

26 June 2009

Secretary
Select Committee on the National Broadband Network
PO Box 6100
Parliament House
CANBERRA A CT 2600
Email: broadband.sen@aph.gov.au

Dear Committee Members,

Re: National Broadband Network

I am pleased to write in response to your letter of 15 June 2009 inviting comment to the Senate Select Committee on the National Broadband Network (NBN).

I write in my capacity as CEO of the Australian Institute for Commercialisation (AIC), but with the added benefit of being a Board member of EM Solutions, a small Australian niche designer and manufacturer of radio telecommunications link equipment, and also as an electrical engineer with a career spanning over thirty years in the telecommunications and related sectors, with OTC Australia, Telstra, and finally SITA. In the latter corporation, I held the position of Vice President for Network Services, first in Australasia, then in North America, and ultimately managing its networks throughout Europe.

The AIC is Australia's leading national consultancy organisation advising entrepreneurs, small business, research organisations, and governments on the commercialisation of their intellectual property (IP) and know-how. Since 2002, the AIC has worked with thousands of entrepreneurs and researchers through its professional development programs to improve their understanding of the steps they need to take to commercialise their invention or research; facilitated over one hundred collaborations and commercialisation deals for government agencies and businesses to licence their IP or technologies; and provided direct commercialisation assistance, such as market research, commercialisation frameworks, and opportunity analyses to hundreds of clients in both industry and government.

The rollout of the NBN will not only provide new telecommunications services to the public, it is also a unique generational opportunity to remap the entire Australian telecommunications environment, and to develop new markets, new service providers, and indeed, new industries.

However, there are risks that if poorly structured, much of the investment in Australia will be spent on civil works, with the remainder on procuring the bulk of the high value, high IP content overseas. This would be a great loss to the nation and result in negligible multiplier effect from the capital invested.

I was working in research and development into broadband networks while at OTC, and then Telstra, in the period from 1990 to 1994. During this period, the first Web browsers were being developed and the Internet was relatively unknown. I vividly recall a presentation I made to senior OTC management about the new Internet, predicting that by the year 2000, growth in data traffic would be such that it would exceed the volume of OTC's entire voice network. This was dismissed as absurd and by "not in my lifetime" comments. Broadband technology during the '90s did indeed progress rapidly, but telcos around the world looked for a "killer application" that would drive usage to the extent of filling their quite significant unused capacity. Numerous predictions for such applications included telemedicine, electronic data interchange (EDI), and images – all of which even today barely drive broadband demand. It was only when internet browsers became widely available did the demand for broadband access accelerate to the point where it caught up with the (pre-existing) state of technology.

The first point of this story is to be sceptical – very sceptical – of predictions for future uptake. The second is to be totally convinced that the rollout of the network is truly justified on the basis of demand. It is not at all clear to me that 100Mbps speeds to 90% of Australia's premises can be justified by demand.

No home in Australia to my knowledge receives its town water direct to its premises through a 1-m pipe, nor has a freeway terminating at its driveway. Some reduction in capacity is both understood and expected, simply because high flow rates to the door are not only economically infeasible, they are also unnecessary. Likewise with telecommunications networks, my own experience suggests that fibre to the curb (FTTC) systems are certainly more economic as well as being quite adequate.

In addition, I wish to bring to the attention of the Committee the following concerns to ensure that the NBN maximises the national interest:

- **Ensure there is proven market demand for broadband access to the premises**

As noted above, the history of telecommunications is littered with examples of technological advances that have withered because of lack of demand. A further example is the deployment of ISDN, which came to be referred to as "I still don't (k)now" because it was a network looking for an application to drive usage.

In the case of the NBN, the marginal utility of the additional bandwidth should be well established first before deciding on the access speed to the premises. Overseas experience or a trial in Australia in a representative area such as regional Queensland could be used to obtain a realistic value for the marginal utility of access bandwidth, which I would imagine would head to zero somewhere between 2 and 10Mb/s for the average person.

- **Reverse the reduction of R&D in telecommunications in Australia**

With the convergence of IT, telecommunications, content, and computing during the tech boom at the beginning of this decade, telecommunications companies around the world divested their R&D activities. Telstra Research Labs has disappeared, as has Bell Labs. As a result, any significant R&D has been pushed either upstream in the value chain to equipment manufacturers (Nokia, Ericsson, Cisco, etc) or downstream to value-adding IT providers (SAP, Google, Siebel). Although multinational companies profess to perform their R&D globally, the actions of Ericsson in Melbourne or Motorola in Sydney and Adelaide in closing their R&D facilities, or of numerous similar companies in Ireland more recently, have the capacity to wreak havoc on an economy and its skills base. Web posts suggesting that pursuing a PhD in telecommunications in Australia is no longer worthwhile (such as <http://forums.whirlpool.net.au/forum-replies-archive.cfm/927368.html>) make sad reading.

