

Top Ten Myths behind Fibre Policy

By Peter J Cox BEC MBA

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I had hoped that the decision by the independents to determine which party formed the government would not be based on the respective NBN policies of the two major parties as the debate is based on a number of false assumptions.

As a result I had refrained from publishing my analysis during the election period to avoid it being viewed as politically motivated as I believe broadband policy should be determined by what is in the best interests of all Australians, not on political point scoring.

However, the claimed statement by key independent Tony Windsor following a meeting with the Department of Broadband that he had been convinced "You do it once, you do it right, you do it with fibre" prompted me to publish. On what basis could the Department be giving such advice as there is no international evidence to support such a contention and the US and the UK for example do not have such a policy?

Further the Broadband Minister Stephen Conroy told Sky News "that if you want to give people equivalence in regional and rural Australia, you need the technology that can deliver...that is clearly a fibre-based broadband network". Most broadband will be fibre based but if the Minister means that fibre should be provided to 93% of Australian homes where is the technical or economic evidence to support such a contention? Other countries have a universal broadband service plan without building fibre to nearly all homes.

The case for fibre to the home in Australia has been pursued largely by the beneficiaries; the consultants whose businesses gain from the proposal, the suppliers who are beneficiaries of the proposed \$43 billion expenditure and the major competing telcos who are seeking a way to gain parity with Telstra to be more competitive in the future.

These proponents have relied on a series of myths to influence politicians, the media and a largely unsuspecting and confused public.

This is not a political argument as I believe that the Liberal Government was greedy in selling off the publicly owned Telstra, even though the proceeds went to the people, without instituting an access policy to provide for effective competition. This allowed Telstra to use its dominance to maximize market share and profits with no incentive to build high speed broadband and leaving Australia well behind many other countries in the world.

My concern is not with the need for national broadband but with the hyperbole that surrounds the arguments for delivering a 100 MB fibre system to nearly every home in the country at an extraordinary

cost. Some of the proponents are claiming how the world is watching our NBN but mostly in amazement and curiosity as no major economy is proposing such an expensive government expenditure.

Nevertheless these myths have grown up around the government's NBN venture:.

Myth 1 - An enabling technology

Some draw comparisons to the great enabling technologies of history "that alone or in combination with others, provides the means to generate great leaps in performance and capabilities of the user"¹. Classic examples include the wheel, the steam engine enabling the Industrial Revolution, the printing press, electricity, the telephone, digital, computers and the internet.

Broadband, and fibre in particular, is not a new invention, it is only a means of delivering existing and well proven technologies in a faster way.

America's National Broadband Plan is largely concerned with providing basic broadband to all Americans whilst the UK Government places the emphasis on building Britain's digital industry.

Myth 2 – The Need for Speed

In the US the National Broadband availability target under the FCC National Broadband Plan is for actual download speeds of at least 4 Mbps and actual upload speeds of at least 1 Mbps with an acceptable quality of service for most common interactive applications would ensure universal access. Though some other countries offer far higher speeds the US consider these objectives to be very high for universal service and one of the highest universalisation goals in the world.²

In the UK, The Digital Economy Act, known as Digital Britain, plans to have 90% coverage in the UK by 2012 with a minimum speed of 2 Mbps.

Though most of us would consider these speeds to be very low both the US and the UK believe these speeds to be adequate to provide most of the benefits of a digital economy to the home.

The Australian government's plan to provide 100Mbps, or actually a gigabyte plus, to 93% of homes and the remainder to get at least 12Mbps through wireless and satellite seems disproportionate compared to the US and UK objectives.

Outer metropolitan, country and remote people will all be able to receive the same email, social networking, internet, music, movies, videos, health, education, teleconferencing and public services as those with fibre in the cities.

¹ BusinessDictionary.com

² FCC, National Broadband Plan, P 135

Myth 3 - The Cost of Speed

The US Congress and President Obama under the Recovery Act committed the US to spending US\$7.2 billion (A\$ 8.6 billion) to improving the country's broadband infrastructure. More than US\$2.5 billion of this goes to the Department of agriculture to focus exclusively on infrastructure projects to take broadband to rural and remote communities. Of the remainder, US\$4.4 billion goes to the Department of Commerce to support anchor institutions such as hospitals, schools, public safety broadband networks, public computing centres and to teach Americans the skills and provide the centers to provide easier access to high-speed internet. The US also intends to move US\$15.5 billion over the next decade from the existing Universal Service Fund that would have been spent on phone services to support broadband in unserved areas.

