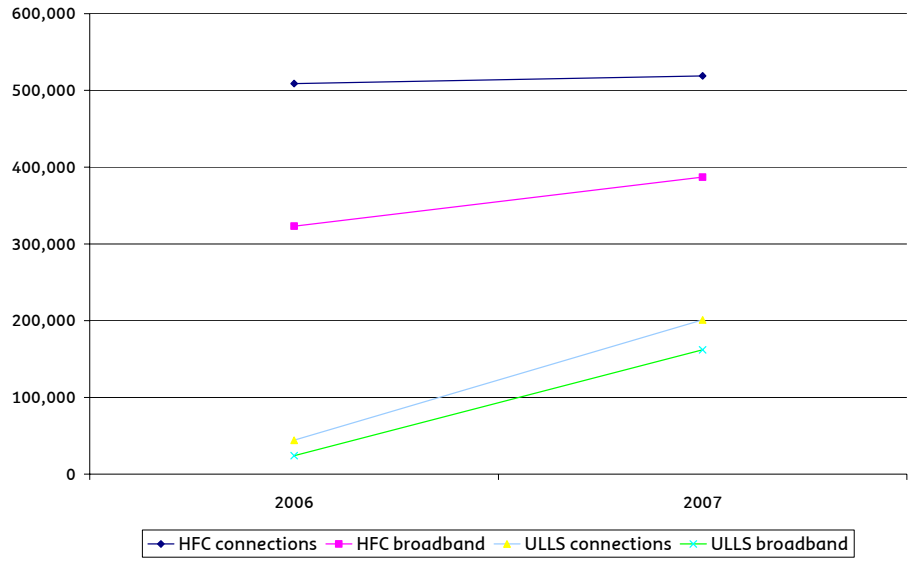
Source: SingTel Optus; Virgin Media

46 This trend appears to be accelerating. In its latest financial report, SingTel Optus reports that ULLS-based telephony, including for wholesale services, grew by 355% year-on-year[52]. In the last quarter alone, SingTel Optus added 70,000 ULLS telephony customers. Its HFC broadband growth was 23% in the last year, but even this was outstripped by ULLS broadband growth of 675%. SingTel Optus added 66,000 ULLS broadband lines in the last quarter. In the same period, it added only 6,000 new connections to its HFC network[53].

52 SingTel and subsidiary companies, Management Discussion and Analysis of Financial Condition, Results of Operations and Cash Flows for the Second Quarter and Half Year ended 30 Sept 2007..

53 Optus no longer separately reports its HFC telephony subscriber numbers.

Figure 16: Growth in SingTel Optus' ULLS connections compared to HFC connections



Source: SingTel Optus and subsidiary companies, Management Discussion and Analysis of Financial Condition, Results of Operations and Cash Flows for the Second Quarter and Half Year ended 30 Sept 2007.

47 The difference in the ratios between on-net and off-net services is not fully explained by the difference in Virgin Media's national cable coverage figure of 50% of UK homes compared to SingTel's Optus' coverage of around 30% of homes. As Virgin Media does not use access services within its cabled areas, its on-net figures represent 100% of its telephony and broadband subscribers within its cable network footprint. By contrast, in New South Wales, Victoria and Queensland SingTel Optus has DSLAMs in almost 80% of the ESAs in which it has HFC.

48 The higher number of on-net telephony and broadband subscribers which SingTel Optus would achieve if it was performing at Virgin Media's levels would account for a substantial proportion of the ULLS services which SingTel Optus appears to utilise within its HFC footprint. Under the "SingTel Optus imputed based on Virgin performance" analysis (see Figure 9 and Figure 10), its HFC network connections would rise from 519,000 to 702,000. In the latest financial reports SingTel Optus says it has 201,000 ULLS telephony subscribers and 162,000 ULLS broadband subscribers. Some of these services may be "doubled up" on the same ULLS SIO. The distribution of SingTel Optus ULLS across ESAs is also confidential. But given the high overlap between ESAs with HFC and SingTel Optus DSLAMs it is reasonable to assume that a substantial proportion of these ULLS services are in HFC ESAs. If so, half or more of the possible difference between SingTel Optus' current HFC connections, and the higher imputed number based in Virgin Media performance, could be accounted for by ULLS services. Telstra has proposed that the Commission request information from Telstra wholesale which it will be able to match with information on SingTel Optus' HFC network to get a more complete picture of the overlap (see Section H).

D There is no plausible technical or commercial reason why SingTel Optus does not use its infrastructure in preference to Telstra's

49 In Section C, Telstra showed that SingTel Optus is not utilising its HFC network to a level comparable with its overseas peers. In this section, Telstra will show why the SingTel Optus HFC Network is 'fit for purpose' and its conduct cannot be explained away by the litany of excuses offered by or on behalf of SingTel Optus for its relative poor record of customer take up, which include[54]:

(a) its network is too small and lacks the scale to succeed;

(b) many (ie 800,000) homes in the HFC footprint are "not serviceable" because they are not attractive or viable to service, including multiple dwelling units (MDUs);

(c) HFC technology is simply not up to scratch;

(d) the HFC network has been rendered unviable because of the overlap with Telstra's HFC network; and

(e) its principal pay TV rival controls content.

50 In fact, within the constraints of the technology and customer connection policies SingTel Optus chooses to apply to itself, it does as well as many overseas cable companies. The SingTel Optus HFC network is clearly 'fit for purpose'. The problem arises where SingTel Optus chooses not to use its HFC network because of the ready availability of low-priced access services.

D.2 SingTel Optus' HFC network is of comparable scale to overseas cable networks

51 It has been argued that the SingTel Optus network is too small and too geographically confined to provide a competitive substitute to Telstra's ubiquitous PSTN. However, the SingTel Optus HFC network is comparable in geographic reach and scale to the cable networks deployed by competitors in overseas markets – networks that have been a catalyst for vigorous infrastructure-based competition. The deployment of individual HFC networks within geographically confined areas is the norm overseas:

(a) there are other countries where cable has been deployed in geographically discrete "pockets", such as the UK with cable penetration of nationwide of approximately 50%. Telstra's New Zealand subsidiary, TelstraClear, has deployed a HFC network which passes 150,000 homes in Wellington and Christchurch. Although this is only equivalent to a national cable penetration of 9%,[55] TelstraClear has achieved a take-up rate of 50% of homes passed;

(b) even in countries where cable penetration is much higher than Australia, this coverage is comprised of separate local and regional networks. For

[54] SingTel Optus Submission to ACCC on Telstra Application for LCS and WLR Exemptions, November 2007

[55] New Zealand Census 2006.

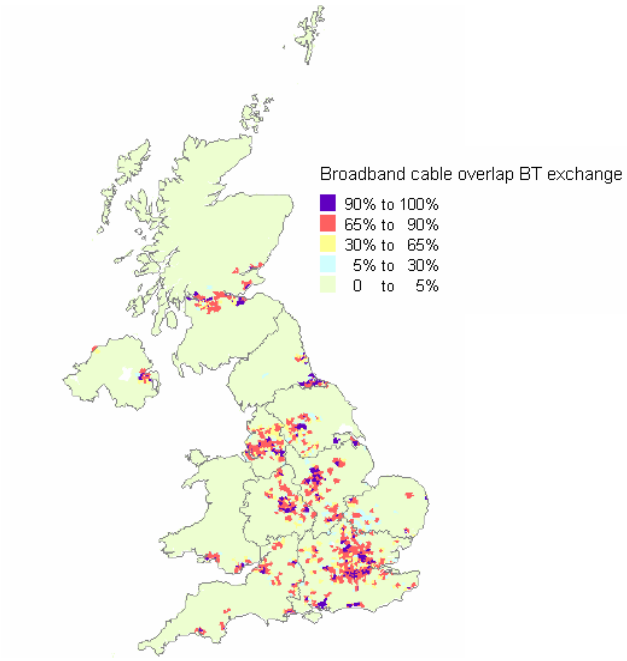
example Canada, which has nationwide penetration of over 95%, has at least 6 major cable operators operating in separate geographic "pockets". The Netherlands, which has nationwide cable penetration over 90%, has at least 4 major cable groups operating in separate parts of the country. Switzerland, which has nationwide penetration of over 85%, has 252 cable operators. These countries rank consistently rank at the top f the OECD broadband league table;

(c) at best, overseas cable operators have a collection of regional network "pockets" across the country, for example, Time Warner or Cox Cable in the US and Rogers in Canada, and therefore could be said to get some sort of "national" scale. However, most cable operators are confined to a single geographic market or part of the country and are as successful in their respective markets. For example, Videotron operates in contiguous areas in Quebec in Canada, offers broadband services with speeds up to 20Mbps, and is experiencing annual growth of 24% in its broadband base and over 100% in its telephony base; and

(d) like competitive HFC networks, many of the new fibre-based FTTP networks being deployed by entrants in overseas markets are at a city or local level and are substantially smaller than the SingTel Optus HFC network. For example, in Hillegrom, a small town between Amsterdam and the Hague comprised mainly of single dwellings, a new FTTP has achieved a take-up rate of 85% of the 7,400 homes it passes for at least one of its services (Pay TV, telephony or broadband), winning customers both from the nationwide PSTN incumbent KPN, and Casema, one of the longest established Dutch cable operators. In any event, SingTel Optus has a substantial national presence through its cable network throughout three of Australia's largest cities.

52 Figure 17 shows that the percentage of BT exchange areas in which Virgin Media passes at least 65% of homes, is less than 20%.

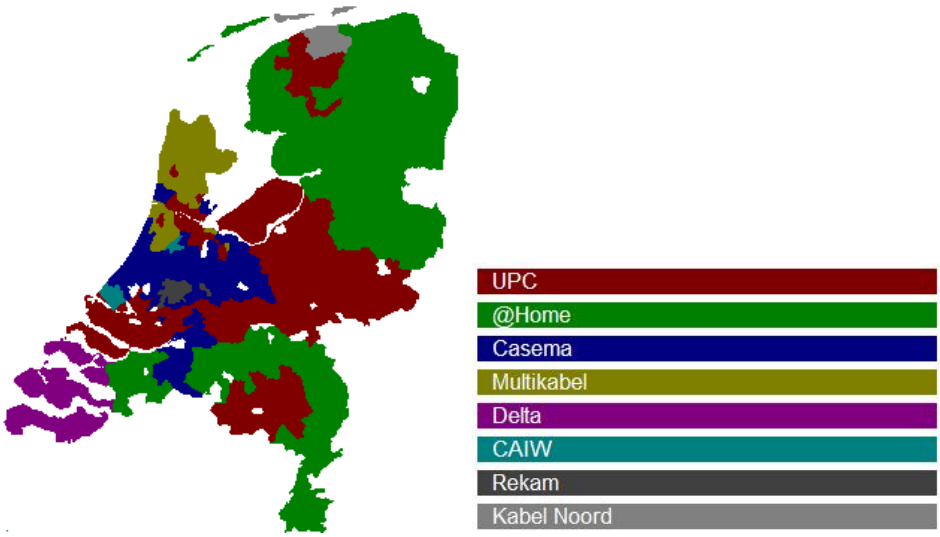
Figure 17: Degree of broadband cable overlap in BT exchange areas



Source: Ofcom, *Review of the wholesale broadband access markets*, 2006/07

53 The geographic fragmentation which occurs even in countries with high cable coverage is illustrated in Figure 18, which shows the service area of the Dutch cable operators:

Figure 18: Service areas of Dutch cable operators



Source: digitale kabeltelevisie at http://www.digitalekabeltelevisie.nl/, accessed 12 December 2007

54 On subscriber numbers, SingTel Optus ranks as a significant cable operator internationally. As Table 4 shows, SingTel Optus would rank 11th amongst the largest cable operators in the US, the world's largest cable market which has hundreds of cable operators. Table 5 compares SingTel Optus to cable operators in other countries.

Table 4: Number of SingTel Optus subscribers compared with those of US cable companies

SingTel Optus compared with US cable market service providers[56]		
Rank	**MSO**	**Basic subscribers**
1	Comcast Cable Communications	24,141,000
2	Time Warner Cable	13,391,000
3	Cox Communications	5,424,000
4	Charter Communications	5,376,800
5	Cablevision Systems	3,139,000
6	Bright House Networks LLC	2,327,100
7	Suddenlink Communications	1,416,800
8	Mediacom Communications Corp.	1,344,000
9	Insight Communications	1,341,100
10	CableOne	696,700

[56] Source: National Cable & Telecommunications Association, *Cable operators ranked by number of subscribers: Top 25 Cable Operators,* June 2007 online at www.ncta.com..

SingTel Optus compared with US cable market service providers[56]		
11	SingTel Optus[57]	519,000
12	WideOpenWest	361,400
13	RCN Corp.	355,000
14	Bresnan Communications	294,900
15	Service Electric	288,700
16	Atlantic Broadband	285,700
17	Armstrong Group of Co.	232,500
18	Knology Holdings	221,800
19	Midcontinent Communications	199,100
20	Pencor Services	183,400

Table 5: SingTel Optus subscriber numbers compared with overseas MSOs

MSO	Country	Basic subscribers
Virgin	UK	4,854,500
Casema/MultiKabel/essenet[58]	Netherlands	3,400,000
Videotron	Canada	2,500,000
Shaw	Canada	2,300,000
UPC	Netherlands	2,235,000
Cogeco[59]	Canada	1,484,090
i-Cable[60]	Hong Kong	786,000
SingTel Optus	Australia	519,000
Star Hub	Singapore	499,000
Eastlink Communications[61]	Canada	260,000
CAIW[62]	Netherlands	140,000

55 Comparing SingTel Optus with local and regional cable operators in other countries is supported by the trend to define markets for the purposes of regulation on a more localised or regional basis, including in countries where there is only partial network overlay on a national basis.

(a) The ERG has said[63]:

> *[g]iven the impact of scale effects on competitive conditions in different areas of a country, the national market structure may become more heterogeneous as the NGA roll-out may not happen everywhere.*

(b) Professor Cave states in his report at Annex 1[64]:

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57 SingTel and subsidiary companies, Management Discussion and Analysis of Financial Condition, Results of Operations and Cash Flows for the Second Quarter and Half Year ended 30 Sept 2007.

58 *Verkenning van omroepmarkten in Nederland Marktontwikkelingen en beleidsinstrumenten*, TNO, February 2007; Dutch subscriber numbers are from Q2 2006.

59 Cogeco, (2007) *Cable sector customer statistics*, 2003-2007.

60 i-Cable, Annual Report 2006, Results highlights, online at http://www.i-cablecomm.com/ir/annual/2006/06eng_resultsH.pdf

61 Telstra estimate.

62 Prime Newswire, *First European Cable MSO Joins MoCA*, 28 August 2007, online at www.primenewswire.com

63 European Regulators Group, (2007) *ERG Opinion on Regulatory Principles of NGA*, ERG (07) 16rev2, at XIII.

> *There is also evidence of EU regulators in markets without ubiquitous alternative networks are recalibrating regulation matched to the presence of alternative networks in 'pockets'. The standard test for a geographical market – homogeneity of competitive conditions within it – tends to yield national markets when there is a 'patchwork quilt' of areas with different endorsements of infrastructures which are however united by a uniform retail price imposed by the regulator on the incumbent in. But this story generally does not work for broadband, the retail price of which is not regulated. In such circumstances there is a strong argument for permitting differentiated geographical treatment, either at the stage of market definition or of remedies. The feasibility of doing this has been demonstrated in New Zealand, where the geographical scope of access regulations change almost in real time, as competitive build out occurs*.

Once the performance of overseas local and regional cable networks is legitimately decoupled from a national market definition, a comparison can reasonably be made between the performance of the SingTel Optus HFC network and the performance of cable networks in other countries, irrespective of the national cable network penetration figures.

D.3 There is more scale available to SingTel Optus

56 The current subscriber numbers understate the scale achievable by SingTel Optus on its HFC network, for 4 reasons.

57 First, while broadband penetration has been growing, Australia still ranks down the OECD league table and there is room for growth. As the overseas experience discussed in section C shows, cable operators are well positioned to ride the broadband wave if they make the investment in high speed services.

58 Second, there are probably a large number of premises physically connected to the SingTel Optus network, but which are not currently activated. In the early days of subscription television by cable in Australia, there was significant churn both between FOXTEL and Optus Vision and away from each of the pay TV operators. As a result, a very large number of premises will already have a "drop cable" from the SingTel Optus aerial HFC network to the premises. The installation of the drop cable is usually the most expensive element in connecting premises to an HFC network. Assuming that Telstra's HFC network can be regarded as a proxy for the Optus network in limited circumstances, Telstra is of the view that Optus is likely to have drop cables installed to more than 500,000 homes which are currently not Optus customers.

59 Third, there is a natural process of "infill" within network areas as single dwelling units are replaced by multi-dwelling units and vacant lots are built on. Telstra estimates that the number of individual premises within its HFC network boundary has increased from 2.5 million in June 1997 to 2.67 million. On this basis, the number of premises passed by the SingTel Optus HFC should have increased from 2.2 million to approximately 2.3 million.

60 Fourth, and most importantly, SingTel Optus treats only 1.4 million out of 2.2 million premises passed by its network as "serviceable", and abandons the other 800,000 (36% of the homes passed on the 1997 rollout figures). Telstra's

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[64] Prof. Cave, (2007), *Applying the ladder of investment in Australia*, Annex 1, p.6.

experience of its HFC networks is that less than 7% of premises are too difficult, too technically complex or too expensive to connect because, for example, they are a long distance from the street or the cabling has to cross the property of another customer who will not give consent. Table 6 illustrates the growing gap between the proportion of homes treated as serviceable by Telstra and SingTel Optus for their respective HFC networks. The increase in homes passed for both networks between 1998 and 2007 represents "infill" (see above). Telstra also has invested in improving its proportion of homes passed which are serviceable. SingTel Optus treats more than 5 times the number of homes as unserviceable as Telstra, and the gap is likely wider on an imputed homes passed basis.