R&D is absolutely fundamental to economic growth and those responsible for designing and installing the NBN must be accountable to ensure a significant amount of ongoing *and enduring* local R&D is part of their strategy. I recommend the Small Business Innovation Research (SBIR) (www.sbir.gov) program in the US as a well tested and very successful scheme that could be used as a model to ensure such R&D is 'sticky'.

- **Redress the lack of opportunities for SME access to supply telecommunications infrastructure in Australia**

It is not clear to me why a company like Skype never emerged in Australia, but there is a fair bet that if it did it would have been squashed by the incumbent voice call providers. The AIC works with a number of early stage companies seeking to commercialise their products, and observes frustration at lack of access to engineering trials, and ultimately the procurement cycle, of the established tier-one telecommunications companies. The supply chain too often begins and ends with a multinational supplier, and innovative Australian companies struggle to receive both access and capital.

This is reinforced by the risk aversion of those managing the procurement cycle in the large telcos. A focus on reducing risk, time to integrate, and cutting costs will never favour cash strapped, small, early stage innovators – exactly those Australian companies that government industry policy should encourage. Establishing a series of NBN pilot or test-bed networks around the country, hosting seminars such as technology clinics along the value chain to build linkages, and encouraging collaboration to reduce risk during the pre-procurement cycle are simple but effective steps that can be taken to enable SME participation in the NBN build and operation.

- **Enforce a new model for an Australian industry development plan**

As noted above, the NBN presents a unique opportunity for Australian industry participation. On the surface, the network equipment market would seem “tied up” by large multinational corporations. Yet nearly all large international telecommunication manufacturing or service companies (NEC, Nokia, Alcatel, Nera, Siemens, Philips, Ericsson etc) received their initial boost by being selected to supply major parts of their home country telecommunications infrastructure. Huawei and Datang are two large Chinese equipment suppliers that emerged during the past decade as a result of Chinese network builds, and are now among the global majors. This has not happened in Australia so we have no international telecommunication company of any size.

The industry development plan associated with the NBN must be more than a multinational committing to spend part of its receipts in Australia. That trick has been seen many times in Australia in the past, always to prove a temporary measure. It is fundamentally bad policy to induce multinationals to set up manufacturing facilities in the country as part of offsets or as a condition in awarding a large contract. Once established, my observation is that the multinational generally later tries to extract additional “rent” for staying by threatening closure and job losses as soon as the contract finishes, if there is no follow on work, or if the economy slows.

The commitment must be enduring. That is why locally owned SMEs must be integral to such a plan, and their contribution must be ‘sticky’.

Consider the following previous major investments and attempts to build an Australian telecommunications industry capability.

1. Broadband Microwave Link Network (1960s/70s) NEC and Siemens were selected by Telstra – no local company
2. Microwave Landing System and Interscan (mid 1970s) – a slightly different industry model with some success but not directly with landing systems
3. Satellite System: 1980s. Hughes (US) selected with an offsets program - failed to deliver on developing a local industry for satellite or satellite subsystems design and manufacture.
4. Direct to home satellite terminals (TVRO) early 1990s - no local industry development
5. Microwave Distribution Systems (mid 1990s) - an early form of one way broadband delivery to private users/networks with no local industry developed other than an installation capability.
6. Mobile phone network roll out (analogue system in early to mid 1990s, and then digital in the late 1990s to early 2000s). The policy used was to select an international company to run the projects, and to source some items from local companies. Of the whole infrastructure required for a mobile phone network from the handsets through to the base station components (antennas, amplifiers, filters, frequency converters etc) and the software, it seems that the only industry development success was that of Argus Antennas, a company that grew out of the Interscan project and that was able to apply its design and manufacturing skills developed on the Interscan project to mobile base station antennas. Motorola committed to a wireless R&D facility
7. Fibre optic cable roll out (late 1990s and continuing) - no local industry development. Basic level fibre optic capability at AWA disappeared. Olex cables were used to add protective covers to imported fibre optic cable and wrap into bundles with steel cores but this disappeared. AOFR was a local supplier of optical components that did not manage to make the step to a larger entity. The end result was there has been no significant industry development.

In over 50 years then, Australia, despite developing one of the best telecommunications infrastructures in the world has not managed to build a significant Australian company, or indeed, industry sector to design, manufacture, commission, and support this infrastructure other than through branches of international companies.

So what has gone wrong?