The amount spent directly by the US Government on broadband to the home is only a few billion dollars and relies heavily on the private sector to build and finance most of the broadband infrastructure.

The proposed expenditure in the UK is even more meager with the Governments £300m Home access scheme for low income families. It further proposes to provide £200m from direct public funding to the delivery of the Universal Service Commitment on a mix of technologies. The intention was to incorporate a new tax of £6 p.a. on home lines, say £120 million p.a. to fund the expansion of broadband but it was dropped when the election was called.

Canada has a similar problem to Australia with large geographic size and a small population and the government has provided \$225 million over three years to extend broadband coverage to as many unserved and underserved households as possible.³

Despite the US and the UK expounding the same rhetoric as Australia on the importance of the digital economy and the need for universal broadband they each intend to spend only a small fraction of the \$43 billion Australia is spending on the NBN alone. This does not even include the costs of educating and training the public in its use and the provision of services.

Myth 4 – The Importance of Fibre

In the UK the Government is committed to providing the Universal Broadband Commitment of 2Mbps by 2012 through the upgrading of the existing copper and wireless networks.⁴ The UK Government believes its commitment leads Europe and it will be delivered by a mix of technologies: DSL, fibre to the street cabinet, wireless and possibly satellite infill. There is no mention of fibre to the home (FTTH) as proposed to 93% of Australian homes.

In the US the National Broadband Plan is about establishing competition policies, ensuring efficient allocation and use of Government owned assets in particular making 500 megahertz of spectrum newly available, creating universal availability and maximizing use of health, education, energy and homeland security. No mention of fibre systems in the executive summary of the plan. When the plan speaks of

³ Canada's Economic Action Plan provided to Industry Canada

⁴ Digital Britain – Final Report, P 12

how broadband is transforming American life it says “broadband networks can take multiple forms: wired or wireless, fixed or mobile, terrestrial or satellite. Different types of networks have different capabilities, benefits and costs.”

The Australian dictate for fibre to reach 93% of homes is not even considered in the US or the UK.

Myth 5 - The Mantra of Speed for services

The need for speed for health, education and energy grids or a trans- sector approach is a mantra repeatedly chanted by a leading advocate in Australia for fibre to the home and the NBN, Paul Budde.

Nobody would disagree with the benefits that can be gained in these sectors as outlined by both the UK Digital Britain report and the US FCC National Broadband Plan.

The problem is that surely most Universities, colleges and hospitals would already be connected by high speed fibre systems delivering gigabytes. The problem for them is distribution around their own institutions which would be a combination of fibre, LAN, wireless and copper. On a large campus of up to 30,000 students the same problems of sharing lines or wireless cuts down the speed considerably. Speaking to a large University recently that is building a wireless system they said that they are trying to limit use to academic purposes which may be a forlorn hop. A small suburban college informed me that the provision of a free no limits system was essential to attracting full fee paying foreign students who want to be able to download movies and play online gaming.

Telstra connects their approximately 5500 exchanges all over Australia with fibre. This should provide reasonable access to fibre connectivity to most major corporations, government bodies, research institutes, universities and hospitals in Australia.

The expansion of high speed broadband by a variety of technologies should be provided to all schools and health centres in Australia not already connected.

However, this is a totally different proposition to providing fibre to all 8 million homes in Australia.

The FCC Broadband Plan demonstrates that all email, browsing and YouTube video applications require 1 Mbps, a streamed SD classroom lecture 4 Mbps and two way video conferencing 7Mbps. None of this requires 100Mbps or 1Gbps systems for use in households.

Power grids often have their own fibre and if not most of their monitoring is low bit rate telemetry type data. Home Monitoring for health purposes or for security or fire alarms again only require low data rates that can be supplied by wired or wireless technology and do not require fibre.

A home with 9-10 Mbps speed can download a MP3 file in a few seconds, a 35MB video in 30 seconds and an 800MB movie in 11 minutes.

The head of the National eHealth Transition Authority (NEHTA) has admitted that high speed networks are not needed at this time but a reliable service is most important particularly in remote regions⁵.

The government is committed to providing wireless systems that will have a minimum rate of 12 Mbps that should meet most household needs.

It is acknowledge that an inherent problem with wireless and some other technologies is that actual speed is reduced by the number of users at any one time. However, this can be overcome with more transmission points in heavy traffic areas. Further, the speed of wireless is increasing greatly with 4G, LTE and other technologies. Consumers find the flexibility and portability of wireless broadband to be of great benefit and it is the fastest growing area of the industry at the moment.