Table 6: Homes passed and serviceable – Telstra and SingTel Optus

HFC	Homes Passed	Homes Serviceable	Serviceable	Not serviceable
SingTel Optus 1997	2,200,000	1,400,000	63.64%	36.36%
Telstra 1 January 1998	2,505,977	2,065,786	82.43%	17.57%
Telstra 23 November 2007	2,667,387	2,491,868	93.42%	6.58%
SingTel Optus imputed November 2007	2,341,702	1,400,000	59.79%	40.21%

Source: Telstra for Telstra data which excludes businesses, SingTel Optus for SingTel Optus data from "Optus Submission to the Australian Competition and Consumer Commission on Telstra Application for LCS and WLR Exemptions", 5 November 2007,

61 Telstra's 6.5% unserviceable homes is consistent with international practice. For example, Virgin Media treats 94% of homes as "serviceable" for all three of its core services (Pay TV, telephony and broadband), which is similar to the Telstra count. This percentage is likely to increase significantly with the completion of a major network upgrade in London.[65]

D.4 The missed opportunity of MDUs

62 A substantial proportion of the premises SingTel Optus considers not to be serviceable are MDUs.

63 SingTel Optus openly acknowledges that it has a blanket policy of not wiring up any MDUs[66], giving the following reasons[67]:

(a) in most cases, SingTel Optus' original network design did not accommodate MDUs;

(b) difficulties in securing commercial agreement from body corporates;

(c) lack of space to install the type of bulky equipment SingTel Optus still uses to deliver cable telephony;

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65 Virgin Media, Annual Report, 2006 at p. 16.
66 SingTel Optus Submission to ACCC on Telstra Application for LCS and WLR Exemptions, November 2007, par 2.41.
67 SingTel Optus Submission to ACCC on Telstra Application for LCS and WLR Exemptions, November 2007, par 2.42.

(d) the lack of multi-line equipment available from SingTel Optus' vendor; and

(e) the physical awkwardness of its HFC telephony network equipment (including splitter boxes), making it difficult to retrofit HFC telephony for individual MDUs.

64 In the cable industry generally, MDUs are treated as attractive, concentrated clusters of customers and potential customers who can be serviced with limited network extension requirements. Indeed, high customer penetration for broadband services in some countries is often attributed to the presence of MDUs and their superior economics of density. Citing fibre operator Fastweb's policy of almost exclusively targeting MDUs, the Europe FTTH Council states that the large number of MDUs in Italy is an advantage in terms of alternative network rollout: "High levels of population urbanization and MDU density contribute positive factors to Italy's operational factors."[68] Similarly in Korea, MDUs are identified as a factor assisting broadband development[69]:

> *The combination of high population density, prevalence of multi-dwelling units (MDUs), and extensive new residential and other construction has been very favourable to the roll-out of fibre, cable and DSL networks. According to the MIC, more than half of the population live in apartments where VDSL technology's short transmission range is not a critical issue.*

65 Conversely, the prevalence of single dwelling units (SDUs) in Australian suburbs is given as an explanation for the lower level of broadband penetration here. Therefore, one would think that when SingTel Optus's network passed by an MDU, it would be anxious to "mine" that MDU for all the additional customers it could give for the price of a single backbone install.

66 In Telstra's view, the challenges faced by SingTel Optus in servicing MDUs are far from prohibitive, and are even less so looking forward due to technological advances.

67 The technical issues of space, physical awkwardness and lack of multi-line equipment (reasons (c), (d) and (e) above) appear to arise from essentially the same issue: SingTel Optus is using ten-year-old telephony technology which requires bulky equipment in addition to the equipment required to support the broadband service. If SingTel Optus upgraded to the latest version of cable telephony technology, such as VoB, it would not need to haul its large boxes into MDUs.

68 The network design issue (reason (a) above) cited by SingTel Optus appears to be a reference to the fact that most MDUs cannot be served directly from the street: they require amplification equipment to ensure appropriate signal strength, "backbone" cabling up the vertical risers of the MDU building, and lateral cabling into each living unit. This is not an issue of fundamental design constraints within the SingTel Optus HFC, as all cable networks, including the FOXTEL network, face the same issues in serving MDUs. SingTel Optus may have to do more work to serve MDUs than SDUs, but there are also more customers sitting inside from which to generate revenue to cover the costs of that additional work.

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[68] J Doran, The Yankee Group, 'Mass-market fiber remains distant on the European horizon', December 2004, p. 8, online at http://www.ftthcouncil.eu/documents/articles/Articles_Yankee_study.pdf.

[69] Dan Maldoom (2005), *Broadband in Europe: How Brussels Can Wire the Information Society*, pp 163-164.

69 Standard cable industry practice is to complete MDU wiring once customers in these MDUs have signed on, or to coincide with marketing plans in that area. It is therefore unsurprising that SingTel Optus' original network design did not actually complete these extensions, but left them to be done as and when customers signed up. To the extent that SingTel Optus suggests their original network designers did not contemplate connecting MDUs, this is implausible (as is clear from SingTel Optus' assertions at the time that it would offer service to 50% of Australians).

70 SingTel Optus' reason (b) – that they have difficulties securing body corporate agreement – is on par with the challenges faced by Telstra and Austar in acquiring new cable customers in MDUs. More effort is involved than individual SDUs, but again there are more customers per network connection. SingTel Optus' disinterest in MDUs stands in stark contrast to the practices of other cable and pay TV operators in Australia:

(a) Telstra has consistently and systematically tackled the commercial challenges of gaining body corporate agreements, with the result that around two-thirds of MDUs in Telstra's cable footprint have been "backboned";

(b) Austar has cabled a significant number of MDUs to deliver its satellite pay TV service, with only one revenue stream (pay TV) to defray the cost;

(c) MDU access agreements, at least for the FOXTEL network, are not exclusive; and

(d) it is Telstra's experience that most new blocks of units are pre-wired by the developer for the delivery of cable services using coaxial cable.

71 Overseas regulators have been concerned about competitor access to MDUs. Regulators have taken action in the US and Hong Kong to prevent exclusive arrangements between carriers and building owners and to require building owners to give non-discriminatory access[70]. The premise of this regulatory intervention is that MDUs can and should be served by multiple networks.

72 Telstra has not entered exclusive access arrangements with MDU owners. SingTel Optus may argue that, while there is no formal exclusivity in Australia, the opportunity for wiring up MDUs, in practice, is lost once the first network is present. In many markets, the second-in or third-in competitor faces a challenge in winning away customers from the first-in competitor. That dynamic often drives particularly intense competition. For example, RCN is an overbuilder in the US. In those cities where it operates where there is a high proportion of MDU (that is, New York and Chicago), substantially all of its subscribers are MDU based. However, RCN also targets MDU in cities and areas which have a housing mix more comparable to Australia. These were set out in RCN's 2Q 2007 investor update, as shown in Table 7, which sets out the percentage of connected premises in MDUs compared the total number of premises connected:

[70] Federal Communications Commission, First Report and Order and Further Notice of Proposed Rule Making regarding competitive access to multiple tenant environments, FCC 00-366, 12 October 2000; Office of the Telecommunications Authority, *Information note for Incorporated Owners and Building Management Office of Building regarding Access to Buildings by Network Operators with section 14 Authorization granted by the Telecommunications Authority under the Telecommunications Ordinance*, 2 July 2005, online at http://www.ofta.gov.hk/en/Inbuilding/system/bmo_notes.pdf.

Table 7: Proportion of MDUs in RCN MDU target areas

Area	% MDU
Boston	41
DC Metro	51
Eastern Pennsylvania	23

Source: RCN 2Q 2007 investor update

73 An advantage which SingTel Optus has over overseas overbuilders is that it can use its HSDPA network to provide broadband and voice services to individual subscribers within an MDU. Inquiries of the SingTel Optus customer help desk suggest that it is using HSDPA as an alternative in HFC areas.

74 SingTel Optus' reluctance to serve MDUs goes beyond backboning as-yet unwired MDUs. Telstra believes that *even where MDU backbone wiring is in* place, Optus is refusing cable service to MDU customers – instead requiring them to take copper-based services using Telstra's wholesale offerings.

75 SingTel Optus has a self censoring policy that reduces its scale within its cable footprint by 800,000 potential customers. Even if it won only 25% of the customers in MDUs, compared to the 37% rate it claims for "serviceable homes", SingTel Optus would increase its HFC subscriber base by a third.

D.5 HFC technology is highly competitive

76 It has been suggested that the HFC-based technologies deployed in the SingTel Optus network are somehow inherently inferior to those deployable on the PSTN. However, this is not borne out by the competitive position achieved by the overseas cable networks nor by the capabilities of the latest generation of cable technologies.

77 The development of a broad range of standards associated with the delivery of voice and data services using HFC networks has been brought about by the creation of CableLabs in the US. This organisation is able to create standards on a rapid basis which are then used by vendors to deliver low cost customer premises equipment. The wholesale cost of basic cable modems is comparable to the cost of ADSL modems.

78 The early versions of CableLab's standards, called Data Over Cable Service Interface Specifications (**DOCSIS**), initially focused on residential services, beginning with pay TV and expanding to asymmetrical broadband services to support downloading from the Internet. As

Table 8 shows, subsequent versions of DOCSIS have been developed to support business-grade data and telephony services and multi-channel, multi-media services.

Table 8: Progression of DOCSIS services supported

Services Supported	DOCSIS Version			
Services supported	1.0	1.1	2.0	3.0
Broadband Internet	X	X	X	X
Tiered Services		X	X	X
VoB		X	X	X
Video Conferencing			X	X
Business Services			X	X
T1/E1 Voice and Data Services			X	X
Private Networks for Business (L2VPN)			X	X
Entertainment (Switched Digital Video)				X
Downstream Channel Bonding				X
Source Specific Multicast				X
QoS for IPTV Multicast				X

Source: CableLabs

79 The SingTel Optus HFC was originally deployed with DOCSIS 1.1. It has not been subsequently upgraded to support the following standards. As Table 9 shows, SingTel Optus lags behind other cable operators:

Table 9: Cable operator standards and date of upgrade

Cable operator	Current standard	Date of upgrade
Starhub (Sing)	DOCSIS 3	End 2006
GCI (Anchorage)	DOCSIS 3	End 2007
Eastlink (Canada)	DOCSIS 3	Mid 2008
Rogers (Canada)	DOCSIS 2	2004 and trialling DOCSIS 3
Cogeco (Canada)	DOCSIS 2	2005
Shaw (Canada)	DOCSIS 2	2005
UPC (NL)	DOCSIS 2	2004 and trialling DOCSIS 3 for launch 2008

Source: Gilbert + Tobin; CRA International

80 As explained in Annex 2, the DOCSIS standards are backwards compatible and cable networks can be readily upgraded without requiring outdoor plant or CPE to be swapped out. If SingTel Optus followed the lead of the overseas cable operators, its HFC network could be used to provide all of the services which are provided using ULLS. The investment required by SingTel Optus to be able to offer business grade, voice, E1 and Layer 2 virtual private network (**VPN**) services is low. Further, Optus could use its existing IP based core network to work with its existing cable modem termination systems in order provide high quality voice services using its HFC network. Telstra's technical expert has estimated that the costs of SingTel Optus upgrading its HFC to a higher DOCSIS standard where required and using existing cable spectrum, would be a few million dollars.

81 SingTel Optus also has a distinct advantage in upgrading its cable network compared to overseas cable operators. The main technical limitation on the deployment of new services by HFC network operators is the scarcity of both upstream and downstream spectrum. Typically, this is caused by a requirement

by the cable operator to carry both analogue and digital television services. In the US, the issue is also compounded by a limited amount of spectrum for upstream services. Cable operators had to spend significant capital in deploying nodes to reduce the number of homes supported by each node. Some US cable operators are down to less than 500 homes per node.

82 SingTel Optus does not face this problem because pay TV is only carried in digital form on its HFC network. As a result, SingTel Optus has significant amounts of both upstream and downstream spectrum that could be used for the delivery of both internet access services and more advanced services such as voice and business services. SingTel Optus currently has about 2,000 homes per node. While this ratio may need to be reduced as subscribers grow and more data intensive services are offered, SingTel Optus faces a far less demanding pathway to upgrade than the US cable operators.

83 The only constraint that SingTel Optus faces on its upstream spectrum is its decision to continue to use an obsolete technology for the delivery of voice services. SingTel Optus uses a technology known as constant bitrate or CBR technology, introduced in the mid 90s, replaced on most of the major overseas cable systems by VoB-based services supported by the same cable modem that supports broadband services. The dated CBR technology uses significantly more upstream spectrum than current cable telephony technologies. CBR technology is also expensive and inefficient because it requires large customer premises equipment on the outside of the building, known as customer access units, which take more time, effort and skills to deploy than a cable modem supporting VoB.

Case study:

Videotron is a cable operator based in Quebec, Canada. Its cable footprint covers 2.3 million homes. Videotron launched its VoB service two and a half years ago. By mid 2007, its VoB telephony service was available across 85% of its cable network. Within the first two years, Videotron acquired 388,000 residential telephone subscribers. In the last six months, it has added another 120,000 – an annualised growth rate of nearly 60%.

D.6 Overbuilders can be viable too

84 SingTel Optus' argument that its scale economies are undermined by the presence of the Telstra HFC network are not consistent with the overseas experience of HFC and fibre operators who overbuild in areas where there is both an existing incumbent PSTN and cable network.

85 Overbuilders in the US are viable and successful. For example, three of the larger overbuilders in the US are RCN Communications, WOW and Knology. Although "third-in", each of these networks has obtained a viable market share. WOW was voted "highest in customer satisfaction in North Centre US" by J.D. Power & Associates[71]. As can be seen from Table 4, these networks have comparable customer bases to that of SingTel Optus.

[71] JD Power and Associates (2006) Internet Service Provider (ISP) Residential customer satisfaction study, 20 September 2006.

86 FTTP based operators are also entering metropolitan residential markets in the US and some European countries, over-building both the incumbent's DSL network and the existing cable network. These third networks have proven to be highly successful, although lacking the scale of both incumbent and the cable operator.

Case study:

In Hillegom, a small town (7,431 homes) halfway between Amsterdam and The Hague, a 100% FTTH rollout began in March 2006 and was completed in mid October. The network is built and operated by Lijbrandt Telecom, recently acquired by Dutch billionaire Dik Wessles.

The project in Hillegom is known by the name of the CPE used in subscriber homes: Kadaka (KAstje Dat Alles Kan, box that can do everything). By August 2006, the FTTH network had passed 5,400 of the 7,432 homes of which some 4,600 (or 85%) of homes have subscribed to one or more services (TV, telephone, Internet). The uptake of TV is 3,950 homes (73%), a churn from local cable operator Casema.

The uptake of the telephone service is also 73% , a churn from Casema and local incumbent telco KPN. So in Hillegom Casema and KPN are left to battle it out for of the remaining 27%.

The Hillegom network is so successful that the company will start a FTTH project in nearby Lisse in October (10,000 homes) and it has decided to roll out FTTH in the whole '(Tulip) Bulb region' (Bollenstreek in Dutch). That comprises 120,000 homes to be rolled out in the next 36 months in the very heart of the Randstad, the Netherlands's most populated area (Amsterdam, The Hague, Rotterdam, Utrecht and the territory between those cities).

87 In any event, SingTel Optus' subscriber numbers show how well it has been able to compete despite the presence of the Telstra HFC network:

(a) SingTel Optus has more cable modem customers than Telstra, although its number of premises passed (and its 'serviceable' homes) is smaller than Telstra. SingTel Optus has 387,000 HFC broadband subscribers at 30 September 2007, up from 323,000 a year before. SingTel Optus reports that, as at June 2007, 37% of its 1.4 million "serviceable homes" are connected to the SingTel Optus HFC network, up from 36% a year ago, with a bundling rate of 77%, up from 75% a year ago[72]. This compares to 336,000 broadband subscribers on the Telstra HFC network.[73] Telstra's network passes 2.8 million homes, which is a penetration rate of 12% of homes passed. With half the target premises of Telstra, SingTel Optus has 15% more broadband subscribers; and

(b) SingTel Optus' take-up of broadband services in the homes its treats as serviceable is as high as cable operators in overseas markets which are the only network overlaying the incumbent telco's network, including

[72] The % of customers who take local telephony plus at least one of broadband, dial-up internet of pay TV.
[73] Telstra Annual Report 2007.

amongst the former monopoly cable companies which have ubiquitous connections for basic pay TV.

D.7 SingTel Optus has access to all of the pay TV content that Telstra's cable carries

88 Under a content equalisation deal struck in 2002, SingTel Optus gained access to all of the pay television content that FOXTEL offers on Telstra's cable. As part of the arrangements to win the Commission's approval of that deal, FOXTEL made several court-enforceable undertakings regarding the non-exclusivity and availability of content it acquires. According to SingTel Optus, these arrangements "*provide an effective regime for retail network operators to access FOXTEL's content.*" [74]

89 In 2005, SingTel Optus entered a further deal to resell FOXTEL's digital pay television services via the SingTel Optus HFC cable, ensuring its pay television product would carry a content package equivalent to that offered over Telstra's HFC.

90 As a result, SingTel Optus' HFC cable now carries all of the 'best-available' content, as well as a wider range of content than Telstra's cable.

