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*"It's all about
time to revenue:
no cable,
no cash flow."*

Cost-Benefit Analysis and Review of Regulatory Arrangements for the NBN

This Submission has been prepared in response to the open invitation from the Department of Communications. On 13 February 2014 the Department announced its intent to seek Public Submissions to the Regulatory Issues Framing Paper. This Submission seeks to make a case for HFC assets to be incorporated in to the NBN Co delivery model: to reduce the impact on public finances and reshape the industry structure on a more sustainable footing.

14 March 2014

NBN Regulatory Review
Department of Communications
GPO Box 2154
CANBERRA, ACT 2610

Dear Madam / Sir

Submission – Cost-Benefit Analysis and Review of Regulatory Arrangements for the National Broadband Network

Please find attached my Submission for your consideration.

"It's all about time to revenue: no cable, no cash flow."

In the context of the communications sector undergoing massive structural change and being in transition, the recommendation of this Submission is that the Government move towards the incorporation of the HFC infrastructure(s) and declaration of the wholesale cable broadband data service under Part XIC of the *Competition and Consumer Act 2010*.

The schedule for the NBN wholesale broadband network completion shall, in part, be dependent on the revised Statement of Expectations for NBN Co and of course, NBN Co's 2014-17 Corporate Plan. It means that superfast 100Mbps download services are many years away unless the cable HFC assets are leveraged for the greater good.

To address the identified culture issues reported in the Strategic Review and so keep NBN Co focused on its core mission, this Submission recommends that 'New NBN Co' becomes a network-service mediator intermediary of the alternate fixed networks (including cable) in the immediate term.

I am available to meet and discuss this Submission with you.

Yours sincerely,



Dermot Cox
M. Marketing (Monash), CPM

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About the Author

Dermot Cox is a 30-year career telecommunications and high technology professional.

His broad experiences span from being country manager for a global telecommunication vendor; an advocate for community demand generation programs through the Australian Government and the Government of Tasmania; leading market development programs with telecommunications carriers; and leading a multi-disciplinary team for 21st Century Next generation architectures.

In building multi-year business cases, he has been exposed to many technologies such as Cloud, optical transport networks, network-based services, 3G networks, analytics, carrier voice, terabit data, Enterprise IP Telephony, GPON, and cable networks.

Confidentiality

This Submission is made by the Author as a private citizen.

It's an independent Submission with no support provided by vendors, Access Providers, and Access Seekers. It is understood that the Submission may be used by the Department of Communications in its deliberations and public inquiry.

Back to the Future (again)

For context, the author has been advocating for the inclusion of the current HFC assets in to the delivery model for NBN Co since March 2009.

Hansard. (Emphasis added **Bold**).

Mr Dermot Cox, Marketing Director, C-Cor Broadband Australia Pty Ltd, Committee Hansard, Canberra, 4 March 2009, p. 63.

2.144

A new witness to this inquiry, Mr Dermot Cox, appeared in Canberra to provide a different perspective on the broadband issue. Mr Cox was strongly in favour of **upgrading the existing HFC cable network**, which he believed could 'deliver the lowest cost broadband infrastructure to major cities and towns around Australia'.

He expressed concern that 'the current policy mix seems to have caused a dire lack of investment in cable broadband over too many years' and **questioned whether the government** was aware of 'how simple and cost effective it would be to make existing cable broadband networks deliver super-fast speeds'.

2.145

Although the upgrade was clearly addressing metropolitan areas in the main,

Mr Cox did explain that it would be possible to: **Modernise those [HFC] networks** and save the effort and investment dollars for the people who are underserved ... Put the bucket of money there, as distinct from replacing perfectly good broadband [HFC] infrastructure.

2.146

Mr Cox also made reference to the need for consultation with communities and local government, which he stated has been 'completely overlooked'. This was particularly in relation to the physical dimensions and locations of the nodes involved in an FTTN build, which would be not only significant in size but would also require a power supply and cooling systems. Mr Cox commented that 'I think some people will take an offence at the impact on their streetscape' of the nodes.

1.0 The Takeaways

The Australian communications sector is commencing a massive industry structural change: it's in transition.

