

Development of Broadband Infrastructure & Regulation: Comparing New Zealand & Australia

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First Some Terminology 1

Technology	Characteristics	Performance	Upgrade potential
FTTP	Fibre to the premise	>1000/>400 Mbps	NA
FTTB	Fibre to a node within a multi dwelling unit using existing copper	>100/>40 Mbps	Simple rewiring within building
FTTC	Fibre to a small street node serving around 20-40 premises within 200 metres with copper tail	>100/>40 Mbps	Likely to be feasible

First Some Terminology 2

Technology	Characteristics	Performance	Upgrade potential
HFC	Hybrid Coaxial Fibre using street node and coaxial tail – usually former cable television network	>100/>40 Mbps	Not well established*
FTTN	Fibre to a street cabinet serving around 200-250 premises within 800 metres with copper tail	25-100/>40 Mbps Varies by copper length & condition	Possible but expensive*
Fixed Wireless	Cellular network technology to a fixed connection enabling more substantive aerial	25-50/5-20 Mbps	Possible but expensive*
Satellite	Geo-stationary satellite	25/5 Mbps Latency an issue.	Possible but expensive*

* NBN now offers to quote through its Technology Choice program on individual service upgrades to FTTP from any original technology at \$A350 per quote and a likely cost that “generally ranges from a few thousand up to tens of thousands of dollars, and on the rare occasion, far higher than that”.

A Brief History – The Pre-Fibre Days

	New Zealand	Australia
1995	HFC rolled out	First HFC broadband
1999		Local loop unbundled via ACCC declaration
2000		First ADSL services
2002		ACCC local loop pricing principles
2003		First competitive DSLAM roll-out
2004	Telecom commitment to broadband expansion (including wholesale) in lieu of imposition of local loop unbundling	ACCC issues Competition Notice to Telstra regarding relative wholesale and retail broadband (bitstream) price changes
2005		NBN Mk1: Telstra proposal direct to Federal Gov't for a FTTN rollout
2006	Gov't announces local loop unbundling	NBN Mk2: Telstra Undertaking proposal to the ACCC for a FTTN rollout

A Brief History – Fibre in the Access Network

Year	New Zealand	Australia
2007		NBN Mk3: Telstra goes back to Federal Gov't proposing a staged FTTN rollout starting with a \$5B spend on 5 largest cities
2008	Wholesale bitstream regulated First competitive DSLAM roll-out Chorus established as separate business unit from Telecom to operate copper access network Commences FTTN rollout to 91% premises	NBN Mk4: New Labor Federal Gov't stages NBN Request for Proposal (RFP) process with promised \$4.7B contribution
2009	Sub loop unbundled with Commerce Commission standard access charges	NBN Mk5: In wake of RFP failure and GFC, Labor Gov't announces new GBE (NBNC0) to build \$A43B completely new FTTP network in 8 years connecting approx. 90% premises

A Brief History – Completing the Job

Year	New Zealand	Australia
2011	UFB initiative involving the deployment of a fibre-to-the-home (FTTH) network, covering 75% premises. Chorus won most UFB contracts on condition of structural separation from Telecom	
2012		Wholesale bitstream regulated
2013		NBN Mk6: Coalition Gov't announces NBNSCo will transform to Multi Technology Mix approach employing FTTP, FTTN, FTTC, FTTB & HFC using as much existing infrastructure as feasible
2015	UFB extended to connect 80% premises	
2016	Rural Broadband Initiative (RBI) providing mostly fixed wireless services plus FTTN	
2017	RBI extended	

A Brief History – Completing the Job 2

Year	New Zealand	Australia																						
2018	<p>UFB rollout over 75% complete 50% services migrated to UFB (including RBI)</p> <p>Technology of services connected:</p> <table border="0"> <tr> <td>FTTP</td> <td>40%</td> </tr> <tr> <td>Fixed wireless</td> <td>10%</td> </tr> <tr> <td>Copper (mostly FTTN)</td> <td>46%</td> </tr> <tr> <td>Other (mostly HFC)</td> <td>4%</td> </tr> </table>	FTTP	40%	Fixed wireless	10%	Copper (mostly FTTN)	46%	Other (mostly HFC)	4%	<p>NBN rollout over 80% complete 60% services migrated to NBN</p> <p>Technology of services connected:</p> <table border="0"> <tr> <td>FTTP</td> <td>27.6%</td> </tr> <tr> <td>FTTB</td> <td>2.5%</td> </tr> <tr> <td>FTTC</td> <td>1.6%</td> </tr> <tr> <td>HFC</td> <td>16.8%</td> </tr> <tr> <td>FTTN</td> <td>50%</td> </tr> <tr> <td>Fixed wireless</td> <td>5.6%</td> </tr> <tr> <td>Satellite</td> <td>2%</td> </tr> </table>	FTTP	27.6%	FTTB	2.5%	FTTC	1.6%	HFC	16.8%	FTTN	50%	Fixed wireless	5.6%	Satellite	2%
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Near-term Projections