D.8 Evidence shows the SingTel Optus HFC network is 'fit for purpose'

91 The lack of credible excuses offered by SingTel Optus for its HFC network is demonstrated by the fact that the take-up rate in the homes SingTel Optus treats as serviceable is similar to take up rates for overseas cable networks. This clearly shows that the SingTel Optus HFC network is 'fit for purpose' as a competitor to the Telstra copper network and HFC network and other competing access networks, such as broadband wireless.

92 On the most recent ABS data, approximately 46% of homes in metropolitan areas have broadband.[75] The 387,000 HFC broadband subscribers SingTel Optus reports is equivalent to a 28% penetration role of the homes SingTel Optus defines as "serviceable". While the ABS broadband penetration figures represent an average (with Sydney having a higher) penetration, it still suggests that SingTel Optus, in its "serviceable homes" pool, is capturing approximately 64% of the total broadband lines provided by cable, DSL or wireless.

93 SingTel Optus' broadband and telephony penetration figures of its serviceable homes also compare favourably with the overseas cable operators. For example:

(a) Virgin Media reports a cable telephony penetration of 35% and a broadband penetration of 28%; and

(b) TelstraClear's HFC network in New Zealand connects 50% of the homes passed. TelstraClear has a broadband update of 27% of homes passed.

94 SingTel Optus has argued that it cannot be expected to do as well as the former monopoly cable operators in overseas markets because they have a much easier job upselling broadband and telephony across their existing ubiquitous customer base than a new entrant like SingTel Optus selling "cold" to new

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[74] Optus letter to Asa Masterman, DCITA, 29 July 2003, at http://www.dcita.gov.au/__data/assets/word_doc/10988/Optus.doc

[75] ABS 2007, *Patterns of internet access in Australia*, November 2007.

subscribers. However, SingTel Optus has broadband penetration figures which equal or exceed those of the former monopoly cable operators in the US and the Netherlands:

(a) while US cable penetration is 70%, US cable companies have only achieved an average broadband penetration of 27% of homes passed, which is similar to the SingTel Optus' 28% broadband penetration figure for its "serviceable" homes;

(b) similarly, in Switzerland, which has one of the highest cable TV penetrations in Europe at 85% of homes, the cable operators have a broadband penetration of approximately 24%;

(c) Starhub, which passes 99% of Singapore's million homes, has achieved a broadband penetration of approximately 34%; and

(d) the Dutch cable penetration is over 90% of homes passed, but most of the cable companies report broadband penetrations similar to SingTel Optus', as shown in Table 10:

Table 10

Operator	Homes connected (basic cable)	Broadband subscribers	Broadband penetration rate
UPC	2,204,700	526,000	25.8%
Casema	1,344,932	400,000	29%
MultiKobel	318,000	141,000	40%
Essent	1,739,842	595,000	34%

Source: OPTA

95 SingTel Optus is also achieving bundling rates that compare favourably to the former monopoly cable operators overseas. SingTel Optus reports that 77% of its customers take more than one product. Shaw, Canada's second largest cable operator, only manages to sell bundles to 55-60% of its customers. In New Zealand, TelstraClear sells two or more services to approximately half of its customers. In Singapore, only 52% of Star Hub's customers take two or more services.

96 In addition, SingTel Optus, as a telco developing its own cable network, actually has a number of *advantages* over standalone cable operators in other markets. As depicted in Table 11, the extent and diversity of its networks gives SingTel Optus an advantage in being able to deliver broadband and other services across multiple platforms, by building and marketing service bundles, such as "quad play" packages of fixed voice, broadband, pay TV and mobile voice and data.

Table 11: International comparison of network scope by operator

Cable operator	National backbone	Business fibre network	International network	Mobile network	Satellite network
SingTel Optus	✓	✓	✓	✓ 2G + 3G	✓
Virgin Media (UK)	✓	✓	✓	× MVNO only	×
Rogers (Canada)	✓	✓	✓	✓ 2G + 3G	×
Cogeco (Canada)	✓	✓	×	×	×
Starhub (Sing)	limited	✓	✓	✓	×
Time Warner	✓	✓	×	×	×
GCI (Anchorage, US)	×	limited	×	×	×
Cox (US)	✓	✓	✓	×	×
UPC (NL)	✓	✓	✓	× MVNO	×
Videotron (Canada)	×	✓	×	× MVNO	×
Shaw (Canada)	✓	✓	×	×	✓
Casema (NL)	✓	✓	×	×	×
TelstraClear (NZ)	✓	✓	✓	**resale**	×

97 The opportunity for quad play packages was a major driver in the merger between Virgin Mobile and NTL Telewest[76]:

> *With both cable operators and telcos able to complete on triple-play services, it was only a matter of time until they decided to up one level and go for the latest in super-bundling: Quad-play service provision. Selling multi-channel TV, fixed telephony, broadband and cellular subscriptions under one brand, billing system and contact center is something that offers a number of potential benefits to both operators and subscribers.*

98 Other cable operators also have pursued mobile resale and MVNO arrangements to offer quad play, including Time Warner partnering with Sprint Nextel and the cable operators in Canada and the Netherlands (listed in Table 11 above) entering into their MVNOs. SingTel Optus has an advantage in offering quad play services because it owns its own 2G and 3G networks.

D.9 What's the real story about the SingTel Optus HFC network?

99 An apparently contradictory picture emerges of the SingTel Optus HFC network. On the one hand, as detailed in Section B, the SingTel Optus HFC network

[76] http://www.cablelabs.com/news/newsletter/SPECS/JanuaryFebruary_2007/story8.html

appears a relatively weak performer compared with overseas cable networks on a homes passed basis (or the much higher percentage of homes treated as serviceable by overseas cable networks). This is certainly the image projected by SingTel Optus in its regulatory positioning to hang onto regulated services.

100 Yet on the other hand, where SingTel Optus chooses to use its HFC network, the take-up of services on the SingTel Optus HFC network ('run rate' past serviceable homes) compares well to over seas cable networks. It still lags in technology and innovation, but viewed through the 'run rate' lens, the Singtel Optus HFC network seems not to be the inherently flawed asset which SingTel Optus seems to make out.

101 This contradictory picture turns around SingTel Optus' treatment of so many homes as unserviceable compared to overseas cable operators. While SingTel Optus' "run rate" in relation to its self-defined serviceable homes is strong, its overall performance is substantially diluted when the 36% of the passed premises regards as non-serviceable are added back in. Again, it is useful to compare SingTel Optus' HFC network with Virgin Media's. As Table 12 shows, Virgin Media and SingTel Optus have very similar penetrations of telephony and broadband in the homes they treat as serviceable – the difference, of course, is that SingTel Optus treats more than 1 out of every 3 homes it passes as unserviceable while Virgin Media treats 3 out of every 50 homes as unserviceable.

102 Table 12: SingTel Optus services compared on homes passed or homes serviceable

	Virgin Media		SingTel Optus	
	Homes passed	**Homes serviceable (94%)**	**Homes passed**	**Homes serviceable (62%)**
Broadband	26%	28%	16%	26%
Telephony	32%	34%	21%	32%

Source: Virgin Media Annual Report, 2006; SingTel Optus and subsidiary companies, Management Discussion and Analysis of Financial Condition, Results of Operations and Cash Flows for the Second Quarter and Half Year ended 30 Sept 2007.

103 Thus, there are two unique features of competition from SingTel Optus in its cabled areas compared to overseas cable networks. First, SingTel Optus has a uniquely low level of serviceable homes. Second, SingTel Optus has a uniquely high level of usage of regulated access services in its cabled areas. The central question in this exemption proceeding is how these two are linked.

104 The publicly available information from SingTel Optus provides little clue. Telstra proposes that the Commission require SingTel Optus to provide information about the criteria it uses to decide whether to connect customers within its HFC network footprint using regulated access or directly connecting them to its network (see proposed information to be request in section H). However, there are logically two alternative scenarios.

105 SingTel Optus could be using regulated access to connect customers within the 38% homes it treats as "non-serviceable" and not in the 64% of homes it regards as serviceable. This is a plausible explanation on the numbers. For example, assume that SingTel Optus would win only 25% of its non-serviceable premises compared to 37% of its serviceable premises. That would be a total of 200,000 premises. As noted above, almost 80% of SingTel Optus HFC ESAs overlap with DSLAM ESAs. If an even distribution of ULLS services is assumed across ESAs in which SingTel Optus has DSLAMs, the number of ULLS in HFC ESAs would be 268,000.

106 Alternatively, SingTel Optus could be using regulated services across both the separate pools of serviceable and unserviceable homes. For example, cable connections require field visits from SingTel Optus personnel or contractors and when the direct connection provisioning process becomes overloaded, SingTel Optus may fall back on ULLS for serviceable homes.

107 However, whichever of these scenarios apply, SingTel Optus cannot have it both ways. SingTel Optus cannot deny that the comparatively good uptake of HFC services within its self defined pool of serviceable homes shows that the HFC network is fit for purpose as an effective competitor against Telstra (and other providers of broadband services). Therefore, either of the two logically follow:

(a) If SingTel Optus is using regulated access services only to provide services to the 36% of homes passed it treats as unserviceable, it clearly does not need the continued right to access services in respect of the other 64% homes. This then raises the question why SingTel Optus' level of unserviceable homes is so large compared to overseas cable operators and whether the availability of regulated access is allowing SingTel Optus to abandon so many homes for the purposes of its HFC network.

(b) Conversely, if SingTel Optus is using regulated access services within the 64% of homes it regards as serviceable, this raises the question of why SingTel Optus needs to do so, and why it should be allowed to do so, given that SingTel Optus itself concedes it is feasible to connect these homes to its network.

108 The real problem is what SingTel Optus is not doing with its HFC network, given that it seems to work effectively when SingTel Optus does choose to use it to compete. Why does it connect customers within its HFC footprint using regulated access, why does it treat so many more homes as unserviceable than overseas cable operators, what incentives and opportunities does the current regulatory regime provide SingTel Optus to engage in this behaviour? We address these questions in the next section.

109 Whatever SingTel Optus' exact reasons, the problem is what SingTel Optus chooses not to do with its network because it has been given a "soft bed" of access in which to fall. Its failure to compete to connect almost 36% of homes passed impacts more than just those homes. It impacts the state of competition much more broadly, because it deprives all customers within its footprint – and potentially some outside - of the dynamic benefits of infrastructure competition, as we explain further below.

E Why is SingTel Optus' network under-used, and what should be done about it?

110 In this section, we discuss the evidence and expert opinion regarding SingTel Optus' use of Telstra access services. In particular, we:

(a) explore the reasons why SingTel Optus uses Telstra's network in preference to its own for a significant proportion of its business;

(b) explain why SingTel Optus' practices are inefficient and damaging to consumer welfare; and

(c) discuss a range of possible regulatory responses, and explain why granting Telstra's proposed exemption is the optimal response.

E.2 Reasons for under-utilisation

111 It is difficult to be certain, from publicly available material, exactly why SingTel Optus does not use its own network more extensively. Pricing – that is, wholesale access prices forced below SingTel Optus' marginal cost of self-provisioning – is the most obvious reason why SingTel Optus avoids using its own network for more than a third of the homes it passes. However, given the uniqueness of its behaviour internationally, the possibility that other factors are at work cannot be ruled out. Such factors may include:

(a) strategic corporate decisions about risk and capital deployment, leading it to under-invest in, and under-utilise, its own network[77];

(b) failure to update management beliefs based on historic own-network costs and/or previous technology set backs, continuing to believe that self-provisioning is more expensive and less reliable than Telstra's wholesale services; and/or

(c) strategic gaming behaviour[78].

112 If any of these factors apply, then the loss by SingTel Optus of regulated wholesale access in cabled areas will tend to correct the resulting distortions to build/buy decisions.

113 Telstra believes that a significant contributing factor has been the availability of ULLS at prices which are significantly below both Telstra's actual costs and SingTel Optus' own marginal costs of self-provisioning. These prices have been ratcheted down by the ACCC by around 60% in the last 5 years at a time when key inputs into those costs such as the prices of copper, labour and fuel have been rising. For example, ULLS prices are not only low having regard to Australia's population density, but they have fallen faster than equivalent prices in the US and EU over the last 7 years, as Figure 19 shows:

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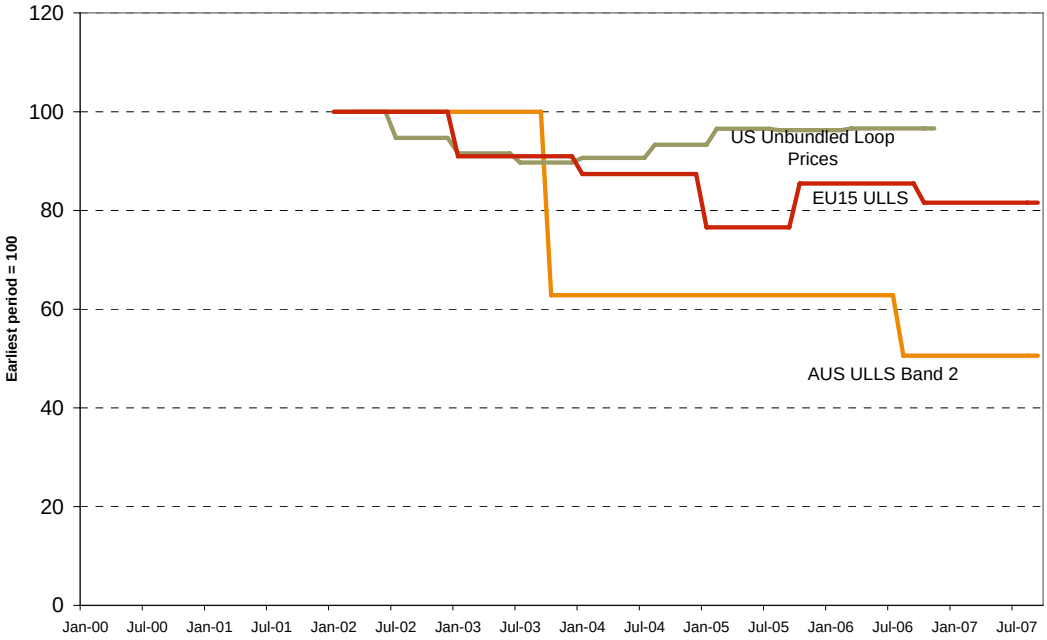
[77] For example, SingTel Optus may have simply decided to invest no more capital in these networks - notwithstanding that capital investment could reduce operating expenses by more than the cost of capital; or if they were highly risk-averse, then lower returns may be very attractive provided that they would be gained at virtually no risk, while moderately higher returns requiring some risk might be less attractive (eg capital investment in facilities or R&D investment).

[78] For example, by failing to fully develop their own networks in order to maintain a degree of dependence on Telstra, thus maintaining access pressures for favourable regulation in chorus with non-facilities-based providers.

Figure 19: Changes in regulated ULLS charges in Australia, the US and EU, 2000 to 2007



Source: ACCC, Australian Competition Tribunal, European Commission, NRRI.

114 The impact of too low ULLS prices in the utilisation of alternative networks has been studied using econometric methods, with the conclusions that, all else being equal, a reduction of 10% in price causes an 18% fall in the subscriber share of alternative infrastructure[79]. Professor Waverman et al found:

> *This intense access regulation (as measure through the LLU price) weakens facilities-based competition and the benefits that such competition delivers*.

115 That being said, fixing the price error would not be sufficient to remove the problem:

(a) First, access pricing is complex and difficult.

(b) Second, when they are wrongly set, harmful consequences follow.

(c) Finally, these problems and risks inherent in access pricing can be diminished by limiting the scope of access only to those areas where it is clearly necessary.

116 The ACCC should be wary of imposing access, and access prices, where there is a viable alternative – such as in the present case.

117 Even if access prices are adjusted to properly reflect costs, SingTel Optus would have both the *incentive* and the *ability* to selectively fall back on Telstra wholesale services in a way that may deliver small, private cost savings to Optus but is socially harmful on a much larger scale by undermining the dynamic benefits of infrastructure competition.

[79] Professor Waverman (2007), Access Regulation and Infrastructure Investment in the Telecommunications Sector: An Empirical Investigation. LECG paper with the support of ETNO, September 2007.

(a) *Ability*: The mandated availability of declared wholesale services means that SingTel Optus is always assured of access as a fall-back to self-provisioning. In effect, SingTel Optus has a free option to use Telstra's services at a uniform, regulated price.

(b) *Incentive*: Because the cost of connecting and serving customers varies by customer, SingTel Optus faces a *range* of costs across the homes passed by its network. Some homes are cheap to connect and serve; others are much more expensive due to, for example, difficult terrain, or being a long distance from the road. SingTel Optus therefore has the incentive to use its own infrastructure to connect lower-cost premises, and exercise the option to use Telstra wherever its own cost to serve a particular home rises above the access price.

118 This cherry-picking behaviour can be characterised as an "adverse selection" problem. Within its HFC network footprint SingTel Optus minimises its own costs (by paying only average cost) despite usage that skews to high-cost premises. Telstra, as the access provider, is effectively under-compensated by the access price, which is based on the cost of servicing *average*-cost premises, and this shortfall must be made up by others (potentially, Telstra and its shareholders).

119 Altering the access price could be expected to alter the *degree* to which SingTel Optus rely on the Telstra network to serve higher cost premises, and therefore the degree of the adverse selection problem. However, merely correcting the access price will not prevent this problem entirely (so long as the access price remains within the range of costs faced by SingTel Optus to connect and serve its various customers).