During this transition, all capital assets must be leveraged for optimal outcomes supporting industry participants and promoting better economic efficiency and productivity.

The cable infrastructure has the lowest cost base unlike the NBN which is undertaking a new network build. It will have the highest cost base of all fixed broadband networks in Australia.

In Australia, no access obligations exist for cable broadband operators as a result of 100Mbps download service or an equivalent or like service, already being declared, including in a generic form.

The community of interest in fixed infrastructure and wireless infrastructure is well established and mature in Australia, unlike the eco-system for cable broadband which is less well-resourced to undertake stakeholder engagements over an extended period of time. This has distorted policy development.

As an example the 2013 Freedom of Information request disclosed that the ACCC on the 13 February 2009 responded to the 'questionnaire on broadband technologies' from the Secretary, Department of Broadband, Communications and the Digital Economy who was seeking clarification on performance capabilities of various technologies. Within this reply to the Secretary, the ACCC identified that HFC is a high performing broadband technology.

But Government Policy with tacit support from the ACCC moved to an altogether new position being a policy that destroyed capital: an anathema to market economists.

In submissions and appearances to the Senate Select Committee on the National Broadband Network and industry forums, I've vociferously asserted that the Australian HFC networks were capable of delivering wholesale open Ethernet access. Refer to APH papers, Senate Select Committee on the NBN 3 Jul 2009 and 30 March 2010.

Based on the major transformation in the Australian telecommunications industry - which won't deliver 100Mbps services in the metropolitan markets until 2021 and the lack of competitive superfast broadband product - the recommendation of this Submission is that the Government move towards incorporation of the HFC infrastructure assets. As part of the implementation, direct the ACCC to declare wholesale cable broadband data service under Part XIC of the *Competition and Consumer Act 2010*.

1.1 Key Findings

The NBN was conceived as part of a 'Grand Plan' to stimulate the economy in the midst of the Global Financial Crisis. It envisaged the delivery of superfast broadband across Australia transforming and stimulating a digital economy.

In its development the then Government created NBN Co - a public monopoly - to deliver wholesale fixed broadband.

The unintended consequences of that Competition Policy stifled industry investment and caused severe damage to the Australian communications industry vendor and support base.

The NBN Strategic Review report of December 2013 highlighted:

- That NBN Co will be an economic drain on public finances unless and until it drastically resets its cost base;
- That the NBN Co wholesale prices are not aligned nor congruent with end-customer market demand;
- That NBN Co is failing to meet network build targets;
- That the pursuit of Fibre-To-The-Premise (FTTP) architecture was driven by mantra rather than engineering excellence focussed on services outcomes substantiated by a 'credible' business case.

Moving to a multi-technology network is consistent with delivering superfast broadband to Australians: it leverages existing assets for faster service delivery, reduces the demand on public finances perhaps by \$BNs, delivers an economically sustainable long-term cost curve.

If the existing broadband infrastructure, including cable broadband assets, isn't incorporated in to the NBN Co multi-technology platform then NBN Co will be destroyed by market forces: mobile broadband operators and/or the alternate fixed broadband operators.

The NBN Co will be niched to death consuming massive public finances.

Realistically, NBN Co will be sold at a massive loss of public equity - a political nightmare in the making.

2.0 The Issues

The Australian communications sector is in a process of a massive transition.

The Federal Government policy to build a fixed wholesale-only network is changing industry structure and industry participant behaviour.

This Submission seeks to complement this Government policy to recognise that the cable broadband network (aka HFC) is a key communications infrastructure that can be leveraged to accelerate the policy effect, promote any-to-any connectivity, promote economic outcomes, and adopt a pragmatic approach to sunken investment in superfast broadband communications infrastructure during the industry transition.

2.1 Mis-aligned Cost Structures

The capital cost to refresh HFC networks is massively cheaper than building a brand new G.PON FTTP overlay.

The NBN Co Corporate Plan highlighted that reaching 93% penetration would deliver a hockey stick cost curve: a penalty unlike any other fixed broadband operators such as HFC networks or the mobile broadband networks. A credible business case would expose these disparities.

A capital cost disadvantage becomes evident in the wholesale sell prices. These sell prices have to be competitive with alternates and with substitutes like mobile broadband.