Year	New Zealand	Australia
2020		Scheduled end roll-out to 8.1m SIOs with peak funding requirement of around \$A50B Expected technologies: FTTP 17% FTTB 2% FTTC 12% HFC 22% FTTN 38% Fixed wireless 5% Satellite 4%
2022	Scheduled end roll-out to 1.5m SIOs 87% premises connected to FTTP Remaining 13% mostly DSL & Fixed Wireless	

Rollout Cost Comparisons

Approx current indicative costs per premises of different technologies

Technology	New Zealand \$NZ2018	Australia \$A2018
FTTP Brownfields	} 2700*	4400**
FTTP Greenfields	}	2200
HFC		2500
FTTC		3100
FTTN		2300
Fixed Wireless		3800

* For UFB1: mostly brownfields with some greenfields

** Based on early rollout in 2013

The Case for MTM v FTTP

- Vertigan review of broadband benefits/costs and regulation advocated that MTM provided an option value over a comprehensive FTTP roll-out
 - Because lesser technologies like FTTN could easily be upgraded if and when needed
 - Based on an upgrade calculation that “conservatively assumes that 20 per cent of the cost of FTTP can be avoided in an upgrade from FTTN to FTTP because of the investment already made in FTTN”.
- However, NBN says in its Technology Choice guidance:
 - “The costs of choosing a different technology from what has been planned or already deployed by nbn is generally higher than the average cost per premises for the nbn broadband access network.”

Why Has Telco Regulation Been Different

- Historically, in both countries telco regulation has differed to infrastructure regulation in other sectors
- Historic dominance of incumbents
 - Including pay TV in Australia
- Changing contestability over time
 - The “Ladder of Investment”
 - Technology shifts
- Expectation that copper would become redundant
 - Hence TSLRIC – because copper replacement would provide more for less
 - But digitisation gave copper an extended life as monopoly infrastructure
 - Effectively, in both countries, digitised copper has morphed into the new broadband networks

Contrast with Regulation of Mobiles

- Strong economies of scale
 - but nonetheless competition feasible
 - albeit with concentrated supply
- Regulation of terminating access services only:
 - voice and text: key to any-to-any connectivity
- Forbearance of other forms of access regulation:
 - Wholesale services to MVNOs – ever seriously contemplated?
 - Roaming

Competition Between Networks

- Competition at the fringes
- Growing fixed connections that don't include a voice service
- Exponential data growth in both technologies in both countries
- Current data usage annual growth rates
 - Mobiles NZ 67% (77% longer term)
 - Fixed NZ 47% (49% longer term)
 - Mobiles Aust 40% (27% longer term)
 - Fixed Aust 30% (42% longer term)
- Mobile continues to comprise small proportion of data
 - NZ >2%
 - Aust 6%
 - Growing mobile data carried by fixed connection and wifi (3% in Aust)
- Can mobile ever be a serious head-to-head competitive threat?
- What impact can 5G have?

UFB and NBN Regulation

- Several factors influenced less intrusive regulatory approach:
 - Networks services provided by wholesale only operator
 - Legacy service pricing provided a benchmark
 - More scope for competitive backhaul
- Less intrusive approaches included
 - Anchor product price regulation under an overall revenue cap
 - Regulatory forbearance for smaller fibre companies in NZ

Anchor Product Regulation

- A feature of regulatory approach in both countries
- Within an overall revenue cap, set regulated prices for key services only
 - Most likely the services likely to be most in demand
- Regulated prices for anchor products then discipline the prices for other services
 - Usual scenario: NSP would seek to attract customers to higher value services from the anchor product
- Anchor products reviewed regularly to adapt to changing customer needs
 - What was a 'premium' product likely to become an anchor product
 - Previous 'incentive' pricing becomes a benchmark for the regulated price

A Tale of Two Broadbands

- Why has NZ UFB rollout prospered while NBN has faltered?