The essential models have always been flawed since each has been a variant of allocating the intellectual substructure of each major national program to an international company, and requiring or asking the international company to source some work from local companies either through offsets, partnerships or similar schemes.

The only variant to this flawed model has been that used for Interscan, where the original intellectual property originated in the Australian Department of Transport and CSIRO. The intellectual base was not handed over or supplied by an international company; rather there was an attempt to build this up locally. The attempt failed as far as this specific technology was concerned because the landing system never became the “standard” for airports around the world for a variety of reasons. However, it succeeded on another level as a whole collection of smaller companies (of which Argus Antennas is perhaps the most significant) were spawned on the intellectual impulse from the Interscan project. For example, Mitec (and subsequently Codan), Triasx, Microe, EM Solutions, Syndetic, and Surtech are a few of the small local companies that emerged to create a design and manufacturing capability which previously did not exist in Australia. However, to my knowledge, none of these companies have significant work with Australian tier-one telecommunication companies despite the fact they are suppliers internationally and to the Department of Defence locally.

The NBN program dwarfs all previous projects and has the potential to succeed where all others have failed in developing a local industry of size, quality and capability to compete globally.

What are the key points?

1. The intellectual base for the NBN must be grown locally and not outsourced. Virtually every large multinational company retains its critical R&D in its home base. During recessions, it sheds first any R&D, followed by the advanced then the basic manufacturing, and finally the support, activities where they are undertaken in countries other than their home base. This has certainly been the experience in Australia (and most other countries) across a range of industries.
2. The NBN company must therefore assume responsibility for the overall system design of the network and not hand this responsibility over to any multinational company, if a key objective of the network is to develop a new Australian industry base with export potential.
3. With the system design capability in-house, the NBN company can itself select supplier companies. Retaining overall prime contractor role with system responsibility within NBN is critical to avoid the mistake in nearly all the other national projects outlined above.
4. If systems responsibility is not held within the NBN company and it does not have a mandate for local industry development and SME involvement, then no level of legal agreements, offsets, or partnerships will likely see significant revenue or intellectually critical work allocated to local industry. This approach has failed every time in the past and will fail again.
5. A corollary of the above is that the NBN company needs to have a positive approach to risk rather than a bureaucratic one. In most cases it turns out that the perceived security and low risk of a large multinational company with perceived experience and capability is a chimera. Large companies suffer their own internal frictions which retard the effectiveness and efficiency of R&D. R&D is best shared between a large number of smaller companies if innovation, low cost and rapid solutions are genuinely required.

In summary, the NBN is a unique opportunity to develop collaborative R&D infrastructure that drives enduring local design and manufacturing capability. The AIC has a number of programs, including its acknowledge TechClinics, that can facilitate this process.

- **Limit spending on civil works in optical fibre networks, where there is little added value**

Installing fibre optic networks inevitably involves digging kilometres of trenches and procuring right-of-way. There is almost no “value add” or multiplier effect from this expense. Further, it benefits a domestic industry only, and pulls resources from other infrastructure builds, thereby raising costs. Instead, other technologies, such as wireless local loop or reuse of TV cable can complete the “last mile” much more effectively, at lower cost, and potentially with much greater benefit to building Australia’s skills base and export potential.

The spending on digging up the ground, putting in concrete, inserting cables and similar civil works should be kept separate and not used to inflate the value of the project

- **Reduce the relatively high cost of broadband access in Australia compared with other countries**

It goes without saying that price and demand are inextricably linked, and that if the pricing is too high, demand will remain unsatisfied. I can only provide anecdotal evidence, but based on my experiences in SITA and from living overseas, Australian broadband internet usage did not accelerate until around 2004, when Telstra released lower cost plans. For many years, Australia was a laggard in domestic take-up of broadband services. Although some would have us believe this was due to a technological lag, it was clearly driven by the relatively high price of access. The closest equivalent to a domestic, unlimited, broadband service I was using in Switzerland in 2001 and that cost me 49 CHF (approx 55 dollars) per month, could not be obtained in Australia until 2004, and that service limited the amount of data I could download and cost 79 dollars. Even today the AIC cannot obtain what I consider to be a relatively basic broadband business internet service for under 800 dollars per month (and two years earlier, the price was double that). There is absolutely no point in building an NBN if the pricing does not at least meet international norms. A pilot network in regional Queensland or elsewhere could be used as a prototype to test various models for costs and demand

I trust that the comments I have made above are helpful to the Senate Committee, and would be happy to participate in further discussions as required.

Yours sincerely,

A handwritten signature in black ink that reads "Rowan Gilmore". The signature is fluid and cursive, with a long horizontal stroke at the end.

Dr Rowan Gilmore
Chief Executive Officer