Submission to the Federal Parliament of Australia

House of Representatives

on the

Inquiry into the Role and Potential of the National Broadband Network

By

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Mr Andrew McGowan
Secretary
House Standing Committee on Infrastructure and Communications
House of Representatives
Federal Parliament
Canberra ACT 2600

Dear Andrew

Thank you very much for the opportunity to provide a submission to this inquiry.

Much of what I have said here has been either submitted to inquiries to the Select Senate Committees over the past decade, or was in follow-up material expressly for some Senators so that they could make informed decisions.

The rest draws on my considerable industry experience.

Please do not hesitate to contact me for further information.

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Terms of Reference

The Committee will examine the capacity of the National Broadband Network to contribute to:

a)   the delivery of government services and programs;

b)   achieving health outcomes;

c)   improving the educational resources and training available for teachers and students;

d)   the management of Australia's built and natural resources and environmental sustainability;

e)   impacting regional economic growth and employment opportunities;

f)   impacting business efficiencies and revenues, particularly for small and medium business, and Australia's export market;

g)   interaction with research and development and related innovation investments;

h)   facilitating community and social benefits; and

i)   the optimal capacity and technological requirements of a network to deliver these outcomes.

Getting the Correct Frame of Reference

Easier Said than Done

When I was at secondary school I had a mathematics problem (about newsprint rolls) that I could not resolve, and so I went to my dad and asked him for assistance. He looked at the problem for about 15 seconds and then said to me "This is a lovely variation on Compound Interest and Amortisation!" He then re-referenced the problem to align with the standard formula for Compound Interest and the problem was quickly and simply resolved!

My father was a Solicitor and he rarely wasted words. His immediate comments went along the lines of: "If you have a problem that you are finding difficult to resolve, and/or the current answer appears very complex, then you are using the wrong Frame of Reference. Step back and look at the problem from another Frame of Reference (point of view). When you have the correct Frame of Reference, then the correct answers will fall out with amazing simplicity".

Pushing for Privatisation

Since privatisation was pushed into the Australian telecommunications industry by the World Trade Organisation (WTO), under pressure from the International Monetary Fund (IMF) from about 1980, the Australian telecommunications network took a technology nosedive as the forces of privatisation leaked the re-investment revenues back to the "shareholders".

Although the then Telecom Australia introduced digital switching technology in 1980 (via Ericsson's AXE telephony switches), this technology could not really show its value, as the whole backhaul network infrastructure was analogue technology. Telecom Australia's Research Laboratory (based in Melbourne) had done considerable research in digital transmission technologies by this research (like most in Australia) had very little associated development, so there was very little if any manufacture of this equipment beyond the prototype or proof of concept stages (so large scale manufacture was simply out of the question).

The hidden financial advantages of digital switching was the comparatively low maintenance (much less than 10% of the earlier analogue / mechanical switches), and the relative ease of switching programmability making a range of diverse customer services available. The WTO "saw value" in digital technologies and globally they were covertly active to ensure that the Government business of telecommunications infrastructure was broken up and privatised in the name of "efficiency"!

What has to be very clearly understood here is that both productivity and / or increased profitability were entirely due to academic advances in technology in moving from analogue / mechanical technology into digital technology.

In business economic terms the technology gain by moving to digital switching was that the backhaul technology maintenance force could be substantially reduced (by at least 40%), so the overhead costs were radically reduced, but these productivity gains were "mill stoned" by the rather incompatible analogue-base backhaul network infrastructure to these digital switches.

In early 1885 single mode optical fibre began to move from the laboratory into the commercial field, heralding the advent of a tremendously productive digital transmission medium that has an amazingly wide bandwidth, very low distance-based attenuation, extremely low maintenance, and extremely good compatibility with digital switches through its then state-of-the-art comparatively cheap digital terminal equipment.

When the Melbourne-Sydney optical fibre cable became operational in 1987, ($45 M) the cost of calls between these inter-capitals were no more expensive than inter-suburban calls because the backhaul maintenance overhead was virtually zero in comparison to the earlier analogue transmission systems.

Thanks to digital technologies extending into remote alarming and remote management, the digital technology maintenance bill fell by at least another order of magnitude (10 times) and the telecomms maintenance overhead is now centralised into one command site (per competing infrastructure business) with a few roving technicians. With the earlier analogue / mechanical technologies a technical work force of several thousand was mandatory, now the national technical maintenance work force is far less than 1,000.

The technology synergy of digital switching and Single Mode Optical Fibre (SMOF) provided a massive quantum leap in telecommunications productivity from about 1990 that should have allowed almost all of Australia's localities to be mesh connected as the stepping-stone for Broadband Internet to all premises. That potential revenue was totally squandered on the highly inefficient overhead costs of privatisation and competition, which is now being addressed by the NBN infrastructure.

It is no wonder that the USA-controlled WTO pushed privatisation into Australian telecommunications as the rivers of profits became clearly visible – particularly if the amount of infrastructure re-investment were minimised. So – instead of Australia having what was one of the best analogue switched networks in the globe, Australia quietly slipped into one of the worst competitive digital switched networks in the developed countries in the space of about 20 years.

Why? Because it focussed on privatising the telecomms infrastructure to become more efficient at maximising its ROI. With the ROI as the prime focus for competitive businesses, customers must therefore be positioned far lower than with any (service-based) infrastructure business, which have as their prime focus to maximise the Quality standards all available services.

The compounding issue is that the Competitive Regime as driven by the IMF and heavily policed by the WTO is in fact the second best approach and a very poor second best too. The Theory of the Second Best[1] is outlined in "Filthy Lucre"[2] a book about economics that is interesting reading (and that is rather difficult for any book on Economics!

Coastal Highways to Nowhere

The primary problem was and still is that only the largest capital cities are inter-connected in a very coastal backhaul (long distance) mesh that almost totally excludes every inland city, town and village (because the immediate ROI is comparatively low).

Because I have more than a decade of experience in the Network Engineering Business Unit as an Engineer and Manager, and I had several years experience as a maintenance technician before that; I readily recognised that the (digital) backhaul network has effectively shrunk back from the earlier analogue inter-exchange network to become what is now a fundamentally simple high capacity partial mesh between the major capital cities with star networks to the regional rural and remote localities.

These high capacity transmission links between the major capital cities have a very high ROI and beyond there the ROI on the rest of the existing digital backhaul network is very low ROI or severely negative. This situation should have been loudly ringing financial alarm bells back in 1990 to shout out that privatised / competitive telecommunications infrastructure is a ponzy scheme.

In May 2010 I produced a substantial submission[3] to yet another Select Senate Committee that was overlooking the McKinsey's NBN Implementation Plan[4]. Part of this submission provides a blueprint of how and where to locate substantial inland backhaul network so that FTTP can then connect with virtually 99.7% of all premises and not involve the requirement for satellite at all.

The secondary problems is that the customer access network (CAN) is still predominantly pair copper with an effective Broadband distance limit of about 2 km – which is about 25% of the metro areas and about 10% of the non-metro areas (using ADSL as the Broadband technology).

Telecom Australia / Telstra was to have FTTP introduced from about 1993 to replace the then ageing pair copper, and clearly the overhead costs of privatisation were diverted most of these funds away from re-investment and into "shareholder dividends". Normal engineering rollouts would have ensured that every locality in Australia would have FTTP by 2000 but the immense overheads of competitive privatisation doomed this productive opportunity, again demonstrating that privatised / competitive telecommunications infrastructure is a ponzy scheme.

Worming out of FTTP

Unsurprisingly, the private sector have heralded the use of Radio / Satellite in the CAN with the prime reason that it is the "least expensive" (read: maximised short-term profits)! There is a major problem in that Broadband requires a substantial electromagnetic spectrum bandwidth meaning that there is a

[1] http://www.moore.org.au/senh/2009/NBN2%20Sub045b%20Moore.pdf
[2] Professor Joseph Heath, "Filthy Lucre" Harper Collins, 2009, ISBN 978-1-55468-395-6
[3] http://www.moore.org.au/senh/2010/NBN%20Business%20Case%202.pdf
[4] http://data.dbcde.gov.au/nbn/NBN-Implementation-Study-complete-report.pdf

defined maximum number of available "channels" that is quite low. This problem is compounded with the equally compelling problem that the delivery of Broadband via radio spectrum (which is termed "unbounded") has to then have a limited geographic footprint – based on the population density.