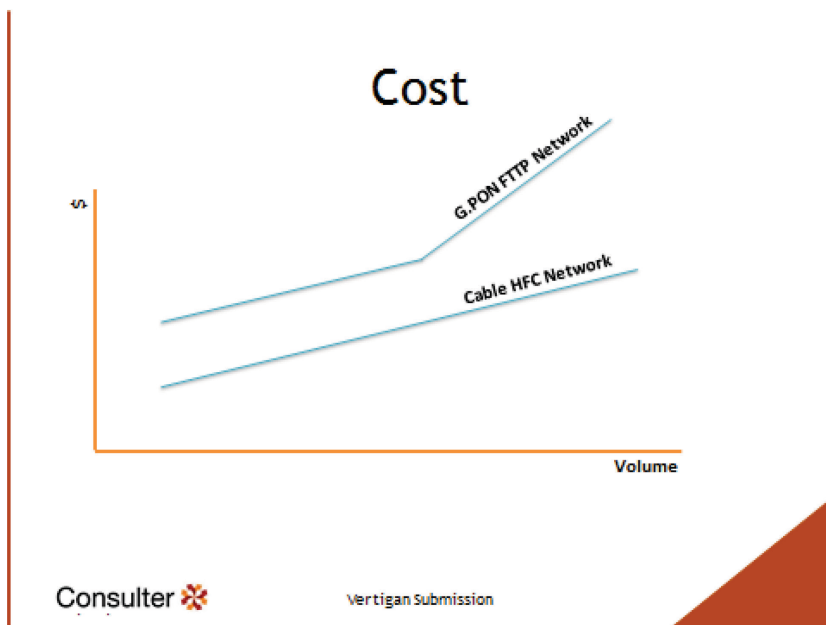


Chart 1: Mis-aligned Cost Structures

2.2 Chronic Under-investment

The current owners of the major HFC networks (Access Providers) have not undertaken any major construction programs to extend their footprint in many years: focus has been on repair and maintenance programs.

The current HFC networks can be expanded or deepened to connect MDUs as part of the transitional arrangements for the NBN. Contrary to myths, the extensions and infill can be built with fibre media to the premises as an alternate to coaxial cable to the premises.

Independently, I have estimated that the capital cost to upgrade and infill the existing HFC network(s) to require about \$1.5Bn. Anecdotally, I've since heard of other estimates ranging from \$1Bn to \$2Bn for similar scope. The positive impacts would be in the short-term for existing cable users. And a programme of infill to MDUs could conclude within three years.

The risk of electronic/electrical reliability failure in the cable network(s) is a risk that can be managed with proactive assessment and preventative replacement of field actives.

