COMMONWEALTH OF AUSTRALIA

Official Committee Hansard

SENATE

SELECT COMMITTEE ON THE NATIONAL BROADBAND NETWORK

Reference: Implications of the proposed National Broadband Network

WEDNESDAY, 5 AUGUST 2009

SYDNEY

SENATE SELECT COMMITTEE ON
THE NATIONAL BROADBAND NETWORK
Wednesday, 5 August 2009

Members: Senator Fisher *(Chair)*, Senator Nash *(Deputy Chair)*, Senators Birmingham, Ludlam, Lundy, Ian Macdonald and Sterle

Senators in attendance: Senators Fisher, Lundy, Ian Macdonald, Minchin and Nash

Participating members: Senators Abetz, Adams, Back, Barnett, Bilyk, Mark Bishop, Boswell, Boyce, Brandis, Carol Brown, Bushby, Cameron, Cash, Colbeck, Jacinta Collins, Coonan, Cormann, Crossin, Eggleston, Farrell, Feeney, Ferguson, Fielding, Fierravanti-Wells, Fifield, Forshaw, Furner, Heffernan, Humphries, Hurley, Hutchins, Johnston, Joyce, Kroger, McEwen, McGauran, McLucas, Marshall, Mason, Minchin, Moore, O'Brien, Parry, Payne, Polley, Pratt, Ronaldson, Ryan, Scullion, Stephens, Troeth, Trood, Williams, Wortley and Xenophon

Terms of reference for the inquiry:

1. To inquire into and report on:

    a. the Government's decision to establish a company to build and operate a National Broadband Network (NBN) to:

       i. connect 90 per cent of all Australian homes, schools and workplaces with optical fibre to the premise (FTTP) to enable broadband services with speeds of 100 megabits per second;

       ii. connect all other premises in Australia with next generation wireless and satellite technologies to deliver broadband speeds of 12 megabits per second or more;

       iii. directly support up to 25,000 local jobs every year, on average, over the eight year life of the project.

    b. the implications of the NBN for consumers and taxpayers in terms of:

       i. service availability, choice and costs,

       ii. competition in telecommunications and broadband services, and

       iii. likely consequences for national productivity, investment, economic growth, cost of living and social capital.

2. The committee's investigation should include, but not be limited to:

    a. any economic and cost/benefit analysis underpinning the NBN;

    b. the ownership, governance and operating arrangements of the NBN company and any NBN related entities;

    c. any use of bonds to fund the NBN;

    d. any regulations or legislation pertaining to the NBN;

    e. the availability, price, level of innovation and service characteristics of broadband products presently available, the extent to which those services are delivered by established and emerging providers, and the prospects for future improvements in broadband infrastructure and services (including through private investment);

    f. the effects of the NBN on the availability, price, choice, level of innovation and service characteristics of broadband products in metropolitan, outer-metropolitan, semi-rural and rural and regional areas and towns;

    g. the extent of demand for currently available broadband services, the factors influencing consumer choice for broadband products and the effect on demand if the Government's FTTP proposal proceeds;

    h. any technical, economic, commercial, regulatory, social or other barriers that may impede attaining the Government's stated goal for broadband availability and performance in the specified timeframe;

    i. the appropriate public policy goals for communications in Australia and the nature of any necessary regulatory settings to continue to develop competitive market conditions, improved services, lower prices and innovation;

    j. the role of government and its relationship with the private sector and existing private investment in the telecommunications sector;

    k. the effect of the NBN on the delivery of Universal Service Obligations services;

l.   whether, and if so to what extent, the former Government's OPEL initiative would have assisted making higher speeds and more affordable broadband services available.

3.   In carrying out this inquiry, the committee will:

a.   expressly seek the input of the telecommunications industry, industry analysts, consumer advocates, broadband users and service providers;

b.   request formal submissions that directly respond to the terms of reference from the Australian Competition and Consumer Commission, the Productivity Commission, Infrastructure Australia, the Department of the Treasury, the Department of Finance and Deregulation, and the Department of Infrastructure, Transport, Regional Development and Local Government;

c.   invite contributions from organisations and individuals with expertise in:

    i.   public policy formulation and evaluation,

    ii.   technical considerations including network architecture, interconnection and emerging technology,

    iii.   regulatory framework, open access, competition and pricing practice,

    iv.   private sector telecommunications retail and wholesale business including business case analysis and price and demand sensitivities,

    v.   contemporary broadband investment, law and finance,

    vi.   network operation, technical options and functionality of the 'last mile' link to premises, and

    vii.   relevant and comparative international experiences and insights applicable to the Australian context;

d.   advertise for submissions from members of the public and to the fullest extent possible, conduct hearings and receive evidence in a manner that is open and transparent to the public; and

e.   recognise the Government's NBN proposal represents a significant public sector intervention into an increasingly important area of private sector activity and that the market is seeking openness, certainty and transparency in the public policy deliberations.

Committee met at 9.08 am

CHAIR (Senator Fisher)—Welcome to the second day of hearings of the Senate Select Committee into the National Broadband Network. This is the second day of public hearing since the government made its announcement in April this year of its projected $43 billion plans for the National Broadband Network. Of course, this committee has had previous hearings and made a series of reports into the government's previous $4.7 billion plan in terms of the National Broadband Network, but we are now into the post-April hearing session.

The first witness we look forward to hearing from today is Mr McKerlie from Bullseye. Before I ask Mr McKerlie to come to the table I advise that proceedings of this committee are public and subject to parliamentary privilege. If any witness at any stage wishes to give evidence in private, which is called in camera, they may make a request to do so and the committee will take that request and the grounds upon which it is being made into consideration when deciding how to proceed. It is an offence for anyone to attempt to interfere with evidence being given before this committee and it is potentially in contempt of the Senate, as indeed it is to attempt to give false or misleading evidence to the committee.

[9.09 am]

McKERLIE, Mr James David, Chief Executive Officer, Bullseye

CHAIR—Welcome, Mr McKerlie. We have your submission, which we have numbered 86. Do you wish to make any amendments to your submission?

Mr McKerlie—No.

CHAIR—Would you care to make an opening statement to the committee?

Mr McKerlie—I have a brief statement and that is that in the observation of the debate on the merit of a national broadband network I believed that the concentration of debate was around the cost and matters of ownership and regulation. It seemed to me with my background—which I might cover very briefly in a minute—that not enough thought was being given to the benefits that would arise from having such infrastructure in place. That is what brought about our writing the paper titled *Business at 100 megabits*. It is an attempt to understand how fundamentally different businesses will operate in an environment where there is ubiquitous high-speed bandwidth available.

I believe what we have done in that paper is looked at some of the fundamental changes that will occur, not only in the way that businesses will operate, but in the societal, legal and regulatory frameworks, with some of the demographic changes and all the matters that are happening, in the same way as through the agricultural revolution, when there was a fundamental change in the balance of power of the economics of the country at the time and then the industrial revolution saw a similar fundamental change in power. We are going to see the same fundamental changes that occur in terms of who holds the levers and who has got their hands on the rocks, in terms of being able to change things. What we have tried to explore was what some of those changes might be. We have not attempted to put a time line on them. Some of them are obvious; we are seeing the early stages of it now, but there is no doubt there are going to be profound changes.

A quick, simple example is the master-servant relationship, which is embedded in our employment system, is based around the employer having complete control, being the master of knowledge and information, providing a job description and training to an employee, slave or a dumb terminal if you like, and that person simply following the instruction. Now if that employee is fully empowered, fully connected to the world, has as much access to knowledge and know-how as the employer, then the relationship goes from one of providing a job description saying, 'This is what you have got to do', to saying, 'Here's a contract for services with set deliverables. How you do it is more your business than our business.' That is one element of what could be very fundamental changes through the document. We tried to identify six core portents of change and then looked across an organisation to see what the impacts of those would be.

CHAIR—Thank you.

Senator MINCHIN—I am happy to ask a few questions.

CHAIR—Senator Minchin.

Senator MINCHIN—I appreciate your submission and your appearance here today. To what extent are the trends you speak of or the developments you foresee already happening? To what extent of what you describe should be a function of the internet, as opposed to a function of just improving broadband speeds? If we boil this down, what we are talking about is that we have got the internet and broadband, but this is a proposal to spend $43 billion to make it faster. I am interested in your forecasting. Are these trends that are already happening simply functions of the internet, what it does for business, and to that extent is it a matter of simply degree, that the trends will happen faster as a result of faster broadband?

Mr McKerlie—I think we need to separate the internet into readily available, so its ubiquitousness. If everyone had internet, albeit slow internet, there are a certain level of changes, but high speed or high bandwidth is going to allow a different sort of content. One of the changes that we talk about is the rise of rich media, which means a lot more video on the internet.

You can have distance education now. It is a bit clunky and all the rest of it, but what is possible with high speed? Whether 100 megabits is enough is probably going to be the debate. I am sure that x-years in the future they will be looking back and saying, '100 is pigeon. We need 1,000', because we will be ramming more stuff through it. But in a distance education environment, or any online learning or training, if there is video content, interactivity and you can see both things, then that needs video-capable bandwidth going both ways and maybe not just teacher to student, but teacher to many students and many students to many other students,

so as one kid gets it and the light turns on and says something, the other kids can see it, just as it happens in a classroom. That requires greater bandwidth.

There is no doubt that with procurement systems and things that are heavily data orientated, it is just the availability of bandwidth that will do it, until the volume of data traffic gets so high, which happens with banks and betting shops on Melbourne Cup day where it does peak, but it is the change in what the internet is going to do. We are seeing it. We build websites and provide those online facilities for people. The demand for bandwidth and server capacity to provide rich media is absolutely undeniably where the trend is and that needs bandwidth, or else you sit there and you watch five frames of a video while it loads and then another five frames.

Senator MINCHIN—I would like to focus on the rich media issue. One of the more cynical reactions to this massive investment in high-speed broadband is that it will enable the faster download of movies.

Mr McKerlie—Yes.

Senator MINCHIN—How will that aid the productivity of the country or make us all better off? Can you pursue that a bit?

Mr McKerlie—I would argue that is not going to aid anything, if we are going to put video shops out of business. You can watch any movie you like now on Foxtel. I have been in bed for five days. At one o'clock today I get on a plane to Toronto. I am feeling as sick as a dog.

CHAIR—Thank you for coming.

Senator MINCHIN—Commiserations.

Mr McKerlie—If I had the option of appearing before you over a video link to provide the same experience as we can have face to face then that would have been a very attractive option. I do not think there is any doubt that the media focus has been very much on the entertainment side of the business. I think the entertainment side of the business is going to look after itself. That is not where it is going to happen. Our paper is very much at what I call the invisible balance sheet, which is those things in a business which you do not measure, like the value of your goodwill, the morale, the reputation, the embedded systems and cultures and all of those things. We have tried to look at how they will be fundamentally changed because there is this greater access to information.

One of the things we identify is that knowledge in itself is no longer valuable because it is commoditised. You can Wiki and get anything you like now. It is not knowledge that is going to be valuable, but knowhow. It is the ability to identify a problem, source the solution and fit the solution to the problem. High bandwidth is a great way to be able to do that. You will be able to search all those repositories of solutions, find the right one and all the analytical tools that will give you all the data. We measure in a business lag indicators—financial indicators—that tell us what went wrong last year based on a decision a board made a year before that. Nobody sits there and says, 'Here's the trends in what people are buying at a micro level.' That is very possible, but that requires more data and more bandwidth.

Senator MINCHIN—You properly focus on the advantages to commerce and business in all of this. One of the issues surrounding this NBN proposal which regrettably we, as politicians, do need to deal with are the issues of cost, feasibility and so on.

Mr McKerlie—I have no argument with that, by the way. I am just putting the balance on the argument.

Senator MINCHIN—I appreciate that. What is proposed is $43 billion to roll this out to 90 per cent of Australia. Whether you want it or not, your home will be connected. In other words, the focus and the cost will overwhelmingly be in connecting every single suburban house in Australia to 100 megabits. One of the criticisms we have is that no cost-benefit analysis has been done. You rightly focus on the benefits, but we do not have a cost-benefit analysis. I just wonder what your reaction to that is. I can see the virtue in a concentration in public policy on ensuring that Australian business, our CBDs and everything else have absolutely world's best telecommunications, but is it sensible for the nation—because it is taxpayers ultimately who are doing this exercise—to be investing in this massive rollout to 90 per cent of suburbia whether people want it or not?

Mr McKerlie—I would have two observations. One is that I grew up in the western districts in Victoria on a property that was 40 miles out of town and we had power by a little generator.

Senator MINCHIN—Malcolm Fraser was your local member.

Mr McKerlie—Malcolm Fraser was a very near neighbour. We could stand on the top of the house and wave on picnic races day. You are quite right; it is very close to the Grampians. The thought now of an Australian living without electricity is not part of what we would call civilisation, part of a modern society and a modern country. I am agnostic as to whether everyone gets high speed immediately, but I think with the fragmentation occurring in the marketplace and the fact that people will do much more of their living, playing and working online, that the government does have a responsibility to see that in the fullness of reasonable time that high bandwidth is available to everywhere. Delivery of government services where there is a finite amount of money and an infinite need is a classic case of point where the economics of delivering those services over broadband is overwhelming. It is like any investment; of course there is a kicker upfront, but if you do not have that infrastructure then those things will not happen.

Another comment you made was, 'Is a lot of this happening anyhow?' There is. I do not think that there is too much in what we have written. There is the risk you know, the risk you do not know and then the big kicker is the thing that you have not even thought about yet. We have not been so brave as to write about what we have not thought about yet. What is in the paper is indications of where people have found it economically viable to do business or conduct their affairs using the internet in that way. Those people have got scale. They have the ability to buy large data capacity and conduct their business that way. What we are saying is that if it makes economic sense for a big business to be able to do it if the facility was made available, there would be two barriers, one being the cost. If it was made available at a price that was affordable, and that has to come from the consumer paying more, but the provider realising that they can eliminate some costs by going online, then much more business and that business case that applies to the big guys would equally apply to many small people. The second barrier is culture.

I led the demand study that Brian Johns did back in 1993, the demand for broadband services, and we identified way back then very much of what we are talking about now, but the impediment to take-up was cultural. In that 15 year time frame everybody knows elderly people who are comfortable enough using online. They get their boarding passes online. Of course kids walk around and they are online more times than they are sort of in the room with mum and dad. They are out there. The generational changes are occurring and online has gone from being a novelty to being used by some to touching pretty well everybody. The next stage, inevitably, will be that there will be no e-business, e-commerce or digital marketing, it will just be business as normal. It is just going to be the normal platform and channel. I think it is an inevitable trend. It is how soon and how we shape it.

Senator MINCHIN—Just to focus on the western districts, unfortunately the western districts will not be getting optical fibre and 100 megabits under this plan. One of our concerns as a coalition is that as opposed to the original fibre-to-the-node proposal this current proposal will potentially put regional and rural businesses at a considerable relative disadvantage because the difference between two megabits and 12 is a lot less than 12 and 100. What is your feeling about that? Under this plan 2.2 million Australians are not going to get 100; they are going to get 12 if they are lucky, including your—

Mr McKerlie—If they have 12 and they only have maybe two now, then I would take the view that they are six times better off and 12 can do a lot. It might take a bit longer to do many things, but at 12 it is not intolerable. It is not perfect, but that is the reality. We are not Britain with 70 million people in a tiny little island; we are a big country with not many people and that is just the way it has to be. I do not have an argument with that, as long as they get something.

People have not really come to terms with the sorts of applications yet to come that will be used. It will just make you look back, like the days when I had to go out and pump the primer and start the old generator to have 32 watt power in there so that we could have dinner with the light on and listen to *Yes, What?* on the radio. They are the sorts of situations that you just do not think will happen, but it will be the same.

CHAIR—You just said six times faster and 12 times faster. Six times zero is still zero. Twelve times zero is still zero. You said, 'As long as they get something.' Do you think they will all get something under the current plans?

Mr McKerlie—I do not know. I have to say that I make no representation as to the current plan. My paper is focused on if broadband was available everywhere what would it mean to how businesses would be fundamentally different.

CHAIR—Senator Macdonald.

Senator IAN MACDONALD—Just coming back to the costs; what you say makes a lot of sense, but does the cost always justify the means? I am looking particularly at smaller businesses. Do they then become uncompetitive versus bigger businesses who perhaps can afford it?

Mr McKerlie—I have given a great deal of thought to that. We provide web solutions for small businesses and large businesses, so from the very big banks to very small businesses. The opportunities for a small business increase much more significantly than they do for a big business. Small business is generally bound by the tyranny of distance. Typically, if you look at a small business it services its geographical area and that is because it has not got legs, trucks and outlets in other places. It can now service the world. You might say that is unrealistic, but it can certainly service the rest of Australia or other states.

Small business can be put on to an advantage. One of the key things that we see happening is with a supply chain that the supply chain will polarise between those who own the customer relationship, which has a fair level of human touch in it, and then those that just produce the widgets or the services, which is the back end. The back end will be increasingly commoditised and it will all be about delivering the best value for money. The front end will be delighting the customer, providing the differentiation and rolling with what the customer needs.

Small businesses own many more customers in Australia than big businesses. Big businesses typically are at the back end. A small business could sit there and say, 'This is what I am going to sell.' A very small insurance fund that I know of in Sydney has only got $200 million in it. It has not got the resources to have a funds manager or a funds administrator. It buys those services from somebody who provides them wholesale. It allows it to be competitive with AMP. It provides a service to a very focused group of individuals, and it provides a superb service. It does not have to worry about all of those other things. If a small business has got some business savvy and understands the opportunities then the small business can actually be far more competitive in this environment and not be squeezed out because it has not got access to economies of scale.

Senator IAN MACDONALD—I have just a comment in passing. Perhaps for rural small businesses it may put them out of business if their customers can deal with the guy in Mosman at that same level.

Mr McKerlie—That is true. It is true that the number of steps in the supply chain does not need to be as many as it is and some will be bypassed. I have not come with a view of where the die will end up when it happens, but a rural retailer that might provide farm supplies can either get with the program, go to all of the farmers in their rural community and work out what they need that they are not having serviced appropriately, and he can procure that—it might take him into insurance products or a whole range of other products that the business does not currently supply—have access to procuring that and just be the delivery outlet. If you own the consumers then you have a huge advantage over those people who are just making the widgets.

Senator IAN MACDONALD—I should have asked this question at the beginning. Do you accept that in all cases the user should be paying for this very fast resource?

Mr McKerlie—That is a political decision, but to me it is just a cost of business. If it is for use for a business then it should be user pays unless it is a public utility that is being provided, like health or education, in which case the government might put their hand up and fund it. It is user pays. It is no different from buying electricity or any other cost of input to running your business.

Senator IAN MACDONALD—It could be a lot more expensive than buying electricity.

Mr McKerlie—It could be. That gets back to over what period do you need the return on the investment. They say every single movie ever made always makes money, but some just take a long time. If you are looking for a payback in three years, that might be tough. If you are saying over the course of a 25-year horizon and what fundamental changes will permeate through, so the increased productivity, better quality of life, increased export capability and all of those factors—which are incredibly difficult to measure; I have not attempted to measure them, I have just indicated where that might happen—then $43 billion might be a very good investment.

Senator IAN MACDONALD—Thank you. I hope you get better. I am glad that I am not travelling to Toronto with you.

CHAIR—Senator Nash.

Senator NASH—Why do you think the market has not delivered what the government is intending to do?

Mr McKerlie—There are a whole range of reasons. Without wishing to be a Telstra basher, I have been heavily involved in telecommunications infrastructure development here. I brought Vodafone to Australia, created PowerTel. I did the same sort of thing in about 20 countries around the world. There is an embedded political system with an elephant in the tent and it is not in the elephant's interest. The elephant will play any sort of dirty game that it can play to continue to get a return on the investment with something it put in place a long time ago.

Senator NASH—Given the regulatory review that is in place at the moment, is it appropriate for the government to be going down this road before that review and any changes to the regulation have actually had a period of time to be implemented or take place?

Mr McKerlie—No. As a non-political person who is a citizen of the world and a fervent believer in Australia, we have just got to build this thing and sort out how to regulate it as you go along. The impact of not accepting what digital is going to do is being myopic. That is what this country has done about pay television, media control and telecommunications. We have a history of putting our head in the sand and not facing up to the fundamental changes that are occurring.