When "Radio" is coupled with the typical housing density in Australian cities, suburbs, towns and villages, this means that radio transceivers (towers with attached radio base stations) would have to be installed about every 500 m in a grid – and connected back to the local exchange with SMOF for connectivity. In other words to have "Hotspot" Broadband wireless connectivity there must be a very substantial amount of FTTN installed and commissioned to make the "Hotspot" technology possible.

Considering that radio base stations are not cheap, and the rooftop rental is expensive and that these need to be located typically about 500 m apart to get the necessary bandwidth together with the urban geographic coverage. Also, the premises receivers are again not cheap considering that these have to be purchased by every premises customer (eg in computers, I-Pads etc); then the "Urban Radio solution is very expensive – but it does provide limited portability.

An alternate and much less expensive option could be to provide FTTP to directly replace the now very aged pair copper cable, and as each premise would have modem/router then these could also include a small radio LAN capability (IEEE 802.11N for example). This technology solution would also provide limited portability within the premises and have the advantages of FTTP in the premise site.

For regional, rural and remote areas using "Radio" as the Broadband medium is complex because the population density is not evenly distributed as postulated very ineptly in the McKinsey Implementation Study of the NBN. The population in these non-metropolitan areas is a series of localities that can be well described via the Poisson distribution, which is almost totally opposite to that of an evenly distributed smoothed average like a child's map showing coloured countries.

This means that in non-metropolitan areas there are clumps of population living in community localities with comparatively large and/or vast distances between them. In a large majority of these cases there is already optical fibre to the local exchanges, and it would not take too much brilliant engineering to change the backhaul into PON CAN at very little cost and provide Broadband Internet to these premises and non-premises and they can have IEE 802.11N radio at these sites.

Creating the Inland Backhaul Mesh

The compounding problem is that there is virtually no high capacity Backhaul network beyond the costal capital cities and I have produced a submission that raised this issue, another that provided an overview on how to engineer a backhaul solution and a third submission that costs the augmented backhaul for Australia at less than $1.5 Bn, but there is a lot of work to be done and we in Australia since privatisation have largely dispensed of the telecommunications workforce. Appendix 1 in this submission is an extract out of an earlier submission that addresses the workforce shortage issue.

Add in the cost of the extra equipment required at the premises end and it very quickly becomes a very expensive option – even though it does provide limited portability. What is deliberately discounted is the fact that the cost of thick (say 240 strand) SMOF cable is very inexpensive, (especially when bought and manufactured in bulk) and this cable would pass these premises in any case – co connecting them is in reality a very cheap option.

Strangely the recent McKinsey report on the implementation of FTTP in the NBN showed that the practical limit for FTTP was only 10 km. This is clearly incorrect and takes into case only the metropolitan situation with a high number of optical splitting for Passive Optical Networks (PONs).

In practice, FTTP can extend to just beyond 60 km before clock (timing) issues (not attenuation) become the limiting factors. This far longer limit restriction radically changes the distance to which optical fibre can be implemented and virtually negates the reason for using Satellite technology in virtually every case and it shows that FTTP is practical for almost all non-metropolitan situations.

All thanks the dark side of competition and privatisation that are rarely mentioned, these dark forces very negatively impacted on the infrastructure replacement and rebuilding programme that was steadily growing pace following the 30's depression and World War 2 that had crippled Australia's revenues for several decades following. Only by the late 1970s was management coming out of the austerity approach that was common in management who came through these depressive times.

To compound the austerity financial / management problem, computer aided design (CAD) and computer aided manufacture (CAM) together with surface mount technology (SMT) all in the late 1980's caused a global manufacturing revolution where most of the Australian telecommunications industry was either closed down and manufactured elsewhere in the globe, where wages and OH&S are minimal; or down-scaled to simple assembly work (ie that of a "Card Jockey").

The revenues that were being reinvested back into keeping Australia's telecommunications network were skimmed off as shareholder profits, with excessive advertising in a locked market, leaving the executive management of with little choice but to leave the predominantly copper based customer access network with a minimum expense upgrade in the metro areas to introduce Broadband customer access network (CAN) connectivity (called "Plan B") and customers void of Fibre to the Premises (FTTP) - which by the way was "Plan A", way back in 1993.

The problem was and still is that business people in the private sector see comparatively immense revenue streams flowing in the infrastructure sector. Stung with this vision a very high percentage of business people have deceptively manoeuvred politicians, the education process and accounting practices to make infrastructure look "inefficient" and provide the only solution "privatise"! The facts are now showing that privatised infrastructure perfectly fits the economic "Theory of the Second Best", and that has resulted with infrastructures being run to the ground and at a most expensive outcome for the common users of these essential services.

Defining Efficiency

One of the major arguments about privatising the telecommunications industry / infrastructure in Australia way back in the 1975 – 1990 era, was that it was "inefficient", and that privatisation would fix this gaping flaw. Nothing could have been further from the truth.

What was not realised was that there are several clearly different definitions for Efficiency, and these were not explained, or considered – with exception to the notion that lazy and / or incompetent staff could not be fired[5], business structures could not be radically changed, and hence the overhead costs made the business of telecommunications unattractive to commercial interests operating /running what essentially is infrastructure.

It is now clear that the definition for efficiency must be related to the mental frame to which it is referred.

- In Physics it is the ratio of output energy over input energy.

- In Private Business it is the ratio of profit over investment.

- In Small Business terms it is the ratio of staff over the desired work outcome.

- In Public Business it is the ratio of people not complaining over the total related population.

- In Economics it is the ratio of the employed population over the total employable population.

These definitions are deliberately misquoted by people and businesses to twist the truth and gain unfair financial advantages from those who should be literate and educated enough to see the lies and act to rectify these situations.

Correcting the Frame of Reference

Following a Select Senate Committee inquiry in August 2010, where I provided evidence to that Committee; I followed up that evidence with some brief addendum submissions that gave a typical example of how the delivery of some Government Services could be financially effective for the Governments at all levels and this fully justified the expenditure of the NBN.

Further, this addendum submission clearly showed that on a private commercial footing the profits would not sustain themselves.

- This abnormality in profitability is initially very difficult to explain until it is realised that the frame of reference for the private business is very myopic and selfish – and that is why private businesses cannot see profits.

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[5] http://www.moore.org.au/senh/2009/20091020%20Public%20Service%20Reform.pdf

- When the scope is broadened to consider the whole of Australia as a private business then with this frame of reference, the Australian Government can see many profits.

The following is a very slightly modified extract of the Addendum Submission (45a)[6] that I provided in July 2009. The first part is about providing Broadband to Birdsville - which was supposed to be a rhetorical question. As it turned out I have considerable backhaul network knowledge and experience, and the intuition to introduce intelligent and very economical engineering to produce a very economical engineering solution for much of south west Queensland. I provided an answer in the hearing but it needed substantiation – and the Senator was not appreciating the economic solution!

The next part follows on and explains how this infrastructure can be costed in an Australian Business (Infrastructure Regime) frame of reference:

Delivering Government Services and Programs

In giving evidence to a Select Senate Committee in 2009 in Canberra, it became obvious that I did not have a concrete example to provide to the Senators (in particular Senator Ian McDonald (Lib Qld)).

The supposedly hypothetical question was that of how to provide Broadband to people in Birdsville – which is just about as far off the beaten track in south-western Queensland as possible. Although I provided an almost immediate answer on how to provide this Broadband Internet service into the Birdsville town at a very reasonable cost (less than $5.0 M), it was more than obvious that he was not expecting or willing to receive an answer that had probably stumped almost all telecomms consultants – as they did not have the national telecommunications network background expertise that I have.