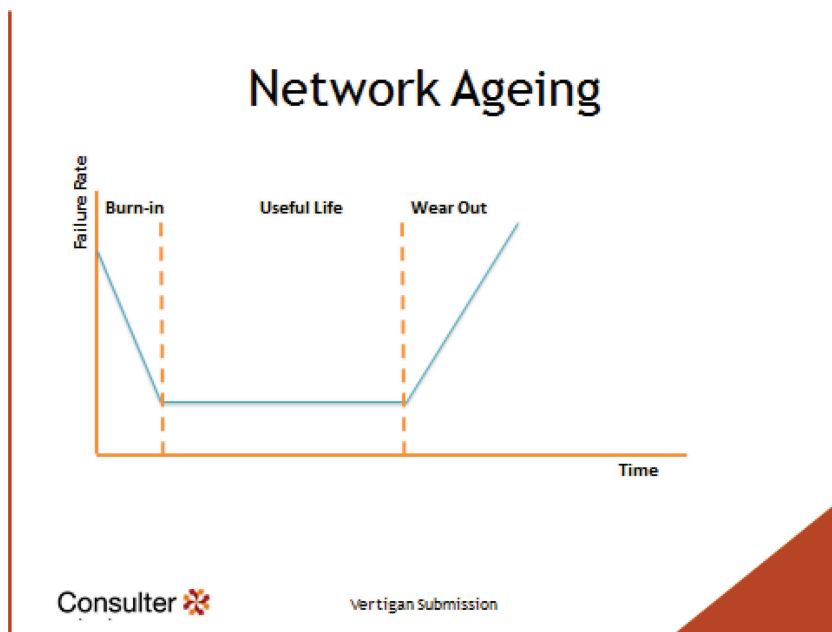


Chart 2: Mitigate cost exposures with an audit

The Burn-in, often called Infant Mortality stage is noted by failure typically from the manufacturing process. We sometime see failure out-of-the-box in consumer appliances. The second stage is the longest. Failure here is with extraneous factor like excessive environmental heat, EMI interference, and lightning. The Wear Out stage is where the electronic/electrical components or connectors fail. Typically, this stage is beyond the design life of the product.

The distant build timeframe for the completion of the current NBN provides a good opportunity for pro-active cable broadband maintenance programs, CMTS / CCAP modernization and subject to discussion new drop cables to end-customer

premises to be recovered by the HFC infrastructure owners and/or Retail Service Providers.

2.3 Substitutes Everywhere

The NBN Co and regulatory settings must negate the current HFC assets and for that matter other fixed broadband networks as sources of direct competition.

Today the alternate fixed broadband segment is dominated by incumbent HFC operators in metropolitan markets. They have a cost advantage in these specific geographic markets.

Today they market cost effective broadband services with, as we have seen, a bright technology evolution towards ultrafast broadband. The much discussed 'superfast 100Mbps' segment is projected to grow its market share.

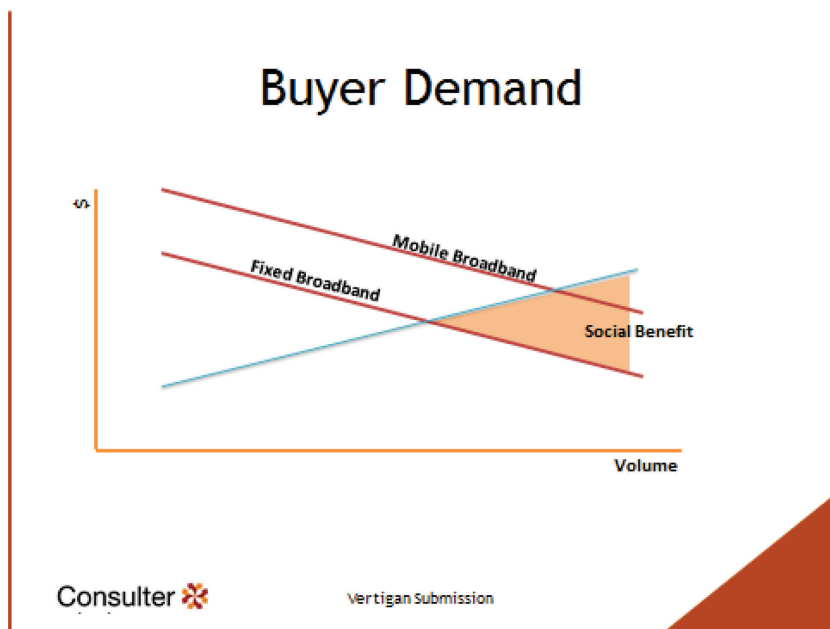


Chart 3: Mobile Broadband is both complementary and a substitute for Fixed Broadband

2.4 Alliances Everywhere

The emerging NBN competitive landscape will change dramatically.

In the short-term, the protagonists for the NBN collaborate to break the asserted monopoly powers of Telstra. In the near-term, these same industry participants will build new alliances with other industry participants.

NBN Market Place

What	Who	Role
Applications	App Providers: Voice, Internet Protocol Television (IPTV), Conferencing	Provide white label services to RSPs
Services	Retail Service Providers	Customer engagement
Mediation	New NBN (Cable Co)	Functional separation of Access Seekers and Access Providers
Infrastructure Owners	iiNet, Optus, Telstra	Build, (Own,) Operate, Maintain

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Chart 4: Emerging Industry Structure

In a different industry structure where the cable networks are IPO'd, the independent HFC infrastructure owners could reasonably build alliances with mobile broadband operators and also with App Providers like Google, Voice Services, Content Houses, and Web Conferencing providers to create highly appealing service bundles.