	Chorus	NBN
Starting Structure	Structural separation of established business	Structural separation of new start business
Public Support	Public/Private Partnership CIP total funding of by 2023 – \$NZ1,330m (FY\$18) 43/57% debt/equity - includes RBI funding (of approx. \$NZ400m) Loss roll forward model	Public company with public funding \$A49B (FY\$16) 40/60% debt/equity Loss roll forward model
Gross Revenue (approx.)	\$NZ980m	\$A2,700m

A Tale of Two Broadbands 2

	Chorus	NBN
Policy Certainty	Following a brief FTTN interlude, bi-partisan commitment to FTTP/RBI technologies rollout	Following a series of failed proposals, Labor FTTP overturned by Coalition MTM
Technology Certainty	Ditto	Confusing range of technologies
Pricing Structure	Single part price with performance tiers	Two part pricing <ul style="list-style-type: none">• AVC with performance tiers• CVC probably in excess of LRMC
Interconnection	Competitive backhaul services for approx. 30 POIs and integrated backhaul within network	Competitive backhaul services for 121 POIs and integrated backhaul within network

Pricing Structures

- Two part pricing is efficient where:
 - Variable charge is set at long run marginal cost
 - Fixed charge is set between stand alone and incremental cost
 - Fixed charge is set to reflect willingness to pay
 - So, appropriate for fixed charge to reflect service value (via speed tiers)
 - Even though higher service value doesn't cost much more
- Pricing in neither country reflects these principles in full:
 - New Zealand has a single price component
 - Australia's CVC (variable) charge probably well in excess of LRMC

Trends in Regulation

- Trend from bilateral to trilateral approach to utility regulation
 - Thus consumer interests play a decisive role along with regulator and service provider
 - Especially re price service quality trade-offs and capex
- How might this be reflected in services to RSPs?
- Scope for more responsiveness by broadband service providers to RSP needs eg:
 - More RSP involvement in future network investment
 - More tailored RSP contracting
- But would more reliance on individual negotiations risk offending non-discrimination obligations?

What Constitutes Discrimination?

- In both countries, broadband service providers are obliged to offer wholesale services on a non-discriminatory basis.
- Different meanings of ‘non-discrimination’ include:
 - All RSPs get the same thing, that is, no individual negotiation
 - There is scope to negotiate individual contracts, but there must be equal opportunity to conclude an arrangement
- Key issue is whether any outcome distorts retailer competition
 - Explicit SLC test in New Zealand
 - Apparent stricter test in Australia: ACCC Guideline includes an equal opportunity test
 - Equal opportunity likely a sufficient test to avoid SLC
- Vertigan Review recommended easing non-discrimination obligations on NBN where it enhanced efficiency or “otherwise approved by ACCC”

Uniform Pricing Obligations

New Zealand	Australia
Chorus obliged to price on a geographically consistent basis	NBN obliged to price same services uniformly
DSL and Fixed wireless used for high cost 13%	Fixed wireless/satellite used for high cost 9% But uniform pricing for basic service only
Other LFCs can price differently	Non NBN broadband providers obliged to provide open access Exemptions and pre-2011 grandfathering
	Proposed Regional Broadband Scheme charge to fund regional services
	Vertigan Review recommended future disaggregation of NBN by technology employed Scope for competition and differential pricing?

The Shifting Bottleneck

- Historically, the natural monopoly component of communications infrastructure has shifted with changes in:
 - Technology
 - Infrastructure development and
 - Demand
- At various times, the natural monopoly component appears to have constituted:
 - End-to-end core, backhaul and distribution services
 - The PSTN
 - Unbundled local loops
 - Unbundled local sub-loops

The Shifting Bottleneck 2

- Currently, the broadband natural monopoly component in both countries appears to constitute:
 - All 'last mile' distribution infrastructure at the layer 2 level
 - Substantial 'within distribution' backhaul infrastructure
- Likely future developments that might shift the bottleneck:
 - Dark fibre services (thus, restricting the bottleneck to layer 1 infrastructure)
 - Wireless tails?
 - Cellular mobile networks – 5G
- At the very least, these developments may necessitate revisiting service pricing
 - Eg appropriate wholesale backhaul pricing to support wireless services?

Conclusion

- History of telecommunications regulation in both countries
 - Appropriate focus on regulation of bottleneck services
 - But bottleneck has shifted over time as technology has rendered parts of the bottleneck contestable and even visa versa with digitisation of copper
 - Such shifting of the bottleneck likely to continue
- In this context, regulatory approaches have combined:
 - Rapid responses to technological change
 - Some forbearance and/or selective regulatory applications
 - Such as different forms of anchor product regulation
 - Backhaul services to MNOs?
- Can competitive threat from fixed and mobile wireless change the need for or nature of fixed services regulation?
- Will 5G be the game changer?