To remedy this situation of not having a concrete example I produced a supplementary submission 45a and part of that submission (with a few technical and cosmetic alterations) is included in Appendix 1 "Broadband to Birdsville" and it shows the altered backhaul network structure to make this happen in a very economical way.

The immediate follow-on from the "Broadband to Birdsville" chapter is a continuing response "Infrastructure Regime" to Sen Nick Minchin (Lib SA) about costing this amongst the users of this scenario. This excerpt is included here:

Taking the above case (Birdsville Broadband) that was raised by Senator Ian MacDonald. Assuming that this infrastructure cost came out as $10,000 per premises, then the <u>external accounting</u> P&L process would move in and look at many issues like:

Medical eHealth savings through customers using BB Internet	*$500*
Unemployment social service cost reductions	*$2,000*
Saving in Petrol and Oil products	*$3,650*
Improved Education	*$5,000*
Trading from the Farm	*$3,000*
Short List Sub-total (per premises, per year)	***$14,150***

So using the External Accounting P&L approach as used in the infrastructure regime, this infrastructure would have paid for itself in less than 9 months, and we have not even asked the shareholders about the profits (because the government and opposition are the shareholders on behalf of the population), and the government overheads on Social Security and Health / Medical are significantly dropped, while these people will be paying bigger taxes!

The obvious argument is that these external accounting P&L figures are far too optimistic, so if these figures were heavily discounted by say 75% then we will get:

Medical eHealth savings through customers using BB Internet	*$125*
Unemployment social service cost reductions	*$500*
Saving in Petrol and Oil products	*$912*
Improved Education	*$1,250*
Trading from the Farm	*$750*
Short List Sub-total (per premises, per year)	***$3,537***

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[6] http://www.moore.org.au/senh/2009/NBN2%20Sub45a%20Moore.pdf

Keeping this <u>external P&L</u> accounting in line with a typical competitive business case, then it should break even over three years (neglecting interest). These heavily discounted figures clearly show that the payback to the government for putting in this infrastructure is more than $10,500 over three years making this infrastructure business case extremely compelling.

This submission[7] was very important and it appears that the people assigned to read these submissions simply did not have the knowledge to associate the data in these tables with the overall Delivery of Government Services and Programs:

Even in this grossly simplified case the nominal savings in Delivery of Government Services and Programs would optimistically be in the order of at least $7,500 per person and pessimistically be in the order of $2,000 per person in non-metropolitan areas. Unsurprisingly, the Final Senate Report[8] totally avoided tabling any of this content

Australia's Technology Future
Technologies like VoIP (Voice on Internet Protocol) is emerging very quickly and predicts like Skype are making a very big hole in the analogue telephone market.

Single screen (small picture) video conferencing will very soon be the order of the day to replace telephones as we now them and in the next few years multi-screen multi camera, meshed video conferencing will become the standard business and education tool.

These technologies cannot operate without significant bi-directional bandwidths and that fundamentally excludes ADSL (Asynchronous Digital Subscribers Line) technology as is it does not have a symmetrical bi-directional high-capacity data transmission property.

We must immediately stop putting in more ADSL and insist that all new Broadband services are provided using FTTP as the first and second choices, and the last choice be FTTN then radio to the premises (RTTP) from that node. ADSL is an obsolete technology!

Achieving Health Outcomes
The above table alludes to the situation that Health can be improved, and one of these is mental health, which is particularly rampant in isolated farms, homesteads where people cannot get to see and talk their problems out with other people.

Improving Educational Resources
In the past decade many of Australia's Universities and TAFE's have resorted to on-line education with a limited degree of success. This success is to a large degree limited by the ability of the lecturer to engage with the students, and a Website is a pretty lame excuse for a classroom.

As Australia improves its Educations resources it too will move to multi-screen multi-camera interactive lecturing / tutoring. This means that if non-metropolitan areas do not have massive bandwidths available at very low costs then they will be divided from the mainstream educational resources.

As a direct solution for this I made submissions to the Federal Government in 2008, 2009 to the so-called Expert Committee[9] and 2010 that answered how to do this. In 2010 I further submitted a costing (a bit less than $1.5 Bn) of the inland eastern side of Australia predominantly on what high capacity transmission systems and associated 240 fibre SMOF cable (massive savings in huge bulk purchases of about 30,000 km) and it looks as all this work went through to the keeper because it actually provided the answers.

Management of Australia's Built and Natural Resources
This is covered in other areas.

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[7] http://www.moore.org.au/senh/2009/NBN2%20Sub45a%20Moore.pdf
[8] http://www.aph.gov.au/senate/committee/broadband_ctte/report/report.pdf
[9] http://www.archive.dbcde.gov.au/2009/april/national_broadband_network/submissions/Malcolm_Moore.pdf

Regional Economic Growth

Australia has a coastal population that severely under-utilises the vast wealth of short internal distances that would considerably boost the regional economic growth and simultaneously it would substantially reduce our carbon footprint.

Most of our freight transport is done on roads that are only manufactured for medium weight vehicles. Highways that are capable of taking road-trains are extremely expensive, and the government is in the belief that it is good business sense to substantially support road freight businesses over rail freight. Nothing could be further from the truth and successive government have been severely compromised to keep supporting road freight. Here are some examples:

In discussion with freight business and government leaders it became obvious that time was the essence and that safety would have to be the obvious casualty – if that were not the case then family vehicles would be banned from highways and the highways would have permanent barriers on then to prevent any head-on collisions.

If the government were really serious about road freight safety then they would have road weighbridges built into the roads that would measure the axle loads, speed, balance, yaw, etc on the fly and they don't! Further the overhead camera system has been successively wound down to read number plates, not speed, not insurance, not registration – as it did when it started about 1995.

In looking at this problem in another frame of reference it is rather obvious that rail transport has a much lower wheel/road friction than road freight, and that rail freight has a very substantially lower air friction in moving a comparable bulk load of say 100 or 200 containers between capital cities. In a submission that I put into Infrastructure Australia in March 2010 this submission[10] showed that Rail freight when run directly in comparison would have a carbon footprint of less than 20% that of the equivalent road freight infrastructure.

Further if the rail was made to run inland instead of coastal then the distances are considerably reduced and further the trains could run at about 200 km/h, which is about twice as fast as any road freight train can safely operate.

Regional Employment Opportunities

With rail freight being inland and the telecommunications being inland then there is every opportunity for considerably increased regional employment opportunities.

What is not said is that Australia has a considerable externally sourced Website hosts. In much the same manner as there would be inland business then there is absolutely nothing stopping a re-think of the Website hosting structure and to locate most of the international Website host MIRRORS in the inland. This strategy has the potential to really speed up Website calling as the delays are then reduced by about 1000 ms to about 200 ms or less, and the amount of external traffic is almost eliminated as only the refresh pages would be brought in.

Looking at this in another angle, the rest of Asia could then call to Australia in preference to Europe, and the USA and that will substantially offset our Balance of Payments in Internet charges – which means cheaper Internet usage fees for consumers in Australia.

Business Efficiencies and Revenues

Currently almost all Head Offices and their associated staff are located in Sydney or Melbourne with Regional offices in Brisbane, Canberra, Adelaide and Perth. Some 25 years ago there was a call to decentralise and Insurance heads were proud of the fact that they "considered" moving their head office from Sydney – Circular Quay end, to Sydney – south of Town Hall. Fortunately those boffins have fortunately retired and/or died.

Because real estate expenses outside the metropolitan areas is a small fraction of that in the capital city CBDs and people in country areas want to be employed, not only will the work ethics be far more diligent, but the overhead costs will be far less making any competitive private business far more profitable – providing that it has a glut of Broadband capability. This was the strategy behind several of my submissions to various Government entities.

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[10] http://www.infrastructureaustralia.gov.au/public_submissions/nfnp/files/10-003_Innovative_Synergies_National_Freight_Network_Plan_Submission.pdf

R&D and Related Innovation Investments

Unfortunately my initiation with the Green Car Innovation Fund (GCIF) a couple of years ago showed me just how compromised the Government is as all this money went to Holden and Toyota to continue to manufacture cars that use petrol as their prime source – even though there were several (many) submissions relating to innovation that were clearly "green" and as an Electrical Engineer I could see that these innovations had a huge potential for Australia.