Ubiquitous WiFi in community centres and population centres is an emerging trend. Both Fixed Broadband operators and Mobile Broadband operators are expected to deploy this technology to complement service bundles. The technology is lower cost than Mobile and quickly deployed: ideal for enhancing Service Bundle attractiveness.

An independent cable operator would build-out a WiFi access network and engage Mobile Broadband operators for customer retention and to attract new customers.

Alternately, NBN Co might also build a complementary wholesale open access WiFi network. An implication of the current industry structure is that NBN Co might end up with all the investment risk and poor customer revenues to sustain the business.

The 'Grand Plan' did not envision such a hostile environment.

The industry regulator will be confronted with a brand new set of challenges.

2.5 New NBN Co

The NBN Co Strategic Review Report identified a number of medium term changes that are likely to be required including making ongoing organisational and culture change.

If NBN Co does move to a multi-technology model, it may be organisationally effective to create a Special Purpose Vehicle, or new Business Unit.

It's all about time to revenue: no cable, no cash flow.

The mission of New NBN Co will be to establish an operating environment that serves as a mediation organisation between the Retail Service Providers (RSPs) and the Access Providers in the short-term. It might own networks or contract them, and indeed contract third-party network build companies during the ramp stage. Chart 5.

The objective of New NBN Co is to break the nexus of distrust by many major RSPs towards Telstra as the dominant Access Provider and owner of the most extensive cable broadband infrastructure. They want to protect their customer data and get fair service levels. They don't want to feed their competitors certainly their largest. Today they suspect they are being disadvantaged by the Access Provider.



Chart 5: New NBN Co

Over time, key functions of Old NBN Co can be moved in to New NBN Co.

2.6 Social Benefit

Above in Chart 3, the relative Social Benefit of Fixed Broadband and Mobile broadband are shown.

Conceptually, Fixed Broadband has a greater Social Benefit than Mobile. This is because of the lower cost or better value of Fixed relative to Mobile.

The big issue is how to pro-actively manage the Social Benefit for the best outcomes including the underserved. Today Universal Service Obligations (USO) provides a mechanism for meeting the need for universal access to voice services: the social safety network.

As the Communications Alliance (CA) wrote in 2008, the industry participants do not want this USO and/or government subsidy to extend to the provision of broadband. Yet, increasingly, voice services will be delivered as a SIP service over a fixed or mobile broadband IP transport network – not over an analogue or digital network.

Market liberalisation and pro-competition protagonists are against USO. They assert USO creates cross subsidisation for the benefit of the incumbent.

Presently, the Telecommunications Universal Service Management Agency (TUSMA) regulates responsibility for access to the STS, payphones, emergency call handling, the National Relay Services, migration of voice-only customers and continuity of public interest services.

As the NBN moves ahead, we might consider a review of what services are included in the USO service definition. If we seek a broadband-enabled society then broadband must be included as an infrastructure platform for service delivery including voice services.

3.0 Regulator's View of the Market

Commonwealth la prescribes how the ACCC is to assess the market. It comprises three criteria Product Markets, Industry Rivalry, and End-User demand. Each is to be given equal weight in any assessment.

The ACCC perspective is that broadband is a national marketplace ignoring the sub-market perspective of the cable broadband networks: does that make sense?

It's not the view of network operators. They are building businesses in niche markets such as MDUs, green-field estates, inter-city markets which they have determined that they get return on their investments.

Following is a view from a cable operator perspective on Product Markets, Technology, Industry Rivalry and End-User Demand:

3.1 Product Markets

The product dimensions of cable broadband data services are functionally better than the ACCC bench mark for broadband services.

The cable broadband (aka HFC) networks are in well-defined geographic sub-markets within major metropolitan markets. They overlap with ADSL/ADSL2+ product markets. It's this overlap that is often cited as a rationale for absence of any applications to have HFC networks declared.

To date, the ACCC has reasonably considered that cable provides an equivalent service to ADSL especially so compared to ADSL2+. But that was turned on its head when the HFC networks introduced DOCSIS 3.0 technology.

I assert that cable delivers a better customer experience than ADSL2+.