Politics and religion always get gazumped by economics and the economics of digital are profound. This is just touching on what might happen. We can hold it away and all the rest of the stuff, but what will happen is that we will put big fat pipes into Asia and absolutely everything that gets done in Australia will be done offshore. It is the fat pipe to the cloud. The cloud will not be here. The cloud will be in Asia.

Senator NASH—Like the generator in the western Victoria analogy, your view of this is pretty much build it and they will come.

Mr McKerlie—Yes. I am not saying how to build it, how to fund it or how to own it, but I am quite convinced from the work that we have done in my 10 years, including five years working in Silicon Valley and working in the application area around telecoms infrastructure and media infrastructure that if you provide productivity increases and increases in consumer benefits they will be adopted and people will pay for it.

Senator NASH—Given your comment about the elephant earlier, if there was a scenario for the government that the elephant decided not to be part of this and the government had to overbuild, what sort of outcome do you think there is going to be then?

Mr McKerlie—I do not know that the country can support two infrastructures.

Senator NASH—If the government wants to implement this NBN, how then do they ensure that they do get the elephant to play the game?

Mr McKerlie—If I was a dictator and I had no political considerations then I would take the assets of the elephant and contribute them to the infrastructure in the public interest—those elements that are core to providing a backbone—and let them focus on owning the customer and delivering the service.

Senator NASH—Have you had a look at any of the impacts of that in terms of compensation if those pieces of infrastructure were to be taken back by the government?

Mr McKerlie—No, stare them down.

Senator MINCHIN—Seriously! I do not know whether you are a shareholder in Telstra.

Mr McKerlie—No.

Senator MINCHIN—Shareholders in Telstra would expect the $20 billion which it insists that their network is worth.

Mr McKerlie—That is right, but in any benefit-cost analysis—and there is no analysis of the benefits—I really urge through this committee and other places that we get our heads around what the benefits are, which is why we have written this. From what we see the quantum of benefits are enormous if you put the right time perspective on it, which you must, because this is long term. These are paradigm changes in the way we do things. In the short term it will cost. Any change has costs and, if compensation for shareholders to Telstra or anywhere else has a cost, that has just got to be built into the benefit-cost analysis to see what the long-term plan is.

I am conscious of time, but the one thing that I would urge is that if we do not get our shit together, Asia will. We will put a big fat pipe into Asia and none of this stuff in Australia will be done here. All of the processing, anything that can be done where the supply chain is internationalised now and outsourced, will go

straight out to a low-cost operation somewhere and the final product will come back in. It will be no different to us selling our wool and buying back the Italian suit.

Senator NASH—Could you give us an example of a couple of practical applications where that would work?

Mr McKerlie—Pharmaceutical. I am creating this as I go, but somebody has a product that they want to sell. They can outsource the R&D offshore. You can be involved in the creation of a pharmaceutical product and not do the R&D. It is actually cheaper to offshore R&D. You could offshore the design of the packaging, bring it back and get it licensed. You could offshore the production packaging. You can actually have it housed offshore and have your little pharmaceutical outlet in western districts Victoria; sit there, take the orders and organise swift delivery, exactly like Amazon does.

It will all go offshore. Economics will always go to where it is most efficient. No regulatory or public policy thing can contain that in the long term. If it does, it does it to the detriment of the country.

Senator NASH—Thank you.

CHAIR—Senator Lundy.

Senator LUNDY—I am interested in the points that you make about collaborative networks and the role that collaborative networks will have in driving use of a high-bandwidth network in Australia. Can you elaborate briefly on the type of collaborative networks? Obviously research comes to mind. You mention social networks. What other kinds of networks, and do you have any comments on the collaborative network that is government service, government service delivery and relationship between government and citizens?

Mr McKerlie—The general principle that we identified was that most networks—be they an IT network, a television broadcasting distribution system network, an organisational network like a franchisor and franchisees, employer and employees or clubs with the committee and the members—tend to be what we might call distributive networks in as much as the information flows from the centre to the nodes. Without being insulting to the nodes, we call them dumb terminals because all they can do is receive. They really cannot do any processing and they certainly cannot transmit back, so the power is around the centre. There is a reason for that and that of course is that in the absence of having the bandwidth there is a limit to how much information can be sent out. It is just the appropriate way to manage knowledge, information, broadcast signals and all the rest, you have a control centre or broadcast centre or an employer that sends stuff out.

With high bandwidth the nodes can actually send information back and talk to each other. There is some formula that a physicist developed that said that the value of the network is to the power of the number of nodes in it; that is on the basis that the nodes are contributing. That has a pretty fundamental change in the way networks work. In terms of pricing, it is very easy if the centre sends something out and says, 'If you want it, here's the price.' It is very easy in terms of IP. The centre sends something out and says, 'Here's the IP. Thou shalt not touch it', but what if the node gets something and enhances it, then sends it along to the next node, enhances it and charges something for doing that? There is a whole change. That is where we see the change in the workplace environments, changes in the way franchisees and franchisors may work where the franchisor is very much dependent on their future by having control over the franchisees.

As the nodes are able to share information and collaborate and the rich media is the source of the information that is travelling around, you have a much greater flow of content. In fact, if there can be collaborative working—and there is lots of software that allows that and even going to meetings where you can have any number of people sit and watch someone take you through a webinar and all the rating tools; the here and now things—then the ability to find solutions, to address problems and to share innovation and all of those things is an enormously fundamental change in how things work.

One of the points we make here is that vision will no longer be about working out where to go, it will be how you behave, because the only thing that is going to hold these nodes to you is if there is a respect and an admiration or something that is other than economic control. There is nothing to stop them going off, taking what they know and doing it somewhere else.

Senator LUNDY—With respect to small business, franchisee networks and so forth, what are the public policy levers that need to be worked on now to make sure that Australian small businesses are going to be high-bandwidth network ready?

Mr McKerlie—I do not know the answer to that today. The second edition to this is actually how to get ready, which is something that we will put our mind to. Clearly it is having the right equipment and having

some of those fundamental things, but we believe the changes required are much more about how you manage a business and how you think about a business.

The statistics we see now are that the average length of time someone spends in a job is now under a year. In the old days if you got a job you would sit there and think of the days that you would get your gold watch. With that transience in a workforce there is an enormous amount of knowledge that goes out with that. If it takes three months to get someone firing in a business, you have got them for six months and then they are spending two months looking to go, it is pretty hard to see how you can make a dollar out of that and it is pretty hard to see how that person can develop and learn. That has to be dealt with differently, the collaborative networks and preparing for that. Is it that gen Y do not want an employment contract to be a servant, but they want someone to say, 'Here's your task and here's your reward. You do it when you want to do it and how you want to do it as long as you get it to me absolutely by this date and to this standard then that will be fine.' I do not know if that is the answer, but that is where we have got to take our thinking because these changes are occurring around us all the time.

Senator LUNDY—I am conscious that I was here late and I do apologise to everybody for that. I have one final question. You mentioned the cloud and obviously the singular importance of Australia being able to hold the businesses that provide services via the cloud here in Australia. What are the policy mechanisms that are required now to make sure that when we are on a highly competitive and high-bandwidth network that will in fact be the case and that we have those types of businesses based here in Australia?

Mr McKerlie—The theme of what I have been arguing is that economics overrules politics, religion and many other things. We have to be in the competitive environment. The government policy has to continue to make it as competitive as possible and encourage people to be as innovative as possible or else the global village will become the global marketplace and it will drift off.

As to what the specific policies are, apart from making sure that we have got affordable broadband, there are probably many regulatory and taxation changes that need to be thought through as that happens, but at the end of the day the simple principle is that we have got to be a very attractive country for people to be doing business in; that is not just to live, because we can live here and have all sorts of business activity elsewhere. We have got to provide that environment, which is going to be challenging.

Our business has an offshore development centre in Bali because it is simply so much more efficient. We are shifting business offshore. It is just critical that we build that competitiveness.

CHAIR—Thank you for your time and evidence today. Travel well!

Mr McKerlie—Thank you.

[9.47 am]

PRICE, Mr Arthur Richard, Chief Executive Officer and Chairman, Axia NetMedia Corporation

CHAIR—Welcome, Mr Price. As you are aware, the proceedings of the committee are public. If at any stage you wish to give evidence in private you can request to do so. As you are also aware, it is an offence to give false or misleading evidence to the committee and, indeed, potentially a contempt of the Senate, as it is for another party to attempt to interfere with evidence to be given.

Do you wish to make an opening statement at this stage?

Mr Price—I would like to ask the committee what the best format here is. We tabled some information. I can either walk through it or I can open up to questions.

CHAIR—You may wish to go through the presentation.

Senator MINCHIN—Could you take us through this presentation, which I have only just seen?

CHAIR—Let us do that. We have it to hand, so that would be good.

Mr Price—The question that was posed to me before we sat down was the idea of what are the fundamental economics and what makes wholesale networks work and not work. This presentation is focused right on that issue. It is not dealing with why next generation networks are so important to the competitive position in the economy; it has taken that as an assumption. It is not dealing with whether to do it or not; it is taking the view that the government has announced it and it is happening. It is all about how you do these networks so they are successful and the presumption is that the first two have already been decided.

At the core of these wholesale next generation networks is they are such a different way of doing business that they are a huge transformation in a value chain and that transformation has to deal with the new way versus the integrated incumbent way. The competition is the old versus the new. It is really quite simple if you start thinking about it in that way.

First take stock of what the old legacy networks have. They have all the short-term advantages. They already have the customer and they have a bundle of services. End users are used to buying bundles because that is the way they have been presented historically. They have what I call the complexity of technology on their side because end users see it very complex in today's technical environment to change customers, change carriers or even an email address. Technology at this point in time and the use of technology is very complicated to end users. They have already done a whole bunch of things to be where they are and going through a wholesale change is a challenge to the end user.

The third point is a chicken and egg argument. Do you have the NGN first and then compelling services second or do you have the compelling services first and then that shows the need for the next generation network? That is clearly in the legacy network camp. You just cannot make compelling services and offer them over legacy networks, so therefore you cannot have them in the market for the customer to experience on an old legacy network. The new network has to come first and then the services come second, but that is an advantage to the legacy environment.

They have no start-up capital challenges in risk-averse capital markets. Today we have got very risk-averse capital markets. Whilst that would impact the value of the incumbent shares trading in the marketplace on some multiple basis, it is not like the new network starting up, getting new capital and having new customers.

The network was created under a monopoly environment and then deregulated, and that is a very pivotal thought. The old copper network would never be there if it was not a monopoly and transformational in the first place. To create that network somebody sat down, had a vision and said, 'We have to have telecom connectivity for everybody.' They took the steps necessary to do it, which really was a government sponsored regulatory and monopolistic environment in order to get it to everybody. They had that and then they had the partial deregulation with IP, which was never the original plan.

They do not depend on another party to deliver retail services. These new generation wholesale networks all depend on another party to deliver services to end users, so the incumbents have those short-term advantages. They are only short term because in the longer term these new networks are compelling.

The real question is how do you get to the long-term as opposed to looking at the next quarter or the next year. If you can look at the wholesale, no-customer-conflict NGNs—as you know we use no-customer conflict because we would say that network cannot compete with its customers—they start without any customers and

never have bundled services. They depend on the evolution of new, compelling services for end users and a change in the way end users buy. Those are transformational things. They depend on the evolution of a vibrant, competitive retail services sector that provides easy-to-adopt, high-value services. That evolution means the end user no longer becomes the technology integrator. There is no question that that is where this whole space is going, but it is not there today. Until it is there it is hard for people to experience a compelling service that is all put together by a group of professional people and delivered in an easy-to-adopt way. These new generation networks enable that, but until they are there they will not exist. They have a huge advantage of network performance, but end users only understand that through experiencing new services that are not available over legacy networks.

The capacity articulation of legacy networks have left everybody confused: up to 20 megabits when it is really 500 kilobits. That whole branding and that whole articulation to the end user has got it so confused that the end user does not know what that means because it does not mean much, so a new high-quality branding of new high-quality performance to an end user is just relative to what they have now and until they experience it they will never understand it, unless they are a technical person, but that is a small end of the market.

So they must survive long enough to allow the development of new players and new services. Their success depends on new capital. That all looks like quite a big challenge, but all basic infrastructure changes have had the same challenges. This is not that much different than before there was power and then after there was power, or before there were railways and then after we had railways. It is a transformational challenge and that sets the playing field.

You can look at the next slide. What does that mean for fundamentals for wholesale networks? We break that down into two pieces. We break it down into community interconnect grid—that is the fibre grid between every community—and then the local access fibre to the premise within the community. To us, those are two quite different challenges.

What are the fundamentals of wholesale networks if they are community interconnect grids? They rely on a customer to connect end users, a retailer. They are subject to predatory competition by the incumbent in isolated local markets. If you do this isolated local market by local market the incumbent can easily marginalise that new network, end up buying it and owning it. That is the history of these wholesale backhaul networks on a local market by local market basis. They have been viable in specialising and servicing customers between and within the CBD of major metropolitan centres. You see these kinds of networks within and between metropolitan centres. So the CBD of Melbourne, the CBD of Sydney and in between Sydney and Melbourne there are multiple carriers and especially wholesale guys picking off high value customers.

When targeting rural remote markets next generation networks depend on committed revenue, typically from government. That is the Alberta example, where the Alberta government committed its business to the network for province wide on the condition that Axia and its partners delivered a network province wide for the benefit of everybody. That committed business creates the economic viability for that kind of wholesale backhaul network in rural remote markets.

When targeting regional higher density markets next generation networks can be viable based on one-time financial support. That is taking the Sydney-Melbourne example just a little further and saying, 'We'll take it to higher density markets and we'll give it some financial support.' The Gold Coast would probably look like that. You can make up that difference with grants. In France's case they use a grant plus franchise for 25 year structure which works for these wholesale fibre only networks.

If we switch to fibre to the premise within the community—now we are doing the piece of fibre to the premise—the passive component of the fibre to the premise is simply long-term civil infrastructure. If you just look at the fibre itself it is just long-term civil infrastructure. It looks more like ducts, power poles, water and sewer systems than it looks like telecom. If you pull it apart and look at it just like that then it has long-term civil infrastructure character. The cost of capital for initial installation and use of compatible existing infrastructure are the dominant drivers of the cost for fibre to the premise. It is all about the construction cost and the cost of the related infrastructure. Everything else is almost irrelevant for fibre to the premise within the community investment. Fibre to the premise has low recurring maintenance cost and activities; it is all upfront capital cost.

For wholesale fibre-to-the-premise investments to be viable the key criterion is to ensure market penetration covers the cost of capital for the implementation of the fibre to the premise and associated infrastructure. That was also true for the copper network when it was implemented. All that up-front, fixed cost; if you get the revenue over that fixed cost they are viable and they are in the game.

I would like to change the order here. I would like to go to our slide 18 first.

Senator MINCHIN—They are not numbered.

Mr Price—Right in the bottom left-hand corner. It is almost invisible. The numbers are in gold at the bottom left-hand corner.

Senator MINCHIN—Perhaps you could tell us the heading.

CHAIR—It looks like page 6 on our copy.

Mr Price—Yes, that is right. It is headed 'Typical NGN FTTP network economics'.

Senator MINCHIN—Thank you.

Mr Price—We have done these on three continents. This is indicative, adjusted for Australia, but think of it as indicative economics. Typically there is a level of financial support. You can assume a range of 30 per cent financial support. The cost of capital then is the cost of typical private capital in normal financial markets.

Senator MINCHIN—Can you just define 'financial support' for the purposes of this graph? Do you mean government subsidy? Do you mean government subsidy?

Mr Price—Yes.

Senator MINCHIN—You mean that is not earning a return on that?

Mr Price—Yes. Think of it as a vital grant and then you get the residual cost of the network after you get that subsidy. The reason we portray it this way is that there are all kinds of ways of structuring financial support, but the easiest way for everybody to understand it is that if it is that amount of grant equivalence then you can substitute equivalent structures. This is one way of getting a feel for it. It is not unusual around the world for people to come up with a grant in the range of a third of the capital. This is working with a third of the capital in a grant format. Then the cost of capital is the cost of private capital in the public capital markets in a normalised capital market environment and then the operating cost is all the other cash costs of running these networks. If you take those and put them together you can see that it is not unreasonable to get into a cost structure of $40 to $60 per month per residential premise. That is putting this in the context of residential premises.

If you look at revenue in that context then of course market penetration is from left to right. You see that these networks get into a viable range once they are over, let us say, 70 per cent market penetration.

Senator MINCHIN—Seventy per cent?

Mr Price—Yes, once you get over into the right-hand quadrant here. At anything less than 70 per cent they have this gap between revenue and costs, which you can look at as losses, subsidies, shortfalls or however you want to look at it. The main message here is that they are fixed cost orientated networks and they are driven by penetration. That is not new; that is the way the copper network was when it was put in. It is just that the copper network has been paid out now so it has a different structure today, but it would look similar to this in the original days. We can then go to the next slide.

CHAIR—What is the heading?

Mr Price—The heading is 'Fibre to the premise NGN head-to-head with legacy network'.

CHAIR—That is a long one.

Mr Price—Yes.

CHAIR—It is our page 5.

Mr Price—This is taking the end user. Of course the challenge with all next generation networks on the first page was how do we get the market penetration. It is interesting. If you look at the incumbent's profitability on their old network and you start taking away customers on a random basis from their old network like the new network would, or it might be worse where it would cherry-pick their best customers, then we find typically the incumbent's profitability goes away when they get to 30 per cent loss in the market. At one end of the spectrum the next generation network needs 60 per cent and up, and of course the existing network also needs 60 per cent and up. There are very few markets where a no-conflict-customer, open-access network fibre to the premise has been built head to head against incumbents. It is happening in Singapore, but it is not operating yet. All the incumbent's profitability is jeopardised by the new network and equally the new network is challenged by the incumbent. The reason for this is simple. They are both fixed-cost networks and the new network will do anything the incumbent's network does and more, so if it is priced right it will get a

material portion of the market and the incumbent cannot afford that anymore than the new network can afford to only have 30 per cent of the market. You have two networks each saying, 'I need 70 per cent of the market.' If you leave that combination of those two costs in the market then, of course, it is the customer that will pay because someone is going to carry double the cost of carrying two networks.

Senator NASH—I am sorry to butt in there. In practical terms, if Telstra does not vend in their infrastructure how do you avoid this situation occurring?

Mr Price—You have jumped to vending in their infrastructure.

Senator NASH—We can come back to it later, if you would not mind.

Mr Price—What I would say is that if you have two competing fixed-wire line networks to a residential premise then only one of them is going to get the business.

Senator IAN MACDONALD—Would you not assume that the existing one would do it at a much cheaper price than the brand new one?

Mr Price—Therefore the challenge is the price of the new one, so that is not a problem.

CHAIR—Please continue.

Mr Price—If you go to the slide headed 'Legacy copper versus fibre-to-the-premise NGN cost', it starts with legacy copper versus FTTP NGNs.

CHAIR—Thank you.

Mr Price—This slide is the evolution of the use of bandwidth and along the horizontal axis at the bottom you have a logarithmic scale on megabits. It is going up by a logarithmic function just to get it on the chart. It is called network performance in 'real symmetrical megabits'. These are megabits the end user actually experiences, as opposed to the megabits that are at the top of their agreement when they sign it in today's infrastructure. Think of these as real megabits. Symmetrical megabits go both directions. They are functional megabits. For all intents and purposes the copper networks, all said and done, had between two and five of these megabits. It is over. It is not going any further. That is just a raw physical technical barrier of real megabits in a symmetrical way over a copper network. That is what this red band is here and this red dotted line.

If you look at the left-hand side, the legacy average revenue per user, it is looking at the residential market and it is looking at ISP plus voice services only. The legacy in the case of Telstra is that the average revenue per end user today on Telstra's network is about $110 a month.

If you look at the band of pricing—that is the line that starts at $50 and goes to $250—that is the band of pricing of Telstra services based on this real symmetrical megabits grid. That is real megabits, not broadcast megabits or marketed megabits. You can see there entry level service for voice plus ISP is in the $50 range per month and the high-end DSL2 or BDSL or the high end data plus voice is about $250 a month. That is their curve based on effective megabits.

If you go right of this line that would be what we would say is the target performance of the next generation network. We describe target performance in the context that it should be reasonably obtainable if the completion of it is efficiently done and makes maximum use of existing infrastructure. It is not all new infrastructure, it optimises infrastructure that is not in the telecom sector today. It may optimise power poles. It may optimise other people's ducts. It may optimise water and sewer utilities businesses.