Appendix 2 has a brief summary of the event.

Facilitating Community and Social Benefits

This is covered in other areas of my submission.

Optimised Network Engineering

In 2011 I further submitted a costing (a bit less than $1.5 Bn) see pages 52 to 64 of the NBN Business Case Version 2[11] of the inland eastern side of Australia predominantly on what high capacity transmission systems and associated 240 fibre SMOF cable (massive savings in huge bulk purchases of about 30,000 km) and it looks as all this work went through to the keeper because it actually provided the answers.

The associated references also provide the answers on how to implement the NBN FTTP structure with a minimum of cost and a maximum of throughput – which is an Optimised Network for Australia's future.

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[11] http://www.moore.org.au/senh/2010/NBN%20Business%20Case%202.pdf

Appendix 1

Broadband to Birdsville

In my initial response to Senator Ian McDonald (Lib Qld) at the Select Senate Hearing on the 20th July 2009 about connecting Broadband to Birdsville, I suggested that a mix of optical fibre and radio would be connected from Longreach as the nearest position to Birdsville, and I was guessing on the position of Longreach in Central Queensland as the nearest regional centre to Birdsville.

Having checked my Gregory's Map 149 "Australia", it became obvious to me that there would be a communication link along the road from Charleville using point-to-point radio as a main bearer going west via Quilpie, Galway Downs, Betoota to Birdsville and this probably is based on 2.4 GHz and probably runs a 140 MB/s PDH link. I am also guessing that this equipment is possibly running near full capacity for voice traffic (0.064 Mb/s per voice channel or a total system availability of less than 2000 voice channels, or directionally 1000 voice channels each way), shared between more than 33 communities.

As Broadband has a substantially larger bandwidth requirement (say 750 Mb/s per 1000 customers in a wholesale sense) then this link would be running in total network congestion if Broadband were to be offered to Birdsville from Charleville, because the available backhaul network bandwidth simply would not be there, as it would be a "tiered star" from Charleville, with many wayside stations on the route and this is probably a good reason why Birdsville may not have high capacity Broadband capability in the immediate future.

In light of that probable network congestion issue west of Charleville towards Birdsville, I would reconsider the option of upgrading the existing optical fibre spur off Longreach (as I had suggested to you in the Select Senate Hearing). As far as I know, currently there is no backhaul connection directly between Longreach and Birdsville, but I believe that there would be an optical fibre from Longreach to Stonehenge, and possibly on to Jundah (as there is a good road there). Jundah is not all that far from Galway Downs (probably about 60 km (or about 107 km from Stonehenge) as the crow flies, depending on where the current optical fibre ends).

It would make very good engineering sense to me to extend the optical fibre from Stonehenge / Jundah through to Galway Downs, and replace the associated existing transmission equipment (probably 150 MB/s SDH) with a much higher capacity for example say 1 Gb/s (1,000 Mb/s) so that the link from Longreach to Galway Downs (and its wayside stations of about 15 communities) would be able to share the backhaul 1 Gb/s capacity, for without getting anywhere near network congestion for intense Broadband Internet uses.

If this optical fibre system was then to cross connect at Galway Downs with the existing 140 Mb/s radio system between Charleville and Birdsville, then this much higher capacity (1 Gb/s) optical link will provide geographic network diversity for the Birdsville link via Galway Downs to both Longreach and Charleville, so that it could be dual parented (which means greatly increased network reliability for the customers).

The extended and upgraded (1 Gb/s) optical fibre link will radically change the backhaul network structure and (as I had originally alluded to in my response), the extended higher capacity optical fibre link with a much shortened tiered star structure will provide a much high network bandwidth per connection, so that Birdsville could have high bandwidth Broadband, with a comparatively small outlay (***commercially, in a competitive regime frame of reference, this infrastructure expenditure would never be financially justified***).

The nominal 140 MB/s radio link from Birdsville to Galway Downs (back towards Charleville) would, in my opinion, be too a low capacity for Broadband, and a rethink here to upgrade this link from nominally 2.4 GHz to a nominally 5.7 GHz system that has a maximum throughput of about 280 Mb/s which is a substantial increase on 140 MB/s. By translating the telephony voice to VOIP at the terminal exchanges, there are substantial bandwidth savings that make Broadband Internet at shared say 40 Mb/s for say 720 locations considerably faster than dial-up Internet over dedicated telephony channels (that would probably be in continual network congestion because dial-up Internet connections are usually on for about 25 minutes where voice telephony is usually just under 3 minutes).

Because of the bursty nature of Internet, Broadband end user speeds could peak over 12 Mb/s, and average about 4 Mb/s, which is considerably faster than say 0.056 Mb/s in optimal dial-up Internet. This is assuming that the physical pair cable CAN between exchange sites and premises is less than nominally 2 km and ADSL 2+ would be used (at this stage).

The backhaul 140 Mb/s radio system from Galway Downs could also be reconfigured so that some of the locations towards Charleville (for example Tenham and Thylungra) could be primarily parented towards Longreach via the 1 Gb/s optical fibre tail and this would give them very good Broadband backhaul availability (if their pair cable CAN is short enough).

From the Charleville end, the extended optical fibre from Longreach to Galway Downs will dramatically increase their opportunities for Broadband use, as the number of wayside communities towards Birdsville from Charleville is dropped from say 35, to about 8 back to Charleville on the 140 Mb/s radio system, where the rest would go to Longreach via Galway Downs on the 1000 Mb/s optical system.

The missing high capacity backhaul link that I proposed in my submission to the Expert Committee and referred to in this Select Senate Hearing would be the high capacity highway to connect these inland communities into the broader high capacity backhaul infrastructure *via Darwin . . . Longreach, Blackall, Charleville, Cunnamulla, Bourke . . . Griffith . . . Broken Hill . . Port Lincoln*. And this backhaul Backbone will then be the inland frame to link the optical fibre grid towards the higher density populated east/south coastal areas, as I outlined in the third page of the supplementary graphics document depicting in light blue a nominal inland grid of high capacity optical fibre.

Here is a quick ball-park questimate of the proposed system:

Optical Fibre Longreach – Galway Downs

Engineering evaluation with a walk through and detailed designs	$50,000
107 km of Optical Fibre at $30,000/km	$3,210,000
5 *1 Gb/s Routers at $20,000	$100,000
4 * Power Packs and Batteries at $10,000	$40,000
Install and Commission Network Equipment	$15,000
Sub total	**$3,415,000**

Radio Galway Downs – Birdsville

Engineering evaluation with a walk through and detailed designs	$50,000
3 Routers and ancillary equipment $20,000	$60,000
8 *5.7 GHZ point-point radio systems $20,000	$160,000
8 * Power Packs and Batteries at $10,000	$80,000
Install and Commission Network Equipment	$65,000
Sub total	**$415,000**

My first guess for the total backhaul work is in the order of $3.9 M, but this is only half the solution as it is not any use having backhaul that cannot connect with the CAN, especially when that backhaul goes through / over these customers properties!

Assuming that these locations do not have ADSL, but do now have the capability for Broadband, with a broad-brush approach, wire all physicals (direct pair copper) through mini-DSLAMs and connect the DSLAM backhaul side to the upgraded backhaul via the routers positioned as regenerators / amplifiers:

Install DSLAMs at regenerator sites to all physical CAN circuits Birdsville – Longreach / Charleville (west sides)

Engineering evaluation with a walk through and detailed designs	$70,000
15 * 48 Channel DSLAMS ancillary equipment $50,000	$720,000
15 * Power Packs and Batteries at $10,000	$150,000
Install and Commission Network	$144,000
Sub total	**$1,084,000**

So this would connect about 720 premises with Broadband using ADSL for a very rough guess totalling about $4.9 M (or about say $6,800 per premises). The fact is the take-up will really be about 70% because the first guess will not align with the premises so the more real cost is towards $10,000 per premises. And this CAN needs to connect with solid backhaul:

In one of the Superman movies there is classic scene, when Superman swooped down so save Lois as she was falling from a helicopter to her certain death. Superman caught her and they stopped in mid-air, and as he held her in his arms, he said, "It's alright Lois, I've got you!" to which a very surprised Lois responded to Superman, "But who's got you?"