Cable broadband can deliver better bandwidth through-put performance than ADSL2+ especially for media rich content like streaming HD video or interactive games or for end-customers with extremely high bandwidth demands.

Yes, cable is not a constraint on national wholesale ADSL prices; but it opens new product service offers for end-customer within local markets that don't have ready access to attractive pricing plans for superfast broadband plans as is evident overseas. In total, these local markets address 7 million Australians.

3.2 Technology

The common view of the Australian industry is that the HFC networks are proprietary, vertically integrated and not attractive to end-customers. I refute these, as follows:

- The technology HFC networks are governed by industry standards – open and published by CableLabs;

- Late 2013, CableLabs released a statement on the next wave of technology standards - referred to as DOCSIS 3.1 – and anticipates new capabilities being released by the vendor community early 2015
<http://www.cablelabs.com/news/new-generation-of-docsis-technology>
- The Foxtel Pay TV (Broadcast) service and the data services can be separated rather than being solely delivered as a bundled service. This means that all RSPs can access the platform to create new differentiated superfast broadband offers. (Refer to earlier submissions to the Senate Select Committee on the NBN and contributions to industry events and publications which have been circulated for peer review); and,
- End-customers are motivated by differentiated product offers and services outcomes rather than their purchase decisions being determined by technology platforms.

In Australia, the ADSL technology is delivered under the ITU G.992.5 (also referred to as ADSL2+ and G.DMT.bis+) which is an International Telecommunication Union standard for asymmetric digital subscriber line (ADSL) broadband Internet access.

The standard has a maximum theoretical download speed of 24 Mbps. Further, this performance is highly dependent on the length of the copper from the DSLAM to the customers’ modems: the longer this copper (loop) length then the less likely is the theoretical download speed. This is a major issue in Australia as the local loop length here is longer than many other countries. Similar facts apply to VDSL2 variants.

The current cable DOCSIS 3.0 technology was ratified as ITU-T Recommendation J.222.

Cable broadband does not have the same performance degradation as copper infrastructure: the technology delivers comparable performances across the 6km length from the node to premises.

The DOCSIS standard supports either downstream throughput with 256-QAM of up to 42.88 Mbit/s per 6 MHz channel (Optus), or 55.62 Mbit/s per 8 MHz channel for EuroDOCSIS (Telstra).

Common DOCSIS 3.0 speeds are listed in the table below.

Channel configuration		Downstream throughput		Upstream throughput
Number of downstream channels	Number of upstream channels	DOCSIS	EuroDOCSIS	
4	4	171.52 (152) Mbps	222.48 (200) Mbps	122.88 (108) Mbps
8	4	343.04 (304) Mbps	444.96 (400) Mbps	122.88 (108) Mbps

DOCSIS 3.1

Late 2013, Cable Labs announced the next wave of technology upgrades to HFC networks. The effect of the new standard is lower unit operating costs: faster speeds, better efficiency, and reduced power consumption across the current physical media.

The CTOs of the USA cable operators have started their strategic planning for this technology introduction in to existing networks. An example is shown in Chart 6.