We say the target for Australia would be the next generation network would have a retail voice plus ISP price starting at about $50 per month and that would carry right over to 25 real megabits, so that line horizontally over to 25 real megabits. Of course that is the power of these next generation networks. They might as well start at 25 megabits. That is where their strength is, and all the way up from there. We would say that it should be able to do 100 megabits of these effective megabits for in the range of $80 to $100 per month. If you can create that next generation network profile, which is the bottom line on that right-hand side of the chart, then all these other things are value added services that fit within the current average revenue per end user, so the end users get this huge uplift in functionality and access to services, whether it is IP video, IPTV, e-learning, e-health, e-security or e-commerce and whether they are small business or big business. Those ones that we have just mentioned are effectively handled within 25 real megabits. There is another whole category of services that would be beyond 25 real megabits.

This chart kind of says how big a transformation it can actually be if the next generation network is executed in a way that delivers these kinds of network performances at these prices. That concludes my opening comments.

CHAIR—Thank you. I might kick off with questions in the time we have remaining. You talked about essentially government grants to prop up delivery in, for example, rural and regional areas, but based on Axia's experience overseas where was the greatest demand for these sorts of services—government, business or residential? Rather than breaking up according to area or region, where was the greatest or the least demand between, say, government, business and residential and how did you leverage that demand so that your services remained commercially viable?

Mr Price—All these services are still in evolution. For instance, Alberta has been running for three years, but the next generation services are still being developed in other markets because Alberta is not a big enough market to create these compelling services all in their own right. I would say that the demand has not got a segmented character.

CHAIR—I am sorry, it has not got what character?

Mr Price—It does not change. We see the same kind of demand, whether it is a farmer in rural Alberta or it is a hospital in the city. They need digital connectivity. They do not need it for exactly the same reason. That does not matter. If you have a high performance digital network it can do all the things that they need. We do not find demand leading by market adoption by any sector. They all want it. They use it for different things; they might buy different amounts of it, but there is no question that everybody needs to move to ubiquitous digital connectivity. There are the laggards in any sector, be it the government sector or the private sector, but I would say that they look alike to us.

CHAIR—Is there anything that you do in the design of the network to ensure that the laggards catch up or do you let them be laggards?

Mr Price—If you are an open access wholesale guy you can only deliver a high performing network for a low cost and make it available to everybody. You do not have any other levers because all those other levers go in somebody else's bundle or somebody else's service. You design the network so anybody can offer anything digital and then the market takes care of that because there are now two people in the market: there is the next generation network which make ubiquitous transport connectivity available and then there is everybody else who is turning that into a service that the end user wants. That is actually everybody else.

CHAIR—I have one further question before I hand over to my colleagues. Do we have the right plan for rural and regional customers, to the extent that they have been promised wireless and satellite? You are essentially saying that people will want the best. Are they going to get access to the best, along with everyone else?

Mr Price—They want what works for them, which is the best for them, but they need different things. The school needs a high performing service that can be distributed to 100 kids. The house needs a high performing service for the people in the house. They actually want different capacities, but they all need reliable, real-time connectivity and then they buy different capacities of it.

I think you have to go for a fibre grid that interconnects, for all intents and purposes, every community. Then the community is on the grid. That means that the school or the hospital can be on the fibre grid, even if the residence is on wireless. We find more rural and remote communities first want high performing wireless at their home and at their business because their business has a mobile character to it. They first want high performing 3G and 4G opportunities. If you have this fibre grid to every community at the right backhaul prices it enables the roll out of 3G and 4G on a higher performing basis in smaller markets.

That is why we would say start with a community interconnect grid that puts every community on a nationwide fibre grid. Start there and then roll out the local access technologies that make sense. Where you can make it work put fibre to the premise because that is done; it is over if you get fibre to the premise. Short of that, the 3G and 4G is for a lot of people that are working in vehicles, tractors and other mobile stuff. The interconnect grid creates the opportunity for 3G and 4G to be high performing for them, so do not miss that.

CHAIR—I have one further question. Would you see the Rudd government's proposal for what it is doing in Tasmania as an example of the interconnectivity grid as you called it?

Mr Price—I have not seen an announcement of a grid that interconnects every community in Tasmania. I do not know. I do not think it is far enough to comment on it.

CHAIR—Thank you. Senator Lundy.

Senator LUNDY—I am interested in your experience in Canada, particularly with respect to the up-front capital costs of rolling out the high-bandwidth network in rural and regional areas and to what extent, even with grants or subsidies, the sequencing of that rollout is informed by committed business in those areas, or whether, as you imply, that is really a separate consideration at that stage of the build?

Mr Price—In Alberta the fibre grid was rolled out to every community on the basis of the government's own committed business.

Senator LUNDY—On the basis of the government's own committed business.

Mr Price—Yes.

Senator LUNDY—Was that a clearly stated business commitment as part of the rollout to those rural and regional areas as well as the metropolitan areas?

Mr Price—Yes. The government said, 'We'll put all our business on that new network if you build that network.' They moved their business from the old legacy network to the new network. In Alberta that was enough to create the province-wide community interconnect grid—not the fibre-to-the-premise part, but the interconnect grid—and then interconnect to every school, hospital and government facility as part of that.

The objective in Alberta was to create a competitive local access regime in small markets and the way we accomplished that was that the government became the prime tenant on the network, which got us over the fixed cost and into the variable cost, which allows us to price wholesale backhaul at compelling rates province wide. That structure is the right way to solve the community interconnect grid for rural and regional and the government needs it anyway. It is not a duplicative spend by the government because they are already spending that money on the old network; they have just got to move it to the new one.

Senator LUNDY—To what extent can you extrapolate that model with the remainder of the build from that community interconnect network to taking the fibre to the actual home?

Mr Price—For rural Alberta the objective was to create compelling wireless, it was not to create fibre to the premise to the residences. What we did is we created this point of presence in the community with this compelling wholesale rates and now there are 70 new small to medium sized wireless people providing wireless service to rural Alberta. That was the objective and that is how it is working.

Senator LUNDY—Which could well reflect our remaining 10 per cent under our current policy as far as the commitment.

Mr Price—Yes.

Senator LUNDY—The 90 per cent to be with fibre.

Mr Price—You would want high-performing wireless services everywhere in addition.

Senator LUNDY—Yes.

Mr Price—You do not want just fibre to the premise and then poor mobility. This community interconnect grid also creates a much higher performing 3G and 4G network as well.

Senator LUNDY—Can you offer some insights to the committee about sequencing of the build? You talk about Alberta where it all happened, but obviously there are workforce constraints with timing of essentially the civil works involved and the engineering works. What can you tell the committee about the sequencing of that build and how that related either to the priority needs of the primary client, being the government as the user of the network, or indeed the revenue that you are able to draw from the network as the build rolled out?

Mr Price—In Alberta with that particular example the government wanted it completed, so it was not a sequencing challenge, it was a get-it-completed challenge. We built that from centres out, because that way as we turned up centres we actually had connectivity back, rather than starting where we had no connectivity back. That would just be a dead asset until we actually had connectivity back, but we did it all in two years. It was not like a prioritisation, it was an efficient execution plan. It was all going to be done in two years anyway, it was not a question of who was six months ahead of anyone else.

Senator LUNDY—Given the size of Australia and the eight year time frame for the build here, can you foresee any issues or challenges about the sequencing of the build?

Mr Price—I keep putting it into the two categories, the community interconnect grid and then the fibre to the premise. They are really two different things. The community interconnect grid should be able to be done

in three years and then that would transform the market from a wireless performance point of view and a backhaul point of view. The fibre-to-the-premise part will have much more of a resources logistical challenge. We think that the fibre-to-the-premise component of this is about two-thirds to three-quarters of the capital. From an execution point of view the big challenge is the actual fibre to the premise. If you pulled the two apart, got the community interconnect grid going on its own path and then did fibre to the premise on a community-by-community basis I think you would get the right priorities that way. You could turn the community priorities into where it is more of a grassroots-up concept instead of a top-down concept and create a bid environment where the community and the infrastructure owners in the community made a bid to do fibre to the premise within the community. We have seen that work pretty well. It works well in France. It works well in markets where all this different infrastructure is spread around and different in every community, creating a way for the community to make the proposal in its own right, harnessing its own assets and advancing it progressively, which is probably a smart way for both efficiency and prioritisation. We look at it that way.

Senator LUNDY—Thank you.

CHAIR—Senator Nash.

Senator NASH—I would like to take you back to when I interrupted you during your opening statement regarding the market share issue and obviously the need to have 60 to 70 per cent of the market. If one of the options is an overbuild by a government, if they cannot get the incumbent to be part of the new NBN, in your view what is going to be the outcome?

Mr Price—Let us just talk about the overbuild. Telstra really does not have material fibre to the premise. It really does not. It has got fibre to the premise in some CBDs and that is it. When you look at the overall cost structure here, if it is run really efficiently, the fibre-to-the-premise piece of this is in the range of $20 billion in our view; it does not get into an inefficient execution model with people trying to pull money out of a pot. The fibre-to-the-premise part would be in the range of $20 billion. The community interconnect grid—the rest—is in the range of let us say $5 billion to $7 billion. Telstra really does not have that $20 billion of fibre. They are not remotely close to it. In our view that part is going to be driven by some other dynamics. They do have the copper in the community, they just do not have the fibre to the premise. The fibre to the premise is not an overbuild. It is an overbuild of copper, it is not an overbuild of fibre. You want to make that differentiation, because it is an entirely different thing to think of overbuilding copper. It is necessary. The copper is old and worn out. It should be discarded. In any economic environment, performance wise, that copper to the premise is over, so it should be replaced with fibre.

With the community interconnect grid, in Alberta 30 per cent of that community interconnect grid was already there and we bought it from the incumbents once the incumbents knew we were willing to overbuild. We made a business-to-business decision where we bought that fibre from the incumbents on their voluntary negotiated base.

I do not think practically at the end of the day you have to be willing to build, but I do not think you end up overbuilding if you have the right framework for a commercial decision in the first place.

Senator NASH—You would then have to offer something to get that transfer of customer base from the incumbent across to the new.

Mr Price—That would be something different. That is the market penetration question. What I am saying in the first place is that the fibre is not there now. I think there is the image in the public, at least in the press, that Telstra may have 60 per cent or 70 per cent of the fibre now. That is not remotely close, because the fibre-to-the-premise part of this is what is driving the numbers, and they just do not have that.

Senator NASH—I also asked the earlier witness this question. Why do you think the market has not delivered what the government is intending to do?

Mr Price—That the market deliver this network?

Senator NASH—Yes.

Mr Price—It is not financeable in a standalone basis without a regulatory framework that is reliable, and the regulatory framework right now favours the incumbent.

Senator NASH—Could that be changed? In terms of a time frame there is no benefit in changing the regulatory framework first and then seeing if it works. Do you think the government should just dive in?

Mr Price—I would say, in reality, even changing the regulatory framework is a big debate. That debate has been going on here for the four years that I have been involved in Australia. I think the right thing is almost as my predecessor said. This is a transformational investment. The right thing to do is to be prepared to go ahead with it, have a business hat on in terms of what the options are and then it works.

Senator NASH—Will the punters punt though if they do not know the rules?

Mr Price—The punter is Telstra and you are asking whether they will punt.

Senator NASH—And the others who may wish to punt, if they do not know the regulatory environment into which they will be required to go.

Mr Price—The government has made the decision to underpin the next generation network. That is my view. I watched four people including the Prime Minister make a decision and they made a decision. They are underpinning the next generation network. They are going to have one. So now the punters are saying: 'What happens when they do?', not whether they will. I am of the view that this thing is going ahead. It has been committed. The business discussion is how do you do it and how it makes no sense to have two networks.

Senator NASH—Thank you.

CHAIR—Senator Minchin.

Senator MINCHIN—From your evidence I assume you are suggesting to this committee that the actual cost of the government's proposal is around $27 billion, not $43 billion. Is that what you are putting to us?

Mr Price—With no contingencies and with efficient execution we would say the range is around $27 billion and less than $30 billion. These projects have a risk of getting into a highly politicised environment where the numbers then become some other set of numbers. I would say the government has quite a bit of contingency for that.

Senator MINCHIN—We will see. I am also trying to determine the extent to which you are putting to us that the viability of the FTTP NGN is dependent on what you call financial support, that is government subsidy or government grant. The government is not suggesting by any means that is the premise. The government has announced that this is and will be a commercial entity, this NBNCo. The government is only putting in $2.7 billion. It is going to borrow all the rest, so it has got to get at least a return that meets the cost of capital and wants a return on the $2.7 billion that it is putting in. Of course, it is relying on private sector investment for at least 49 per cent of it. The business has to be a commercially viable business from what the government is saying. The government did not come out and say, 'We're going to do this and we're going to subsidise it to whatever extent is necessary.' The government has come out and said, 'This is going to be a commercially viable business. We're going to attract private sector investors', and all the rest of it. Are you actually saying to us that is not real, that it has to have, in effect, government subsidy?

Mr Price—I know you do not expect me to accept your view of what the government said.

Senator MINCHIN—I am just telling you what the government said.

Mr Price—I accept that is your view of what the government said.

Senator MINCHIN—That is what the government said.

Mr Price—I did not hear them say that.

Senator MINCHIN—I can get you the evidence. That is what they said.

Mr Price—I am not informed of that. What I am saying is that there is a whole bunch of support that goes to regional and rural Australia already.

Senator MINCHIN—Yes. Let us not get into a debate. I am satisfied that is what the government said. What you are saying is that this cannot be done without a degree of government subsidy.

Mr Price—As the current telecom industry works. There is a whole level of subsidy currently working in order for Telstra to deliver the quality service they deliver in rural Australia now. This is not taking the benefit of those. This is saying you can take all of Australia, put it on a whole new next generation grid and the cost structure, if that cost of capital is private—of course the private sector has a higher cost of capital than the government attributes to their cost of capital and that is appropriate—you could say, for instance, fifty-fifty private sector and public sector money and then you would have less grant support because it would mean maybe five per cent interest long-term cost of capital and that would change these numbers. There is an infinite number of ways of structuring financial support. One of them is just giving long-term five per cent T-

bill or rate money, which would not be seen as a subsidy. If we put that in here you would reduce this financial support because that private sector cost of capital is in the 10 to 13 per cent range.

Senator MINCHIN—Exactly.

Mr Price—If you say, 'I want to do it with all private sector cost of capital', how much do you come up short? It is in this 20 to 30 per cent range. Of course, the government is not talking about financing it that way, but you can see how we could reduce the private sector amount of capital and then reduce the government financial support in the form of grants; this is to get it into the ballpark. I would say even in these numbers that financial support is way less than the government involvement that has been announced, so now you are in the: how do you organise it and how do you structure it? My point here is that this network starts with a cost structure of a $50 or $60 per month range, not what I have seen quoted as $100 to $150 or $200. It can be structured so it is in the range of compelling wholesale rates nationwide, as against the current telecom spend by people in Australia. It can be structured that way.

Senator MINCHIN—But only with what you call ongoing financial support.

Mr Price—No. This financial support is not ongoing. It might look that way here. It is saying that the private sector can handle two-thirds of the capital at private sector cost of capital and the residual is government grants. That is what this is saying. If we change this to 50 per cent private sector capital and five per cent T-bills, then you would find that financial support in the context of grants would be much reduced. That is just reshaping it. If you take the government's announced 51 per cent they put up, 49 per cent the private sector puts up, which is half and half for numerical purposes, if their part is put up at five per cent cost then the private sector has way lower cost for that half. If they can also take into account substantial funding in telecom is already going to regional and rural Australia and they crystallise that into one time span and get rid of it—let me use an example—they would have a payout of having a $2 billion one-time grant to solve regional and rural against their current programs. That $2 billion grant would deal forever with the regional and rural dislocation in this new network. That would not be a grant, that would be a saving against ongoing programs.

Senator MINCHIN—None of this suggests any cross-subsidisation by customers. It is all done purely on the cost of providing the service in the area concerned.

Mr Price—Yes.

Senator MINCHIN—City is not cross-subsidising country?

Mr Price—Right. That is why you start with this interconnect grid and solve the regional dislocation with the interconnect grid. You then do the fibre to the premise within the community and the wireless off the end of it. If you do it that way it solves this perpetual cross-subsidy program process; all our numbers would say that it would only take $2 billion of grant to deal with that. The government is spending more than $500 million a year now, so they get a payout on that $2 billion and the long-term spending is over. That would deal with the community interconnect grid.

CHAIR—Thank you Mr Price. The committee will now suspend for a short break.

Proceedings suspended from 10.38 am to 11 am

JAKUBOWSKI, Ms Liz, Director, Government Relations, NICTA

PERCIVAL, Dr Terence Michael, Director, Neville Roach Laboratory, NICTA

SENEVIRATNE, Professor Aruna, Director, ATP Laboratory, NICTA

CHAIR—Welcome. You have heard the rules and regulations that I talked about earlier on today so I shall not go through them again. We have your submission. Do you wish to make any amendments or changes to it?

Prof. Seneviratne—No, we do not.

CHAIR—Do you wish to make an opening statement?

Prof. Seneviratne—Yes, we do. Thank you very much for the opportunity to comment on the proposed rollout. We believe that the National Broadband Network will have a significant impact. As stated earlier, it is similar to the railroads and other infrastructure done in the 20th century. We believe that the NBN will be the key to Australia's success in the 21st century.

By way of background, NICTA was established in 2002. Its mandate was to create a world-class research organisation that will scale globally and also have an international impact. This was in response to concerns the Australian government had that there was underinvestment in strategic research, resulting in a long-tem imbalance in Australia's ICT research and development capability. Since inception, NICTA has grown into a fairly big organisation with 300 researchers and some 300 PhD students. NICTA submits that it is critical that the network infrastructure is scalable. This is because technology is constantly changing. While these technological changes are underpinned by use inspiration, it is based on the needs of the applications that can be foreseen, plus the applications that cannot be foreseen at the current point in time, such as IPTV, which people have been using with the existing technology, through to 3DTV that might come in the future.

In working towards this goal, NICTA has created a number of spinoff companies in mobile phone technology, optical communications, satellite communications, audio networking and software systems. It has licensed the technology to Australian companies. For example, technology developed here in Sydney is now in more than 350 million mobile phones around the world. In addition, NICTA has graduated 120 PhD students who are working in the Australian government and in industry, and it has worked with government agencies in defence, security, traffic management, health, government services, environmental monitoring, and worked with national and multinational companies as well.

NICTA believes that the NBN is the enabler for the digital economy. Current service levels may be acceptable for some applications, but the rollout of the NBN will significantly enhance innovation in many areas, including education, infrastructure monitoring, digital media, logistics and transport, tourism, e-government, cloud computing and a whole host of other areas. We believe some of the greatest challenges are in the next generation of services, the services that will run on top of the NBN. There are numerous examples of where the lack of a national broadband network is stifling innovation and economic development.

For example, currently the universities in Australia are well served by a world-class network provided by AARNet, where all the university campuses are interconnected by a network of between one and 10 gigabytes. These universities are interconnected to the universities and the research institutions around the world with similar capacity. This has enabled Australian researchers not only to keep pace with the rest of the world but in some cases to be the world leaders in their area. Some schools also have similar facilities, but the majority do not. The NBN will provide this much-needed higher capacity and bandwidth and provide connections to students in an equitable manner.

I will give you some examples of the types of things that NICTA does. NICTA is working actively in certain areas providing these services. If you take digital media, we are actually looking at peer-to-peer technologies that will enable the hosting of massive multiplayer games, as well as distributing digital content in a more effective manner, which will not only reduce the cost but has the potential to reduce the carbon footprint.

If you look at logistics, again, NICTA is working in transport systems to look at traffic management. If you go down Anzac Parade today on the way to the airport you will actually see some cameras at the corner of Barker Street and Anzac Parade, which are actually monitoring the traffic and easing the traffic flow. This is a trial we are doing with the New South Wales Roads and Traffic Authority.

In infrastructure monitoring and security, we are working on automatically monitoring the levels of service that will be offered to the public. The idea is you can predict how these services will react. We have done this with government agencies. For example, we have been working with the Australian Taxation Office and

Centrelink to look at the services that they require. This is critical because, as everybody has high-capacity connections, these services need to be able to scale as well. If everybody suddenly lodges their tax return in this high-bandwidth connection, the services at the other end have to be able to cope with them. We are working on how infrastructure could be monitored, including critical infrastructure such as bridges, and also looking at security and surveillance in ports and railways.