This classic scene encases the associated problem by connecting Longreach with an extended 1 Gb/s high capacity optical fibre link to Galway Downs, so that Birdsville can have Broadband. We may have solved the problem of getting a good backhaul network infrastructure from Birdsville to Longreach, but there is not enough backhaul network capacity to connect Longreach with the rest of the major backhaul which is in this case located along the eastern continental border. So the link from Longreach to Emerald would need to be upgraded, and probably the Emerald – Rockhampton link too! Hence my reasoning for the inland high capacity backhaul link in the first case…

I hope that this extended answer to your very difficult question about connecting Birdsville onto Broadband gives you and other Senators an insight into how one piece of well considered backhaul infrastructure with engineering know-how can positively affect the performance of more than 50 remote communities. In this case these communities are more than 600 km apart and covering an area of about 162,500 square km, without resorting to very expensive continued foreign debit by utilising satellites and/or radio in a first instance.

Infrastructure Regime

When I responded to the questions from Sen Nick Minchin (Lib SA) on competitive businesses, I did not have a concrete example that clearly showed why and how the competitive regime (competing businesses) is the wrong frame of reference to use with infrastructure, as the "Second Best" scenario always results. In this case there is the need for the $43 Bn NBN to correct the severe underspend in non-metro telecomms infrastructure that started in about 1983 after the Davidson Report (1982) initiated the 'commercialisation' of the telecomms infrastructure. Even then, that report got it wrong by instigating the universal services obligation (USO), which this year was about $145 M to make the non-metro areas look as though they are commercially viable.

During the Howard Government tenure there was the NTN fiasco, the DAB rollout, the HiBIS and a few other programs to inject telecomms funding on a commercial basis – when clearly this should have been on an infrastructure basis (and this is why they failed). As it turned out, the extended answer (above) that I provided to Senator Ian MacDonald is a classical case that shows the ballpark funding, as a concrete reference to use to show how external accounting P&L with infrastructures operates to the benefit of Australia's economy.

In the above extension of the answer provided to Senator Ian MacDonald, if the competitive regime frame of reference is used, then there is no way that this infrastructure would be installed as the internal P&L statements would show that the customers would never pay enough for the services at levelled commercial rates, and Telstra (in this case) would never amortise these costs and make enough profits over a short enough time frame to satisfy their 'competitive' business model.

The internal P&L accounting used with the competitive regime runs along the internal lines of "the retail users will pay a lot more than the whole infrastructure costs, and over a specified time frame of say three years, and the rest is almost straight profit, minus overheads."

If Telstra did put in this infrastructure, then they would have to answer to their shareholders, who would not be at all pleased because this funding would not be giving a financial return.

With the above scenario, the wholesale outlay will be in the order of $10,000 per premises, so if this was spread over three years then this is a monthly bill of about $277, before interest is considered, so the wholesale bill will be in the order of $300 per month, per premises.

The retail rate will be approximately 100% over the wholesale's unit rate, so this will be about $600 per month per premises, and considering that the going retail ADSL rate is nominally say $60 per month, the Birdsville case is simply not justifiable by internal accounting methods, as it is in the order of 10 times more expensive than the nominal rate.

What may not be obvious is that since about 1990, Telecom Australia / Telstra changed its accounting methods to use internal P&L accounting to match the needs of its shareholders, and maximise its profits. Consequently almost all new infrastructure from that date has gone onto telecomms facilities is equipment that has a high usage rate and a low per-premises cost, and that basically meant that

Band 1 and Band 2 (major capital cities, their suburbs and major non-capital cities). The rest of Australia has basically missed out.

Taking the above case (Birdsville Broadband) that was raised by Senator Ian MacDonald. Assuming that this infrastructure cost came out as $10,000 per premises, then the external accounting P&L process would move in and look at many issues like:

Medical eHealth savings through customers using BB Internet	$500
Unemployment social service cost reductions	$2,000
Saving in Petrol and Oil products	$3,650
Improved Education	$5,000
Trading from the Farm	$3,000
Short List Sub-total (per premises, per year)	**$14,150**

So using the External Accounting P&L approach as used in the infrastructure regime, this infrastructure would have paid for itself in less than 9 months, and we have not even asked the shareholders about the profits (because the government and opposition are the shareholders), and the government overheads on Social Security and Health / Medical are significantly dropped, while these people will be paying bigger taxes!

The obvious argument is that these external accounting P&L figures are far too optimistic, so if these figures were heavily discounted by say 75% then we will get:

Medical eHealth savings through customers using BB Internet	$125
Unemployment social service cost reductions	$500
Saving in Petrol and Oil products	$912
Improved Education	$1,250
Trading from the Farm	$750
Short List Sub-total (per premises, per year)	**$3,537**

Keeping this external P&L accounting in line with a typical competitive business case, then it should break even over three years (neglecting interest). These heavily discounted figures clearly show that the payback to the government for putting in this infrastructure is more than $10,500 over three years making this infrastructure business case extremely compelling.

Typically the Australian telecomms spend (investment) on infrastructure would be in the order of $5 Bn per year, but if you go back to about 1990 and rationalise the telecomms investment by about 50% due to the competitive regime kicking in, (including considerable ACCC based costs for thousands of lawyers in Telstra) so the infrastructure investment is about say $2.0 Bn per year, then the underspend thanks to the competitive regime is about 19 * $2.0 Bn = $38 Bn, and looking backwards this is a bit under what the NBN is ($43 Bn)!

When I described the outline of the economic *"Theory of the Second Best"*, in the Selective Senate Hearing it should have been very obvious that *the competitive regime is clearly the "Second Best" strategy for the Australian economy* – but we are naturally competitive, and the least disruptive positioning for the competitive regime is in retail reselling. We have several very successful competitive businesses like David Jones, Myer, Woolworths, Coles, Harvey Norman, Bunnings to name a few; and all of these have focussed customer markets, with a minimum of infrastructure, and a minimum of involvement with the ACCC. Telstra as it is, has a maximum of infrastructure and a maximum of interaction with the ACCC!

If we really want the "First Best" for Australia, then it is a 'no-brainer' to utilise the infrastructure regime for telecomms infrastructure at a wholesale level (ie NBN and Telstra Infrastructure Wholesale working as one) and let the competitive regime retail this wholesale infrastructure products and services to the public, just like other major successful retail trading businesses in Australia.

So here is the problem: *We now know that by using the competitive regime's approach of utilising internal P&L statements to prioritise infrastructure on a biggest returns basis, this maximises infrastructure in the "metro" cities and minimises infrastructure everywhere elsewhere.*

We know that the NBN is being set up (as a company) funded by the government as an infrastructure regime business to put in infrastructure everywhere so that areas that have missed out in the last 20 or so years can be provided with Broadband Internet (and both sides of Government and Opposition have a general agreement with this strategy)!

Why would the Government and Opposition be so inept to put the NBN back into the competitive regime after any time frame at all, when they have the historical facts that prove this situation ends up with a "Second Best" economic situation for Australia?

Staff and Training

The evidence that I presented in response to Senator Nick Minchin (Lib SA) questioning about staff ages was rather incomplete, so this short addendum addresses most of the areas that I did not cover.

Before I left Telstra in 1996 there was a concerted effort to bring in a younger work force particularly in the sales and marketing areas. In general I commended this competitive business approach as the shopfronts usually have younger clientele and this maximises their business profitability, and seniors are usually not high-revenue clienteles.

In regards to the technical / field staff in the telecomms industry; the general (office-based) thinking is that with Intranet (behind the firewall), the Global Operations Control (GOC) via the telecomms equipment alarm monitoring system can connect to virtually every telecomms piece of equipment (both in the Backhaul and in the CAN), and most service issues can be either immediately resolved by a data table command change from the GOC, and/or later resolved by a field staff person when they next visit that site.