Myth 6 - Speed is needed for international competitiveness

A frequent argument is that Australia (and the US and the UK) are behind many other countries in both broadband penetration and speed and hence are losing international competitiveness and innovation. If this is the case then the rate of GDP growth should be highest for countries with high broadband penetration and the greatest speed.

OECD data shows that there is an inverse correlation of -0.36 between the growth of GDP between 2005-2009 and broadband penetration.

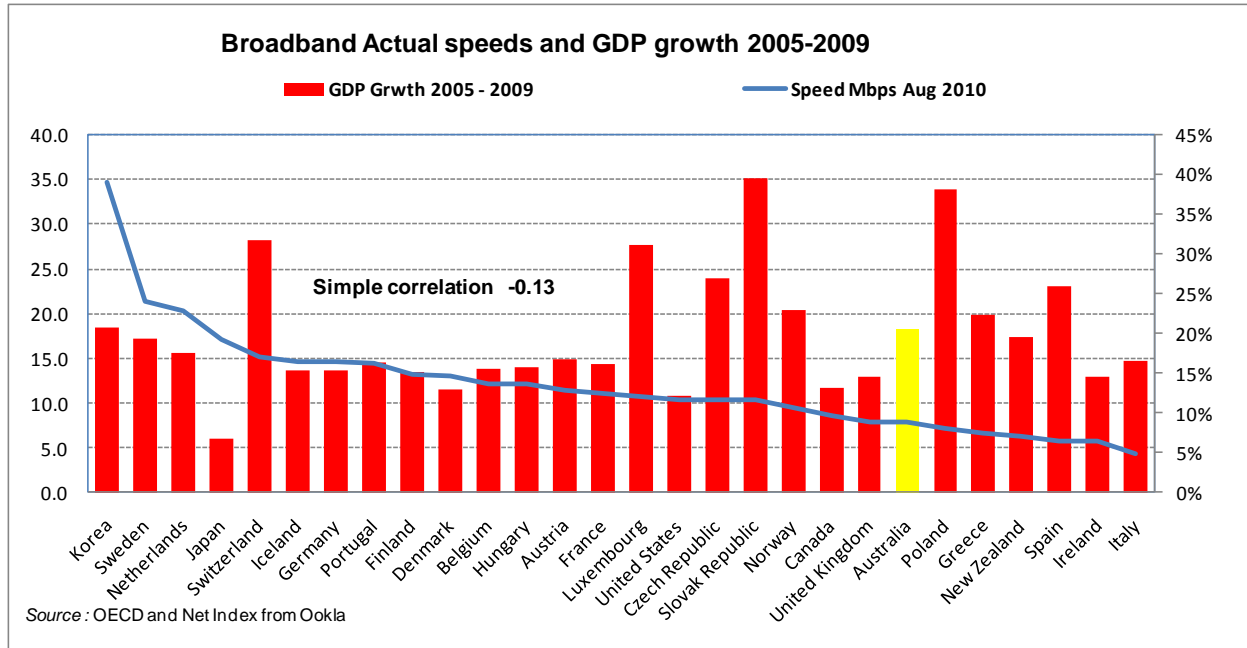
Leading OECD countries for broadband penetration such as the Netherlands, Denmark, Norway and Korea had average growth in total over the four years of about 15% and yet countries with low penetration such as the Czech Republic, Poland and the Slovak Republic had total growth of 25% plus. Switzerland and the tiny state of Luxembourg had both high broadband penetration and high growth.

The OECD countries repeatedly quoted with the fastest advertised broadband speeds of Japan and Portugal of over 100Mbps in reality only have actual average speeds of 17 and 14.5Mbps respectively.⁶ France with advertised speed of 55Mbps falls to 11 Mbps in practice. Korea has an average advertised speed of 53Mbps and high actual speed of 34Mbps.

A chart of the OECD countries by actual speed again has a -0.13 negative correlation with rate of GDP growth between 2005 and 2009. Korea, Sweden and the Netherlands had the highest actual speeds and GDP growth over the four years of 20.8% to 17.5%, on or slightly below the average of OECD countries. Japan with the highest advertised broadband speed of 107Mbps had a dismal growth of 6.9%. Switzerland had both good broadband speed and high growth of 31.7%. Other counties with well above average GDP growth for the period including Luxembourg, Czech, Slovak, Poland, Spain and Australia had below average broadband speeds.

⁵ Computerworld, 27 August 2010

⁶ Speedtest.net from OOKLA, Household Download Index, August 2010



Of course the missing giants are the non-OECD countries led by China and India. Both China and India had growth of over 40%, twice the OECD countries but broadband speeds only a fraction of the OECD with 3.0 and 1.3Mbps respectively.