In e-government, we are also looking at how technology can enhance services. We are working with the Lending Industry XML Initiative, which is actually creating a standard that will enable the loan industry to work seamlessly across many organisations. We are looking at electronic conveyancing activities as well.

In terms of education, again, we are looking at how you can aggregate content to deliver to schools and TAFE. We have just done a study with the New South Wales Centre for Learning Innovation and run a trial at the Merrylands High School, which has allowed students to aggregate content and take their netbooks or mobile devices and get their teaching material on to it. This allows the teachers to interact with the students better and for the students to get new material on time.

Finally, for example, we have developed indoor wireless technologies that will provide ultra high-band connectivity to devices. This will enable people to utilise the rich media that the NBN will facilitate to be delivered to their personal devices.

In conclusion, NICTA believes that the NBN is a unique opportunity. The real challenges are not only in the current services but also in the future services that people will develop, given this opportunity, and this will enable us to overcome the tyranny of distance that has, in some ways, been an obstacle to Australia taking full advantage of the potential global economy. That is essentially our submission.

CHAIR—Thank you. Ms Jakubowski, do you have anything to add?

Ms Jakubowski—I have nothing to add.

CHAIR—Senator Macdonald.

Senator IAN MACDONALD—Thank you for your submission. In your research do you look at the cost benefit of these things? Is that part of what you do?

Prof. Seneviratne—No. We are a technology research company. We do not do a cost-benefit analysis of actual physical rollouts or actual deployments.

Senator IAN MACDONALD—You said you had some subsidiary companies where you were licensing technology out to people.

Prof. Seneviratne—Yes, we do.

Senator IAN MACDONALD—I assume you would be doing that at a profit. Somebody in your organisation would be making sure that what you are doing is cost effective?

Prof. Seneviratne—That is correct.

Senator IAN MACDONALD—I gather from what you say that you have not looked at the overall cost benefit of this national broadband network to the nation. You mentioned a lot of innovative things that we could be doing and you mentioned that universities were already hooked up to a very good network. Again, have you given any thought to whether the majority of users would need something as good as the NBN?

Prof. Seneviratne—Yes, we have. We believe that will drive innovation in areas that we have not been seeing in the past. I think this will give rise to innovations that will actually make Australia competitive in the ICT sector.

Senator IAN MACDONALD—I can sometimes use a computer, but I do not understand how they work. In your submission you talked about a data signalling rate and you were saying that that compares with useable data throughput. Is it possible for someone to have a 100 megabit per second connection but still only receive 12 megabits per second download speed? I do not need you to give me a lecture on how it all works, but just for an amateur.

Senator NASH—I was keen on getting some definition around those two things, if you could blend that in.

Prof. Seneviratne—I think the best way of explaining this is to give you a very simple explanation of what we mean by 'signalling' and what we mean by 'data'. Signalling is essentially making sure that, if you think in terms of two devices communicating with each other, they have to make sure that they are operating correctly. You have to make sure that one device asks the other device whether it is alive, dead or not functioning. There

have to be some exchanges of information between the two devices or a number of devices to see whether they are operating correctly. In addition to that, there are also some other types of information that need to be added to the actual information the user uses to get it from one place to the other.

What we are essentially saying in our submission is that there are no impediments for providing any rate that a person wants to provide to the customer. We are saying that that should be clarified, because this could be interpreted in a number of different ways. It could be the aggregate rate. It could be the user rate. It could even be a combination of the two. All we are saying is that that should be clarified and there should be a service level agreement reached between the customer when the final rollout is done to ensure that they get what they wanted.

Senator NASH—So that it is not misleading?

Prof. Seneviratne—It is not misleading; that is all.

CHAIR—Senator Macdonald.

Senator IAN MACDONALD—Someone once suggested to me that you could get whatever bandwidth you wanted under the present networks, where they exist, but it was all a question of cost. Is that right? Can I sign up to 100 megabits per second today if I am prepared to pay for it?

Prof. Seneviratne—Yes, if you are prepared to pay for all the digging of the trenches, getting the licenses and putting the fibre through.

Senator IAN MACDONALD—From the network to my own house?

Prof. Seneviratne—Yes.

Senator IAN MACDONALD—Thank you.

CHAIR—Senator Nash.

Senator NASH—On the issue of satellites and Ku and Ka bands, and looking at the last 10 per cent and the idea that it will be a mix of wireless and satellite, can you give us an idea of how current satellite would be improved by the Ka? Are there any issues around satellite access and capability?

Prof. Seneviratne—The issue is cost and also the coverage that you are going to get. Satellites can be designed to have beams in certain areas or they can be focused. It depends on how the satellite is deployed to get the coverage that you want. In terms of getting the speeds that are required, I do not think there are issues, but it is an issue of cost.

Senator NASH—I suppose cost does not come back to you because you do not do cost benefit, so I will save that for someone else. In terms of your business, how much of your research and development goes into improving services into regional Australia?

Prof. Seneviratne—We actually develop technologies that will make efficient use of the existing technology. That could be applied to rural as well as metropolitan. Just to expand on that and give you an example, if you think in terms of video distribution, you can distribute the video from a central server down to each house. One other way of doing it is, if every household has a set-top box with the capacity to store the information, you can store it locally and start distributing locally. It does not have to be brought down from the central server. This is what we call peer-to-peer. Your neighbour gives you the information. There are issues with copyright and so on, but the technology of distributing information means that you can reduce the backhaul capacity that is required. That could be applied in rural or metropolitan areas. It can be applied in a high-rise building in the city or in a rural area it could be done in a regional sense.

Senator NASH—I have had a number of representations from the Isolated Children's Parents Association, which is concerned about ensuring there is equity in access to telecommunications with regard to education in particular. Under the proposed model that is being put forward by the government do you see that students in rural and regional areas are going to have a lesser service than the metro areas or would you see it as comparable?

Prof. Seneviratne—It depends on the network that is rolled out, but with the technology that we are developing, if there is a gap, it will try to address that gap. We were talking about aggregation of data. For example, you could download the data overnight, aggregate it and give it to students. The technology that we are developing addresses that type of imbalance, if there is any imbalance. It is the usage that will really determine whether some people are disadvantaged and some are not.

Senator NASH—At what point would that be determined?

Prof. Seneviratne—I am not 100 per cent sure.

Senator NASH—If how they aggregate and so on will determine whether there is any disadvantage or disparity, that would obviously come after the network has been built and been utilised?

Prof. Seneviratne—Yes, depending on what the rollout will be.

Senator NASH—It is a bit chicken and egg at the moment?

Prof. Seneviratne—It is a bit chicken and egg.

Senator NASH—You mentioned scalability earlier. With what we know, which is fairly sketchy at this stage, about the actual technologies and what is going to go where, are you comfortable at this point that the technologies being put forward will have that scalability?

Prof. Seneviratne—Yes, we believe that the technology is scalable, but all we are suggesting is that that should be in the design specification; that the scalability issue is a first-class citizen.

Senator NASH—It would actually be unacceptable for it not to be, because to spend this amount of taxpayers' money on a network that then did not have the provision to take new applications as we went through time would be pretty stupid, would it not?

Prof. Seneviratne—That is correct.

Senator NASH—Thank you.

CHAIR—Senator Lundy.

Senator LUNDY—I would like to follow up on a couple of points you have made in your submission and your opening statement. That is particularly the transformative effect of higher bandwidth networks on logistics and transport. You mentioned a trial that is occurring at the moment on Anzac Parade in Sydney. I would like some more detail about how those applications will be used and particularly what their expected impact is on transport efficiency and lightening the carbon footprint.

Prof. Seneviratne—Again, for me to answer that question I have to give a little bit of background and then tell you what could be done. Currently the traffic lights in Australia and about 130 cities around the world use something developed by the Roads and Traffic Authority called SCATS, Sydney Coordinated, Adaptive Traffic System. It actually detects the number of cars in an intersection and adjusts the green light so that you can get the maximum throughput on the road. If you go at a specific speed, theoretically in Sydney you should get a wave of green lights. It is done by putting an inductive loop on the road which essentially counts the cars as they go. They have to cut the road. You might have seen them at 2 in the morning cutting the road to put the loops in.

This information is transmitted through a telephony network, which is a very low speed network, back to a central computer. The central computer essentially crunches the numbers and optimises the green lights to go. This gets only one input—a very unreliable type of input—from the loop detectors that you have on the street. If you have video information, you can count the number of cars, see the queue lengths and get much better optimisation. But video requires higher bandwidth. A higher bandwidth network would really help in optimising traffic.

Senator LUNDY—Thank you. On the issue of critical infrastructure protection and security, can you elaborate on the sorts of technologies that would be reliant on higher bandwidth networks to enhance the security and protection of our critical infrastructure?

Prof. Seneviratne—Again, on critical infrastructure protection I will need to give you an example to explain. Currently if you have a bridge in a country area, the only way you can detect loads is by instrumenting the bridge with sensors and then drive a truck up and down it a couple of times to see the stresses and strains on the bridge. They would collect the data, bring it over to a lab in Sydney, or wherever it is, and analyse the data. If you had connectivity, this instrument can be on all the time and you can actually detect the deterioration in a much more real-time sense, which is much more cost effective as well. You can get much earlier warnings if things are going to go wrong. That is an example.

Senator LUNDY—Thank you for that. It is very important to have practical examples of how the NBN would transform these sorts of functions.

CHAIR—Senator Nash.

Senator NASH—In your submission, in the overview of the NBN, you talk about the user experience being the same as that achieved with 100 megabits Ethernet connection. Can you give us some background and tell us what you mean by that?

Prof. Seneviratne—Yes. The current internet essentially has what is called asymmetric bandwidth. You can download data much faster than you can upload data. One of the disadvantages of that is that people cannot run services at one end of this asymmetric connection. And it is not just that; if your kids generate massive amounts of video, the upload is the one that is going to prevent them from actually doing good-quality editing and so on. One of the advantages of the broadband network is that you could actually have upload data rate the same as the download data rate. That is one of the things that will transform the next generation of applications, and that is what we were trying to point out.

Senator NASH—Thank you.

CHAIR—I thank NICTA.

[11.26 am]

FLEMING, Mr Peter, Chief Executive Officer, National e-Health Transition Authority

HAIKERWAL, Dr Mukesh, Head of Clinical Leads, National e-Health Transition Authority

CHAIR—We now welcome Mr Fleming and Dr Haikerwal from the National e-Health Transition Authority. You have been in the backblocks for much of the proceedings this morning, so I shall not repeat the rules and regulations. We have your submission. Do you wish to make any amendments to it?

Mr Fleming—No, thank you.

CHAIR—In that case, do you wish to make a brief opening statement for the committee?

Mr Fleming—Yes, please.

CHAIR—You may proceed.

Mr Fleming—You are no doubt aware of the work of the National e-Health Transition Authority, which was funded in 2006 by the governments in Australia to find the right technology for a future e-health system. Our work has focused on building a health identification service, clinical terminologies, authentication and secure messaging specifications that will form the infrastructure for a future individual electronic health record in Australia. E-health is recognised as pivotal to health reform and the need for a future health record was widely acknowledged in the recently released final report of the National Health and Hospitals Reform Commission. Electronic health communications moves the health sector from a reliance on pen, paper and human memory to an environment where we can reliably and securely access and share health information in real-time across geographic and health sector boundaries.

NEHTA has to date built its short- to mid-term business case on the assumption of existing telecommunications and infrastructure services. Although initial e-health benefits are not dependent on the full rollout of the National Broadband Network, our program of work relies on collaboration with local teams in state and territory health departments, public and private sector and in rural and remote areas to build e-health solutions based on national building blocks. These collaboration opportunities are essential elements to health reform, which would be further enabled by the rollout of the National Broadband Network.

Broadband networks must be available for a wide cross-section of Australians if we are to fulfil the real promise of e-health around the smart use of data, information and communications. The proposed network would unlock many new opportunities for innovative solutions in healthcare. While the full gamut of solutions could never be predicted, potential new opportunities include increased support for telehealth based health care services in rural and remote areas through improved access to satellite, which in turn will improve the equity of access to healthcare services for a wide cross section of Australians; improvements in home based care and emergency services through improved wireless broadband services, which in turn will allow more choices in aged care and independent living; improvements in ambulance services through improved wireless broadband services; and on-demand access to large diagnostic image collections.

Many elements of the current and future NEHTA work programs, such as unique health identifiers, secure messaging referral, discharge, medications management and electronic health records can be implemented using existing broadband technologies. However, there is a range of issues with the current system that need to be addressed, irrespective of the technology involved. These include improving network access in rural and remote areas, setting minimum communication service level standards, as health care services are increasingly reliant on network connectivity to deliver critical care; and increasing competition in the market to drive down the cost of network access.

NEHTA recognises that the economic benefits of a national broadband network are significant, but they cannot be realised unless there are products and services that can leverage the network. As a result, investment in broadband needs to be part of a coordinated investment program. The national e-health strategy relies on a guided marketing model. NEHTA's role in that strategy is to support incremental implementation by collaborating with local partners to develop e-health solutions that leverage national building blocks. The incremental rollout of the NBN represents an opportunity for NEHTA to work with the NBN and local partners to deliver world class e-health solutions locally.

CHAIR—Thank you. Senator Lundy.

Senator LUNDY—There are several examples around the country already where health services can benefit from video linkages and the sort of services on a higher bandwidth network. Does NEHTA have a summary of all of those areas of innovation where they are occurring or an audit of the pointy end of digital networks informing health service delivery?

Mr Fleming—No, we do not. Through a COAG business case at the moment we do have examples of some of the activities that we would move on. If I can take a step back, the activities that NEHTA is currently addressing include a series of foundational projects, the health identifiers themselves, secure networking services that support that, and clinical terminologies that once again support that.

Following on from that, once the identifiers are in place, the first areas that we would see activity would be in relation to the movement of transactions using those secure identifiers. That includes things such as discharge referrals, referrals in general and transactions related to medication management. Over time, and subject to COAG business case being approved, the expectation is that an electronic health record would be built and that health record would be populated by many of the types of transactions that I spoke about. That health record could contain information related from a general practitioner. It could relate to MRI information, pathology data and so on. There is quite a wealth of information that could be held within that.

Internally, I tend to run the analogy of the Apple iPhone, only because there has been a series of advertisements in the press over the last few months that shows a picture of the iPhone and talks about the 35,000 applications that are now available on it. The job in NEHTA is not dissimilar. Apple has built a piece of infrastructure and put some standards around that as to how it could be accessed, and from there a whole series of applications have been built. Within NEHTA, through the funding from the governments, we are putting in place foundational services; putting in place some services that can only be provided centrally, but then through a series of standards making that open to allow the private sector to add further benefit. There are many examples we could use—telemedicines and so on—but I am sure in the future as the foundations are built there will be many new innovations that will be delivered.

Senator LUNDY—Going to those issues of security, the identifier and so on, to what extent have you mandated open standards and interoperability of all of the applications that you are managing and indeed that others may develop in the future?

Mr Fleming—There are a couple of components there. Firstly, in many of the areas where we are working there are a number of international bodies and countries involved. We are working closely with international groups to ensure that wherever possible standards reflect an international flavour rather than being specific to ourselves. NEHTA is not a standards organisation. We put together a series of specifications and then move that through the standards process. That process is under way at the moment. The intent, though, is that through the standards process we would be looking at open systems but with secure processes around that.

Senator LUNDY—Open is often more secure.

Mr Fleming—Absolutely. And certainly interoperability would be quite an essential element of what we need to deliver on.

Senator LUNDY—As far as the decisions that NEHTA has made already, are you able to confirm that a requirement of NEHTA is to be fully interoperable and to have open standards applying?

Mr Fleming—Yes, certainly.

Senator LUNDY—In terms of the processes that you are currently going through with the standards bodies, what do they specifically relate to and why do you need to go through a standards body if you have required an open standard?

Mr Fleming—I can use an existing example. Recently the Practice Incentives Program was announced. That is the incentive program run with the GP community. The public announcement was around a standard for many transactions. As a result of that, NEHTA is working with the MSIA to define a standard for a generic transaction that would be utilised within the health community. That transaction will utilise individual health identifiers, what we call the national services, which are the security services around that. It is basically creating the headers, the trailers and the secure processes that work with that.

The intention down the track is that once we have the generic standard defined, which should be done by early next year with the industry, we would then start to define specific transactions, such as a discharge referral and how that should look and operate. The reason for the collaborative approach is that it has such a huge impact on practices through Australia—the entire health community—and also not just new software

vendors but the huge amount of legacy systems in the marketplace. The standards need to be cognisant of the legacy world and the journey required to move us into the future.

Senator LUNDY—I do not know quite where to start. In terms of the contract that has been put in place for that process for transactions, does that contract require open standards and interoperability for what is being developed?

Mr Fleming—The standard will require that, when we move a specific transaction, in this case a generic one, software vendors will receive an accreditation utilising the standards that will be put through Standards Australia.

Senator LUNDY—Who has that contract?

Mr Fleming—This is a joint activity including NEHTA.

Senator LUNDY—And who else?

Mr Fleming—And the MSIA, the Medical Software Industry Association.

Senator LUNDY—Which companies are providing services as part of that arrangement?

Mr Fleming—This is a group that has been formed to agree the standard for this generic message type. The MSIA has nominated a group of their members to sit on that committee. It is not a contract as such.

Senator LUNDY—Who is developing or providing that service as the standard is being developed?

Mr Fleming—The process of developing the standard is, firstly, to get an agreement between ourselves and the software industry as to how the standards for this transaction will look. From there, the next stage would be to agree a timeframe for when members of the software industry would implement that within their environment, incented through the Practice Incentives Program.

Dr Haikerwal—At the moment there is very limited functionality of that central messaging function. As we grow the size of the electronic health records and clinical transfer of information that will increase the breadth of the collaborating group to include the clinical communities to make sure that standard is not just applicable from a technological point of view but also from a health point of view.

Senator LUNDY—You are a long way down the track in actually contemplating where this is going to go. One of the key features that has been put to me, in terms of the strengths of the National Broadband Network, is the importance, as applications applying to whole sectors such as this are developed, of having open standards and full interoperability informing the subsequent capacity to innovate. But I think I have all the assurances that I was seeking about those principles applying to the development that you are undertaking.

Mr Fleming—Yes, correct.

Senator LUNDY—Thank you.

CHAIR—Senator Nash.

Senator NASH—What sorts of technologies and speeds are being used by the hospitals at the moment out in the regions? I imagine they would all vary, but do you have a ballpark range?

Dr Haikerwal—It is exactly that. They will vary significantly from some places in rural New South Wales that have nothing to those that are very high tech, for instance, St Vincent's in Sydney, the Alfred and so on. However, the problems are that the connections to the greater clinical communities are not there, and that is what we are working on, to connect the hospital system with private practitioners in all disciplines in the community. That would require the interoperability that Senator Lundy was talking about. Also, because of the vast matrix of connections required, this needs to be powered by a network such as an NBN.

Senator NASH—That is one key area where you would see enormous benefits. Can you name a couple of key benefits that the NBN will bring to e-health?

Mr Fleming—One of the key points that has been raised as we have gone through our consultation process has been the need in the rural and remote communities for vastly improved communication services not just in terms of speed but also in terms of quality of that service. It is a clear area where we would see benefits down the track.

Senator NASH—With that in mind, given there is an eight-year timeframe for this to be rolled out, should the rollout start in the regions given how much further behind the metropolitan areas they are at the moment when it comes to health? Or are you not allowed to have a view?

Mr Fleming—I think that is a matter for government policy, sorry.

Senator NASH—Would it seem practical and sensible to address the regional areas first to try to align some of the health needs across the country?

Mr Fleming—Certainly within the NEHTA program we would be looking to ensure equity in terms of the projects that we are working on and how they drive through, but in terms of the NBN that would be a matter for government policy.

Senator NASH—Absolutely, and well answered. It certainly would seem to the committee that, where there are those great areas of need, it would be sensible to address those areas first.

CHAIR—Dr Haikerwal was going to volunteer some further information.

Dr Haikerwal—One of my other recent pieces of work is with the National Health and Hospitals Reform Commission process. Certainly the inequity in health delivery in Australia, and in particular in Aboriginal and Torres Strait Islander populations and rural populations, was identified as a major need. One way of addressing the health gap and the digital divide is to make sure there is equity of access to the electronic infrastructure wherever people live in Australia.