120 The scope of SingTel Optus to purchase ULLS within its HFC footprint is significant – as is the degree of the consequent adverse selection problem:

(a) of the 2.2 million homes passed by its HFC, only 1.4 million homes (or 64%) are classified as "serviceable" by HFC.

(b) SingTel Optus would therefore rely on Telstra to service 36% of homes in its cable footprint.

(c) In fact, the true extent is likely to be higher still, because significant organic growth has occurred within the cable footprints since rollout stopped in 1997. Telstra's HFC, which passed 2.5 million homes at the time rollout stopped, now passes 2.8 million due to growth *within* the cabled area. If the number of dwellings in Optus' footprint grew at the same rate in the same period, its network would now pass nearly 2.5 million homes, of which 1.4 million represent only 56% "serviceable" as defined by SingTel Optus, and it would rely on Telstra for up to 44% of homes in its footprint.

121 The extent of SingTel Optus' cherry-picking behaviour defies international and local wisdom and practice regarding the proportion of homes that are truly difficult to service by cable, as shown in Section D above. Other cable operators service almost all of the homes in their footprint; while SingTel Optus passes over more than a third.

E.3 Cherry-picking by SingTel Optus in its cabled areas damages competition and welfare

122 It might be argued that, provided SingTel Optus is faced with access prices equivalent to the efficient forward-looking costs of supply, its rational choice of

network will also be efficient and therefore in the LTIE. However, while picking and choosing between networks may minimise the immediate costs SingTel Optus faces in supplying its customers, this behaviour is inefficient from a social viewpoint, especially in the longer term.

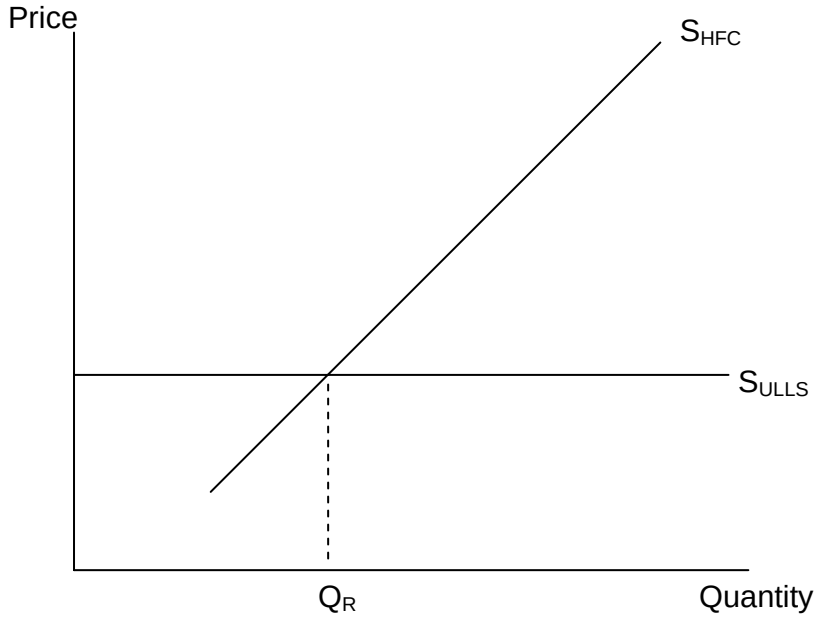
123 At the outset, it is important to note that the incentive to engage in adverse selection would apply (to a greater or lesser degree) *regardless* of which network was cheapest overall. The incentive to pick and choose exists whether the average own-network cost is above, below or the same as the uniform (or averaged) access price, because selection is made on a de-averaged, premises-by-premises basis.

124 In other words, adverse selection can be expected to occur notwithstanding the relative cost-efficiency of each network, because the (average-priced) option of access is available in respect of each dwelling in SingTel Optus's HFC footprint. It would therefore be incorrect to conclude – on the basis of SingTel Optus' use of Telstra's wholesale services - anything about which network can serve the homes in the HFC footprint at least cost, because access would still occur even if the alternative network was cheaper overall[80].

125 SingTel Optus' use of access services in this way leads to less infrastructure competition than would otherwise occur. This is illustrated by Figure 20 where SingTel Optus is faced with a choice between supply over HFC (S_{HFC}) or supply over ULLS (S_{ULLS}). Although the marginal cost of supply over HFC will vary depending on customer-specific cost structures (hence the upward sloping supply curve), SingTel Optus' marginal cost of supply over ULLS will be relatively constant (at least within ULLS bands). Whilst infrastructure-based supply will occur to the extent that the costs of HFC supply are below the cost of supply over ULLS (Q_R), it will not occur beyond that. Thus, the availability of regulated ULLS leads to an artificial 'capping' of infrastructure-based supply. To the extent that this capped level falls short of the quantity that *would be* supplied in the absence of a regulated alternative, it can be sub-optimal.

[80] Provided that the access price falls within the range of costs faced by SingTel Optus in respect the homes in its footprint. If it did not, dual sourcing would not be expected to occur at all.

Figure 20: Capping of infrastructure-based competition due to availability of regulated access



126 The "first-best" form of competition is thus compromised, because:

(a) this conduct may not be consistent with productive efficiency, as it may involve the use of Telstra's average-priced services even where SingTel Optus' costs are lower; and

(b) even if it were consistent with productive efficiency, it comes at the expense of dynamic efficiency because there are benefits from the wider use of SingTel Optus' network that are not entirely captured by its owner. For example, benefits flowing from the rivalry between two networks, from innovation and from development of new processes are sacrificed for immediate cost savings. In policy terms, this might be described as "short term gain for long term pain". As Professor Cave notes:[81]

> *Such dynamic benefits are the reason for the preference expressed by many regulators, including the ACCC, for infrastructure competition, and are thus, explicitly or implicitly, given great weight.*

127 Ultimately the full social benefits of competition will not be realised where productive efficiency is promoted over dynamic efficiency. It is generally recognised that, especially in technologically dynamic industries such as telecommunications, there are three key social benefits flowing from competition (all of which are compromised by SingTel Optus' conduct):[82]

(a) the rivalry effect, whereby the threat of being displaced and the prospect of displacing rivals provides incentives for competitors to perform;

(b) the portfolio effect, which implies that contemporaneous investment by competitors greatly increases the probability of the most efficient

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[81] Prof. Cave, (2007) *Applying the ladder of investment in Australia*, Annex 1, p. 9

[82] See eg Ergas H, Menezes F, 'The role of competition in Australian defence procurement', *The Melbourne Review,* Vol 3 No 1, May 2007

processes being developed (otherwise referred to as dynamic benefits); and

(c) the information effect, whereby the process of competition reveals information, such as the true level of costs. This can be especially important in regulated industries where such information can be scarce because for example, prices are not set commercially.

128 The importance of infrastructure competition over access-based competition is well accepted by leading economists. Professor Waverman summarises it well[83]:

> *Regulation that encourages facilities investment by incumbents and entrants alike permits a greater variety of services (existing ones and new ones) to be offered by a greater variety of competitors over a greater variety of competing technological platforms. Regulation that dampens such competition may have the short term merit of leading to greater services competition based on existing platforms, but the innovation, investment and dynamic efficiencies it forgoes more than outweigh the benefits of more effective services-based competition.*

129 This is a particularly important issue as we stand at the threshold of a new era, that of next-generation networks (NGNs). [84]

The existence of a vigorously competing alternative end-to-end network (such as HFC) provides the best prospect of infrastructure-based competition surviving into the NGN world, where the viability of duplication will be tested. It is all the more important from a competition and social welfare perspective to nurture and retain the competitive pressures created by infrastructure competition. Put another way, the loss of actual or potential infrastructure competition in the NGN world may be very costly. Importantly, it is within these geographic areas that the prospects of competition between duelling NGNs is greatest in Australia.

E.4 Professor Cave's view is that this amounts to a mis-application of the ladder of investment

130 In Professor Cave's view, this "highly unusual" behaviour by SingTel Optus risks thwarting the ladder's very objective:[85]

> *This dual sourcing behaviour risks thwarting the ACCC's objectives vis-à-vis infrastructure competition – which would seem naturally to entail encouraging competitors to develop and use their facilities where they exist, and the promotion of access-based entry only where they do not.*

131 His view is that the ladder approach "requires active management by the regulator"[86]. He says:

> *it is not a policy of continuous 'easy access', but one of 'tough love' in which competitors are chivvied up the ladder by price incentives or the expectation of*

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83 Professor Waverman (London Business School), 'The Challenges of a digital world and the need for a new regulatory paradigm', in *Communications – the next decade (A collection of essays prepared for the Office of Communications, UK)*, edited by Ed Richards, Robin Foster and Tom Kiedrowski, November 2006.

84 Prof. Cave, (2007) *Applying the ladder of investment in Australia*, Annex 1, p. 6

85 Prof. Cave, (2007) *Applying the ladder of investment in Australia*, Annex 1, p. 2

86 Prof. Cave, (2007) *Applying the ladder of investment in Australia*, Annex 1, p. 4

withdrawal of the more comprehensive access products corresponding to the lower rungs of the ladder.

132 Regulators such as OPTA have noted the difficulties of setting supply condition along the ladder so that entrants have sufficient incentive to climb, and the danger of getting "stuck in a state of services based competition"[87].

133 SingTel Optus is not merely stuck. It has slipped down the ladder. This is plainly contrary to the purpose for which the ladder was put in place, and demands remedial action to stem the losses to competition and end-user welfare.

E.5 The best solution is to disable the "climb-down" option, most especially for those players who are at the top of the ladder

134 In considering this exemption application, the Commission faces a choice. Refusing the exemption will preserve the status quo, with all of its associated losses. Granting the exemption will stimulate rivalry, and unleash the benefits of end-to-end infrastructure competition (in the same way as has occurred overseas, where regulators have discovered that removing access ladder entirely has had a far more stimulating effect on competition than simply adjusting the rungs).

135 Leaving the ladder in place for players who have already reached to the top of it, and are now climbing down, defeats the purpose for which the ladder was constructed in the first place. Professor Martin Cave concludes in his expert report that maintaining the status quo[88]

> *suggests a likely continuation of the 'dual sourcing' policy on the part of the competing network operators, and very limited incentive to invest in their own networks. This has led and will lead to a diminution of the arena of competition and hence to a loss of dynamic efficiency.*

136 The foregone benefits of competition are likely to be very large, as indicated in Section C above. SingTel Optus is plainly capable of exerting very strong competitive pressures via its own HFC network, and the benefits of ongoing infrastructure rivalry with Telstra should not be under-estimated, especially when multiplied across large numbers of end users.

137 Granting the exemption will stimulate investment and competition. It enables the ladder to be targeted at those who are in a position to climb it, rather than making those at the top equivocal about exploiting their investments. Cherry-picking will no longer be possible.

138 Overseas experience shows the formidable power of infrastructure-based competition. When deprived of regulated access, cablecos respond by investing more aggressively.

139 In the US, following the FCC's decision to forbear ULLS in Anchorage, the cable operator, which had been using ULLS for approximately 7% of its customer base, substantially increased its capital investment in connecting premises to its

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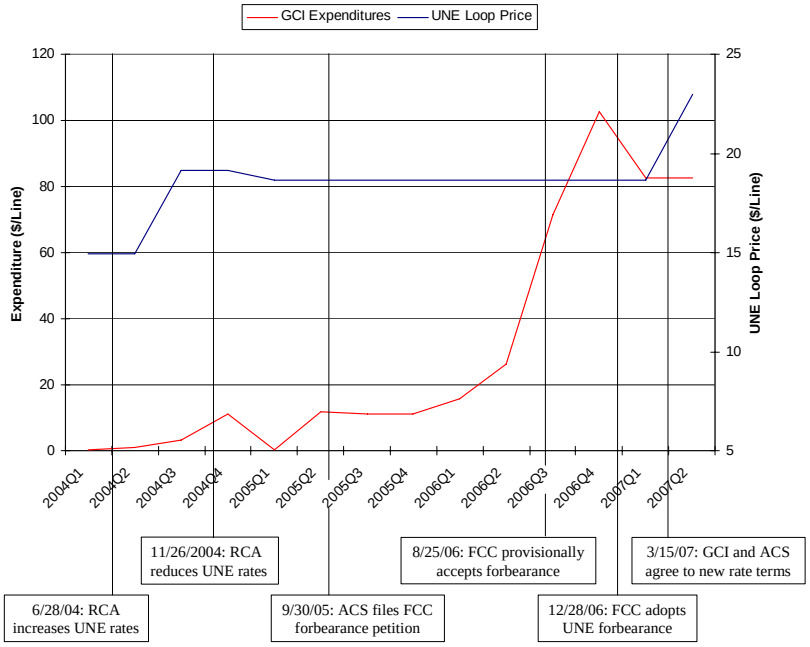
[87] OPTA (2005), Regulating Emerging Markets, Economic Policy Note; No. 5, April 2005 at page 20.

[88] Prof. Cave, (2007) *Applying the ladder of investment in Australia*, Annex 1, p. 12

network[89]. As Figure 21 shows, during the period that GCI had access to UNE at regulated prices, GCI's line extension capex (per line in use) ranged between $0.41 to $11.79 per quarter. Following the FCC's decision, its line extension capex ranged from $71.61 to $82.62.

140 When the state regulator had earlier increased ULLS prices, there was only a small impact on the investment made by the cable operator in connecting premises to its network. This suggests that withdrawal of access provides a greater stimulus to competitors climbing the ladder than increases in the access price.

Figure 21



Sources: GCI Inc. SEC filings, RCA Dkt. No. U-96-89 Orders.
Note: Capital expenditures are in nominal terms.
Reproduced from Eisenach, Jeffrey A. and Singer, Hal J., "Irrational Expectations: Can a Regulator Credibly Commit to Removing an Unbundling Obligation?" . AEI-Brookings Joint Center Related Publication, No. 07-28, December 2007 Available at SSRN: http://ssrn.com/abstract=1065161

141 The story is similar in Hong Kong, where OFTA decided in 2004 to withdraw ULLS and LSS regulation by 30 June 2008. During the transitional period, ULLS was to be withdrawn from those buildings served by at least two networks (eg the incumbent telco plus one competing network). At the time of the Government's decision, 53% of households had access to alternative network infrastructure,[90] and network deployment has continued to rise dramatically since the decision to wind back wholesale regulation. By September 2005, over 71% of Hong Kong subscribers had access to competing facilities-based providers (excluding connections based on ULLS or spectrum sharing).[91] By mid 2007, 79% and 55% of households have a choice of at least two and three fixed carriers respectively.[92]

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89 Eisenach, Jeffrey A. and Singer, Hal J., "Irrational Expectations: Can a Regulator Credibly Commit to Removing an Unbundling Obligation?" (December 2007), AEI-Brookings Joint Center Working Paper No. 07-28, online at http://ssrn.com/abstract=1065161 at page 14.

90 Commerce, *Industry and Technology Bureau Legislative Council Brief: Review of Type II Interconnection Policy*, July 2004, at page 4.

91 OFTA, Percentage of Households with Choice of Self-built Customer Access Networks Continues to Rise, media release, 29 September 2005.

92 Ofta, Large Majority of Households in Hong Kong have a Choice of Alternative Fixed Network Services, press release, http://www.ofta.gov.hk/en/press_rel/2007/Nov_2007_r1.html

142 Infrastructure-based competition will also result in better incentives being put in place at the wholesale level, which is relevant (and only relevant) to competitive outcomes at the retail level.

143 First, SingTel Optus will have incentives to compete at the wholesale level via their HFC cable, since this will add to their scale (noting there is more than one DSLAM operator in most of the ESAs where the exemption would apply). There are no technical reasons why SingTel Optus cannot provide resale-based wholesale broadband access, and a development path exists for more independent access to be given in future.[93]

144 Second, third parties will continue to have regulated access to Telstra's network, ensuring (in most relevant ESAs) more than one source of supply for wholesale services. In any event, barriers to entry at the wholesale level are low, and this exemption will not damage competition at that level.

145 Looking forward, strengthening infrastructure-based competition is all the more important given the impending migration to next-generation networks and the likely loss of exchange-based access points . Professor Cave believes that this makes infrastructure-based competition in the present world all the more important , because of the pro-competitive leverage it will bring to the future environment:

> *In my opinion, this development places greater emphasis in the future on the importance of promoting competition between end-to-end networks, as against the access-based model described above. In many countries, the most likely source of NGA competition is the existing cable network. The best outcome for consumers would be a race to upgrade to NGAs between the incumbent telco deploying FTTN or FTTC networks and the cable operator moving to DOCSIS 3, which supports much higher speed and higher quality services*[94]

146 Telstra's incentives, too, will be enhanced – most particularly, its incentives to invest: first, because SingTel Optus' competitive actions will demand response; and second, because the scope of regulation will be reduced, thereby reducing the risks to Telstra that its investments will be expropriated.

147 The costs of regulation, and the risk of regulatory error and gaming (and all of the distortions that they entail) will also be avoided if the exemption is granted.

148 Moreover, the risks of harm to competition and end-user interests from granting the exemption are low.

149 While SingTel Optus may face some short-term cost increases (if it is assumed that its present conduct is in fact productively efficient) these are likely to be small and temporary, and would in no way compromise its ability to compete with Telstra.

150 First, the exemption would only apply to a limited number of homes, some of which already appear to have lead-ins installed[95].

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93 Harris, Technical Report, at Annex 2.

94 Prof. Cave, (2007), *Applying the ladder of investment in Australia*, Annex 1, p.6.

95 As noted in Section D.4, SingTel Optus does not offer cable service to some MDU premises, even where back-boning is in place.