This computer screen realism mentality is endemic, and there really are field staff that are much like 'board jockeys' that travel from site to site (Backhaul and CAN) and replace faulty board assemblies, then commission the equipment back into service inside an agreed 'time window' in coordination with the staff in the GOC in Melbourne.

With first generation digital equipment of the early 1980s, this equipment had reliability Mean Time To Failure (MTTF) figures measured in decades, not weeks or days as it was with earlier mechanical and analogue equipment. Telstra was put in a very awkward position of having to put off thousands of highly trained technical staff. With the second generation digital equipment installed from about 1990 onwards, this 'globally manufactured' equipment had remote alarming and control such that it could be 'managed' from an operations centre, and Telstra was again in a very awkward position of offloading more than 90% of its remaining backhaul (core network and edge network) engineering and technical maintenance staff. This is the prime reason why Telstra now has a relatively young staff, and why contractors to Telstra are usually the older maintenance ex-staff! This is also the prime reason why Telstra's staff, have a generally short historical memory.

So in general, now most exchange sites are totally unmanned, but nationally there is another field staff team that is basically CAN and peripheral/edge backhaul based, that installs and commissions new equipment, and this is the area that really needs to be trained up and soon.

Optical fibre is not nearly as simple to splice as compared to join copper wire pairs using insulation displacement connectors (IDCs). The optical splicing equipment is expensive, and each splice has to be measured and recorded well before the optical fibre cables are put into service. Optical Fibre technology has come in since about 1986, and it is now used almost universally throughout the backhaul network, and business / enterprise CAN, to radio base stations (for mobile phones and mobile Internet), and the fibre component of HFC.

Australia has several hundred (if not a few thousand) trained field staff, but apart for some of those in the business / enterprise area, almost none of these staff have any background in optical fibre technology – particularly in splicing. When it comes to installing an optical fibre CAN, we are looking at say 10 M premises, and therefore about 30 M splices. If this were to be rolled out in say four years, then in round figures this is about 30,000 splices every weekday. Considering that a fast splicer will get through say 100 splices per day, then Australia will need at least 300 splicers working full time for four years, and these splicers will need the associated splicing and measuring equipment which costs about $25,000 each.

Unlike general rack installation work, training in optical fibre technology is a precision job (understand the centre of the fibre is typically about 9 um, not 0.4 mm as in urban pair copper cable). Learning the basics will only take a few days, but learning to do repetitive and precise splices, detailed field based measurements and accurate field recording takes months and a lot of patience; and these qualities do not suit the vast majority of the outside field staff.

I hope that this clarification explains to you how and why existing trained field and maintenance staff that have been displaced some decades ago may not be useful for the installation and commissioning of FTTP and the associated equipment interfacing into the augmented backhaul, and why Telstra had to make some rather unpalatable decisions about its own staff numbers. This addendum also shows that Australia will have to educate and train a small battalion of field staff that have Optical Fibre Splitter certifications (and experience), in the short term, together with the necessary and expensive splicing, testing and calibration tools and equipment.

Appendix 2

Comments on the GCIF

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Thank you for the opportunity to attend the open forum at the Wesley Centre in Sydney on the 3rd February 2009, conducted by the Department of Innovation, Industry, Science and Research (DIISR) concerning the Green Car Innovation Fund (GCIF). All these comments are my opinions and are provided in good faith.

Observations on the Meeting

Judging from the very high percentage of polite criticism of the GCIF, it was very clear that this policy had been concocted in a very hasty manner; as the policy clearly did not come near meeting the aspirational goals of the large proportion of attendees; so it was very clear, and I am sure almost everybody there understood that the frame of reference that the policy makers in the DIISR was using was very different from most of the people in the room.

It was equally unfortunate that the presenters of the policy spent so long presenting the policy, as the Framework Paper had already been distributed in an eight-page PDF on the DIISR website. Almost everybody that attended the GCIF briefing would have firstly read and comprehended the PDF – as this would be standard business practice to do the basic homework before attending.

As it was, both of these presenters had a small run of PowerPoint slides that basically skirted around the Business Case structure and how Grants would be monitored, and these slides were included in the handouts in the room, so really – in efficient business terms – this could have been a 'flick through' with about 15 seconds per slide, and then the real handout should have been a 'How to Construct the Business Case' document and a 'How the Monitoring Works' document! We all could have all moved into meaningful questioning within about 20 minutes from the meeting being opened!

Structure of the GCIF

In linear terms, the GCIF seemed to contain major flaws in that the GCIF had two finance flows: stream A and stream B, and it took time to realise that the GCIF was in fact not one contiguous policy, but ***one mainstream non-green policy for car-manufacturers*** with another very minor broad-scope, very ill-conceived and highly un-coordinated green innovation development policy tacked on the side as an afterthought with the hope of giving the funding scheme some 'green' credibility.

From what I could understand, the GCIF is the financial vehicle to legalise the draft of substantial Government funds (about $150 M) into GM Holden to keep the Fisherman's Bend plant going with minimal work disruption. It seems that Cabinet was heavily coerced by a car builders union to cough up the funds to keep the plant operational without real consideration as to what was to be manufactured. This frame of reference would explain why GM Holden is hell-bent on producing yet another line of virtual 1972 Torana's using an existing gasoline powered engine that is anything but 'green'! In this light, the GCIF probably stood for *Gasoline Car Injection Finance* before bureaucrats in the DIISR deliberately massaged this funding vehicle to make it appear palatable!

The DIISR needs to look extremely closely at this Australian GM / Union scenario and then relate this diabolical GM / Union scenario to the USA and realise that this flawed course in Australia needs to be changed sooner than later, and this union is not assisting Australia. The second part of the 'A' mainstream GCIF seemed to be covering up the funding announced by the Prime Minister to arrange that Toyota will produce a line of Hybrid (Gasoline / Electric) Camry vehicles in Australia, and for that, Cabinet has approved $35 M. The GCIF is for $1.3 Bn over the next 10 years, so in linear terms that is $130 m per year! For 2009 the advance investment (spend) is $150 M + $35 M = $185 M, which is negative $65 M for 2009, and the remainder funding for 2010 will be nominally $65 M, (not $130 M), before the big car manufacturers align their Business Cases for the 2010 trance to ensure the big car manufacturers take all the funding in the A stream, leaving nothing for 'green' technologies. So the 2009/10 funding in the B stream has already been almost fully allocated to the mainstream car manufacturers, and this was clearly noticed!

It was interesting to note that nobody in the room spoke on behalf of stream A, so either they knew to 'lay low until the seething mass had cleared' or were in the Melbourne meetings! It was noticed that

the GCIF was not named the GVIF where the V would stand for Vehicle, and the departmental panel were addiment that the name could not be changed, from the word 'Car' so this was further proof that the naming was concocted by a co-political a self-interest lobbying force outside the department, to suit themselves, and my guess that it was again from a car workers union in eastern Australia, forcing the Labor Federal Government's "neck" and find a politically 'clean' name to launder the money!

The term 'Vehicle' also excluded motorcycles, (which were explicitly rejected - even though their carbon footprint is far smaller with green technology), busses were totally rejected as were lorries, and heavy / public transport machinery – because these were not mainstream car manufactured in Australia – apart from Goanian in Newcastle, and QRail in Queensland! It was also noted that the department panel totally rejected any car over 3 tonnes (most likely because the current plant car production lines cannot handle greater than 3 tonnes without being innovative)!

Technically, I believe that Sports Utility Vehicles (SUVs - those truck-like vehicles) are not cars but are actually registered on the road as lorries, and as such, by these strict naming of this fund, most likely coined by the union only allowing cars for the funding, then SUVs are therefore ineligible for the grant, so the union has in effect fitted a rod to their own back.