CHAIR—Senator Macdonald.

Senator IAN MACDONALD—Were you about to move on?

Senator NASH—No, I am still on this, but jump in.

Senator IAN MACDONALD—Bearing in mind that 10 per cent of Australia will not have fibre-to-the-premises and one would expect that that will be the 10 per cent in rural and regional areas of Australia, the sorts of places that you are saying would benefit substantially from a good connection, what is your understanding of the impact of having satellite and wireless in those areas as opposed to fibre-to-the-premises?

Dr Haikerwal—In Katherine, for instance, they have a system where they have a very good broadband connection into Katherine and the communities outside will have a Wi-Fi connection and have satellite as well. It is like everything else; it works, but the point is that if we are looking at the future we want to make sure that the system will work better in the future. The expectation and the hope is that by enhancing the broadband situation to add to satellite and to add to existing Wi-Fi, we can get a better system.

Senator IAN MACDONALD—Katherine would have fibre to the hospital. I do not know, but I would assume that the hospital at Burketown in the gulf probably would be relying on wireless and/or satellite. What impact is that going to have in not having the same as everyone else?

Mr Fleming—My understanding is that under the NBN system they would have a 12 megabit connection.

Senator IAN MACDONALD—That would be by wireless, via satellite?

Mr Fleming—That would be via satellite. That would be a substantial improvement on what exists today.

Senator IAN MACDONALD—Would they be on satellite today?

Mr Fleming—It would depend on the remote areas that we are talking about. The feedback we have received through the consultation is that bandwidth in many of those remote communities is highly questionable and certainly the uptime or the quality is difficult to rely upon.

Senator IAN MACDONALD—Under the National Broadband Network what these remote places are going to get is satellite. I suspect all of them would have satellite. Is this going to be a different sort of satellite that will enable them to do more?

Mr Fleming—My understanding is that the solution being suggested here would be a substantial uplift in the quality of the service and the speed of the service.

CHAIR—Senator Nash.

Senator NASH—In essence, it is not going to be a perfect world with the disparity in the 100 and the 12, but it would be an awful lot better than it currently is, I take it?

Mr Fleming—That is correct, yes.

Senator NASH—You mentioned in your opening comments that, as a result of the NBN, there would be more choices in aged care and independent living. Can you expand on that? Aged care is going to be such an issue in particular out in the regions. What greater choices will be provided by the NBN?

Mr Fleming—There are certainly a number of newer technologies that allow for in-home monitoring and support. One of the key drivers for NEHTA is to provide the patient or the consumer with a lot more power

and ability to interact into their own healthcare. Being able to utilise many of these newer technologies—for example, remote monitoring, blood pressure monitoring and so on—allows for the aged care recipient to potentially be at home significantly longer.

Senator NASH—Dr Haikerwal might be able to address this one for me. One of the things raised a number of times over recent years is the ability through the use of e-health to remotely assist doctors/GPs out in the regions through professionals or specialists in a metropolitan area. To what extent is that currently happening, and under the new NBN what do you see as the improvements to those types of arrangements, bearing in mind the difficulties for people in remote and regional areas to access specialist care?

Dr Haikerwal—One of the biggest shortfalls of supply, as you are obviously well aware, is access to specialist services outside metropolitan areas—regional and remote. We have one Medicare item currently that attracts a rebate, psychiatry services, and the usage of that has been pretty poor. Obviously the state health services will be providing some access by remote video conferencing facilities, but what we would see with an enhanced broadband situation is that being accessible much more universally. You can do a very good-quality consultation using platforms with video and only, say, a $100 camera on top of a computer and a good quality connection to pretty much anywhere. That allows an access to a greater number of people, specialists and GPs, who do not have to be in a specialised environment to use that crosslink. They can do it from one consulting room to the next. It means that people will be much more likely to want to use it. Therefore, we need to be making sure that the technology is there, but also the systems and platform to make those connections work better.

For instance, there is a group called the Mental Health Professionals Alliance which is trying to get together all the various providers in the mental health arena to work in this network arena with video conferencing, which allows them to discuss cases as well as consult remotely, be it in the individual's home or preferably with their local health care provider or general practitioner and the distant psychiatrist, psychologist or dermatologist, for instance, in due course.

Senator IAN MACDONALD—You see in the movies that when you go to see the psychiatrist you lie down on the chair and the psychiatrist sits behind you so you cannot see them anyhow. Are you suggesting that there could be a camera there, you come into a room by yourself, lie down on the couch and then the camera talks to you?

Dr Haikerwal—In reality it could happen that way, but ideally, no. You actually have to have a health professional with you because you need to have the interpretation of the service. In the current arrangements it does happen that the psychiatrist will be at a distance and the GP will be with the patient, but that model is not working currently and we need to be able to enhance that. It does not replace face to face, but it actually helps fill in some of the gaps and put people into a holding pattern between one consultation at a distance before you can get the face-to-face.

Senator NASH—One of the difficulties in getting GPs into regional areas is the fact that they do not have that specialist support base to refer to like you have in metropolitan areas. Enhancing connectivity through the NBN would result in greater speeds and improved services. Surely that would improve GPs' ability to access that specialist base of knowledge, either those going out to a regional area or those who are currently there? Would that be right?

Dr Haikerwal—Absolutely. One of the biggest detractors for people to move any distance from the cities is the lack of facilities. If you have facilities and support in your work people are more likely to make that move. That support includes the local hospital, but it also includes the specialist at a distance so that you can get some help with the work that you are doing. There is more surety, if you can have that arrangement with someone at a distance, to know that you can manage more locally.

We have seen this in the city areas, too, where there is more work being taken out from hospitals to the community. The local providers, the GPs and other health professionals will do that if they know there is some bailout such that they can get some additional help.

Other than waiting for an appointment, if you can do that via video conferencing and video group conferencing on a platform where you have those connections well made, that would be an enhancement. That is alongside professional development and the individual patient's ability to access information and get further tools to help them manage their own health. Those are all things that suffer from the digital divide. If we have a system that is connecting up the dots, bringing people closer together to the technology, it means that you can do that in a much more enhanced environment.

Senator NASH—Looking at it from the other perspective as well, in your view for health what would be the ramifications if the NBN did not get built?

Dr Haikerwal—It is like the carrier pigeon and the post; you can do things, but it is rather more difficult if you do not use the technology. If we have the technology and we can break ground and lead the world, especially in regional and rural technologies and healthcare delivery, which we can do, we should be out there doing that.

Senator NASH—Are there instances in other countries around the world where you could perhaps direct the committee to look at some of the existing evidence of rural and regional communities, in terms of health, having an improvement in their network services, broadband and the resultant improvements? You do not need to answer that now. You might take that on notice and come back to the committee with some examples that we could have a look at where that improvement has already been done and can be measured. That would be useful.

Dr Haikerwal—Yes. Off the top of my head, Canada is doing some work, but we can get some more information for you. The Baltic region in Scandinavia has projects around regional and rural remote, and data that if you do not have the health services people leave; that by putting in health services and enhancing those with an e-environment they have actually got some guide—

Senator NASH—That would be very useful. Thank you.

CHAIR—Senator Lundy.

Senator LUNDY—I have asked all of my questions.

CHAIR—Thank you, gentlemen, for appearing today.

Dr Haikerwal—To try to encompass what we were trying to say I would make just a few points.

CHAIR—Please do.

Dr Haikerwal—I thank you very much for the opportunity to speak to you. We think this is a significant nation building infrastructure undertaking. From the point of view of the health system, the use of the health system, the funders and managers of the system, and indeed those charged with providing the care of all Australians, the future of health care is an electronically enhanced system otherwise known as e-health.

In the National Health and Hospitals Reform Commission we talked about the necessity for healthcare to be based on good-quality, accurate, timely, useable data. This includes not just clinical information and transfer, but also data, video and voice, which we have discussed. There are several applications that can be helped, including research and development, clinical, administrative and public health, and the entire e-health agenda is underpinned by high-quality, high-speed broadband networks. Universally available and equitably accessible, this technology has the ability to power our healthcare and our health to even better levels than today, and address the needs in particular of Aboriginal and Torres Strait Islander people and regional Australia. Further, by delivering the vehicle to seek, find and use the tools to support and learn about their own healthcare needs, Australians can move to manage their health and knowledge without the current tripwires of the digital divide.

The smart use of data enables decisions to be made about an individual's healthcare, the healthcare system and its management, the pursuit of excellence and a safety and quality agenda. We trust that the information we provided you helps your deliberations and, of course, we are happy to provide any more information if you wish.

CHAIR—You have prompted me to ask another question. We have a couple of minutes so bear with me. I just wanted to echo the point that the universality of the NBN does resolve issues relating to the digital divide that have always informed how fast these sorts of innovations have developed and, in fact, hindered their development in the past because that is something that we had to fix first.

My question relates to evidence that we heard earlier today. As far as the fibre network is concerned, the distinction between the community interconnect, that is, the particularly fat pipes between significant civil nodes, if you like, be it health or education facilities, and businesses, and from there out to residences and so forth, does NEHTA have a view on where that intercommunity network, if you like, or connecting up all of the health centres and the community facilities, should be in the relative priority of resolving that aspect of the National Broadband Network, and is it part of what you do to advocate that that level of interconnectivity with the NBN occurs sooner rather than later?

Mr Fleming—We do not have a timeframe on that. Certainly within NEHTA we are taking the perspective that we need to move through a series of incremental changes. There are 850,000 people who work in healthcare in Australia. If we tried to implement a big-bang approach it would break and processes would not work. The approach we are taking is to get the identifiers in place first in the foundation projects, which leads us to being able to move transactions fairly rapidly. Taking referrals as an example, it would certainly be a view of NEHTA that quickly we would want to move a referral not just from a GP to a hospital but to allied health professionals, specialists and so on. Through the standards we are building we would expect at least that level of community networking to occur within one or two years and not out in the decades of the future.

Senator LUNDY—And obviously not contingent on a whole of health sector bandwidth build. That is something that you can start straightaway.

Mr Fleming—Absolutely, and something we are working towards.

Senator LUNDY—Are you working on another stream of innovation that is about the high-bandwidth interconnectivity between health centres and hospitals? I am happy for you to take that on notice to give the committee a bit of feedback.

Mr Fleming—We will take it on notice. The answer is that we have been working on the basis of the current infrastructure with the expectation that these other things are moving along. Where we would expect the high-bandwidth applications to come in would be once the electronic health record is in place and particularly when we have various parties looking to access, for instance, MRI-type data. Diagnostic images can be quite bandwidth intensive. It is as that electronic health record gets built and we get greater community care involved that we would expect that to occur.

Dr Haikerwal—One of the real concerns that came across to us in our consultations with the reform commission was the lack of access because of the digital divide; people not actually having access to their own data and so on. It makes sense that the community settings—libraries and community health centres—would be the first cabs off the rank from that point of view to at least bring some more equity to the people that do not currently have access.

Senator LUNDY—That does make perfect sense, because you are kind of like the libraries of the health services area. I would like to explore what that might look like from a health consumer's perspective in a regional or fairly remote heath centre. Is it envisaged that people will be able to be stepped through an experience of accessing their records on a PC within those health centres—that sort of thing? Is your planning that granular at this point?

Mr Fleming—If we look at the electronic health record, it is envisaged there will be a patient controlled record and the patient will decide who has access. From the research we have done we know that 78 per cent of the population have said, yes, they would want an electronic health record. Some 98 per cent of those people have said they would automatically give access to their GP and so on, because we do need them to be updated. The intention with the electronic health record is that the patient would own it and decide who they give access to. In my case it might be my GP and he or she would have access. As a patient from home or from anywhere I choose I would want access to that record. I would expect it to be very fulsome and contain not just the information that the GPs have put in there but potentially pathology data, with the ability to add to that diagnostic imaging information and so on. It is not just that we would expect that access to be in a community health centre; it would also be from my home or wherever I chose.

Senator LUNDY—I appreciate the bit about permissions to GPs and so forth, but I am thinking more about in the waiting room. If I did not have PC or internet access at home or was not confident in accessing my record, if there was a PC in the waiting room perhaps staff could introduce me to my health record in the first instance, or sort of like an avenue for training that is in a supported and knowledgeable environment. That is just a thought.

Dr Haikerwal—That is certainly in the direction that NEHTA has been running with the individual electronic health record process, which is very similar to what our commission was talking about as well. That is exactly right. It is about empowering people to take greater responsibility for their own healthcare and being able to manage it better. Those are very reasonable expectations.

CHAIR—Senator Nash.

Senator NASH—In respect of the number of GPs that are happy with the idea of going to that patient record that lodges with the patient or somewhere else rather than lodging with the doctor, are GPs getting on board?

Dr Haikerwal—In terms of the use of electronic data for things other than billing, which used to be quite dismal, we are at about 98 per cent, based on Department of Health figures at the moment from AIHW, in terms of use in general practice. The use of technology is kind of getting there. The problem is what I call a superhighway to nowhere. We have got nowhere to go with data. We have to connect up with everybody else. There is then the notion that a patient held/owned record can cause some concern, until you explain the reasoning behind it. It does not mean that the GP record disappears. That stays as it is. But the information that the patient wants uploaded to the shared record can go up at the patient's request. It does not remove or detract from what the GP is doing on the desktop and it can potentially add to it as they can bring other information down from the share the patient has had put on from other sources.

Senator NASH—I am just trying to get a better handle on how comfortable the GP profession is in moving to that sort of environment.

Dr Haikerwal—It is probably very early days, because the report came out last week. One of my roles is to see what the snags and tripwires might be, because eventually this is the way it has to be. It is a patient record, but it does not detract from the work that you are doing. Hopefully it will not stop you participating.

Senator NASH—It just might stop a few inadvertent notes being scribbled on the odd card. Thank you.

CHAIR—Thank you, gentlemen.

[12.06 pm]

DOHERTY, Mr Gary, Director, Business Development, Commonwealth Scientific and Industrial Research Organisation

MOODY, Dr James, Executive Director, Development, Commonwealth Scientific and Industrial Research Organisation

ZELINSKY, Dr Alex, Director, ICT Centre, Commonwealth Scientific and Industrial Research Organisation

CHAIR—We welcome the CSIRO. You have been sitting amongst the madding crowd for most of the morning, so I will not go through the protocol. We have a submission from you. Do you need to amend it in any way?

Dr Zelinski—No, we do not.

CHAIR—Would you care to make a brief opening statement for the committee?

Dr Zelinski—Yes, please. Good afternoon and thank you for the opportunity to appear in today's proceedings. As you are well aware, CSIRO as the national science agency has a major role in the national innovation system in addressing issues that are of national importance. In recent times the CSIRO, through its National Research Flagships Program, has successfully taken on national challenges in the areas of water, energy, health and climate change. Using large-scale multidisciplinary research partnerships CSIRO has harnessed its world-class expertise to develop practical solutions to these real world national challenges.

The recently announced national broadband network, NBN, initiative, can also be viewed as a national challenge. The five- to eight-year timeframe for the rollout of the NBN creates the opportunity for science and innovation to play a role in the delivery of high-performance broadband services for Australia. CSIRO's world-class capabilities in information, communication, mathematical, material sciences and technologies, coupled with a significant track record in telecommunications, makes it well placed and ready to tackle the scientific challenges of helping Australia deploy its national broadband network.

We believe CSIRO may be able to assist in the challenge of the rollout of the NBN in four areas. Firstly, we are working on new wireless access technology—the last 10 per cent of the NBN—that is potentially as good as the 90 per cent fibre solutions, and gigabit wireless backhaul solutions that can reduce network deployment costs. Secondly, as a trusted adviser, CSIRO could provide independent advice around network design and optimisation of network topologies, possible ways to expand fibre spans by improving the efficiency of optical repeaters, and the use of automated technologies for fibre installation by using robotic technologies.

Thirdly, CSIRO could provide technologies and advice to ensure that the NBN is a high-performance network from the user perspective which is secure and trusted, delivers quality of service and as a piece of critical infrastructure is well protected. Finally, we are working to develop new broadband applications for health, delivery of government services, mining and energy management. For us, broadband is an important enabler for many areas of future scientific research, innovation and is a key technology linking the 55 CSIRO sites across Australia and its partners in our national innovation system.

I should note, of course, that the discussed CSIRO technologies, while having great potential, are still under development. Significant risk always exists with R&D that the intended consequences are not always realised. However, we hope that CSIRO's technology and advice might create options for the government in the NBN rollout. CSIRO stands ready to assist in this important endeavour. Thank you.

CHAIR—Thank you. Is there anything else by way of opening statements from your colleagues?

Dr Zelinski—No.

CHAIR—I am very pleased to hear you say that CSIRO is working on wireless satellite provision to 10 per cent of the population. You said in your opening statement that it stands to be potentially as good. I and my colleagues around the table will have listened to that very keenly because of the view that we hold that rural and regional Australians deserve equivalent access to equivalent services at equivalent prices. What do you mean by 'potentially as good'? Can you expand on that?

Dr Zelinski—'Potentially as good' refers to the speed of access as well as the quality of access. We have to be mindful that wireless and satellite technologies, while they always seek to go faster and be more reliable,

are not exactly replacements for fibre technologies. They can be pushed out and we believe that through innovation and research you can make the wireless technologies more reliable and quicker.

CHAIR—To equivalence with fibre?

Dr Zelinski—One of the things about fibre is that it is a future proofed technology in the sense that currently it is at 100 megabits; potentially you could go to 200, a gigabit, 10 gigabits and so on. Wireless is always lagging and the current access speeds are not at the 100 megabits per second. We think they could be sped up significantly to match the current stated standards of 100 megabit fibre access.

CHAIR—Other witnesses have suggested that there is the potential for wireless and satellite to leapfrog over fibre in some way. Do you think that is a prospect?

Dr Zelinski—I am unaware of that position.

Dr Moody—Dr Zelinski said that fibre would usually trump the other technologies. Research and development is necessarily a risky place, but of course technology development does continue. Our role is to help advise government on some of those at the forefront of technology so it can be taken into account as the NBN gets rolled out. It is all about the mix. It is very hard to say one technology over another. It is about the implementation of the mix in the right environment, and all those things have to be taken into account. Our role with CSIRO is to hopefully bring some advice, if required, around the forefront of technology.

CHAIR—In that capacity it is public knowledge that there is no overall cost-benefit analysis of the NBN proposition at large. In the capacity of advising government has CSIRO provided or been asked to provide a cost-benefit analysis of the work that you are doing, particularly the provision of satellite and wireless services to the 10 per cent?

Dr Zelinski—No, we have not.

CHAIR—You have not been asked?

Dr Zelinski—No.

CHAIR—Is that the sort of work that your organisation would have the expertise to do if asked?

Dr Zelinski—That is an interesting question. We are essentially technology developers and provide solutions in that space. Of course, when we look at any technology we always try to evaluate its potential impact. Will the health technology potentially be able to save lives? Will an environmental technology save/reduce costs and so on? We do that sort of modelling at a core scale, but we certainly do not offer services where we would go out on a national scale to offer cost benefit and valuation of a proposition that is out there.

Dr Moody—A cost-benefit analysis is much more than just the technology side. There is a whole lot of other dimensions and that is something that I do not think CSIRO would be qualified to look at.

Senator NASH—Any cost-benefit analysis would be good at this stage.

CHAIR—It would. Your submission essentially says that this bit of the service delivery will not be economically viable, correct? I understand your submission is essentially saying that, but Dr Moody is correctly suggesting that in a cost-benefit analysis there are other factors that you would take into account; is that right?

Dr Moody—Our submission is just trying to present one option. That is the way you might like to look at it. We understand, once again as Dr Zelinski said, there is impact from the technology that we do. There is a lot of risk involved, because these are all recent breakthroughs. But the term of reference that we were trying to address was No. 2e, I believe, which was around the prospects for future improvements in broadband infrastructure and services. We took that one to heart to say there are potential prospects out there. There is a lot more work that would have to be done around what this might mean into the future.

CHAIR—In terms of the work that you are doing are you adequately resourced? You have the expertise to do it, but are you adequately resourced to do it within the timeframe that you will essentially need to do it in?

Dr Zelinski—CSIRO has established a new theme or a large research project in this area. It is resourced at about $6 million per annum currently in this domain area. We are always seeking partnerships as we go forward, be it with commercial partners, government authorities, state governments and vendors, to actually help us further develop the concepts and invest in the proposition. Currently we do not have all of those partners lined up, but we are certainly seeking them and we have made our own investment, which we are projecting to carry forward over the next three to five years.