151 Second, the terms of the proposed exemption are reasonable. Customer premises more than 75 metres from the cable will not be the subject of the exemption, giving SingTel Optus continued regulated access to these highest-cost homes. Further, there are appropriate 'transition' periods before the exemption would take effect, to enable orderly migration.

152 Third, the costs of connecting a customer are not particularly large: on average, Telstra's estimates show that the capital costs of a connection (including a telephony-capable modem) represents only 8 months' revenue for an average SDU, and only 13 months' revenue for an eight-unit MDU.[96] Given the limited number of homes that would be subject to the proposed exemption, this will not impose any constraints on SingTel Optus that would harm its ability to compete.

153 In any event, SingTel Optus would still have recourse to non-HFC alternatives including commercially negotiated wholesale access, and it would come to such a negotiation from a position of strength. Among other things:

(a) it would possess the ability to walk away from the negotiation in favour of self-provisioning by HFC;

(b) it could also walk away to self-provision by its 3G network, which is being re-packaged to offer telephony and broadband into homes at prices comparable to fixed network packages; and

(c) it would come to the table as a significant fixed and mobile network owner from whom Telstra requires access.

154 If anything, such a negotiation would be likely to yield more efficient prices that better reflected the skewed cost characteristics of the premises accessed – something that regulated prices, based on averages, cannot achieve.

155 The ability to commercially negotiate access is one reason why the risk of pushing SingTel Optus to levels of investment that are inefficient are low. Others include the fact that the exemption does not extend to any premises not already passed by cable (within 75 m); as such, it does not require new rollout.

156 That is not to say that extended rollout could not result from this exemption. The nature of dynamic infrastructure-based competition is such that as SingTel Optus' number of customers increases, its level of investment in fixed-cost platforms (such as an upgraded voice platform) will also likely increase due to improved economies of scale. Once platform investments are made, the incentive to utilise them makes it more likely that extended rollout will occur. Such an outcome would, though, be consistent with strengthened competition and improved welfare.

157 As Eisenach and Singer found,[97] the evidence is that both entrant and incumbent will significantly increase investment around the decision to forbear from regulation. They concluded:

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[96] Attachment 1.

[97] Eisenach, Jeffrey A. and Singer, Hal J., "Irrational Expectations: Can a Regulator Credibly Commit to Removing an Unbundling Obligation?" (December 2007), AEI-Brookings Joint Center Working Paper No. 07-28, online at http://ssrn.com/abstract=1065161 at page 31.

robust facilities-based competition – the primary goal of unbundled access regulation – is better served by moving forward the date of regulatory forbearance than by gradually relaxing unbundling requirements.

158 Compared with the counterfactual, then, the proposed exemption is manifestly more likely to lead to better competitive and end-user outcomes. However, Telstra notes that it is important to keep in mind in considering the proposed exemption that the statutory criteria and the case law demand that the Commission consider the overall net effect. Even if the Commission is of the view that the exemption would bring about some temporary or transient deficiencies in competition, or if it is not perfectly satisfied with some of Telstra's arguments, Telstra submits that the long-term benefits to end users of promoting facilities-based competition and removing unwarranted regulation would significantly outweigh any such short-term negative impacts.

F Telstra's proposed exemption

159 In this section, we:

(a) explain how Telstra's proposed exemption would work; and

(b) compare Telstra's proposed exemption against other exemptions or forbearance approaches internationally in response to the presence of alternative networks.

F.2 How Telstra's proposed exemption would work

160 Telstra's proposed exemption would mean that SingTel Optus could not acquire regulated access services, including ULLS, to connect customer premises where the property boundary is less than 75 metres in a straight-line from the nearest point on that part of the SingTel Optus' local network infrastructure which is capable of supporting subscriber connections.

161 The proposed exemption:

(a) would only apply to SingTel Optus' network as it exists at the date of the exemption order. The only additional network infrastructure SingTel Optus would be required to install as a result of this exemption would be individual subscriber drops. SingTel Optus has stated that further network extensions are unlikely. If SingTel Optus deploys additional network in the future, Telstra would need to apply for an additional exemption in respect of that network;

(b) would not apply to those parts of SingTel Optus' network which are not reasonably capable of supporting direct customer connections, such as links to the nodes from the core network; and

(c) the 75 m zone would not apply cumulatively: that is, if SingTel Optus connects a subscriber premises, the boundary of the exemption zone would not shift out to the end of that subscriber drop. The 75 m would apply only from common parts of the customer access network which serve multiple customers.

162 The 75 m connection distance is based on the standard connection distance which is used in the FOXTEL network. This is the approximate reasonable distance of a drop before an amplifier has to be installed to serve the customer site. Telstra does connect premises over a longer distance for an additional charge to the customer, including to cover the costs of the amplifier. SingTel Optus could also adopt a similar approach (and may well do so now). However, Telstra has taken a conservative approach and used the shorter standard connection distance.

163 The following Figure 22 and explanatory table illustrate how the exemption zone would apply:

Figure 22

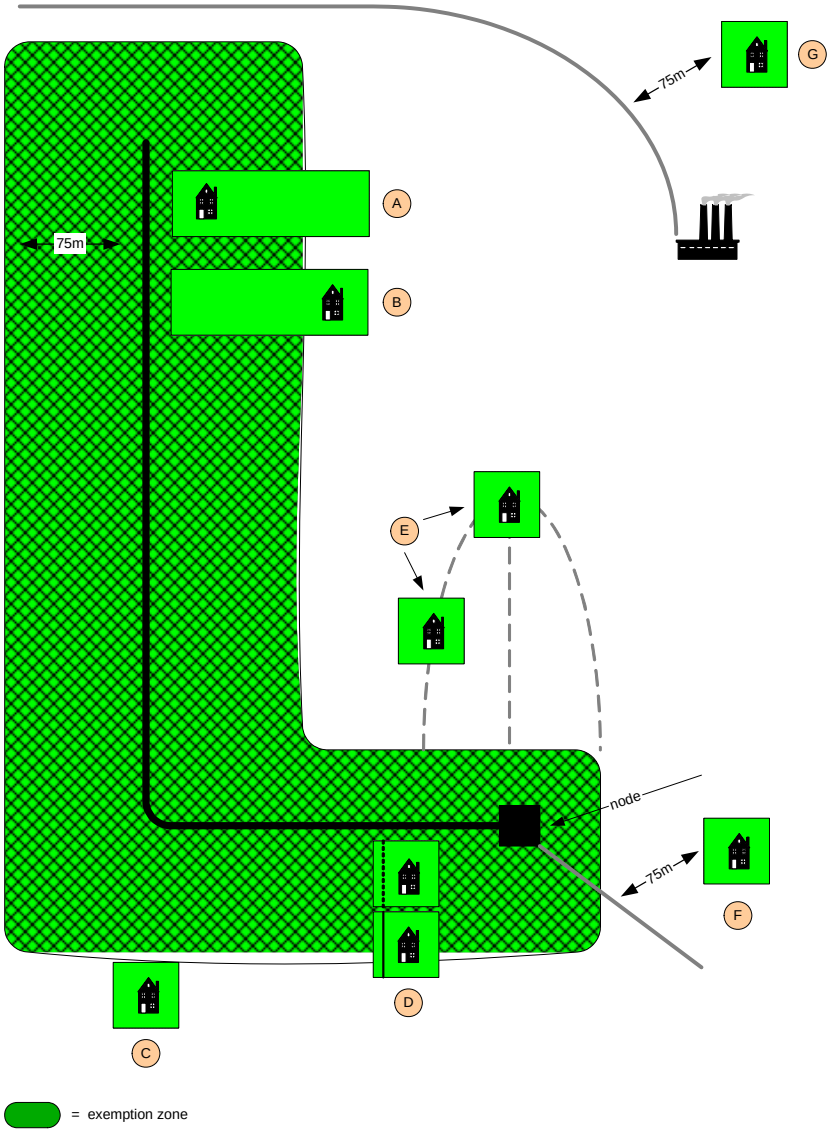

Table 13

Case example	Is regulated access available to SingTel Optus?	Explanation
Case A	✗	The property boundary (and the customer premises) are within 75 m of the distribution network.
Case B	✗	The property boundary is within 75 m of the distribution network. While the customer premises is outside the 75 m zone, SingTel Optus and the customer can agree (including for a charge) for additional wiring to be installed on the customer property.
Case C	✓	The property boundary is more than 75 m from the distribution network. It does not matter than the property boundary is less than 75 m from another property connected to SingTel Optus network. While it would be technically possible to set up a "daisy chain" connection fed from the closer property, Telstra does not propose that this situation would be caught by the exemption. It is hoped that if SingTel Optus has the

Case example	Is regulated access available to SingTel Optus?	Explanation
		incentive to "sweat" their network harder as a result of the exemption, they will stretch beyond the 75m.
Case D	✗	The battleaxe block is within 75 m. The subscriber drop would have to traverse the intervening property. Consent of the intervening property owner would be required. This does not affect a large number of individual subscribers, but the cable operators should have enough experience in dealing with these situations to develop workable solutions.
Case E	✓	If the existing network was extended into an adjoining street, the properties in that street would be within 75 m of the extended cable. However, SingTel Optus is not required to extend their networks under the exemption.
Case F	✓	The customer premises is located within 75 m of the fibre link between the core network and the node. However, the fibre link is not capable of supporting individual connections and does not qualify as distribution cable.
Case G	✓	A fibre spur has been laid in to connect a large corporate site. It may be feasible for SingTel Optus to install a node and connect other sites in the area. However, under Telstra's proposed exemption, the fibre to the premises link would qualify as a subscriber line and would not trigger the 75 m exemption zone.

164 Telstra believes that its conservative approach to the exemption means that SingTel Optus should feasibly be able to use HFC connections in circumstances where it now chooses to use ULLS. In Attachment 1, Telstra has calculated the typical costs of a 75 m subscriber drop for single dwelling units and MDUs. Based on SingTel Optus' Fusion product (which has a 24 month contract), we estimate that SingTel Optus can cover the costs of an installation in an SDU installation within 8 months and if SingTel Optus signs up at least two units within an MDU, within 19 months.

165 The Commission does not have to be satisfied that each and every customer within SingTel Optus' footprint can be feasibly connected to its HFC network. As we discuss below, overseas regulators have recognised that if the competing operator's network is sufficiently extensive within the exemption area, the incumbent will not be able to price discriminate on an individual customer basis because it will not know the whereabouts of the competing operator's network with complete accuracy, nor will it know whether the competing operator will decide to connect the customer premises.

166 Telstra has designed the exemption in a way which will be practical and straightforward to implement. As the network is "frozen" for the purposes of the exemption as at the order date, the 75 m exemption zone would be established upfront on a once and once only basis for the term of the exemption. This provides clarity and certainty to both Telstra and SingTel Optus. The practicality of the exemption is demonstrated by the three years of experience in New Zealand with a similar distance based carve-out. Telstra's proposed approach will actually be simpler to implement because the New Zealand exclusion zone has to take account of all alternative networks and the boundaries have to be adjusted whenever any competitor deploys additional network.

167 Based on the New Zealand procedures, the exemption zones could be identified and implemented as follows:

(a) SingTel Optus would provide Telstra Wholesale with a street by street map of its HFC network. Obviously, this is highly confidential information and, as in New Zealand, strict confidentiality rules would apply to this information to ensure that it is not available to Telstra personnel engaged in competitive activities;

(b) Telstra would overlay the map with its own detailed network map, which identifies infrastructure down to the individual premises level. The overlay mapping would identify the 75m exemption zone;

(c) A composite map would be provided to SingTel Optus for verification. As the map contains highly confidential Telstra information, SingTel Optus would need to assume confidentiality commitments; and

(d) Once the map was settled, a list of street addresses which fell within the exclusion zone could be produced. This list could be loaded into the SingTel Optus wholesale ordering process to allow rapid cross checking when an order for ULLS or other access services is received from SingTel Optus retail or from wholesale customers; and

(e) Telstra would be prepared to commit to an independent expert dispute resolution process to deal with disputes over whether the exemption zone is accurately identified. As no qualitative assessment is involved – the only question is whether the relevant type of SingTel Optus HFC infrastructure is present – these disputes should be readily and quickly resolvable by an expert.

F.3 Telstra's approach is more conservative than overseas approaches

168 Telstra's proposed exemption is more narrowly drawn than the overseas exemption (called "forbearance" in North America) decisions made taking into account the presence of alternative end to end networks, as Table 14 shows:

Table 14

Regulatory decision	Minimum percentage of homes passed by competitive network in exemption area	Minimum no. of networks	Is there a maximum connection distance from competing network?	Does the exemption apply to new network?	Do all access seekers lose access to regulated service?	Is there a transition period?
FCC's Omaha UNE forbearance	75%	2	no	Yes, within wire centre	yes	6 months
FCC's Anchorage UNE forbearance decision	75%	2	no	Yes, within wire centre	yes	12 months
Ofcom bitstream decision	65%	4	no	Yes, within exchange area	Yes, but ULLS remains in place	12 months

Regulatory decision	Minimum percentage of homes passed by competitive network in exemption area	Minimum no. of networks	Is there a maximum connection distance from competing network?	Does the exemption apply to new network?	Do all access seekers lose access to regulated service?	Is there a transition period?
Anticipated Canadian approach	75%	2	no	Probably yes	yes	1-3 years
New Zealand resale decision	100%	2	Yes, 100m for residential premises and 200m for business premises	Automatically yes	yes	no
Telstra proposed exemption	100%	not relevant (because access not removed for other access seekers)	Yes, 75m for all premises	Limited to boundaries of current network	No, regulated access services available to other access seekers	Yes, 6 months for premises with 5 lines or less and 12 months for other premises.

F.3.1 Geographic Area

169 Most of the overseas exemption decisions have used the incumbent's exchange area, or an amalgam of exchange areas, as the geographic unit for the exemption. As the boundaries of the competing local network are unlikely to coincide with the incumbent's exchange boundaries, it is necessary to make a decision about the extent of coverage of a competing network within an exchange area before the network is counted for the purposes of the exemption, or forbearance, decision. Regulators have tried to identify how much alternative network penetration is required to serve as a constraint on the incumbent and to give the entrant sufficient momentum to overcome the barriers to expansion into the rest of the exchange area.

170 Ofcom requires a minimum coverage, by which it means homes passed, of 65% of an exchange area before an alternative network counts towards the requirement for four networks for exemption/forbearance to apply. Ofcom explained its approach as follows:[98]

> *The test used by Ofcom to determine whether a particular operator is present within an exchange footprint is whether that operator is able to provide a competitive constraint. Suppose there is one operator (a hypothetical monopolist) serving the whole of an area and Virgin Media serving only part of it. Then could this hypothetical monopolist within the exchange footprint introduce a profitable SSNIP, or would it lose sufficient customers to render the SSNIP unprofitable? Clearly, if Virgin Media is only able to supply (say) 10% of*

[98] Ofcom, *Review of the wholesale broadband access markets 2006/07*, Explanatory Statement and Notification, 15 November 2007, p 61.

the potential customers within an exchange footprint then this leaves 90% that would have no choice but to stay with the hypothetical monopolist, thus suggesting that a SSNIP is likely to be profitable. On the other hand, if Virgin Media is able to supply (say) 90% of the potential customers within an exchange footprint then this only leaves 10% that would have no choice but to stay with the hypothetical monopolist, thus suggesting that a SSNIP is less likely to be profitable (assuming that prices are uniform within the area). The minimum overlap required would be where a SSNIP is profit neutral and to determine this value on this basis would require accurate information about marginal costs, prices/profitability and cross price elasticity, which is not available with sufficient accuracy. It is clear, however, that for Virgin Media to provide a competitive constraint in a given exchange footprint, it must be able to supply a significant part of that area, probably above 50%, though not necessarily as high as 90%. Therefore, Ofcom has proposed to use a value within these bounds …. Ofcom has considered Virgin Media as being present within an exchange footprint if it is able to supply at least 65% of the homes and businesses within the footprint.

171 The FCC has opted for the higher figure of 75%[99] in identifying wire centres in which it will grant forbearance from UNE, including ULLS. The FCC considered that at this level the cable operator would have the incentive and capability to overcome any remaining barriers to expanding to a 100% coverage.

172 The FCC considered that, with the deployment of an extensive local access network within a geographic area, the entrant had got over the largest barriers to entry and that it would have the incentive, infrastructure and capability to compete aggressively in that geographic area:[100]

Our reliance on extensive facilities-based coverage for determining where forbearance is warranted stems from the importance facilities-based last-mile deployment plays in lessening the need for regulatory intervention. As the Commission previously has found, the telecommunications industry is characterized by high fixed and sunk costs, network effects, and economies of scale, among other barriers to entry. When a new market entrant has overcome these barriers by investing heavily enough on its own facilities that it satisfies the last-mile coverage threshold we adopt here, we believe the new entrant has demonstrated a deep commitment to compete vigorously for customers. In areas where competitive last-mile facilities deployment satisfies the coverage threshold we set forth above, we have solid evidence that the competitive entrant in all probability will be able to fulfil those commitments

173 Removing regulated access throughout an exchange area which is only partially covered by a competing network, does require the competing network operator to build out the balance of the exchange area if it wishes to serve customers who were formerly served using regulated access. The FCC saw this as an advantage of its approach as it would provide an incentive to extend the reach of infrastructure-based competition.

174 However, the FCC noted that even if the cable operator never expanded to cover the remaining 25% of the customers in the forbearance area, those customers

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99 This is an estimated based on publicly available information.