The LPG Lobby Group
Several people had their own agenda, and it was interesting to hear the Taxi Lobby (for want of a 'front') sprout the values of using Liquid Petroleum Gas (LPG) powered taxis for the past 25 years, while that person did not comprehend that LPG is not a 'green' technology by today's standards, but more a 'brown' technology associated with smog, relative inefficiency compared to hybrid gasoline/electric power, and a proportionately big CO_2 producer! The LPG Lobby Group stance was in itself a watershed in that it invoked the carbon life-cycle management (CLCM) into the argument, and that in itself seriously questioned the relative value of gasoline / electric powered hybrids in favour of LPG /electric powered hybrids.

So this Taxi Lobby front inadvertently showed that Petrol and Diesel powered vehicles need to be phased out in favour of LPG, and that LPG itself is to be phased out unless it is an LPG / electric hybrid vehicle, and LPG is to be phased out in favour of entirely electric vehicles. Unfortunately, the LPG Lobby Group inadvertently showed the serious folly in the farcical funding of an upfront $150 M to GM Holden to continue making gasoline powered dinosaurs and it was obvious that the DIISR panel is stuck between a rock and a hard place! GM USA has on its production line the GM Volt, which is to all intents and purposes a very 'green' car, which could be quickly production transferred into Australia at GM Holden. Clearly, GM Holden should be manufacturing the GM Volt with an electric engine as a matter of urgency!

The Electric Lobby Group
The Electric Engine lobby group had several voices, and it was clear that these voices were not unified, but were dispersed in a range of technical developments, and that was clearly the argument for Stream B to have this 'clean – green' element in the Funding arrangement so that the vast majority of the funding could be flushed through to appraise the unions demands for no loss of workers jobs.

It was pointed out during the discussion that the kilometre range of Electric vehicles is limited, and it was also agreed that for urban use this is not a problem. From discussions that I had both before and after the meeting, it seemed to me that the travelling range was between 100 km and 250 km depending on the motor, the speed (hence the drag coefficient), and most importantly the battery technology.

The DIISR panel were not technical engineers but were career bureaucrats, and it was clear to me that a high proportion of the audience were ingenious engineering innovators. This was a volatile mix as innovators are naturally motivated to think laterally and act on thoughts where bureaucrats are naturally risk adverse and this was a mental chasm, leading me to consider the possible serious lack of innovative management in the DIISR itself!

Chinese Walls in the DIISR
Being risk adverse, it was interesting to note that the bureaucratic DIISR panel was highly reluctant to allow communication of who attended to become common knowledge. This is not a Privacy issue as pointed out by the Fed Gov Senior Privacy Policy Officer who was in an adjacent room, but a Fair Access policy issue; meaning that people who did not bother to attend this DIISR meeting really didn't have a leg to stand on for not having Fair Access to the details of the other people attending! I wondered what this panel were going to do with this attendees list other than to file the connections list

in the rubbish bin and lose this collaborative knowledge element! This DIISR panel seemed to be so wrapped up in their internal policy arguments that they collectively could not see the bigger picture where they have a leading responsibility in getting the innovators together on a massive scale for Australia. This blindness is a serious misgiving, and it became obvious to many people in the rooms that although these bureaucrats meant well – it was like having career schoolteachers giving career guidance to students about executive management and/or mining / software / engineering / architecture etc. (and we all know how hopeless that is)!

Slipping Into Plan B

During the PowerPoint presentations Michelle Harrington gave a four-stage plan for innovation development, and personally I found this to be seriously wanting, because I immediately saw five-stages as follows (with Research separated from Development):

- Research
- Development
- Proof Of Concept
- Small Scale Production
- Large Scale Production

From my perspective, I wondered if she or any member of her team had actually done any professional Research and/or Development, as I know from my more than 40 years professional telecommunications engineering experience in the telecommunications and IT industries, it horrified me to see that the DIISR presentation had the R&D lumped together.

There is a vast difference between a Research approach and Developing the innovation towards a Proof of Concept (POC) trial, and these three stages are entirely different. Even further, the Small-Scale Manufacturing (SSM) is another major step beyond a POC and these must not be confused, and it also made it rather clear how in Australia we come out with so many half-baked POC innovations that are really just the embryo of the Development stage and it is no wonder these innovations in Australia are SSM as undeveloped POC projects which die slow and expensive deaths!

This situation is because the POC has not been taken into the SSM stage, and the POC was never really functional; that is, the developmental stage production bugs have never been resolved, so it can't be reliably manufactured, so there obviously a serious gating process that is probably lacking in the DIISR Business Plan structure!

It seemed very interesting that the DIISR presentation went to a lot of time to explain the necessary steps for producing a Business Plan, yet there seemed to be no direct publication or even 'fill in the following blanks' documentation that would really get this process through the innovation evolvement gates.

There are two sides of creating a Business Plan, and the first side shows the innovator / inventor the bigger picture of what time frame and costs will be necessary to move the innovation through the development, proof of concept and small scale production gates. The other side is that the Business Plan openly exposes the innovation so that others who wish to invest in the innovation can profit from financially supporting the process through the gates.

When A Business Case is a Steal

From Dr John Clarke's book "Working With Monsters" (ISBN 1-74051-154-9), he states on page 24 that about 1 in 3 adult males are psychopaths and about 1 in 300 adult females are psychopaths, and at the outset this might seem rather frightening, but remember that most of these mental psychopaths have made the laws to contain and isolate the physical psychopaths! *(I am also sure that adult females have socially engineered these figures to report an abnormally low proportion of female psychopaths – but other indicators expose that myth!)* This means that there are a high percentage of professional workplace psychopaths in business and it does not take much to realise that most of these are the ones that worm their way to the tops of their organisations, and have delight in 'killing' others futures, 'taking over' business opponents and **covertly stealing innovations** from Business Cases!

We in Australia have several instances of certain 'innovative' banks whose executives have intentionally stolen large amounts of Australia's infrastructures from the Australian Federal and State Governments in the name of "Competitive Business Efficiency". *(The efficiency was in extracting the maximum money from the public who were forced to use these essential services; not the efficiency in providing low-cost high-reliability end-user essential services!)* We have just witnessed a swathe of

these white-collar psychopathic criminals based in the USA that have plundered the financial markets for their own good at the expense of the World economy, and these lovely people are the pillars of society, granting themselves exorbitant bonuses; and note that these highly esteemed people have absolutely no conscience relating to monopolistic business practices and publicly these people are usually charismatic!

The situation of allowing the merchant banking fraternity with their lawyer and accountant friends looking over Research / Development phase Business Cases is akin to having Dracula manage the Blood Bank, and only the most inept of Government bodies would let these workplace psychopaths near to Business Cases owned by largely indefensible innovators! This being the case, it is therefore imperative that the DIISR must radically change its mode of operation from one of a more than arm's length passive financial and distant structural support for innovators and competitive industry – into a collaborative industry support group that proactively creates the Business Cases for these innovators in privacy, and provides front up funding and guidance in alignment with the CSIRO to coordinate innovation and take these innovations through the Development and POC stages so that they can then be farmed out to Australian based manufacturing / software houses for SSM.

Innovating the DIISR

With the slightest little bit of innovative thinking – the more intuitive people in the DIISR would readily realise that trains and buses have a comparatively far lower drag coefficient compared to the general one passenger per car, because drag is relational to vehicle length compared to front cross sectional area, making these vehicles far more 'greener' than their private car cousins.

We have State Governments that are chronically short of good public transport vehicles (Trains, Trams, Buses) and these same State Governments are bleeding money to import very expensive buses and trams and trains for public transport needs, and we have vehicle production line companies that are making an excess of road vehicles that they cannot sell fast enough. *This is Captain Obvious national economic innovation that is truly embarrassing!*

On top of this situation we have a Federal Government that is throwing money at these idiot road car manufacturers (just like in the USA) to keep making the road cars when these manufacturers can be readily diverted into making buses, trams and trains, rail cars, and that is what we need now, as it employs people in Australia, and makes Australia debit free! It is high time that the bureaucrats in the DIISR thought outside their little cubes and got innovative, and proactively collaborated with the research and development expertise that is screaming for assistance and unification in Australia to move into POC and beyond into SSM.