CHAIR—The short answer is: only if you get outside help, is it?

Dr Zelinski—We continually partner to deliver impact for Australia. CSIRO very rarely does something on its own. We actually go out to seek to work with a partner, be it with the agricultural/rural community, to deliver solutions in the water space or the environment space. Partners usually bring contributions with them, and that is how we generally work. Dr Moody might like to add to that.

Dr Moody—The key element is that partnerships are much more than funding or whatever it is. For us to have impact from the science and technology that we develop we need to partner with different agencies, industry, communities or whatever it might be. That is the thing that we are really interested in. We have made an investment within CSIRO. We brought together different parts of our portfolio into a new area because we believe this is such an important national challenge. We have made our own investment in that and now we are talking with a whole range of partners around making sure we have impact for that area.

CHAIR—Without those partners and without those contributions from those partners in whatsoever kind, CSIRO will not be able to realise, if you like, return on the investment that it has made thus far?

Dr Zelinski—We continually prioritise and reprioritise our work as we go forward. Sometimes it means through partnerships we may increase or decrease our investment. We continue operating within a finite envelope of resources. We have delivered technologies as required. In the end our priorities continually change and we adapt to those priorities. It might be that if we cannot secure a particular partnership in this particular space we may look to our own resources, but that will be decided as the project is rolled out.

CHAIR—Thank you. Senator Nash.

Senator NASH—Thank you, gentlemen. It is good to see work being done focusing purely on the regions. In terms of the satellite, obviously compared with wireless it is not economically viable, but I think you say for the last one per cent satellite should—

Dr Zelinski—One per cent to two per cent.

Senator NASH—Do we take from that, given that it is not economically viable, there is going to have to be ongoing government assistance to maintain that into the future as part of the overall network?

Dr Zelinski—The challenge with satellite technology is the bandwidth. Those communications are currently around 10 gigabits per second. The next generation are scaling to 100 gigabits. There has been talk that some years out there might be a 900 gigabit satellite. But these have to be launched, deployed and so on. There are ways to maintain the viability of that technology, but what CSIRO has been looking at is whether there are ways that we can reuse the digital dividend, the analogue TV spectrum, and use that as a communications medium; in other words, use science and—

Senator NASH—I will get to that in a second.

Dr Zelinski—We are looking at it more or less as a chance to replace. But in the end I am sure there will be places even with the proposed technology that we are thinking about developing or endeavouring to develop that may not be reached, so you will still need a satellite solution.

Senator NASH—Yes, absolutely. I suppose what I am trying to get at really is the delivery mechanism. If we are talking about a wholesale network across the 100 per cent, whether it is fibre, wireless, satellite or however it ends up, if as you say that satellite component is not economically viable who is actually going to deliver that satellite service? If it is purely commercially then is that not going to require an ongoing subsidy from government to maintain it?

Dr Moody—I am not certain that we have actually said in our submission that it is not economically viable. What we have tried to put forward in the submission is that there are different options available as part of that mix. Technology is always advancing. It may be that we put forward one particular technology, which in another three weeks could be suddenly made redundant by another technology. That is the nature of research and development. What we wanted to really try to do is give you a taste of some of the prospects for those future improvements in size of technology that may be coming down the pipe.

Senator NASH—We are very thankful for that. In terms of wireless, can you give us a bit of an idea how the wireless backhaul is going to work?

Dr Zelinski—In the sense of how it will work technically?

Senator NASH—Yes.

Dr Zelinski—Essentially there are already microwave systems out there. We are actually talking about operating in that space. We have built systems in that space and it is effectively stacking up frequencies in the microwave case and to build these. We have already built a six gigabit system—demonstrator. It was over a shorter distance of one to two kilometres. That was technology developed two years ago. We believe that technology or approach is scalable to build, say, a 15 gigabit system. But effectively it is a way of dynamically allocating frequencies. You could actually build a 15 gigabit system by just stacking up these links one on top of the other, but you would have a whole bunch of these dishes. What we are talking about is through smart electronics and so on being able to switch the system in to actually allow it to dynamically allocate that frequency as required. Mr Doherty may want to add something to that.

Mr Doherty—And extend the range to about 50 kilometres. We believe we will have a six gigabit per second point-to-point microwave link for backhaul within the next 12 to 18 months. If you look at the current technologies, they are about a quarter of a gigabit per second, so even that is a substantial improvement. There is potential with research to take that further

Senator NASH—I think you mentioned over 50 kilometres potentially.

Mr Doherty—Yes.

Senator NASH—Can you give me a practical example of where that would work? Would that then link into a fibre backhaul network?

Mr Doherty—Yes.

Senator NASH—What you are talking about is extending the backhaul out off the fibre network to get that deeper penetration; am I right?

Dr Zelinski—Yes.

Mr Doherty—Yes, that is correct.

Dr Zelinski—We have not tried to do an analysis of the whole of Australia but looked at a case where such a system could be deployable. We actually found two towns just from analysis—Rainbow Beach in Queensland and Stewarts Point in New South Wales.

Senator NASH—Where is Stewarts Point?

Dr Zelinski—That is a good question.

Mr Doherty—It is on the central to north coast. These towns are in remote locations not near highways, so where you would expect the fibre to be laid. They are within about 50 kilometres of another town that you would expect fibre to be run to reach that point of presence. They are also coastal towns adjacent to national parks, where you would not expect that people would want trenching to occur. They are a couple of example towns we have selected where this backhaul solution might be more appropriate.

Senator NASH—This is interesting. If they did not want trenching they presumably would not want thumping great dishes or anything nearby, would they?

Mr Doherty—I guess that is something they would have to make a choice about. These are 50-metre towers, so they are not huge.

Senator NASH—Just on the issue of the spectrum, which you also raised in the submission, and the idea about taking it from the analogue TV, again, I suppose it is a chicken and the egg. As you say, you are just developing all of this technology. But in a perfect world for the type of wireless that you are talking about— over, say, that 90 per cent to 98 per cent—is the spectrum available to do that? Perhaps it is not currently. Apart from analogue TV would that be enough even if the government chose to access it through those sorts of arrangements or are there other areas? Is there simply enough spectrum to support it, taking into account the potential scalability as well?

Mr Doherty—There are two solutions. One is the backhaul solution and the other is the regional access solution, which is the way in which we provide 100 megabits per second to the subscriber. One is backhaul and one is a local access connection at a much higher bandwidth than other wireless solutions. That will require 35 megahertz of the TV bands that will be freed up with the conversion to digital TV. We have quantified the amount of spectrum that is required. The exact frequencies for that can vary.

Senator NASH—The 35 megahertz is out of a total of how much that will be available, just roughly?

Mr Doherty—It is a bit hard because the bands are not contiguous. UHF is about 300 megahertz and VHF is between 45 megahertz and 230 megahertz. There is quite a bit of spectrum there.

Dr Moody—I believe that is about five TV channels; is that not right?

Mr Doherty—Yes.

Senator NASH—In layman committee language. Do you have any idea of what the competing interests will be to try to obtain that spectrum when it is freed up from analogue TV? If it is not going to go to wireless is there any—

Dr Zelinski—That is not for us to comment on.

Senator NASH—I am sure it is not.

CHAIR—Senator Macdonald.

Senator IAN MACDONALD—Being a bit parochial, we have had submissions from the Torres Shire Council stating that they cannot get high-speed broadband and are finding difficulty in getting any sort of reliable connection in the islands, many of which you will recall in the eastern area are quite mountainous. Does CSIRO have solutions for how you might provide high speed or reliable, which is what they are after, communications to those sorts of islands?

Dr Zelinski—In principle our technology could address those types of situations, but specifically I would have to take that question on notice to go and have a look at the exact configuration. You would need at some point a backhaul point, a transmission tower and so on. If you are transmitting over water there may be other challenges associated with that. Off the cuff, I think there is some potential in that space, but in order to say categorically that is the case we would have to take that on notice.

Senator IAN MACDONALD—Have you been commissioned by anyone to look at places such as the Torres Strait islands, perhaps Mornington Island or some of the more remote communities in the Northern Territory and northwest of Western Australia?

Dr Zelinski—We have had some discussions in the Northern Territory but not with the Torres Strait Islander Commission or any of those agencies. We have had some discussions with the Northern Territory government about the very technology that we have been talking about today to see whether they would be interested in conducting a trial or a deployment and to test out these types of technologies.

Senator IAN MACDONALD—Is it something that you are proactively 'selling'? Are you out marketing this technology or are governments contacting you?

Dr Zelinski—Our job is always to engage. We are continually doing new research and new technologies. We continually seek to partner or to engage with external stakeholders who potentially could benefit from our technologies. This is an ongoing process. This technology that we are developing at the moment is still in the laboratory stage. We have actually had some recent breakthroughs. It promises what we are hoping to deliver. We are still a way away from actually deploying it, but we are now starting to think about where we could do this and who we should do this with. It is really a case of establishing a list of potential partners or stakeholders that we could engage with and then systematically approaching them.

Dr Moody—As Dr Zelinski said at the very beginning, most of our conversations are not just around this one particular technology that we are focusing on now. It is about technologies. It is about the network itself. It is about the applications that we can build. Generally that is the broader picture and the broader engagement that we have around the entire broadband space with many different parts of Australian society, community, industry and so on. Where applicable we believe the technology is just one more potential option, but of course it needs more development. The other space where we have been engaging with state governments or other parts of government is on the health space. For example, in telehealth or in energy and the smart grid space. All of those go into a broader mix. We believe one of the real strengths of CSIRO is that we can actually bring together all of those different parts of the system into one place so that you can bring together expertise in health, together with expertise in wireless and ICT, and put it all together and say, 'Here is a potential solution.'

Senator IAN MACDONALD—Would I be right in assuming that the federal communications department has commissioned you to assist it in the rollout into these more remote areas?

Dr Zelinski—We have not been commissioned by the department.

Senator NASH—Why do you think that is?

Dr Moody—That would be a matter for the department.

Senator NASH—Why am I not surprised by that answer?

Dr Moody—That being said, we are always talking with departmental colleague around issues.

Dr Zelinski—We regularly provide briefings around our technologies.

Senator IAN MACDONALD—As I said, I would have taken it as being barely worth raising as a question to you that in this rollout they would have had you on board. Perhaps they are using someone else that they think is better. Are you aware of that?

Dr Zelinski—We are unaware of the advisers the government is using.

Senator IAN MACDONALD—It is the sort of thing where you people over a long period have shown some expertise.

Dr Moody—Not to give the wrong impression; we have, of course, been talking to the department. When we are asked for advice we give advice, of course. So, yes, we are engaged with the department.

Senator NASH—But not on this?

Dr Zelinski—Not on the specific four challenges that we have here in front of us. We are in the early stages of discussing this option. As I said, these are recent developments. The patents have only been filed recently, so you cannot really go out and talk about these in a public sense. We have got to the point now where we believe we have something which is potentially viable and we are now trying to engage with industry, governments, agencies, vendors and so on.

CHAIR—That is good. So, I do not need to remind you that these proceedings are indeed public.

Dr Zelinski—Yes.

CHAIR—Senator Macdonald.

Senator IAN MACDONALD—Just completely from left field, for the advice you would give a government department you would certainly send a bill; is that correct?

Dr Moody—It depends on exactly what sort of advice. Sometimes for government departments we do commissioned work and that is around specific questions or otherwise. Sometimes it may just be that we will give advice as required, where literally CSIRO is here for the national challenges, whether it is in water, health or all of these different areas, including broadband. If we are asked for advice, it is part of our role to give it, if we have the answer already. If it involves more research and development or creating new knowledge, then we look to find ways to fund that. For us it is always a question of quality as well. We want to make sure that the advice we give has a quality backing behind it. If there is existing knowledge, we are very happy to share that with departmental colleagues. If it is about new knowledge, we have to do some work to make sure that the knowledge is quality assured.

Senator IAN MACDONALD—This is getting into a bit of hyperbole as well as hypothecation almost.

Senator LUNDY—As least you admit it up front.

Senator IAN MACDONALD—Would you be expecting that you would be engaged to help with the rollout of the NBN in more remote or difficult places?

Dr Zelinski—CSIRO is always ready to assist.

Senator IAN MACDONALD—Are you expecting to be asked?

Dr Zelinski—It is nice to be asked, and we hope we are asked, but sometimes we are not.

Senator IAN MACDONALD—It is just something that this committee might look at. It seems incredible to me that on a major undertaking that is going to cost us $43 billion these sorts of things have not been proactively looked at from the beginning. You are obviously doing work that would be of assistance. I cannot believe it would not all come together.

Dr Zelinski—I might add that the work we have done has not been in the public space. It is not technology that you can go down and buy through a catalogue.

Senator NASH—A lot of the stuff the government is doing is not in the public space arena.

Dr Zelinski—We are in the business of, through innovation, creating new options for the government. Options can be selected or not selected. Likewise, as we said in the opening statement, there is always risk

with research and innovation that, yes, we think we can do this, but sometimes research does not deliver exactly what we intend it to do.

CHAIR—I have a question in response to that. Understanding that these have been in development for you and therefore there are confidentiality issues, the government requires of parties in this process confidentiality in coming to government, if you like. Would you not have had sufficient trust in the department to trust the department with confidentiality or indeed the government to let it in on your secret in time for it to have been taken into account in the planning?

Mr Doherty—We have a very good working relationship with the Department of Broadband, Communications and the Digital Economy.

CHAIR—We just want to explore the 'very goodness', I think.

Senator NASH—Our surprise is merely a compliment to the CSIRO and the work you are doing.

Dr Moody—That is a genuine statement; we do have a good relationship with them. We also believe that, when the time comes, as part of this rollout—and our advice is appropriate—we will be engaged with it in one way or another. In terms of the options, we also realise that there is a whole large mix of things that they have to take into account from the policy side and from the rollout side. They are aware of these particular technologies, and therefore we assume that will be taken in the right time as part of the mix.

CHAIR—Senator Nash.

Senator IAN MACDONALD—I was just going to make a comment in finishing. What you are doing will give a lot of people hope that perhaps they might be in a situation where they can participate in what everyone else in Australia is hoping to participate in. This is good work.

CHAIR—Senator Nash.

Senator NASH—I just wanted to clarify something that is probably quite obvious. As to the one per cent to two per cent that you are talking about for the satellite and the 90 per cent to 98 per cent for the wireless, the one to two per cent for the satellite is obviously on the geographical constraints where wireless is simply not going to work in some of those particular areas?

Dr Zelinski—We have tried to reuse infrastructure. The analogue TV channels do have broadcast towers. What we are proposing to do is to reuse the broadcast towers as the communications points for these wireless point-to-point solutions. We have a good distribution of broadcast towers around Australia, which access most Australians, but not everyone picks up a TV signal. What we are talking about is that very small number—I cannot tell you exactly what that is, but it is in that one per cent to two per cent area potentially, or maybe even less, that you will need to look at satellite technology.

Senator NASH—Given that you are working off those broadcast towers, would you then be able to provide the committee with a geographical map of where that 90 per cent to 98 per cent is going to lie?

Dr Moody—We are not sure how much access we have to that information.

Mr Doherty—We provided in the paper some information about Griffith and the reach in Griffith.

Senator NASH—I am asking more in general. We have had some difficulty in actually getting some geographical description of where all these percentages lie. You are obviously working off those existing towers. We are just trying to get a more tangible understanding of exactly where 90 per cent to 98 per cent geographically on a map of Australia is going to lie.

Dr Zelinski—I might add that when we did the study we looked at an innovative way to be able to provide wireless access. It appears that the analogue TV channels reach a large percentage of the population. We did not go through and check exactly what that was. We looked at some subsets of indicative regions. Griffith is one area where we did a study to understand how you could roll out this proposed technology against existing technology solutions, and that is in the submission.

Dr Moody—There is obviously a list somewhere around broadband towers, but there is a whole lot of other factors you would have to take into account, including the digital elevation models and so on. There is quite a big body of work that you would have to undertake to get that map.

Senator NASH—So that is a code for 'still no map'. Thank you.

CHAIR—Senator Nash just asked a question.

Senator LUNDY—She has really picked up the issue that I wanted to ask you about, which is the extent to which you have been able to cross-reference your ideas with a geospatial and topographical illustration of the Australian landscape to try to identify where these holes are. The tough lesson out of the Opel exercise and the department's production of maps during that course of action showed everybody that there were topographical details in communities that precluded certain types of wireless technology. My question is: to what extent have you cross-referenced your analysis to date with geospatial and topographical features of communities that would inform whether or not you can get the signal where it needs to go? I had a thought on the back of Senator Nash's question. Have you cross-referenced it with the existence of current analogue television black spot data, given there has been government programs running for well over a decade targeting television black spots, which is the analogue bandwidth that you are looking at targeting.

Dr Zelinski—The answer is that we have not done that work. We have done the preliminary work. The other aspect of the technology that we are trying to develop is that it is using these MIMO technologies, which is Multiple Input Multiple Output antennas—beamforming is the name of the technology—that allow you to create point-to-point links between the receiving station and the transmitting station.

Senator LUNDY—It is potentially to get around hills?

Dr Zelinski—Hills and the black spot solutions. We are aware that there are many potential interferences. It is a technology that we think is less susceptible to interferences due to elevation, trees, objects and so on. Nevertheless, we are in the early phases of the work. If we can find a way to support potential partners and stakeholders to take this work further obviously that would be one of the works we would undertake.

Senator LUNDY—I am not sure of the status of the government held public sector geospatial information. I know it is publicly available in the UK and the US. It is a pet campaign of mine to make it available for research and to everyone who wants it here in Australia. It may well be available, but from a government policy point of view, and from my perspective, it is linking that prospective of using wireless networks with very accurate geospatial and topographical information—all that sort of information that will actually start to make it real, assessable, quantifiable and measurable as far as the NBN is concerned. Thank you for your evidence. It has been really interesting.

Senator NASH—And well done on the work you are doing.

CHAIR—Indeed, it has. In respect of the paper that you have provided, are you wishing for it to be tabled, in which case it becomes public?

Dr Zelinski—This is a very high-level summary of our presentation. It just goes through the basic issues and there are pictures there that illustrate some of the concepts we are working on. I do not know whether it will add a lot to the submission, but it may help illustrate some of the challenges. We focused only on one challenge today. There were three other challenges where CSIRO could really make a big difference. That is not only in the deployment but also in the network operations and in the applications.

I might add that in Canberra we have our broadband health demonstrator, called RID/ES. The next time parliament is sitting we are happy to invite senators to have a look at this technology. It is a technology that relies on 100 megabits of bandwidth, but it allows you to do remote diagnosis of patients. That is another area where CSIRO is working.

CHAIR—Would this be viewable in Canberra?

Dr Zelinski—Yes.

CHAIR—We will ask the secretariat to investigate and pursue that offer with you. Thank you very much. I would like to clarify whether you are accepting of this being made public?

Dr Zelinski—Yes.

CHAIR—Thank you. Here is to CSIRO continuing to be able to help and making a difference.

Dr Zelinski—Thank you very much.

CHAIR—The committee will suspend for lunch.

<center>**Proceedings suspended from 12.47 pm to 1.48 pm**</center>

KRISHNAPILLAI, Mr Maha, Director, Government and Corporate Affairs, Optus

CHAIR—To kick off this afternoon's proceedings we welcome Mr Krishnapillai from Optus. You are familiar with the rules and regulations that govern proceedings of this committee so I shall not repeat them. Would you care to make an opening statement?

Mr Krishnapillai—If you will indulge me, that would be great.

CHAIR—Thank you.

Mr Krishnapillai—Thank you for the opportunity to speak today. I might just read out a prepared statement and then I am happy to take questions on that basis.

Optus has made a written submission to the committee since its terms of reference have been expanded to include the decision around the government's new fibre-to-the-premises venture. These talking points cover the main areas of that Optus submission.

First of all, I will deal with the viability of the NBN. Optus categorically welcomes the fibre-to-the-premises network as an opportunity to change the landscape in our sector. We believe it is a once in generation opportunity to significantly change competition in our sector. The challenge for the government is ensuring that that new network is financially and economically viable. This can only be achieved if the take-up of services is high, prices are affordable for consumers and the network earns the appropriate rate of return to attract private sector investment.