The US has led the world in creativity and innovation in computers, the internet, software development, smartphones, digital tablets and social media with both low broadband penetration and speed however it has also had a GDP growth below the OECD average.

Some rely on the OECD figures for correlation between broadband penetration and GDP per capita but this only demonstrates that by definition the richer countries measured by GDP per Capita would have a higher level of consumer spending including on communications, broadband and entertainment.

In conclusion, over the period 2005 to 2009 there was no relationship between the speed of broadband and the growth of GDP. This is not to argue that there may not be a relationship in the longer term from the development of digital technologies, high speed broadband and economic efficiency and growth.

The advantages of international competitiveness will come from business rather than super high fibre download rates of videos and games to homes.

Myth 7 – If you build it, they will come

The world wide trend in demand for communications, including both mobiles and broadband, is to demand more for less. Over the last decade despite the huge growth in mobile phones and broadband the growth of the communications sector of Household Final Consumption Expenditure (HFCE) has grown by 76% but its share has only increased by 0.5% to a 2.8% share. In the same period Recreation &

Culture has grown by 70% and the share increased by 1.9% to an 11.8% share. For people to spend more on communications then they have to spend less in other areas such as food, rent, health, cafes and restaurants or recreation. The argument of the Internet Industry Association that households have a propensity to pay more is very limited. Total HFCE is a relatively fixed cake limited to the growth in overall household expenditure.

As a result there has been a large, and probably unexpected growth over the last ten years, in prepaid mobile phones which now have about a 35% share of mobiles but only a 12% share of mobile revenue.⁷ Despite the growth in data demand on smartphones increasing ARPU the rate of growth in mobile spending is slowing and some of it is replacing previous expenditure on fixed lines.

Broadband is now becoming a mature market with fixed broadband slowing at about 65% of homes and the growth largely coming from mobile broadband, a significant proportion of which would also have fixed broadband. However, some of that mobile growth will be by people unable to get fixed ADSL2+ particularly in the outer suburbs of cities. The average retail spend on Telstra for fixed broadband was \$57.70 a month in 2009 which is probably higher than most of its opposition who are largely competing on a cost basis. Telstra are believed to be changing tactics to be more price competitive in a tougher retail environment. The second factor that has occurred in the market for both mobiles and broadband is fixed cap pricing where again the customers are trying to get the most bandwidth for the least expenditure.

This pattern of expenditure is also happening internationally. In the UK the cost of fixed line rental has fallen by £8 per line in real terms since 2005 and the retail price for broadband has fallen by £90 per annum in real terms⁸.

Growth in mature European markets of fixed broadband particularly in saturated markets such as Netherlands, Germany and Switzerland has slowed.⁹ Germany, Europe's biggest and richest economy has one of the lowest deployments of fibre in Europe reaching only 0.4% of German homes compared to more than 10 percent in Norway and Sweden.¹⁰

In France, the company Numericable had only 152,000 customers for its 100Mbps service out of 3.2 million home passed, a penetration rate of 4.75% in 2008. They are now offering fibre for €39 or A\$55 per month.

The rate of growth of broadband subscribers in the US is falling and only in 15th place in the OECD by penetration but with total broadband subscribers of 81 million in December 2009 it has over twice the number of subscribers in the OECD as next placed Japan and Germany.

⁷ Extracted from Telstra 2009 annual report which has about 45% of the mobile market.

⁸ Digital Britain

⁹ ABI Research-August 19, 2010

¹⁰ Informa Telecoms & Media

China actually experienced a decline in broadband subscribers in 2008 but has grown in 2009 to over 103 million subscribers, by far the largest in the world and is growing even faster in 2010. China has average penetration of about 28% and speed of about 2Mbps.

The really big issue is whether people will pay more to get 100Mbps when they can receive most of their requirements for between 12Mbps and 25Mbps. Telstra have upgraded their HFC in Melbourne to 100Mbps passed about 700,000 homes and with a retail price of \$168 per month the demand is believed to have been very minimal, literally in the low thousands.

Myth 8- Cost of the NBN

I do not propose to make a detailed appraisal of the NBN figures here because I, like a number of other analysts, would like to see a full cost benefit analysis of the project. However there are several issues.

There were 8.2 million households in Australia at the end of 2009 and the number of households reached by fixed broadband including DSL, cable, satellite and fixed wireless was about 5.3 million or 65% of total households. A further 11% still had dial up connects for total HH internet reach of 76%. The intention of the NBN is to connect to nearly all homes and fibre to 93% which would be over 8 million fibre connected homes by the end of the build period and a total reach of nearly 9 million homes.