100 Federal Communications Commission, *Petition of ACS of Anchorage, Inc. Pursuant to Section 10 of the Communications Act 1934, as amended, for Forbearance from Sections 251(c)(3) and 252(d)(1) in the Anchorage Study Area*, WC Docket No. 05-281, Memorandum Opinion and Order, 30 January 2007, at 20.

would likely still benefit from competition between the cable operator and the telco:[101]

> *There is no evidence in the record to suggest that Qwest [the incumbent telco] is able to discern exactly where its facilities-based competitors are capable of providing service or to suggest that were a facilities-based competitor covers as much as [75] percent of the end user locations in a wire center that Qwest could impose prices, terms and conditions on the remaining [75] percent of customers that are less favourable than the prices, terms and conditions available to the other [75%] percent of customers in that wire center.*

175 Telstra's approach to use the cable network footprint as the geographic unit for the exemption is more conservative than using Telstra ESAs.

176 As illustrated in Figure 5, Figure 6 and Figure 7, SingTel Optus appears to have 100% coverage in 8 ESAs and lower levels of coverage in the balance of 215 ESAs in which it appears to have HFC. By tightly mapping the exemption to the SingTel Optus HFC footprint, the practical outcome is that SingTel Optus will pass 100% of homes in the exemption area. SingTel Optus will continue to be able to use ULLS and other access services in the balance of those ESAs in which it does not have HFC coverage.

177 So, in comparison to the US approach, SingTel Optus will not have to build any additional network infrastructure other than individual subscriber drops. While we believe that providing SingTel Optus with incentives to expand its current HFC coverage would be in the long term interests of end users, we anticipate that SingTel Optus will assert that the curtailment of the carrier powers and immunities with respect to aerial cabling is a significant barrier to deployment. While Telstra does not necessarily accept that SingTel Optus could not feasibly restart its build, we are taking a conservative approach and limiting the exemption to the SingTel Optus HFC network as it is today.

178 While the Telstra approach is modelled on the New Zealand approach to the resale carve-out, we are again taking a more conservative approach:

(a) there is no distinction made between business and residential premises. The maximum subscriber reach proposed by Telstra is based on the costs of connecting single dwelling residential properties;

(b) the maximum connection distance for all premises is 25% shorter than the maximum distance which applies to residential premises in New Zealand; and

(c) the exemption does not automatically expand as new network is deployed. Telstra's purpose is only to capture network as currently deployed. SingTel Optus has stated that further network deployment is unlikely. If it does occur and Telstra wishes to seek an exemption in respect of that network, a separate exemption application would be required.

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[101] Federal Communications Commission, *Petition of Qwest Corporation for Forbearance Pursuant to 47 U.S.C. §160(c) in the Omaha Metropolitan Statistical Area*, WC Docket No. 04-223, Memorandum Opinion and Order, 2 December 2005 at p 37, footnote 187.

F.3.2 Business customers

179 The FCC rejected the cable operators' arguments that forbearance should only apply to residential customers and not apply to business customers on the following grounds:

(a) ULLS can be used to supply both residential and business customers and that, as operators segment their downstream customer bases differently, using a residential/business split for forbearance could trigger uncertainty and dispute;

(b) cable networks can be readily upgraded to support high quality voice and data services required by most business customers. The FCC defined coverage to mean the capability of the cable operator's local loop facilities to offer "within a commercially reasonable time, the full range of services that are substitutes for the incumbent LEC's local service offerings";[102] and

(c) In the Anchorage and Omaha markets, there was limited demand for very high capacity data services required by large corporate or specialised customers, and most business customers' requirements could be supported by the upgraded cable networks.

180 The technical report from Harris at Annex 2 describes the technical developments in cable networks that support high quality data services. Upgraded cable networks can support high quality IPVPN services, equivalents of leased lines (eg E1s) and complex data applications.

181 The US cable operators are beginning to make significant inroads into the business customer segment. The chief operating officer of Cablevision told the company's investors on March 28, 2007, that: [103]

> *there is a tremendous opportunity in terms of current revenue dollars being spent by businesses. In the small business area there is $3.6 billion currently being spent by small businesses on telecom services and in the larger enterprise service area there is $2.2 billion....In the small business area, there are about 600,000 businesses inside our footprint spending $3.6 billion a year on telecom services. We have been selling a four-line service through most of this year, ramping that up in a very manual way to go to scale the business like we did with our residential business and we just decided and will start rolling out an eight-line product to that universe, which expands the potential for us and allows us to scale a variety of products to fulfil the needs of that area.*

182 Telstra estimates that there are approximately 100,000 business premises within the SingTel Optus cable footprint. Given the predominately suburban nature of the deployment areas, most of these business customers are likely to be SMEs. The SingTel Optus HFC network, even with its current technical constraints, should be able to provide competitive voice and data services which meet the needs of many of these SMEs. Telstra estimates that it would cost SingTel Optus no more than a few million dollars to upgrade its network. SingTel Optus already

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[102] Federal Communications Commission, *Petition of Qwest Corporation for Forbearance Pursuant to 47 U.S.C. §160(c) in the Omaha Metropolitan Statistical Area*, WC Docket No. 04-223, Memorandum Opinion and Order, 2 December 2005 at 30, footnote 156.

[103] Cablevision website, *Cablevision Q3 2006 Earnings Call Transcript*, 8 November 2006. available at http://www.seekingalpha.com/article/20161-cablevision-q3-2006-earnings-call-transcript.

has the back-office systems, sales force and account management processes required to support business customers as it competes for those customers on its other networks.

183 If there are large corporate customers within the SingTel Optus footprint with data service requirements that cannot be met with an upgraded HFC network, SingTel Optus has an extensive urban fibre network from which a fibre "shot" could be built to serve that customer. It is likely that this is the approach SingTel Optus would take today, rather than serve those large corporate customers off ULLS. Telstra anticipates that the cut-off point at which SingTel Optus shifts from ULLS to fibre is about 4Mbps, and business data services to that speed can be readily supported on an upgraded HFC network.

F.3.3 Application to other access seekers

184 The FCC's approach to forbearance means that all access seekers lose access to regulated services once the first competing network is deployed.

185 The FCC disagreed that its forbearance decision would create a duopoly between the cableco and the ILEC. The FCC noted that the forborne areas are "precisely the geographic areas where we would expect to see further investment and deployment by [the cablecos] and where we are most likely to see other competitors make the investments necessary to provide service without resorting to unbundled loops and transport". [104]

186 The withdrawal of the regulated requirement for access does not mean that the incumbent will cease supplying the formerly regulated services on a commercial basis at competitive prices. The FCC considered that the incumbents would still have strong incentives to provide wholesale services:[105]

> *Moreover, given Cox's ability to absorb customers without any reliance on Qwest's local exchange facilities, Qwest will be subject to very strong market incentives to ensure that its network is used to optimal capacity – irrespective of any legal mandate that it do so. Faced with aggressive "off-net" competition from Cox, we predict that Qwest will endeavour to maximize use of its existing local exchange network, providing service at retail* and at wholesale*, in order to minimize revenue losses resulting from customer defections to Cox's service. In short, Qwest will prefer that a customer be served by wireline competitor using Qwest's facilities at wholesale rates above that customer's use of Cox's network, which offers Qwest no revenue whatsoever but only a miniscule reduction in its costs.*

187 The FCC also considered that, although the cable operator did not currently offer wholesale services on its network, it would face similar incentives to do so. Third party access seekers, therefore, would have the benefit of competition between at least two wholesale providers.

188 In its proposed decision to withdraw bitstream services from BT exchange areas, Ofcom also thought that the lack of a current wholesale offering from Virgin

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[104] Federal Communications Commission, *Petition of Qwest Corporation for Forbearance Pursuant to 47 U.S.C. §160(c) in the Omaha Metropolitan Statistical Area*, WC Docket No. 04-223, Memorandum Opinion and Order, 2 December 2005 at 37.

[105] Federal Communications Commission, *Petition of Qwest Corporation for Forbearance Pursuant to 47 U.S.C. §160(c) in the Omaha Metropolitan Statistical Area*, WC Docket No. 04-223, Memorandum Opinion and Order, 2 December 2005 at 41.

Media may well change as entering the wholesale market became more attractive to Virgin Media on the withdrawal of regulated access: [106]

> *in principle, absent regulation, it is possible that cable operators and ADSL operators might offer a wholesale broadband product. .... Under competitive market conditions, both Virgin Media and BT might have an incentive to offer a wholesale product. Competitive pressure would mean that, on average, their upstream (network) and downstream (retail) divisions would make only a normal return (i.e. their cost of capital). In these circumstances, Virgin Media or BT would find it profitable to supply a wholesale product to any alternative operator which was more efficient than them in the provision of retail services, or was one that could successfully market broadband services to a wider range of customers (perhaps through greater product differentiation or combining with its own service offering such as content).*

189 The difference, of course, between the FCC approach and Ofcom's approach is that Ofcom was concerned about the risks of co-ordinated behaviour if, despite these incentives, the market ended up with less than 4 significant competitors.

190 Telstra's exemption application, in a sense, takes a middle way. While Telstra proposes that the exemption would be triggered by the presence of a single alternative network, the right to the regulated access service is lost only to that network operator; other access seekers continue to have the right to acquire regulated access services. The Telstra approach has the following advantages:

(a) SingTel Optus will still have the incentives identified by the FCC and Ofcom to connect more retail customers to their own network;

(b) SingTel Optus will still have incentives to begin supplying wholesale services. If they do not offer wholesale service, they will lose customers and lose scale to Telstra and to other DSLAM-based operators which supply services in the HFC network footprint. There is at least one other DSLAM-based operator, and sometime two or more, in each ESA in which SingTel Optus has network;

(c) Telstra still will have the incentives to offer commercial wholesale services to SingTel Optus;

(d) while Telstra believes they are overstated, concerns about duopoly or co-ordination are addressed through the continued availability of regulated access for third parties.

F.3.4 Transition Period

191 The FCC's approach has been to allow a 6 month transition period to allow the cable operator time to build out, although the Anchorage cable operator was allowed 12 months because of the short building session due to the extreme winter conditions. Ofcom is proposing a 12 month transition period for the withdrawal of bitstream access.[107]

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[106] Ofcom, *Review of the wholesale broadband access markets 2006/07*, Explanatory Statement and Notification, 15 November 2007, p 44 at para. 3.181.

[107] Ofcom, *Review of the wholesale broadband access markets 2006/07*, Explanatory Statement and Notification, 15 November 2007 at p. 3.

192 Again, taking a conservative approach, Telstra proposes a 12 month transition period as follows:

(a) The exemption would kick in at the end of the first 6 months for premises with 5 lines or less. This is the cut-off point used for the Customer Service Guarantee. It would capture residential premises and some small businesses. It would exclude most medium sized businesses and branches of large businesses, such as banks;

(b) The exemption would kick in for premises with more than 5 lines at the end of 12 months. This is intended as a reasonable proxy for more complex business customers. The 5 line cut off is based on the definition of standard telephone service used in the Customer Service Guarantee.[108]

193 Telstra's proposed exemption will provide SingTel Optus with time to:

(a) plan and implement an orderly transition period for existing customers served by ULLS and other regulated services;

(b) negotiate access arrangements with building managers and body corporates and to install infrastructure in MDUs;

(c) plan and implement an upgrade in its HFC network and associated systems to support business and wholesale services. Use Telstra regulated access services in the meantime to build up a customer base within MDUs to migrate across to their own network. Starhub in Singapore completed the upgrade of its cable network within 9 months of commencing work.

[108] Telecommunications (Customer Service Guarantee) Standard 2000 (No. 2).

G Telstra's Exemption is consistent with the LTIE Test

194 In this section, we discuss:

(a) market definition in the context of the LTIE test;

(b) how providing SingTel Optus with greater incentives to utilise its own network through withdrawing their access to regulated services meets the LTIE test; and

(c) the Commission's legal power to make the proposed exemption.

G.1 Market definition

195 Telstra agrees with the Commission's previously expressed views that market definition is not necessarily a determinative exercise for processes under Part XIC:[109]

> *In identifying relevant markets, Part XIC of the TPA does not require the ACCC to take a definitive or determinative stance on market definition....Furthermore, over time, declaration itself might affect the dimensions of these markets, particularly in relation to the functional dimension. Accordingly, market analysis under Part XIC should be seen in the context of providing an analytical framework to examine how declaration would promote competition rather than in the context of developing 'all purpose' market definitions.*

196 Market definition is a useful tool in considering this exemption application in 4 aspects:

- Use of a sub-national geographic market which is linked in some way to the presence of the SingTel Optus network;
- The treatment of VoB and PSTN services as substitutes in the downstream retail product markets;
- The sequence in which retail and wholesale markets should be considered; and
- Inclusion of self supply in the upstream product markets.

G.1.1 Geographic Markets

197 As discussed above, there is an increasing trend recognition amongst regulators, including the Commission itself, to define markets (both retail and wholesale) for direct connect services (such as local telephony and broadband services) at a sub-national geographic level.

198 The question is then whether the geographic market should be the Telstra ESAs in which SingTel Optus HFC network is located or the whether the geographic market boundaries should be mapped to the SingTel Optus HFC footprint itself.

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[109] ACCC, Local Call Services Review Final Decision, July 2006, p.29.

As discussed in section F, most overseas regulators have, with the exception of New Zealand, aligned the geographic market boundary with the incumbent's exchange areas. This was done for three reasons. First, it was seen as being more practical because of the difficulties of mapping overlaying competitor network footprints to produce a single outer boundary. Second, removal of regulated access in an exchange area partially covered by a competitor's network would give that competitor an incentive to roll out more network. Third, even if customers were in the part of an exchange area not covered by a competitor's network, they would still benefit from competition because the incumbent would be unlikely to price discriminate in the retail market at that level.

199 Telstra has proposed an exchange level market definition in its other exemption applications, but there are good reasons to consider an approach to market definition which maps the SingTel Optus footprint in this exemption application:

- An exchange based market definition makes more sense in relation to Telstra access services which are themselves configured to the Telstra network architecture, particularly ULLS and LSS. There is no clean alignment between the ESA boundaries and the SingTel Optus HFC;

- The practical problems identified by the overseas regulators in using competitor network footprints do not arise here because SingTel is the only competing end to end network in its deployment areas;

- SingTel Optus has said that it will not expand its network, including because of the removal of the carrier powers and immunities in late 1997. While Telstra does not accept that SingTel Optus faces insurmountable hurdles to expanding its network, basing the market definition around the current network takes a conservative approach.

200 In any event, Telstra does not believe that there would be much difference in the analysis whether the geographic dimensions of the market are based on ESAs or SingTel Optus footprint. As the overseas regulators have found, the presence of the SingTel Optus HFC makes it unlikely that Telstra can target customers which SingTel Optus would not connect to its network. This would be the case even in those ESAs where the percentage of SingTel network is below the threshold level used by the overseas regulators given the more or less contiguous coverage of the SingTel Optus network through substantially most of the Sydney, Brisbane and Melbourne metropolitan areas.

G.1.2 Product markets

201 There is an increasing recognition amongst overseas regulators that voice over broadband services are a close substitute for PSTN services. While quality concerns continue with access independent VoIP services, such as Skype, access dependent voice services offered by the broadband network operator offer an equivalent level of service because the network operator is able to control and manage call quality on an end to end basis. The cable operators in the US forbearance decisions offered their competing voice services by means of VoB which the FCC regarded as being of sufficient quality to substitute for both residential and business PSTN services.

202 In Europe, access dependent voice services are now usually included in the same market with PSTN services. As far back as February 2005, the French Competition Bureau, Conseil de la concurrence, disagreed with a preliminary decision of the telecommunications regulator, the Autorité de régulation des télécommunications (**ART**), to exclude VoB from its definition of wholesale and

retail fixed telephony markets.[110] The Competition Bureau was of the view that VoB services are evolving as a substitute to PSTN services and that on the basis of a forward looking approach to market definition required under the new EU regulatory framework, VoB should be included within the same market as PSTN services.[111] The Competition Bureau noted that excluding VoB services from the same market as switched voice services could distort the assessment of the appropriate regulatory remedies and therefore the market dynamics.

203 In welcoming the German regulator's decision to include VoIP services (both access dependent and access independent) in the same market as PSTN, the European Commission commented[112]:

> *The German regulator has also assessed the market with a view to ongoing technological developments and has included Voice over Internet Protocol (VOIP) services in the market definition of the calls market. VOIP services are set to become increasingly important in the future and are already substitutes for traditional Public Service Telephone Network (PSTN) telephony. The regulatory authorities of France and the Netherlands had already examined VOIP services in their respective notifications earlier this year. The Commission now supports BNetzA's position with regard to these innovative services and believes it will boost competition in fixed line telephony markets.*

204 The Canadian regulator, the CRTC, considered there was no doubt that VoB services offered by cable operators were a substitute for PSTN services. The CRTC also considered that with increasing broadband speeds achievable on cable and DSL networks, that access independent VoIP also should be regarded as being in the same market as PSTN[113]:

> *The Consumer Groups argued that, at the time of their submission, VoIP services were only weak substitutes for local exchange services. The Consumer Groups submitted that a general finding that VoIP services were in the relevant product market would be premature; however, it could be assessed on a case-by-case basis. Restated in a later submission, the Consumer Groups submitted that it would be inappropriate to treat access-independent VoIP services as being in the relevant product market.*
>
> *[In response to the Consumer Groups' arguments], the Commission notes that both Bell Canada and many competitors offer versions of access-independent VoIP service. The Commission further notes that the evidence indicates that these access-independent VoIP services are being priced and marketed as substitutes for local exchange services. In light of these considerations and the growing number of customers that are substituting access-independent VoIP services for traditional ILEC local exchange service, the Commission considers that access-independent VoIP services are in the same relevant market as circuit-switched local exchange services.*

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110 Marchés de la téléphonie fixe, available in French at http://www.art-telecom.fr/publications/c-publique/analyse-fixe-211204.pdf

111 See (in French) ART-Telecom, "Analyse des marches de detail et de gros de la telephonie fixe" Communiqué de presse, 21/12/04.
http://www.art-telecom.fr/communiques/communiques/2004/c211204.htm;
Conseil de la concurrence, "Le Conseil de la concurrence vient de rendre un avis a l'ART sur le marché de la telephonie fixe" Communiqué de presse (17/2/05).
http://www.conseil-concurrence.fr/user/standard.php?id_rub=149&id_article=387

112 "Commission welcomes decision of German telecom regulator to find the international calls market in Germany competitive ", European Commission 23 December 2005.