End user pricing in return, generated by NBN investment, will be determined by two key factors, firstly the actual capital bill cost and, secondly, the level of take-up of services in that new network. In our view, the government estimate of $43 billion cost is at the absolute top end and could be significantly lower, particularly by utilising existing assets across the sector. For example, Optus's HFC cable network could be upgraded to a full fibre-to-the-premises solution at a cost far below the deployment of new fibre to each premises in those locations. Build costs can also be reduced by aerial deployment of fibre, rather than burying underground. The visual and environmental impact of this aerial fibre is significantly less than the HFC cable rollout of the mid-nineties and, in fact, the fibre-to-the-premises optic fibre cable will be thinner and close to equivalent to electric cables, far thinner than today's HFC cable. The fibre-to-the-premises cable does not have conductive properties in the same way that HFC cables do and can therefore be deployed much closer to existing overhead electricity cables.

For the NBN to be viable it must provide services, as we indicated in our submission, to more than 60 per cent of Australians. This is achievable. In places like Japan and Korea, two leading fibre-to-the-premises markets, residential and business penetration was that high or higher within the first few years of rollout. We believe the maximum wholesale price should be $50 on average for residential customers, ideally less, in order for the average household to pay no more and, indeed in significant circumstances, less than they do today.

I now touch on challenges for the NBNCo. The government must encourage all present participants to put their traffic on the NBN. Having two national networks running side by side will result in one or both networks failing to deliver to their full potential or failing altogether. The critical risk factor for NBN is a vertically integrated Telstra competing against it.

The HFC experience gives us an empirical example of the difficulties facing new entrants seeking to win customers away from Telstra. Telstra will go to any length to protect its inherited monopoly position on which it earns up to 60 per cent to 88 per cent margins on its current fixed network.

Optus rolled out HFC networks in the mid-nineties in the most commercially attractive areas of Sydney, Melbourne and Brisbane. Telstra then rolled out its own cable network, following Optus's cable street by street. Telstra has overbuilt on the Optus cable and its own copper to defend its existing telephony revenues from new Optus cable. Both Optus and Telstra were forced to write down their cable investments by over $2.4 billion over that period of time.

The clear lesson for government is an NBN rollout alongside the existing Telstra network will mean retailers using the new network will face the significant challenge of winning customers away from an uncooperative Telstra. Telstra could take the NBN head on with targeted price reductions, selected upgrades of network in some areas to match the NBN speeds and by locking customers, as we understand they are doing now, into long-term contracts.

I turn to regulatory reform. Telstra's vertically integrated structure has been the key impediment to competition in the fixed-line market. The present regulatory arrangements do not fit to regulate a powerful vertically integrated incumbent, as I noted last time in front of the Senate hearing. This is unique in the world. Telstra's position, and the position the incumbent has achieved over the last decade or so, is unique in the sense of being able to segue its dominance in fixed telephony, across into pay TV and particularly pay TV content.

Optus and others, including the ACCC, have argued for the structural separation of Telstra. The government should require Telstra to be structurally separated through legislative change into an access services company and a retail company. Each of these should be operated independently, on arm's length terms, through some sort of ring fencing arrangement. This structure could be implemented by giving, for example, Telstra's existing shareholders two shares for each share they hold today. One share in the existing retail entity and another share in a new ASC. The ASC would hold all of Telstra's existing fixed line infrastructure and assets and would provide wholesale only services to all retail providers.

Implementing structural separation of Telstra now is critical to help underpin the future viability of the NBN. The separated access services company would provide an appropriate foundation vehicle for the NBNCo. Separating Telstra now will also have clear benefits for competition in the fixed-line services market today. A healthy market structure, or a sustainable market structure, would lead to improved customer choice, affordability and innovation. This will put the industry in the best jump-off point for mass migration of customers and businesses to the NBN. In the absence of structural separation, Telstra should be required to set up a separate access services company which is legally and functionally separate from its related retailing entities.

However, separation is only part of the equation. It needs to be combined with a clear legal obligation to provide access on a genuinely equivalent basis, such as implementation of a clear equivalence of access obligation and strengthening the powers available to the ACCC to take effective action. The most effective form of equivalence is equivalence of inputs, obligation standard, as adopted in the UK, New Zealand and now Singapore. This would mean the ASC and subsequently the NBNCo would have to supply all access seekers with the same service, on the same terms and conditions, including price, using the same operational and IT support systems and with access delivered in the same time frames.

Optus also believes the ACCC should be given stronger powers to regulate terms and conditions of access for fixed-line services.

Finally, I might pick up on a couple of comments that were in the press this morning. First of all, I cite the comments from Telstra regarding the apparent technical breach of provision of information is once again, in my view, an attempt to create fear, uncertainty and doubt, and continues its rather underhanded attempt to imply that only Telstra can build an NBNCo and only Telstra can be trusted with this information. This is clearly not the case and we look forward to seeing what this 'technical' breach of this information actually is. We regard this as a slur across the sector.

Secondly, in terms of the AFR article this morning that Telstra faces fines of up to $300 million for a series of lost-the-keys incidents with capacity at local exchanges where competitors were looking to introduce competing infrastructure, I highlight that the original quote or media release from Telstra on 19 March 2009 had David Quilty originally saying:

The ACCC is suing us for something we proactively and voluntarily reviewed and fixed a year ago. The case relates to a small number of inadvertent process issues. This is an issue and we fixed it—without the involvement of the ACCC. Since we fixed the problem a year ago, the ACCC has not once suggested it had problems with our new processes.

Mr Quilty also said:

The ACCC has consistently campaigned for greater powers to meddle in the telecommunications industry. Taking court action a year after this issue was resolved is a clear demonstration of what is wrong with the current regime and the way it is administered.

For once I agree with David Quilty; it is a clear indication of what is wrong with the current regime and the way it is administered. The clear implication from Telstra's alleged attempts to admit liability and therefore admit to settling the court case is precisely the sort of example we have been talking about for the last decade, and that is a series of examples of the incentive and ability for Telstra to not only use the litigation process to develop pricing strategies that lock out competitors, but to also use a whole series of non-price terms and conditions, and even access to exchanges and access to IT systems, to make it more difficult for any

competitor to offer competing services. This is a crystal-clear example of why structural separation must and can be the only solution to fundamentally change the dynamic within our sector. I might leave it at that.

CHAIR—Thank you for that customarily unprovocative opening statement. Senator Minchin.

Mr Krishnapillai—I toned it down.

Senator MINCHIN—I will just divert because the issue that you just raised is important, given that some of us were at that hearing yesterday. I think it was in response to my line of questioning that this issue came out. At the risk of sounding like the counsel for the defence of Telstra, which I would not want to be, I should add that I thought it was good that Telstra appeared before the committee yesterday to talk about the NBN bill. I thought their approach was constructive and positive in relation to the government's NBN legislation. I was questioning them about the security of information which they or any other utility might supply in the course of the development of the implementation study, and pressing them on their satisfaction with the whole RFP process and the security of information there as a model for what is now proposed. I have got to honesty say that it was really in passing, not developed and not pursued by us, that a mention was made of a technical breach that was drawn to their attention by the department. With respect, I detected no endeavour to put this on the table as some big demonstration of their lack of confidence in the arrangement. I thought it was in passing, not pursued by them, and only in response to questions and only as a result of the department writing to them about it. I just put that on the table; take it or leave it.

CHAIR—To clarify, the proceedings yesterday were not of this committee. It was a separate committee.

Senator MINCHIN—Yes.

CHAIR—Thank you. Senator Minchin.

Senator MINCHIN—Your fundamental thesis really is that essentially the NBN is not viable unless the Telstra network is effectively rolled into the NBNCo, that we cannot have a situation where you basically have copper competing with fibre. The government says this has got to be commercially viable, so it does depend on somehow getting Telstra involved in the NBNCo. Can you explain further how you would like to see this play out? Your preferred option is that the parliament legislate Telstra and create two separate companies. Then what? How do we achieve that? That has not solved the problem in itself. You have then got a wholesale Telstra company operating a fixed-line network with shareholders who want a return on that and apparently a $20 billion asset there that they will want to work. How do we get from that point, because that of itself does not solve the problem? How do you get from there to a monopoly provider of optical fibre?

Mr Krishnapillai—Our starting point is that the fibre-to-the-premises network, as outlined in the government's policy, is an essential prerequisite for Australia to participate fully and effectively in the twenty-first century economy. The debate has gone away from that particular point. From the point of view of our sector, we underestimate the transformational power of broadband across the entire economy. The ability for businesses to be more efficient and the ability for health, education and other government services as well to be delivered in a more effective and efficient way is the starting point. It is crucially important that the fibre-to-the-premises network gets built but, secondly, gets built in the right way, so it has as much open access and as much potential for retail competition as possible. Clearly, in the future, the differentiation of companies like Optus and others across the sector were built on things like IT systems, products and services, broadband applications, customer service and so on that differentiate our offer from any other retail provider. In our view, that is where the intelligence of that network will become, not out of the fibre itself.

In terms of what the fibre itself will look like, our view is that it will be a commoditised utility based network. The differentiation will be limited between one sort of fibre and another. The clear view, in terms of our modelling, is for that to be delivered at the cheapest possible utility rate of return, without excessive amounts of risk built into that particular return, you need to have a single network. For that to be a single network you therefore do need, as you have highlighted, to have the bulk, which in our view is 60 per cent of the traffic, to be commercially viable going across that new NBN. As you have highlighted, the issue evolves down to how we involve Telstra and what incentives we put on Telstra to change its modus operandi from the last decade to work with the industry and the government to actually make the fibre-to-the-premises network successful.

Our view is that the short-term way to do that is to change the incentives for Telstra behaviour. That clearly means a structurally separate Telstra, first and foremost, where the incentives around an access services company are built around maximising revenue and traffic on that particular network, rather than choking off demand in order to protect its existing margins. Secondly, it also requires the incentive for that ASC to, over

time, move into what we see is the future network, which is a full fibre network. In our view, the incentive to do that has to be built around getting the regulatory reform process right today, changing the incentive around management, IT systems and everything else with an access services company and, as you point out, our view is that we do need Telstra involved in that particular process.

Senator MINCHIN—Just to pursue that, presumably the way that would occur would be that Telstra, in a sense, by some financial and cooperative arrangement with NBNCo, effectively sells in its existing network in return for equity in the company, which might be the 49 per cent that the government says is on offer in NBNCo. There is a $20 billion asset sitting here that has got to be dealt with somehow.

Mr Krishnapillai—First of all, we would not accept that it is a $20 billion asset.

Senator MINCHIN—I am only referring to the government saying that that was the stopper on the RFP process, but whatever it is.

Mr Krishnapillai—The costing on that particular asset, as is the ULL process today, is based on pretending you dig up every street, rebuild and cover with concrete every driveway in the country, that that is the cost. That is one of the fundamental flaws, if you like, in the way costing is done today, the pretence that we reinvent the network every year and, therefore, what costs would be associated and what access price is built out of that.

Leaving that to one side, the key for us is that there does have to be a deal or an arrangement that suits Telstra, Telstra shareholders, the industry and, in fact, also the government. Our view is the potential for that is there when you start to look more strategically at the sector rather than have a short-term or backward looking view of protecting past margins. To be colloquial about it, I think the jig is up. I think Telstra, at some point, needs to realise that its existing behaviour and incentive to protect its 60 per cent margins is a strategic approach that is no longer going to be relevant in the future. In the longer term that copper based network will have inherent and quite significant disadvantages to a fibre network. Even Telstra themselves, when they put forward a proposal to your government in 2005, outlined that they knew that they had to move to a fibre world. The question is how do you make them do that through a single government network, rather than doing it through some other mechanism. It is going to happen anyway, so to me it is about making sure that you get the right incentives in place to get that to happen in a cooperative way rather than a destructive way.

Senator MINCHIN—You do not think that outcome is achievable without full separation to begin with. Presumably the government is already talking to Telstra about the basis on which it might now, absent full separation, come to some commercial arrangement in relation to its fixed-line network.

Mr Krishnapillai—We do not identify that as a forced separation. We see it as two things. Firstly, it is a recognition possibly by the Telstra board that it is in our long-term strategic interests as a business and as the major player in this sector to be involved in the future of the sector, which will be a fibre future. That is the first one. Secondly, in terms of the ability for the government to set rules and regulations, clearly our view is that Telstra does not set the rules, and should not set the rules, around its participation in the sector, nor its ability to offer services. The government sets licence conditions; it sets rules and regulations for every sector about how you participate and under what circumstances you can participate. In our view, the government is therefore fully entitled to set forward licence conditions or other requirements that, if you want to participate or offer services in a particular market, these are the rules that you have to offer them by. For example, a licence condition could be that if you have more than a certain percentage of the retail broadband market you are unable to offer wholesale broadband services. It is not being forced to do a structural separation. You are saying to them that if you want to behave and offer services in a certain way in the Australian marketplace, government sets the rules around that and those rules say to you that the way that you can do that is to structurally separate voluntarily.

Senator MINCHIN—I read your submission as saying that the parliament should simply legislate to force this separation and then the process can begin. You are saying that you accept that it would be preferable if they came to that conclusion themselves.

Mr Krishnapillai—Yes. What I am trying to say is that there are two parts to it. I strongly believe that it is in their strategic long-term interests, but clearly I am not a Telstra board member. Secondly, to make sure that it is very clearly within their strategic long-term interests, I think the government should look at changing the legislation to make that more apparent.

Senator MINCHIN—Just as a passing note, certainly my experience in government was that when examined this question of, as you put it, splitting Telstra into two companies and giving a share each, so to

speak, does not account for the loss of inherent value in being vertically integrated. There would be a loss of value there, which would imply compensation or something. It seems to me, even under your scenario, that it would be better to achieve this outcome without forced separation involving compensation and so on.

Mr Krishnapillai—It is debateable that there would be a loss of value. There are many companies that choose to de-merge for a variety of reasons; they can unlock value in parts of the business that are held back in other ways, partially from regulatory settings and so on. I certainly would not accept that there is necessarily loss in value. Secondly, if there was a loss in value, maybe the value is attributed to the fact that they have a nice little monopoly business. In terms of the broader economic responsibilities that the federal government has, it is not appropriate for them to continue to retain that nice little monopoly business.

Senator MINCHIN—Your scenario, which is common among many of those who have submitted to us, is that inevitably this provider, NBNCo, of optical fibre, fixed-line service must be a monopoly provider. That is the only way it can work, and the government's open intention is to privatise this, so we will move from having Telstra as the monopoly provider to NBNCo as the monopoly provider, but potentially, under the scenarios that we are describing, with the former Telstra wholesale as a 49 per cent shareholder in this business. Is that something that would concern you? Is that a scenario to be avoided in your view?

Mr Krishnapillai—The logic, from our point of view, is that in order to get as low a rate of return on investment as possible and therefore to have the appropriate utility type pricing, we believe that you need to de-risk as much of that business as you can and clearly the major way you can do that, in financing terms, is to have that as a monopoly business. The other advantage to that is rather than focusing on just commercial or potentially commercial areas, you can significantly roll that out to a far higher percentage of the population— 90 per cent is the view that we have been working through in terms of our modelling.

If it is, indeed, recognised that you want to have that as the lowest possible build cost and low as possible access pricing, it should be a monopoly. Secondly, as I pointed out, we do not see the ability to differentiate those types of fibre as residing at that build layer; we certainly see that at a higher broadband application layer. Once you go through that process then you accept that if you are going to have one particular network it is important that that company is unable to compete in the retail market, which is a key principle, and that the ACCC has much stronger powers than it has today to set pricing up front, rather than this ex ante, decade-long period of litigation we have had on say ULL pricing. ULL pricing is an interesting one. That was declared not long after 1997 when the regime was changed. Twelve years later, we still do not have certainty in terms of ULL pricing. We have had the latest round of Telstra appeals being rejected, yet after 12 years we do not have certainty. As an investor in the sector, and the same as most companies who invest in the sector, one of the key things we always look for is regulatory risk. That regulatory risk is alive and well and created by Telstra.

Senator MINCHIN—You make the point that is pertinent in that you will have a monopoly provider of a fixed-line wholesale network which will require significant and strong regulation in terms of price.

Mr Krishnapillai—Correct.

Senator MINCHIN—Just on that point, you may have seen recently that Grahame Lynch had a piece in CommsDay talking about Singapore being an example of how this does not always work out all that well, given SingTel's share in Optus. I just wonder if you are familiar with that example? Have you read his piece or do you know whether there is some issue there that you might want to draw to our attention?

Mr Krishnapillai—Without going through it point by point, my view would certainly be that it has worked out pretty well. The outcome has been that there are a couple of fibre-type deliverers of services to most Singaporeans. There is a structurally separate SingTel in place now in terms of the passive infrastructure, the electronics that actually deliver fibre and the retail providers. There is a three-way split, which is different to the Australian context, I know. I think you will see significantly higher speeds available to a much broader sections of the population in Singapore far more quickly than many other countries in the world. I would certainly argue that is a success.

Senator MINCHIN—What he was asserting were examples of issues surrounding wholesale pricing by the new entity, some difficulty with that and temptations on the part of the supplier to extract as much as they possibly could in terms of wholesale pricing and issues with that regulation.

Mr Krishnapillai—If you are asking me whether I would rather have the pricing power with the ACCC or Telstra wholesale, categorically we would rather the pricing power with the ACCC.

Senator MINCHIN—I will defer to others.

CHAIR—Senator Nash.

Senator NASH—You were talking about putting the traffic onto the NBN and you said that you believe that government should encourage providers to put the traffic onto the NBN. What is your definition of 'encourage'?

Mr Krishnapillai—There are a number of ways of doing it. Firstly, the major traffic provider is Telstra, so I have to address the issue of Telstra's incentive and involvement with the NBN. Secondly, in terms of other providers, I think there is already a natural incentive in play that fibre based solutions will deliver far higher capability and solutions than traditional copper or even DSL-type solutions over the next decade or so. I think there is already going to be a technology incentive in place that over time we are going to see more of those services and therefore more operators wanting to deliver services on fibre because the applications that we are talking about are far more effectively delivered on fibre.

Senator NASH—I am excluding regional areas out of this because I think there will always be a need for government intervention where there is market failure. Why do you believe that the market has not delivered what the government is intending to do?

Mr Krishnapillai—To date, in terms of fibre delivery?

Senator NASH—Yes.

Mr Krishnapillai—I guess there are a few key factors. First, I highlighted earlier to Senator Minchin's question that our view is that if you have—to be colourful about it—a wrecking ball such as Telstra in the sector the ability for Telstra to slow down in multiple ways, not just through litigation but also through access to exchanges, to IT systems and other things like that, will significantly bog down the sector in terms of being able to roll out alternative forms of broadband.

Secondly, we have seen first-hand examples of where companies like Optus have rolled out an HFC style network in the mid-nineties and we have seen the response of Telstra which, as I highlighted beforehand, was to follow down the same street and basically carpet bomb those particular areas to make sure that the company, Optus in this case, lost sufficient money and had to write down sufficient capital so that there was a significant disincentive to further expansion of that particular network. That comes back again to the view that we think there should only be one network. I guess it is the ability and incentive for Telstra to frustrate competition. The first-hand example of when you do have alternatives selectively going to areas, the ability for a very large player like Telstra to destroy competition in those areas, leads to regulatory risk in terms of investment decisions and therefore a slow-down in investment and full fibre-to-the-premises type networks, which all of us in the sector know is ultimately the end game. We have been saying that for many years.

I can give you another example. There was a decision by the federal government, which we absolutely applaud, to go out with a $250 million backhaul solution throughout Australia. We can use that as a case study as to what has happened over the last decade. Those areas that are only able to offer services via Telstra backhaul have significantly higher pricing than those areas that do not. It is a significant choke point. When we have offered services or built our own infrastructure in those areas, as we have throughout Australia over the last decade, we have seen radical reductions in pricing by Telstra on those particular areas in the order of 50 per cent plus. That does two things; it gives a good consumer benefit, but it also means that the player who is investing in that area has suddenly lost a lot of its potential return on that particular investment and Telstra can cherry pick area by area to make sure that anyone who enters a particular market, particularly in regional Australia, will be decimated in terms of investment potential in that particular area. The reason we applaud the federal government's decision is that this is a comprehensive, Australia-wide and coherent backhaul solution, which means that there will be no ability, in our view, for Telstra to take piece-by-piece action in those sort of areas. We believe this is a very significant opportunity to finally have companies like Optus and others able to competitively offer services in regional Australia. It is the significant bottleneck that we have faced for many years.