There are 1.65 million business and government subscribers of which 90% already have broadband but presumably a proportion of the smaller subscribers would not have fibre at this time.

On a simplistic basis the cost of reaching say 10 million subscribers at a total cost of \$43 billion would be \$4300 per household or business subscriber, whether they take it or not. However, the cost per household in low density outer metro and country areas for fibre to the home could be multiples of that and far higher than wireless.

The Jury is out for a couple of years on the Tasmanian \$700 million trial market but it is believed to be based on a take-up rate of 17% but they may experiment with an opt-out basis rather than an opt-in policy. At this rate the cost per subscriber would be in excess of \$20,000. The Telstra high speed cable experience in Melbourne is for far lower penetration rates.

The chairman of NBN Tasmania has said he is hoping to replicate the Verizon experience in the US of 28-30%. This would raise the effective cost for a 30% penetration rate to a huge \$14,000 per high speed subscriber on an Australia wide basis. And this is before allowing for cost overruns which on a major long term project may raise the cost per household significantly as demonstrated by costs for trains, highways, tunnels, submarines, helicopters and jet fighters purchased by governments of any side.

The NBN model is based on three levels of demand for total fixed- line broadband of 70, 80 and 90 percent penetration which we have seen earlier to be highly unlikely.

The assumed wholesale entry levels of \$30 and \$35 which even with all costs within budget would still only give an internal rate of return of 6-7 percent. For private shareholders to gain a commercially acceptable return reflecting risk would probably require a return of at least 12-15%. The wholesale price

would need to be commensurately higher further increasing the retail price and lowering demand. Every \$100 per subscriber of cost overrun would be a further \$1 billion in costs.

Even with the few basic facts that we have on the NBN it is clearly obvious that it cannot achieve a commercially viable return.

This topic should be revisited when a detailed business model is provided by NBN.

Myth 9 – Social Benefits

Attempts have been made to estimate the returns to society of more efficient government, health, education, energy and climate practices from broadband of 1-1.5 percent a year of GDP per year as a justification for a national broadband system.

However, the most important factor is to determine the cost-benefit equation for the mix of technologies and the resultant different levels of expenditure. The question is whether the same or similar benefits can be achieved with a different technology mix and a much lower cost structure.

The governments of both the US and the UK, for example, obviously do not believe that the cost of fibre to the home broadband warrants a government investment of a fraction of the cost of the Australian NBN.

Myth 10 - Political Intransigence

As I said at the beginning this is not a political doctrine but a realistic look at the false assumptions behind the requirement to build fibre to 93% of Australian homes.

It is written to help inform policy makers of all political parties to assist in achieving the best return for the Australian people for the lowest public investment.

Recommendations:

1. Determine the objectives of
 - a. International competitiveness, innovation and the provision of high speed broadband delivering better and more efficient government services, health, education and energy
 - b. A fibre broadband system of at least 1GB (not merely 100MB) to hospitals, medical centres, universities, colleges, schools and businesses all over Australia to drive world leading innovation and creativity
 - c. Universal connectivity to all Australians including outer metropolitan, country and remote areas with broadband of a minimum download speed of 12 Mbps
 - d. Businesses to locate where the resources, labour, energy, capital or technology are best able to produce goods and services
2. Change wholesale competition rules and incentivise the corporate sector to finance, build or upgrade broadband systems in metropolitan and regional urban areas

3. NBN, or similar body, to provide universal connectivity to all Australians in regional and remote areas using fibre, wireless and satellite where appropriate
4. Provide competitive backhaul fibre or wireless in urban and rural areas if needed but ensure that existing dark fibre backbone is utilized if commercially possible and not overbuilt
5. Legislation to make spectrum available for providing wireless broadband and to build wireless transmitters
6. Ensure access at fair prices to towers, poles, conduits, and right of ways
7. Systems can be built in parallel around Australia providing wireless in outer metro and regional areas whilst laying fibre backbone ensuring regional areas gain improved broadband performance to deliver all services
8. Provide businesses with especially high bandwidth needs access in thousands of towns and offices throughout regional Australia to fibre or high speed cable connectivity
9. Assist low income families with new lower cost devices, pre paid broadband, education and training to access public services
10. Ensure that all services available to those living in the cities including email, social networking, the internet, music, movies, videos, health, education, teleconferencing and public services will be equally accessible to those living in outer metropolitan areas, regional towns, the country and remote Australia.