113 CTRTC, Forbearance from the regulation of retail local access services, 6 April 2006,
http://www.crtc.gc.ca/archive/ENG/Decisions/2006/dt2006-15c.htm

205 Clearly, on the approach taken by overseas regulators, both the current SingTel Optus cable telephony service and any VoB service to which SingTel Optus would be treated as close substitutes for Telstra PSTN voice services in the areas where the SingTel Optus HFC network and Telstra PSTN overlap.

G.1.3 Sequence in which Markets should be considered

206 As Professor Cave states in his attached statement, "[t]he ladder policy is also implicitly supported by a major feature of the regulatory regime in the EU which makes it unlawful to regulate markets which are effectively competitive."[114] This necessarily requires that the regulator to first consider the extent of competition in retail markets to determine, before moving upstream to consider what (if any) remedies by way of regulated access are required in wholesale markets.

207 Ofcom has explained this approach to sequencing retail and wholesale market analysis and the impact on the decision about wholesale remedies as follow."[115]

> *The analysis of retail market definitions is logically prior to the definition of upstream (wholesale) markets. This is because demand for upstream services is a derived demand, i.e. the level of demand for wholesale inputs depends on the demand for outputs (retail services). The definition of a retail market is likely to influence the market definition, and consequently any assessment of SMP, in related upstream markets. Where wholesale services are an important input into the retail services, the relevant upstream markets are generally (at least) as broad as the demand-side substitutes in the relevant retail market. Because of this, Ofcom's preferred approach to market definition is to define markets sequentially, starting with those that are furthest downstream, and ending with those that are furthest upstream. The purpose of Ofcom's market definition exercise is to inform its assessment of market power and identify appropriate remedies in the relevant market. It is*
>
> *therefore important that, at the wholesale level, markets are defined using the assumption that there is no regulation in any market. This approach ensures that the assessment of market power at the wholesale level does not depend on a retail market definition that is influenced by wholesale remedies. The method avoids the potential problem of circularity which could arise in market definition. However, the market definition used in any assessment of market power in downstream markets must be conducted in the presence of any proposed regulation in markets that are further upstream, since the presence of any such regulation may provide a constraint at the retail level by removing barriers to entry.*

208 The presence of alternative end-to-end networks should sharpen the focus of analysis about whether access regulation is needed upstream. End users are offered a choice of a full range of services by competing operators. As inter-platform competition is involved, there is likely to be differential pricing and service offerings between the competing network operators.

209 It is useful to consider how the presence of infrastructure-based competitors is factored into the analysis of regulated access overseas. The Canadian Competition Bureau's view is that regulated access should only be granted

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[114] Prof. Cave (2007), *Applying the ladder of investment in Australia, Annex 1, p.5.*

[115] Ofcom, Review of the retail leased Lines , symmetric broadband originations and wholesale trunk segments markets, Final Statement, 24 June 2006, paras 2.3 to 2.5

where the incumbent is dominant in both the upstream and the downstream market. The Bureau posits a three limb threshold test for access regulation:

- The firm controlling the facility in question is vertically integrated and dominant in two markets. The first relevant market is the upstream market (or wholesale market) for the facility. The second relevant market is the downstream market (or retail market) in which the facility is an input. A necessary condition for concluding that there is dominance in the upstream market is that it is not practical or feasible for competitors to duplicate the facility in question;

- Mandating access to the facility is likely to result in competitors entering or expanding in the downstream market[116]; and

- Such entry or expansion is likely to result in a substantial increase in competition in the downstream market within a reasonable period of time.

210 Where cable operators have rolled out networks the Competition Bureau considers that the regulated supply of ULLS is unnecessary as they are a competitive constraint in both the wholesale and the retail market.

> *These service providers have the incentive ability and capacity to discipline the exercise of market power by the incumbent at both the retail and wholesale levels of the industry.*[117]

211 In Telstra's view, the LTIE test requires a similar pattern of analysis, beginning in retail markets and then moving to wholesale markets only if there is not effective competition downstream. The focus of the LTIE test is in securing competitive downstream markets in which end users acquire services.

212 As set out in the Second Reading Speech to the *Telecommunications Competition Act 2002*:

> *...[the Act] is a fairly straightforward but not entirely simple matter—all of it directed at the principle of making the industry more competitive so that benefits flow through to consumers.*

213 Competition in wholesale markets is relevant to the extent that it impacts upon the interests of end users. If the downstream retail market is competitive, regulation is unnecessary. Thus, the Explanatory Memorandum for the *Trade Practices Amendment (Telecommunications) Bill 1996* states[118]:

> *It is not intended that the access regime embodied in this Part impose regulated access where existing market conditions already provide for the competitive supply of services*

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116 Ibid.

117 CRTC, Review of Regulatory Framework for Wholesale Services and Definition of Essential Service, Evidence of The Commissioner of Competition, 15 March 2007, para 17.

118 Item 6, proposed s152AB.

G.1.4 SingTel Optus Self Supply Relevant to Wholesale Markets

214 SingTel Optus currently supplies wholesale services within its HFC network only using DSLAMs and not using its HFC network. If SingTel Optus ceases to have access to ULLS, it will not be able to supply these wholesale services.

215 However, this does not mean that SingTel Optus will exit the wholesale market. As noted above, overseas regulators have considered that, on removal of regulated access pricing of incumbent services, infrastructure-based competitors will have more incentive to provide wholesale services on their own networks.

216 Even if SingTel Optus did not decide to immediately supply a wholesale HFC service, it would still be appropriate to include SingTel Optus HFC network in the analysis of the competitiveness of the wholesale market. Self supply by SingTel Optus to its own downstream retail arm still acts to discipline Telstra in the downstream market, which again is the focus of the LTIE test.

217 In the UK, Ofcom has also viewed cable-based competition from the perspective of the downstream retail market when considering wholesale regulation. In its consultation paper proposing to withdraw bitstream access in certain markets, Ofcom rejected arguments that it should disregard Virgin Media when considering the appropriate level of wholesale regulation because Virgin Media did not supply a wholesale service. Ofcom noted that as the purpose of access regulation was to promote competition in the downstream retail market, it was valid to take into account self supply because Virgin Media disciplined BT in retail markets:

> *It is still possible to consider the question of market definition at the wholesale level because, as noted above in the discussion on indirect constraints, competition would take place further downstream at the retail level. The relevant question is whether a hypothetical monopolist of a wholesale service could profitably sustain a small but significant price rise. Retail prices can be regarded as being compromised of a number of input costs and one of these input costs can be characterised as the cost of a wholesale service. If the charge for this wholesale service was to increase, and all other elements of the retail service were priced at the competitive level, this would translate into a price increase at the retail level*[119].

218 SingTel Optus' HFC network already exerts significant competitive pressure in retail markets and provides choice for consumers within the network footprint. SingTel Optus reports an overall penetration of 37% of its "serviceable" homes, and broadband take-up is at 26% of serviceable homes passed. Its HFC network is clearly 'fit for purpose' and capable of competing. If broadband penetration is between 40-50% in those homes, as the ABS data suggests, SingTel Optus appears to account for a substantial proportion, if not the majority, of broadband services its serviceable homes.

219 Accordingly, the Commission should view this exemption application through the prism of significant competition which already exists at the retail level between Telstra and SingTel Optus' end to end networks within the HFC deployment areas.

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[119] Ofcom, Review of the wholesale broadband access markets 2006/07, 15 November 2007 http://www.ofcom.org.uk/consult/condocs/wbamr07/wbamr07.pdf

G.2 The LTIE test

220 The exemption requested will promote the LTIE because it will:

(a) promote competition;

(b) encourage the economically efficient use of infrastructure; and

(c) encourage economically efficient investment in infrastructure.

which will result in likely improvements in the price, quality and range of the services offered to end users.

Promotion of Competition

221 The largest pro-competitive impact will arise because SingTel Optus will respond to the loss of access by competing more vigorously via its own HFC and mobile networks. It will be prepared to make the marginal investments required to access a substantial proportion of the 36% of homes passed which SingTel Optus is able to treat as "unserviceable" because of the availability of regulated access.

222 That SingTel Optus will be stimulated to invest in its own infrastructure – rather than by withdrawing from the market in these areas – is demonstrably likely because:

(a) overseas cablecos routinely service 90+% of dwellings in their footprint, indicating that SingTel Optus has plenty of room for viable growth in connections within its existing footprint. The fact that Telstra and Austar routinely service MDUs in their footprint, indicating that MDU challenges are surmountable;

(b) overseas experience shows that when access regulation is removed, cablecos respond by investing for example, as occurred in Hong Kong and the US (see Section E.5). As Eisenach and Singer have said[120]:

> *We find evidence that an entrant will significantly increase investment around the decision to forbear from regulating an existing access technology. We also find evidence that an incumbent will significantly increase investment around the decision to forbear from regulating a new service.*

(c) Where SingTel Optus does offer service, its cable modem uptake is 26% and growing, and bundling is strong, with the result that total HFC network connections are now increasing after several years of stagnating figures. This, together with the availability of well-tested voice-over-cable upgrade options and a digitised pay TV service that carries 'best-available' content, indicates that the economics of its HFC network are better than ever, and it is primed to take on greater competitive responsibilities.

223 As these marginal investments are made, powerful market forces will be unleashed. Infrastructure-based competition is unquestionably more potent than access-based competition because competitive pressure is brought to bear over

[120] Eisenach, J and Singer, H, "Irrational Expectations: Can a Regulator Credibly Commit to Removing an Unbundling Obligation?" (December 2007), AEI-Brookings Joint Center Working Paper No. 07-28, online at http://ssrn.com/abstract=1065161.

the whole value chain, leading to greater competition on price and quality dimensions, and improved scope for increased choice and innovation.

224 Even Allens Consulting Group, in a Report prepared for SingTel Optus, notes (while failing to mention that SingTel Optus already has existing infrastructure) that substantial, sustainable competition will only come when Telstra's competitors roll out their own infrastructure (see Section A).[121]

225 Of course, end-to-end competition is not a "one-shot game" where SingTel Optus simply services some extra customers by cable. It is what follows that counts for even more – it will spark a dynamic, intensifying process of competition that will deliver benefits over the life of those investments. As SingTel Optus steps up, Telstra will respond, with the result that end users will benefit on price, quality and choice dimensions relative to what would ever occur under access-based competition. For example:

(a) SingTel Optus, with greater scale, will be more likely to invest (and invest sooner) in upgrades such as higher-speed services or improved voice, because the fixed costs of doing so will be able to be spread across more customers. Once those fixed investments are made, it will then become more attractive for SingTel Optus to make incremental investments to acquire yet more customers, such as additional rollout or infill; and

(b) Telstra's own incentives to invest in upgrades to its copper network or its HFC network will increase, both in response to greater competition from SingTel Optus, and because narrower regulation will reduce the threat of non-compensatory access and expropriation.

226 These outcomes must be compared to the counterfactual, if the exemption is not granted. SingTel Optus would continue to engage in adverse selection, and have no greater incentive to innovate or become more responsive to end-users. As Professor Cave says in his expert statement[122], continuation of SingTel Optus' dual sourcing policy will lead to:

> *…very limited incentive to invest in their own networks. This has led and will lead to a diminution of the arena of competition and hence to a loss of dynamics efficiency.*

227 Strengthening infrastructure-based competition is all the more important given the imminent migration to NGNs, the architecture of which will render much of today's access redundant. The opportunity to "roll forward" existing infrastructure-based competition in a way that reduces the need for, and risks of, regulation in an NGN environment places a very high value on the establishment of viable infrastructure-based competition with today's networks.

228 The exemption removes unnecessary regulation. As the Commission has acknowledged, the benefits need to be carefully considered against the costs and risks of regulation:

> *…decisions to regulate should not be taken lightly and should be avoided if the economic benefit is not clear because of the risks of under-investment relative to any benefits.*[123]

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121 Allens Consulting Group, *An integrated approach to developing competitive broadband*, Report to Optus, 28 April 2006, p.1.
122 Prof. Cave, (2007), Applying the ladder of investment in Australia, Annex 1, p.12.
123 ACCC, A strategic review of the regulation of fixed networks, Discussion Paper, December 2005, p.52

229 The FCC considered that where alternative infrastructure had been deployed, the risks and costs of regulation outweighed any continuing benefits:[124]

> *One of Congress's primary goals in the 1996 Act was the creation of competitive local exchange and exchange access markets. To foster such competition, Congress gave new market entrants, which in 1996 lacked sufficient economies of scale and scope to compete effectively in the local exchange and exchange access markets, the right to compete with the incumbent LEC in these markets by leasing at cost-based rates key components (i.e., UNEs) of the incumbent LEC's own telecommunications network. Under this approach, a high degree of regulatory intervention may initially be required in order to generate competition among direct competitors in a situation where one carrier owns the telecommunications network that will be used to provide service to a single pool of customers. Such regulatory intervention results in a number of costs, including reducing the incentives to invest in facilities and innovation, and creating complex issues of managing shared facilities … While the costs of such regulatory intervention may be warranted in order to foster competitive entry into the local exchange access markets where such competition would not otherwise be generated, we find that these costs are unwarranted and do not serve the public interest once local exchange and exchange access markets are sufficiently competitive, as is the case in certain limited areas of the Omaha MSA.*

230 Telstra considers that this is clearly a case where any meaningful cost-benefit analysis would conclude that access obligations are not warranted. The benefits of infrastructure-based competition accrue on a large scale, while any costs arising from the granting of the exemption are limited. Any increased costs faced by SingTel Optus are small by comparison (see section E.5), including because:

(a) SingTel Optus will have the incentive to reduce its connection costs by making additional modest investments in its HFC network. For example, upgrading its telephony service to voice over broadband would eliminate the need for installation of bulky units in SDUs and MDUs which require specialist technicians and add to the cost and time of installation;

(b) as SingTel Optus adds more customers, its economies of scale will increase; and

(c) SingTel Optus has alternatives if particular customers prove expensive to connect via HFC (eg its 3G HSPDA network, or negotiating commercial access with Telstra).

231 As the exemption is mapped to the SingTel Optus HFC network footprint and not to ESA boundaries, there will be no diminution in the ability of SingTel Optus to compete using regulated access services in those parts of ESAs which do not have HFC coverage. While the potential pool of customers that can be served from DSLAMs in an ESA may reduce, it will still be economic for SingTel Optus to utilise regulated access services to serve the remaining parts of the ESA because:

(a) SingTel Optus' investment in DSLAMs and associated infrastructure in ESAs already served by DSLAMs is sunk; and

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[124] Federal Communications Commission, *Petition of Qwest Corporation for Forbearance Pursuant to 47 U.S.C. §160(c) in the Omaha Metropolitan Statistical Area*, WC Docket No. 04-223, Memorandum Opinion and Order, 2 December 2005 at 40.

(b) as Telstra has demonstrated in its submissions in respect of its exemption application relating to LCS and WLR, a DSLAM will be economic to deploy with a relatively low number of customers[125].

232 Because SingTel Optus appears to supply wholesale services by means of its DSLAMs in areas where it has HFC network, this exemption may have some impact on the operation of markets at the wholesale level. However the wholesale market is only relevant to the extent that it impacts end-user markets; and retail competition will not be harmed by this exemption because in the lucrative areas cabled by SingTel Optus there are several providers using many systems (HFC, DSLAMs, and wireless / 3G). Any retail customer that SingTel Optus considers too expensive to connect[126] can be served by others; competition in downstream markets which will be stronger than it would be under the counter-factual due to the dynamic benefits of enhanced infrastructure-based competition (see also section E.5).

233 To the extent that the Commission may nevertheless be concerned that granting the exemption may harm competition in the wholesale market, Telstra submits that:

(a) SingTel Optus may choose to offer wholesale services via cable. At minimum, offering a resale cable broadband service is technically very simple, and bitstream offerings are also technically feasible. The exemption gives SingTel Optus reasonable time in which to prepare. The FCC in its forbearance decisions and Ofcom in its consultation paper on bitstream services both considered that the cable operator offering wholesale services was a likely outcome:[127]

> *in principle, absent regulation, it is possible that cable operators and ADSL operators might offer a wholesale broadband product. .... Under competitive market conditions, both Virgin Media and BT might have an incentive to offer a wholesale product. Competitive pressure would mean that, on average, their upstream (network) and downstream (retail) divisions would make only a normal return (i.e. their cost of capital). In these circumstances, Virgin Media or BT would find it profitable to supply a wholesale product to any alternative operator which was more efficient than them in the provision of retail services, or was one that could successfully market broadband services to a wider range of customers (perhaps through greater product differentiation or combining with its own service offering such as content).*

(b) The withdrawal of the regulatory requirement to supply SingTel Optus does not necessarily mean that Telstra will not continue to supply services on a reasonable commercial basis. Following the decision to phase out in ULLS in Hong Kong, the incumbent reached commercial agreements to continue supplying ULLS. Both the FCC and Ofcom considered that there would be incentives for the incumbent to continue to offer commercial wholesale services:[128]

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125 CRAI, Statement by Dr Paul Paterson for Mallesons Stephen Jaques on the Economic Considerations for LCS and WLR Exemptions, 9 July 2007.