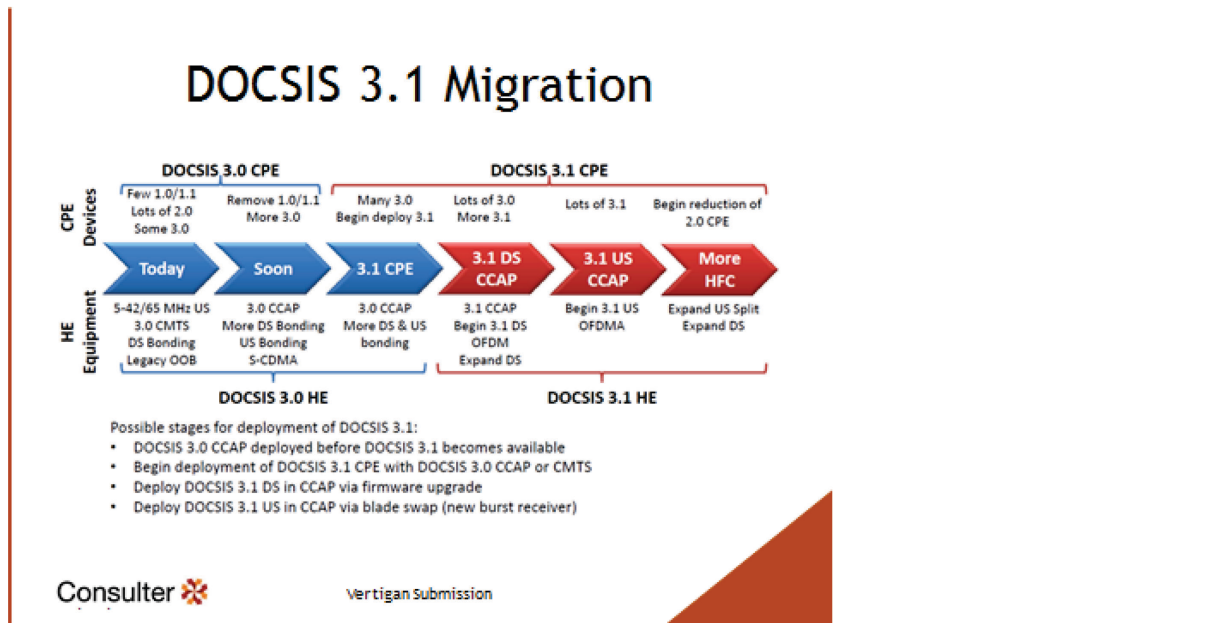


Chart 6: Migrating towards DOCSIS 3.1 (Courtesy of Mr. Jorge Salinger, VP Access Network Architecture COMCAST)

Speed Tiers

The NBN Co has published its wholesale access speeds to telephone and internet service providers for on-sale to end-customers. They are shown below for convenience.

Tier	Download speed (Mbps)	Upload speed (Mbps)
1	12	1
2	25	5
3	25	10
4	50	20
5	100	40

Source: <http://www.nbnco.com.au/get-an-nbn-connection/wholesale-speeds.html>, accessed 13 August 2013

In a separate Submission to the ACCC, the author suggested that a declared wholesale open access cable service to be aligned to NBN Co speed tiers.

3.3 Industry Rivalry

The number of Retail Service Providers (RSPs) and the degree of competitive rivalry between the participants does shape industry participant behaviour and contributes to the diversity of end-customer choices in any given market.

To date, the cable broadband services have only been available to the principal combatants in the major metropolitan markets. This Submission is of the view that the cable Access Providers are more concerned to avoid cannibalisation of existing ADSL2+ revenues and so discourage switching their end-customers across network platforms.

The competition of the Access Seekers has been restricted to ADSL2+ infrastructures and in turn, declaring ADSL2, has focused competition to price and service differentiation constrained by its theoretical capabilities.

In parallel, some RSPs have willingly invested in their own ADSL2+ infrastructure using ULLS (Unconditioned Local Loop Service) in sub-national markets, that is, specific local or community markets where they calculated they'd get a quick return on investment.

The market demand for superfast 100Mbps services market is an emerging segment.

Yet, in the absence of access to wholesale open cable broadband the vast majority of the RSPs can't offer superfast 100Mbps down speed broadband because they are limited to maximum of 24Mbps from ADSL2+.

This means that the two largest cable Access Providers have exclusive access to this segment in the major metropolitan markets until the NBN is constructed by 2021.

3.4 Demand for the service and how the service will be used

As the RSPs gain access to superfast cable broadband from New NBN Co, they'll be able to launch their product offers in to the market.

So rather than being precluded from offering superfast broadband services they could resell New NBN Co (cable) now and build their customer base rather than sitting back waiting for the construction of the NBN.

4.0 The Close

In summary, the long-term interests of the NBN and its end-customers will be better served by the incorporation of the HFC network assets in to the NBN and in doing so enable cable broadband for wholesale Ethernet access.

The outlook for the NBN Co is perilous: its financial metrics are unsatisfactory and with the current industry structure its business model is indefensible from market forces.

The Australian Communications industry is in transition and a positive regulatory policy adjustment will support Access Seekers in an emerging market for superfast broadband of 100Mbps; a segment that is expected to grow.