Getting the DIISR Proactive

From what I can tell, the CSIRO is separate from the DIISR – or if they are under the same banner then they do not seem to be working collaboratively! It seems the both have different Websites, and the linking is at the best hard to find or non-existent!

It seems that the CSIRO is the research arm of the DIISR, but from the high number of university research-based questions raised in the forum today, pleading for proactive funding and pleading for the artificial bar (set at $400k by the DISR for this GCIF) to be totally dropped and the funding made up front instead of well after the event (which by the way will exclude all single entity innovators).

It seems that the DIISR does not seem to know how (or is simply too bureaucratically crippled) to proactively sponsor research in universities. In this 'techno info' age such a policy from the Federal Government's leading department on innovations is very negative, and it needs a major turnaround to stop squandering expenses spent, having taught generations of our innovators in Australian schools, TAFEs and universities, and include a powerful arrangement to proactively fund Australian innovators at all levels and locations. There seems to be no DIISR Development arm (as the psychopathic merchant bankers, psychopathic ex-ministers and psychopathic lawyers have moved in here). This is why innovations are usually stolen before they can move to the POC stage and from there, these innovations move overseas – along with their altered Patents! This would explain why there is no obvious small scale and medium scale innovation production of any reasonable size in Australia, and seems to all intents that the DIISR is the main impediment to productivity of Australian innovation.

There seems to be a major missing Business Unit in the DIISR, which would be the Australian Innovative Business Development Organisation (AIBDO). I believe that this organisation should be chartered to be a major arm of the DIISR and it should feed from the research and development made in the CSIRO, universities, TAFEs, and small scale innovators. The purpose of this Business Unit

would be to proactively support the business development of innovative technologies through the POC and SSM processes and to '***battle harden***' these products so that larger scale manufacturers can swiftly move into production without altered Patent theft and/or manufacturing process issues.

Proof Of Casualty – The UltraBattery

Some few years ago, people in the CSIRO made a major discovery in realising that by putting in a carbon electrode into a typical Lead-Acid battery, the chemical reaction was largely preserved, because at the nano-technology level, the carbon formed what is called an Ultra- Capacitor. The combination of the Ultra-Capacitor in conjunction with the Lead-Acid battery technology created what is now called the UltraBattery.

The reason that the chemical stability was preserved was that the Lead-Acid battery has a major problem in providing hundreds of amperes over a short period and it can cause permanent damage. The UltraCapacitor has the ability to provide very high capacitance with a very low internal resistance – so the UltraCapacitor can provide the necessary current and the battery is chemically not damaged. Proof of this is that a typical lead-acid battery can be deep recycled about 700 times before it physically fails, but an UltraBattery has a deep recycling capacity exceeding 100,000 times, and virtually maintenance free.

The hidden advantage is that the UltraBattery has a much higher power capacity per unit volume, and has a much lower density than an equivalent lead-acid battery, making it an ideal contender for really green car transport in electric hybrid and/or electric vehicles. Now, the CSIRO has researched and developed this battery and the next stage is a proof of concept – and guess what – the DIISR is nowhere to be seen, and the CSIRO cannot find a battery manufacturer to put up a measly $12M in Australia to carry out the proof of concept – so the CSIRO went off-shore to Japan and found a battery manufacturer there, and they worked with that manufacturer to prove the concept, and then that Japanese company is now getting into a small scale production. Not Made In Australia! No thanks to the DIISR!

It just so happens that Toyota had been coerced to manufacture an ICE / electric hybrid car in Australia (after being given an up front $35 M to make it happen), and further, the Toyota Australia company had also been coerced in this latent deal to try the UltraBattery (from Japan) to see how well this technology really is! So I understand 1,000 cars are to try this new technology, and I am sure the batteries will be manufactured in Japan and not Australia. Meanwhile Firefly Energy in the USA seems to have altered the CSIRO Patents and have a newer more compact carbon sponge based lead-acid battery. This demonstrates the very low confidence that I have in the DIISR in being proactive about collaboratively supporting the CSIRO and any other technology advances for Australia. RIP Innovation…

RIP B Stream

About half way through the discussion, it became very apparent that the B Stream was deliberately tacked onto the A stream to give the A stream some 'green' credibility! Because the A stream was basically funding the union backed push to manufacture any old car, and by old we fully understood that gasoline powered cars are simply not 'green' in any form! The B stream is affectionately a 'green' stream, but it is lame and mute, because the funding level was late and miniscule, by recollection about 1:3 and it came out that the "Climate Ready" program also provided research and development funding for 'green' technologies, and its funding ration was in the order of 1:1, making the GCIF B Stream useless!

It was suggested that the funding proportion that was apparently put aside for the B stream should be immediately taken from the $1.3 Bn in the GCIF, and this proportion of the funding should be immediately moved over to the "Climate Ready" funding program. In diplomatic "bureaucratese", this suggestion was flatly rejected because the amount of the B stream was apparently undetermined, and that didn't even fool the flies on the ceiling! The room participants were not confused by the bureaucratese as they all knew that the A stream was the total GCIF and that the B stream never had any funding – just the 'green' name stolen from the B stream to make the A stream appear 'green'. RIP B Stream…

Conclusion

Of the several people that I listened to within and outside the information dissemination, it was blatantly clear to me that there was a groundswell of very frustrated innovators and inventors that were getting the short end of the support stick from the DIISR in favour of major multi-national car

manufacturers that had already squandered their business opportunities, and are still stuck with last mid-century's technology of gasoline powered cars.

It seems the GCIF is really a front for a car workers union to get their workers paid while making obsolete gasoline powered ICE cars, and the 'green' emblem has been stolen from the bankrupted B Stream component of this scheme to launder this finance activity. It would be much better that the DIISR bureaucrats came clean and admitted that this GCIF is a money laundering scheme, dropped the 'Green' farce (unless GM Australia is ordered by the DIISR to manufacture the GM Volt), directed the innovators into the "Climate Ready" financing program, and correctly named the GCIF as the *Gasoline Car Injection Fund*.

It seemed that the DIISR presenters did not comprehend that they are the people that have the capacity to be proactive and the collaborative centre for excellence in managing innovation and development in Australia. Unfortunately, these people appear to be office based bureaucrats that are not innovative business savvy, and consequently their responses showed that they are ineptly working against the very innovators that they are in place to proactively support.

The DIISR has the CSIRO as one of its prime Business Units and it appears that both areas fight against each other. This probably means that both areas are seeking funding from a common but uncoordinated management arrangement, which needs immediate resolution. Innovators need to be kept safe from predatory business psychopaths and the DIISR seems to be oblivious that it has the potential to be the centre of excellence for innovation, and keep the predators at bay, while fostering innovation past the research, development, and proof of concept stages so that these predators can capitalise at the production stage, and this would be a win-win situation.

There seems to be a missing Business Unit in the DIISR, which would be the Australian Innovative Business Development Organisation (AIBDO), which should feed off the research made in the CSIRO, universities and small scale innovators, and proactively support POC and SSM processes to foster the development of Australian-based technologies so that these developed innovations as POCs can be then farmed out to Australian manufacturers for SSM, without being pre-stolen by psychopathic business entities before innovations are matured.

There were several 'lobby groups' that in pointing their fingers have shown self deficiencies, and more commonly gaping deficiencies in the workings of the DIISR. The DIISR seems to by oblivious to the fact that they are the ones that are not proactive, and seem to think that through producing policies, that everything will simply 'happen'. Although the DIISR has all the innovation contacts, these bureaucrats being risk adverse openly avoid being the centre of innovation without being pushed – so maybe these bureaucrats are the wrong breed of staff.

This GCIF forum was brilliant in proving that bureaucrats in the DIISR are really out of touch with innovative industry and that was again proven in the DIISR bureaucrats inability to work with their own CSIRO to develop the UltraBattery technology in Australia through the proof of concept stage to medium scale production, which would have been a prime green technology catalyst for the GCIF to have 'green' credibility.

Thank you.

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