126 Noting that sites more than 75 m from the cable are not affected by the exemption.

127 Ofcom, Review of the wholesale broadband access markets 2006/07, Explanatory Statement and Notification, 15 November 2007, paragraph 3.181.

128 Federal Communications Commission, *Petition of Qwest Corporation for Forbearance Pursuant to 47 U.S.C. §160(c) in the Omaha Metropolitan Statistical Area*, WC Docket No. 04-223, Memorandum Opinion and Order, 2 December 2005 at 41.

given Cox's [the cable operator] ability to absorb customers without any reliance on Qwest's[the incumbent telco] local exchange facilities, Qwest will be subject to very strong market incentives to ensure that its network is used to optimal capacity – irrespective of any legal mandate that it do so. Faced with aggressive "off-net" competition from Cox, we predict that Qwest will endeavour to maximize use of its existing local exchange network, providing service at retail and at wholesale, in order to minimize revenue losses resulting from customer defections to Cox's service. In short, Qwest will prefer that a customer be served by wireline competitor using Qwest's facilities at wholesale rates above that customer's use of Cox's network, which offers Qwest no revenue whatsoever but only a miniscule reduction in its costs.

(c) SingTel Optus' DSLAM assets will continue to be utilised SingTel Optus will be able to use the DSLAMs in those ESAs which do not have 100%. HFC coverage (which is most of the HFC ESAs). Even in the 100% ESAs, not all premises may be within 75 ms of the network. Telstra and SingTel Optus may reach commercial supply arrangements. SingTel Optus will also be able to re-use DSLAMS out-of-area. But even if the exemption did lead to a lessening in the number of DSLAM operators in an area, this would be more than compensated for by SingTel Optus becoming a vigorous cable competitor. There would be no net loss of competition.

(d) In any event, there is no risk of duopoly as a result of this exemption, since (non-infrastructure-owning) third parties would continued to have regulated access to Telstra's wholesale services as set out in Figure 4:

(i) 179 of the 256 ESAs in which SingTel Optus has DSLAMs in New South Wales, Victoria and Queensland also have DSLAMs of at least one competitor in addition to SingTel Optus;

(ii) as set out in Telstra's exemption applications for LCR and WLR, the entry of the first ULLS based operator is good evidence of the economic viability of other DSLAM based operators entering an ESA. In the limited number of HFC ESAs in which SingTel Optus is currently the only DSLAM Operator, other DSLAM operators may enter. To the extent SingTel Optus provides wholesale services in ESAs in which it is the only DSLAM operator, SingTel Optus has an incentive to offer a substitute cable-based wholesale service to retain its wholesale business. If SingTel Optus chooses not to, another operator may enter and deploy a DSLAM to provide wholesale services.

Economically efficient investment in infrastructure

234 The investment stimulated by the exemption will bring us closer to the point of efficient duplication:

(a) cable operators in the US, Canada and a number of European countries have invested viably in customer connections representing over 90% of dwellings passed, and SingTel Optus is well short of this point;

(b) Telstra's and Austar's record of wiring up MDUs indicates that it would also be efficient for SingTel Optus to do so;

(c) cable overbuilders in the US have successfully targeted MDUs.

235 As explained in section E.5, overseas evidence from the US and Hong Kong shows the investment-stimulating effects that withdrawal of regulated access can have on operators with existing networks.

236 SingTel Optus' investments as a result of this exemption will not go beyond that which is efficient. Among other things, it is presently a long way short of what domestic and international comparisons suggest would be an efficient level of investment in connecting homes – together with its ability to negotiate commercial access from Telstra, the 75 m threshold and the number of other networks that might service retail customers, that will constrain the amount the investment to efficient levels.

237 It is in the legitimate interests of the access provider, Telstra, to grant the exemption because it will:

(a) enable Telstra to avoid being "cherry-picked" by SingTel Optus in a way which makes the access price non-compensatory (due to adverse selection – see section E.3);

(b) by limiting the scope of access regulation, give Telstra greater commercial flexibility and incentives to invest in infrastructure, including FTTN networks, and limit the constraints placed on it; and

(c) relieve Telstra of unnecessary regulation (and its attendant costs).

Economically efficient use of infrastructure

238 Currently, the SingTel Optus network is underutilised, especially since pay TV digitisation enabled analogue shut-down and freed up substantial capacity. Granting this exemption will give SingTel Optus the incentive to use its HFC network for homes that it currently treats as unserviceable – almost 36% of its footprint.

239 The additional customer connections that will be stimulated by the exemption will increase SingTel Optus' network utilisation, and as dynamic infrastructure-based competition takes hold, *both* SingTel Optus and Telstra will use their networks more efficiently.

240 As SingTel Optus' HFC penetration increases, so will its functionality as platform and service investments are made (or made earlier than under the counterfactual). New services, larger customer numbers, and the process of keen competition will all lead to better capacity utilisation.

G.3 The Commission's legal power to grant the exemption

241 Section 152AT of the TPA empowers the Commission to grant Telstra an exemption from one or more of the standard access obligations set out in section 152AR in circumstances where such an exemption is consistent with the LTIE.

242 Section 152AT allows an individual access provider to "apply to the Commission for a written order exempting the carrier or provider from all or any of the obligations referred to in 152AR," ie, the standard access obligations set out in section 152AR. It is material that a section 152AT exemption is not an exemption to the actual declaration of service as such under section 152AL; it is an exemption from the standard access obligations.

243 The SAO in Section 152AR(3) obliges the access provider to provide access to the declared service to a particular access seeker upon that access seeker's request.

For instance, section 152AR(3)(a) states that "[a]n access provider must, if requested to do so by *a* service provider…supply an active declared service to the service provider in order that *the* service provider can provide carriage services and/or content services" (emphasis added). Section 152AR(3) expressly contemplates a request from an individual access seeker and a corresponding obligation to provide access to that specific access seeker. While the exemption could apply to all access seekers or a sub-set of access seekers, equally it can apply to a particular access seeker making a request under section 152AR(3).

244 The exemption sought by Telstra is nevertheless capable (upon provision by SingTel Optus of confidential information to the Commission concerning the exact location its network) of being ascertained and defined, and it is therefore a valid request for exemption. This is also not a case where the Telstra exemption seeks to cover unknown future services (such as might be covered by section 152ATA). The scope of the exemption also does not change depending on future events. SingTel Optus' network is already built and the exemption is confined to the existing network.

245 Thus, the exact application of the exemption is fixed by a set of objectively determinable criteria which exist as at the date of the exemption order. There is no uncertainty and no futurity. Telstra may not know the exact boundaries of the current SingTel Optus HFC Network but that is discoverable from SingTel Optus and Telstra has proposed a process by which the boundaries of the exemption can be determined in a straightforward manner. The Commission has the legal powers to compel SingTel Optus to provide that information under s151.

246 In Telstra's view, the Commission has ample legal power to grant the proposed exemption to Telstra.

H Information Requests

247 The publicly available material clearly indicates that SingTel Optus, uniquely amongst cable operators internationally, is a heavy user of regulated access services within its cable footprint. However, as noted in Section D there is very little public information available about how and when SingTel Optus decides to connect customers within its HFC footprint to its own network or use regulated access services. The Commission has power to require information to be supplied under section 155(9) in relation to the exercise of its functions under Part XIC.

248 Telstra requests that the Commission require SingTel Optus to provide its internal policies and criteria which bear on its decision about when to use Telstra's network rather than its own HFC network in areas where the HFC network is deployed. Specifically, Telstra requests that the Commission obtain from SingTel Optus the following information:

(a) the criteria, policies, guidelines or rules used by SingTel Optus to decide whether an End User's premises passed by the SingTel Optus HFC network is serviceable from that network.

(b) SingTel Optus' policies, guidelines or rules in respect of the connection of MDUs located in close proximity to the SingTel Optus HFC network to that network.

(c) the criteria, policies, guidelines or rules used by SingTel Optus to decide whether to offer services to Contestable Customers using either its own HFC network or using a wholesale service acquired from Telstra (such as a ULLS or LSS).

(d) the criteria, policies, guidelines or rules adopted by SingTel Optus in deciding whether to install DSLAM equipment in a telephone exchange which services an ESA in which a part of Optus' HFC network is located; and

(e) the criteria, policies, guidelines or rules used by SingTel Optus to decide whether to migrate End-Users from Optus' ULLS or LSS DSLAM network to its HFC network.

249 Telstra also proposes the Commission obtain from Telstra Wholesale information about SingTel Optus' utilisation of ULLS and LSS across the ESAs in which SingTel Optus has HFC network. As this is treated as confidential information by Telstra Wholesale, Telstra proposes that the Commission require the information to be produced under section 152AU of the Act, which allows the Commission to require an applicant for an exemption to provide information. Telstra proposes that the following information about SingTel's Optus' use of the regulated wholesale services be obtained:

(a) a list of the ESAs in which SingTel Optus has DSLAMs ; and

(b) the number of ULLS SIOs supplied to all access seekers and the cumber of those supplied to SingTel Optus by each ESA as at 31 December 2005, 31 December 2006, and 31 December 2007.

250 This information will put the Commission in a position to match the information obtained from Telstra Wholesale with the information from SingTel Optus to get a more complete picture of SingTel Optus' approach to using regulated access within its HFC network footprint. While Telstra believes that this application can

be determined on first principles – an operator which has a local network if its own should not have access to regulated services at any price – only the Commission is in a position to obtain and put together the information from SingTel Optus and Telstra to get the complete picture of what is happening. If the Commission does not agree with our view that the application can be granted on first principles and considers that it needs to look to the factual circumstances of the market, then the Commission must obtain the information of the kind we have identified in order to properly consider this application.

Attachment 1 Modelling of subscriber connection costs

1. Assumptions

In order to model the cost of supplying a service to new customers, we make the following assumptions.

1.1 Connection infrastructure

For single dwelling units (**SDUs**), there is a 40% probability that an inactive premise already has a drop cable that is inactive. That is, of the 1,400,000 homes passed by SingTel Optus, 519,000 have an active service and 881,000 do not. Of these 881,000 inactive premises, 350,000 already have a drop cable in place.

As the SingTel Optus HFC network is primarily in areas with a residential (rather than business) population, we assume that the MDUs are relatively small. That is, rather than the dense MDU found in city centres and in reclaimed industrial areas (such as the Docklands in Melbourne or Pyrmont in Sydney), the MDU are blocks of 4, 8 or 16 units.

We assume that no SingTel Optus MDU wiring is in place.

1.2 Connection costs

We assume that the cost of adding a service is split between the drop, the installation and the customer premises equipment.

We assume that the cost of installing a drop (including labour and materials) is as follows:

Activity	Cost
Aerial cable drop to SDU	$250
Internal wiring in SDU from drop	$90
Aerial cable drop to MDU	$250
Fit amplifier and splitter in MDU MDF cupboard	$400
Lateral from MDF cupboard to unit (no backbone)	$350

We assume that the customer premises equipment is a cable modem with 4 port router and 2 port ATA. This has a cost of $US90 and is landed and in the SingTel Optus warehouse at a cost of $110.

1.3 Revenue

We assume that connected customers will take the SingTel Optus minimum "Fusion" product.

We assume that the SingTel Optus "Fusion" product has a retail price of $69 per month (including GST) and that this is based on a call cost margin of 50%. That is, the direct costs of the product can be calculated as:

Item	Cost
Retail Price	$69.00
GST	-$6.27
Retail less GST	$62.73
Direct cost	$31.36

Of this direct cost, $14.40 is the regulated price at which Telstra supplies SingTel Optus with a Band 2 ULLS. This implies that the underlying cost to SingTel Optus of providing the broadband access and calls for its Fusion service is $31.36 - $14.40 = $16.96.

Clearly, SingTel Optus has other costs associated with the supply of the service and Telstra would not suggest that the EBITDA margin would approach 50%. However, the service specific direct cost margin is likely to be 50%. Further, those calls which have a higher cost per minute (such as to non-Optus GSM and international calls) are not included.

There is no connection charge and the Fusion contract is for 24 months.

1.4 SingTel Optus' cost of capital

We assume that the SingTel Optus cost of capital is 12% and make the simplifying assumption that this is 1% per month.

2. Model

2.1 Single dwelling units

We model the cost of SDU separately from MDU and seek the pay back period and the internal rate of return measured over 24 months with the assumed weighted average cost of capital.

The average cost of installation to SDU is (531,000 x $340 + 350,000 x $90)/881,000 = $240.

The cost of CPE is $110.

The period in which the capital expenditure for provisioning the service is repaid (measured using retail price less GST, less direct costs) is 8 months.

2.2 Multiple dwelling units

The cost of installation to the first unit in an MDU is $1,000.

The cost of installation to subsequent units is $350.

The cost of CPE is $110.

The minimum number of units in an MDU required to produce a period in which the capital expenditure for provisioning the service is repaid on less than 24 months is 2.

The period in which the capital expenditure for provisioning the service is repaid (measured using retail price less GST, less direct costs) is:

Units	months
2	19
4	15
6	14
8	13
16	12

2.3 Conclusions

The model is very simplistic and does not take into account the benefits from the delivery of a more diverse range of services. However, it shows that, on a rational and conservative basis assuming the average costs as set out above, it is worthwhile for SingTel Optus to provide services to SDUs using cable and to MDUs using cable provided that SingTel Optus can always obtain at least two customers in any MDU.

Attachment 2 ESAs in which Telstra believes HFC network has been deployed

The following tables list the ESAs in which Telstra believes SingTel Optus has HFC network.

The 240 ESA are as follows, provided alphabetically by state:

NSW – 97 ESA		
Ashfield	Frenchs Forest	Northbridge
Avalon Beach	Glebe	Parramatta
Balgowlah	Granville	Peakhurst
Balmain	Guildford	Pendle Hill
Bankstown	Harbord	Pennant Hills
Baulkham Hills	Haymarket	Petersham
Blacktown	Homebush	Pymble
Blakehurst	Hornsby	Quakers Hill
Bondi	Hunters Hill	Ramsgate
Botany	Hurstville	Randwick
Burwood	Kellyville	Redfern
Campsie	Kensington	Revesby
Carlingford	Killara	Rockdale
Carramar	Kingsgrove	Rooty Hill
Castle Hill	Kogarah	Rose Bay
Chatswood	Lakemba	Rydalmere
City South	Lane Cove	Ryde
Como	Lindfield	Sefton
Concord	Liverpool	Seven Hills
Coogee	Manly	Shalvey
Cremorne	Maroubra	Silverwater
Cronulla	Mascot	South Strathfield
Dalley	Matraville	St Leonards
Dee Why	Miller	St Marys
Drummoyne	Miranda	Sutherland
Dural	Mona Vale	Sylvania
East	Mosman	Undercliffe
Eastwood	Narrabeen	Vaucluse
Edensor Park	Newtown	Wahroonga
Edgecliff	North Parramatta	Waverley
Engadine	North Ryde	Wetherill Park

Epping	North Sydney	Willoughby
Five Dock		

QLD – 49 ESA		
Acacia Ridge	Eight Mile Plains	Salisbury
Albany Creek	Everton Park	Sandgate
Albion	Ferny Hills	Sherwood
Ascot	Goodna	Slacks Creek
Ashgrove	Inala	South Brisbane
Aspley	Ipswich	Southport
Bald Hills	Jamboree Heights	Sunnybank
Brookfield	Lutwyche	The Gap
Browns Plains	Mitchelton	Tingalpa
Bulimba	Mount Gravatt	Toowong
Bundamba	New Farm	Valley
Camp Hill	Newmarket	Waterford
Capalaba	Nundah	Woolloongabba
Chapel Hill	Paddington	Wynnum
Chermside	Redbank Plains	Yeronga
Coorparoo	Redcliffe	Zillmere
Darra		

VIC – 94 ESA		
Ascot	Fawkner	Oakleigh
Balaclava	Ferntree Gully	Ormond
Bayswater	Flemington	Port Melbourne
Beaumaris	Footscray	Preston
Bentleigh	Gardenvale	Reservoir
Blackburn	Glen Iris	Richmond
Boronia	Glenroy	Ringwood
Box Hill	Greensborough	Sandringham
Brighton	Heatherton	Scoresby
Broadmeadows	Heidelberg	Seaford
Brooklyn	Highett	Somerton
Brunswick	Ivanhoe	South Melbourne
Bulleen	Jordanville	South Oakleigh

VIC – 94 ESA		
Bundoora	Keilor	South Yarra
Burwood	Kew	Springvale
Caulfield	Keysborough	St Albans
Chelsea	Kooyong	St Kilda
Cheltenham	Laverton	Sunshine
Clayton	Laverton South	Tally Ho
Coburg	Maidstone	Templestowe
Collingwood	Malvern	Thomastown
Cranbourne	Melton	Thornbury
Dandenong	Mitcham	Toorak
Dandenong North	Montrose	Tullamarine
Deer Park	Mordialloc	Wantirna
Doncaster	Moreland	Warranwood
Doncaster East	Mount Eliza	Werribee
East Kew	Newport	West Essendon
Elsternwick	North Balwyn	Wheelers Hill
Eltham	North Essendon	Williamstown
Endeavour Hills	Northcote	Windsor
Epping		