Today, the incumbent Access Providers have little incentive to actively encourage end-customers to switch across to HFC from ADSL2+. Cannibalisation is a major product management issue for Access Providers - it stifles internal initiatives to invest to inspire buyer behaviour.

They just don't want to do and the regulator believes their story.

In its 2012 Submission to the ACCC, Optus wrote:

HFC technology is substitutable for ADSL at the retail level. At the wholesale level, Optus' and Telstra's HFC networks do not provide national coverage and are not configured to provide wholesale access services. Further, because they are not configured to provide wholesale access services, the constraint they offer is an indirect one through retail competition. As such, the effectiveness of HFC as a constraint on wholesale ADSL pricing may be limited in scope".
(ACCC. 'Declaration of the wholesale ADSL service under Part XIC of the Competition and Consumer Act 2010 – Final Report. February 2012', page 11).

It's myopic to assert that cable doesn't reach a national market: today 7 million Australians are within the existing HFC footprint with a high propensity to buy superfast broadband.

But the ACCC wrote in 2013 that the political situation may cause a change:

"The ACCC will assess whether there is any need to consider an inquiry into the declaration of HFC services further, following clarification of the role of HFC networks in supplying telecommunications services within the broader context of the NBN".

(Fixed Services Review – Declaration Inquiry Public inquiry into the fixed line services declarations, Draft Report. December 2013 p90).

Maybe the incumbent Access Providers don't deserve to own the cable broadband assets – why not IPO the network(s).

4.1 The Strategic Review

The NBN Co Strategic Review Report advises that the network construction phase is experiencing difficulties for many reasons.

We can extrapolate that the network construction phase will now extend beyond 2021. Unless some major changes are implemented quickly.

In the meantime, how will metropolitan end-customers get access to high bandwidth services like those now available from the HFC networks? The answer is already in their streets.

The current wholesale ADSL service means that all Access Seekers are denied access to superfast broadband services such as 100Mbps down and 10Mbps upstream speeds: only Optus and Telstra offer these to their customers in the major metropolitan markets like Sydney, Brisbane, Adelaide and Melbourne. (iiNet offers this capability in regional markets of Geelong, Ballarat and Mildura).

A limiting factor affecting adoption of superfast cable broadband services is that the Access Providers choose not to fund a drop cable to a non-connected premise: it's not an option.

Incorporating the HFC assets in the NBN Co is a key first step to building credibility and scale. The Government and the ACCC then must move to declare the cable and other fixed networks.

Then move them under the umbrella of New NBN Co.

4.2 Economic Impacts

The ACCC has three economic principles upon which a decision on whether to declare fixed line services are determined.

A synopsis of the current position and the expected future is shown below:

Current	Future
<p>Bottlenecks The major HFC Access Providers do not market wholesale open Ethernet access for superfast broadband services when the industry standards and technology does support such a wholesale model. This limits RSPs to 24Mbps line speeds.</p> <p>Access Seekers willingly invest in new ADSL2+ infrastructure to build competitive capability.</p>	<p>Bottlenecks The major HFC Access Providers offer wholesale open Ethernet access for superfast broadband services to Access Seekers so they can market 100Mbps services.</p> <p>Cable has non-price benefits such as service quality which are relevant to the expected benefits of the NBN infrastructure.</p> <p>RSPs would have a positive incentive to invest in fixed-line infrastructure during the transition period and this investment is unlikely to impact on</p>

	<p>current investments in wireless networks.</p> <p>Investments in value-added services and transmission shall be complementary to investments in systems to access wholesale cable.</p>
<p>Economic Efficiency End customers are limited to 24Mbps, MDUs are denied access.</p>	<p>Economic Efficiency Enabling wholesale open Ethernet access to Access Seekers will stimulate industry rivalry and deliver better choices to end-customers.</p> <p>Declaration of wholesale cable would encourage the efficient use of existing infrastructure during the transition to the NBN.</p>
<p>Any-to-Any Connectivity Industry standards using Ethernet enables connectivity between all end-customers.</p>	<p>Any-to-Any Connectivity Industry standards using Ethernet enables connectivity between all end-customers.</p>

The Commission is required to have regard to these principles under subs. 152AB of the *Competition and Consumer Act 2010* in accessing the long-term interests of end-users.

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