Senator NASH—You mentioned upgrading your HFC in your opening statement. Why have you not already done that?

Mr Krishnapillai—For the reasons I mentioned beforehand, the $1.2 billion write-down of that particular network and losing approximately $300 million a year on that network in those areas in competition with Telstra. Telstra's ability to undermine and undercut is a significantly underestimated part of the competitive response in those areas where Optus was rolling out network. We are continuing to assess whether there are options for us to upgrade a particular network in a multitude of ways and Telstra has indicated that it is

potentially rolling out the DOCSIS 3.0 upgrade in certain areas. We could also choose to do that. Clearly, in terms of the broader competitive landscape, we would want some certainty around NBN and other future options before we concluded what our decision should be around an upgrade of HFC.

Secondly, in terms of the alternative upgrade path, which is actually to turn it into a full fibre-to-the-premises network, that would again only make economic sense if it was a single network and if the federal government changed the regulatory regime to make that happen.

Senator NASH—With the one infrastructure wholesale access network that would provide a level playing field, as opposed to the current arrangements.

Mr Krishnapillai—That is right.

Senator NASH—There has been some scepticism about building the network and whether or not people would use it, in particular the mums and dads as opposed to businesses and those types of entities which we think would probably take it up pretty well. There is scepticism on one hand. The other side of the argument is the 'build it and they will come' approach. Where do you fit along that scale of the sceptic to the 'build it and they will come'?

Mr Krishnapillai—I can give you a couple of examples. An example that I heard recently, which I quite like, is that if Sir John Monash in Victoria in 1920s and 1930s had to do a full economic cost-benefit analysis in terms of rolling electricity out to regional Victoria it would have failed and would not have gone ahead on the basis of why would you roll out electricity to replace a whole lot of candles and gas lights. What you saw in the network industry is that very quickly, in many of those areas, things like washing machines and so on start to become commonly accepted and used as part of the network. I know they are clearly different industries, but my view is very strongly that when you do have the ability to hook up new applications and new services you will start to see the development of quite significant broadband applications that will lead to the take-up.

All of our modelling has assumed that replacement of candle power by candle power. None of our modelling has included any of the up side, as we see it, of significant growth in usage of broadband networks. We do see a significant growth in usage of broadband. We certainly anticipate that when you start to see applications that require, for example, three dimensional health type applications on various medical applications you are going to need those sorts of speeds. You cannot do that today. When you start to see real user friendly use of things like video conferencing in a mass sense, not in the way today where if you want to do that, as long as you are the only person using it at a particular point in time it is great, but as soon as you start getting into it in the mass sense you do not have the capacity across the network to do that, nor do you have the ability for businesses until the capacity is there for them to develop the IT systems and the access via websites, for example, for customers to use their services in a transactional way.

Quite clearly what I am saying is that I am on the side that says this network will be used. We have multiple examples of applications that can use that network. We also have some international experience. If you look at Japan and Korea, when high speed fibre-to-the-premises networks were rolled out within three to five years you started to see massive uptake, certainly by business, and to a lesser degree, consumer uptake in those areas. We do have first-hand experience that that is what will happen.

Senator NASH—It seems to be a rather lengthy rollout plan over the eight years to get this out. I know from the last iteration of broadband that the government put forward, if my recollection is correct your bid included a roll-in proposal, so starting in the regions.

Mr Krishnapillai—Correct.

Senator NASH—Has your view changed, or should this still have the capacity to start in the regions where obviously there is a much greater level of disparity and underservice?

Mr Krishnapillai—Again, we would wait for the government's lead on what would be most appropriate there. I think the key is to get the regulatory framework right first. If the regulatory framework was right we would certainly see some pretty strong arguments that you would want to roll out fibre in those areas that had limited access to broadband today, but clearly that would be the less-commercial areas. Over a period of time that would be absolutely appropriate and we could see some arguments for that, but you would have to get the regulatory settings right first.

Senator NASH—I know you were talking about moving eventually to a whole fibre-to-the-premises type environment down the track, but at the moment do you think the government has got the mix right in the areas across the technologies with the percentage of fibre up to 90, wireless to 98 and then the last bit satellite?

Mr Krishnapillai—Yes. It certainly fits with our modelling. I know there has been some speculation about the use of wireless and mobile technology to deliver broadband services. Our view is they are complementary services. There are significant technical limitations with the use of spectrum and spectrum availability, which is a whole other kettle of fish. We would see them as being complementary. Fixed networks will have significant inherent technical and commercial advantages over wireless networks, and I say that as a major provider of wireless networks in Australia. Wireless networks will have their own advantages. They tend to be in areas obviously with lower density.

To answer your question, in terms of the split we think the 90-10 is probably about right. The issue will be what split around satellite versus wireless in that last 10 per cent is appropriate, but we see the technology solutions as already available. There are many examples of WiMAX and other wireless solutions today delivering those services not only in Australia but throughout the world, and over the next few years there will be similar examples of satellite delivering those sorts of services. It is clearly a challenge to get to that 90 per cent figure and that is why the eight-year horizon is in there, because of the long tail, if you like, of delivery of those services, but our view is that the vast bulk of those services could be delivered in a significantly shorter time frame.

Senator NASH—Do you think the 100 megabits versus 12 inequity is going to be an issue and is that going to create disparity between city and rural and regional areas, or is the significant lift to 12 in those regional areas, from all the modelling that you have done, going to be of such a nature that even though the size on paper looks different, is it really going to be the disparity that has been stated?

Mr Krishnapillai—I personally do not think that it will be the disparity that people may claim it to be. I think 12 megs is such a step up from where we are today in regional Australia it will be significant. I also think that is probably a minimum standard. I think there is a potential, certainly with wireless, and particularly with mobiles in many of those areas—obviously the Optus network is coming close to 98 per cent population coverage—where you can actually offer much higher speeds than 12 meg on wireless services. I would suggest that up to about the 97 per cent to 98 per cent population mark you will have the possibility of much higher speeds, certainly through 3G and 4G mobile networks, but also through wireless and WiMAX type networks. To answer your question, I think 12 is probably a minimum.

Senator NASH—With the work that you have done so far in terms of the wireless component, is your understanding that the spectrum will be there to be able to support it?

Mr Krishnapillai—There is clearly a whole range of decisions that the government needs to make on spectrum and we await with bated breath on a number of those decisions. Clearly, the spectrum is potentially available and we are of the view that the economy-wide productive use of that spectrum should be for broadband services, particularly wireless broadband services. If you follow that logic through then it makes clear sense that you would allocate a chunk of that spectrum for productive broadband wireless use. As you may be aware, we have put forward through AMTA a view that through the digital dividend, or the switch-off of analogue television over the next few years, it will open up a significant chunk of spectrum and a percentage of that should be allocated or sold to mobile broadband players. If a percentage such as 120 megahertz of spectrum was sold, there is potential absolutely to deliver 12 meg or higher speeds in those areas.

Senator NASH—Thank you.

CHAIR—Senator Lundy.

Senator LUNDY—I just want to go to some of the points that you mention in your submission as other key reforms. In the first instance, I would like to clarify that your arguments about the necessity for the structural separation of Telstra are equally relevant to going forward in an NBN environment, but also your submission argues that the current regulatory review for the existing networks going forward should have Telstra structurally separated while the NBN is being built. Can you clarify that for me?

Mr Krishnapillai—Absolutely. You have nailed it. Clearly, our view is, as has been identified by the government, that the future world of the NBN should have a structurally separate organisation that only provides wholesale services, open access and so on. Our view is also that the best way to get a successful outcome in that future world is to have short-term regulatory reform and to take account of the lessons of history over the last 12 years which have taught us that until we actually get to a sustainable industry structure

we will continue to have the situation where we have 75 per cent of the industry's profits today earned by Telstra, 20 per cent earned by Optus and less than five by the entire rest of the sector. We are not in a sustainable industry structure today. We must address industry structure through the structural separation of Telstra in the short term to lead into a successful outcome on NBN.

Senator LUNDY—You have mentioned some of the regulatory gaming that you have observed in the industry. Senator Nash and I have been reflecting on an earlier hearing where we were discussing the use of not the legal system for gaming, but in fact a padlock on the gate of the fence around an exchange which would be quite an effective way to delay competitors' entry into a particular market. That whole issue of first mover into markets is still one that is relevant right now. In the context of the current regulatory review you make the point about the importance of equivalence in accessing the existing network. What specifically needs to change from a policy point of view to achieve equivalence for the existing network whilst NBN is being sorted out and implemented?

Mr Krishnapillai—In our submission we have outlined four key things. The first one, clearly, is that you need a structurally separate Telstra where there are separate incentives, KPIs, management, premises and so on between a services company and a wholesale access company, quite completely functionally and in every other way separate. Once you have got that you then need to make sure that the IT systems that everyone uses to provision services, to build services and to fault handle services are the same as Telstra retail versus anyone else. This is an underestimated area of the ability for Telstra to frustrate, if you like, competitive access.

I can give you one example which is currently with the ACCC. We have, in large part, withdrawn offering broadband services in the apartment market in major metropolitan centres of Australia because when we cut off a ULL service Telstra is able to switch it on like that, to put a Telstra retail service on, but if we were to put a service on it is a 10- to 14-day wait to have a truck roll and reconnect that. That may not sound like a significant issue, but you can imagine it from a customer's point of view when they are moving into a new apartment. They can go to Telstra retail and switch it on like that or go to Optus or any other player and it will take 10 to 14 days. That access to IT systems drives a lot of that outcome. Sometimes it is not as conspiratorial as maybe some of the sector might think, it is just the fact that we do use different systems. You do need to have the same access to IT systems, provisioning of services, fault handling which is just as important, billing information and billing services.

Finally, you also need to make sure that the ACCC actually has some power to address anticompetitive behaviour. A lot of the ACCC legislation was built in a fairly halcyon environment in the late nineties when we had, if you can recall, the dotcom era et cetera where we had visions of multiple entry points to every Australian home of fibre and so on, which clearly is a pipedream and has been shown to be so throughout the world, but that regulatory environment was built in those days. The response of competitors is not to be able to go and build new infrastructure, it is in fact for the incumbent to be able to slow down that build, so therefore you need an ACCC that can set pricing, in terms of wholesale access, and deal with anticompetitive behaviour. We have suggested a cease and desist power as an example.

Senator LUNDY—Just to follow up the issue of pricing, you make a subsequent point in your submission that the ACCC has adopted different pricing approaches for different services and that there is an ongoing argument about how Telstra offer up the information that they use to set the pricing on their network. What can be done and what ought to be done to resolve that issue of a system of assessing the cost of providing those services once and for all? How would Optus like to see that issue resolved?

Mr Krishnapillai—We have now had first-hand experience of the ability for Telstra to introduce so many variables into the model that they introduce enough doubt that they can take things to appeal for many years. I think that, at its core, that is one of the reasons we have taken 12 years to get to a position of uncertainty on ULL pricing rather than a position of certainty.

We have come to the conclusion that the TSLRIC+ approach that has been traditionally used in this area is inappropriate. At its heart the TSLRIC+ approach in effect says, 'Let's pretend we rebuild the network every year. How much does it cost these days to get a concreter in to concrete over the cable to everyone's house, et cetera?' That is not in our view a fair accounting standard for assessing the value not only of a network but therefore the network cost leading to the overall access price. We would certainly like to see a far tighter incremental cost or historical cost associated with the access price and you can only do that if you give the ACCC the power to say, 'We set prices. This is the model we're using. We're not going to go through 12 years of litigation. This is the price as it stands.'

Just to be clear, we are suggesting removal of merits review of those processes because we have seen that as simply an opportunity to gain in the process. We are, however, recommending that a continuation of ADGR-type processes, as is the case in most government areas, does continue.

Senator LUNDY—Do you think the ACCC has the necessary expertise if they had the right legislative basis to do that cost assessment?

Mr Krishnapillai—I think their expertise has been sufficiently blowtorched by Telstra for the last decade to certainly have the right level of expertise and probably incentive to get the right decisions over the next little while. I think the issue has been more about the framework that they have had to use rather than the personnel involved, but I would leave it to the ACCC to make a comment on whether they think they need additional or higher skilled personnel.

Senator LUNDY—Thank you.

CHAIR—Before I go back to Senator Minchin for one final question I would like to ask one. You have essentially said you are part of the 'build it and they will come' camp and you have drawn an analogy between electricity replacing candles and the National Broadband Network. You also referred to the dotcom pipedream. Online banking means that many of us go to the bank less. However, online shopping has not stopped people going to the supermarket in significant numbers. On what basis are you able to say that the government's fibre to the home is more analogous to electricity than the dotcom and that fibre to the home, if you like, is not a fibre dream whereas you have said that dotcom was a pipedream? On what basis can you make the analogy?

Mr Krishnapillai—The first point I would make is that I would not pretend, like maybe some others, to be able to forecast the future. I am certainly not saying that I can outline what I think the applications will be, nor the ones that will be most attractive to people, but I think we have enough evidence in this sector to show that when you do have that capacity you do start to see the development of applications and services which people will use. Some will fail. Some will succeed.

As you have highlighted, some of the online shopping and other areas have not been as commercially successful as others, but that is the reality of any commercial marketplace, that there will be multiple suppliers and some will succeed and some will not. The potential for consumer benefit and frankly business benefit for things like, as you point out, online banking is, to me, in its very embryonic stages. There are a number of examples. When you look at overseas you start to see the development of those applications that require the bandwidth. When you look at other industries such as the mobile phone industry, where you have seen the iPhone come into play, which is basically a phone with significant application opportunities, you see people take it up, develop even newer applications and start to use heavier and heavier bandwidth.

I certainly would not characterise it as 'build it and they will come', I would certainly characterise it as we have evidence that when you do provide people, as we have done over the last decade, with increased bandwidth, they will take it up. They have certainly taken it up in every single upgrade of technology that we have seen in our sector for the last decade. As soon as you provide that additional bandwidth people use it. I think we do have historical precedent that says that will be taken up.

CHAIR—In the course of answering that you used the words 'commercial viability' and I am presuming from what you said elsewhere as well that 'commercial viability' are two operative words in this context.

Mr Krishnapillai—Yes.

CHAIR—Do you have anything further to say about the extent to which there has been a commercial case mapped or analysed?

Mr Krishnapillai—It is one of those areas where we have certainly done a lot of modelling on the potential for that, and we have gone through a process in the last 12 months with the original fibre-to-the-node process that outlined how we felt that would be commercially viable and under what regulatory framework it would be commercially viable, because the regulatory risk is the key driver around commercial viability. Getting the right rules around that will lead to commercial viability.

I would only comment that we do believe that when you start to see higher levels of speed you do start to see much higher levels of innovation, and therefore applications, using that particular network. We have historical precedent in mobile networks, fixed networks and so on. People use it when it is there. We certainly see that as being only available when you get the right regulatory settings.

Senator NASH—Would the analogy be in some ways that you can only drive a pretty dodgy old car along a dirt road, but if you have got a freeway you can put a Lamborghini on it?

Mr Krishnapillai—Spot on. That is exactly right.

CHAIR—Thank you. Senator Minchin.

Senator MINCHIN—I was a little bemused by your discussion of the issue of backhaul and the government's investment there. Correct me if I am wrong, but your line of argument seemed to contradict your earlier proposition with respect to facilities based competition in that you said that where there was backhaul competition Telstra responded by way of lower prices and a better deal for consumers; where it was the sole provider it exploited that monopoly position—

Mr Krishnapillai—To the hilt.

Senator MINCHIN—to the greatest extent that it could. That is the natural inclination of any monopolist, I guess, and that will not change under the NBN. An NBN with shareholders is going to have an obvious incentive to maximise the return on its investment. That does not change. That just comes back to regulation. You were saying to us that, where there was competition in backhaul, the market itself and the competition itself was the thing that aided the users of those services because there was a consequent price reduction. It just appeared to contradict your earlier argument on this whole issue of facilities based competition.

Mr Krishnapillai—I am not sure how it does, because what we are saying is that the ACCC needs to have enough power to be able to set prices at a reasonable level. You are right. As you have highlighted, Telstra will exploit its monopoly position wherever it has the opportunity, so the ACCC needs the power with the NBN world to make sure that those prices are rigorously tested and set in place at a utility rate of return. I think I mentioned earlier that I would much rather have the ACCC set those prices than Telstra to be able to unilaterally set those prices.

The second part is that over the last decade or so those areas that are commercial or even sub-commercial are areas we have already rolled out fibre to. We have hit the limits of where they are going to. We have certainly done that on many routes throughout Queensland, in particular, but throughout the whole of Australia. Where they are commercial at a certain level and then Telstra drops prices by 50 per cent, they are in some cases sub-commercial, but the incentive to roll out in those areas is sufficiently high that we have done so. What I am suggesting to you is that we have hit that barrier where we are not going to see significant rollout in regional Australia of additional fibre without the federal government recognising, as it has, that it needs to put forward the capital to make sure that occurs. The key will be, as you have highlighted, that you do not want to have that provider in control of what that pricing should be and we have said very clearly that needs to be the ACCC.

Senator MINCHIN—That is my point. That is an issue of regulation. You cannot argue the merits of competition on the one hand but then argue against it on the other. That is what I am saying. Based on your thesis, surely it would have been better for the government to get the regulation of backhaul pricing right and spend its $250 million on extending backhaul and not competing with existing backhaul.

Mr Krishnapillai—I think we have got to a point where the proxy of regulation—regulation in the ACCC is very much, and always has been, a proxy or pretend to try to see what would happen in a competitive market. The reality is that it is not always how competition occurs. Certainly the ACCC is our least worst solution to dealing with regional transmission pricing and they have certainly set it at certain levels. The reality is that when you actually build new fibre and new services in those areas there might be a variety of competitive responses which leads to reduction. I do not see the two in any way contradictory in the sense that you certainly have to have ACCC monitoring of monopoly pricing, but a better outcome is in fact to put an alternative in there and see what happens, and that is what happens with competition.

We would see in our modelling radical reductions in all of the areas that have been targeted by the federal government for build-out of alternative regional transmission.

Senator MINCHIN—Yes. I will not pursue that.

CHAIR—Thank you very much, Mr Krishnapillai.

Mr Krishnapillai—Thank you for your time.

[2.48 pm]

BYATT, Mrs Anne, Relationship Manager, Standards Australia

STEPHENS, Dr David, Government and Stakeholder Relations Advisor, Standards Australia

CHAIR—We welcome Dr Stephens and Mrs Byatt. I will go very quickly through some of the processes of giving evidence before this committee, which are public and protected by parliamentary privilege. If at any stage you wish to provide evidence in private then you may request to do so and the committee will consider your request. It is an offence and potentially in contempt of the Senate to give false or misleading evidence and for another party to attempt to interfere with evidence otherwise given. We have your submission. Do you wish to amend it?

Mrs Byatt—We have one point to note. Some of the standards listed in Appendix C are available, but they are available as superseded. That is due to the fact that they may still be referenced in an accreditation cycle or a conformance cycle. It was listed in there to give the committee indication that the subject matter has been dealt with by Standards Australia for many years.

CHAIR—Thank you for that clarification. Do you wish to make an opening statement?

Mrs Byatt—We do not.

CHAIR—Senator Lundy.

Senator LUNDY—Thank you for your submission. I did have the opportunity to ask NEHTA earlier in the day some general questions about the standards they were developing for the operation of the transactions based services in an e-health network of the future. My general question to Standards Australia is in relation to particularly ICT and technical standards relating to software and whether Standards Australia has a default position of seeking an open and interoperable standard in the first instance and to what extent those parameters are put forward at the start of any discussion about technical standards relating to software?

Mrs Byatt—Our committees are made up of technical experts in particular domain areas, as you may be aware. As the national standards body we also hold the membership for ISO and IEC, particularly in the health area where you would expect there is an awful lot of international work going on, predominantly through ISO Technical Committee TC215 on the e-health and our national committee is very active in that space. Wherever we can we incorporate learnings on interoperability and open standards we build them into any domestic standards that either need to be adopted here or developed here for fit-for-purpose use in Australia.

Senator LUNDY—If the international issue relating to a given standard is yet to be resolved does Standards Australia always take the position of openness and full interoperability to those international bodies, or does that depend on the Australian working group's advice to you?

Mrs Byatt—It does depend on the working group or the technical committee's advice to us. We, as an organisation, do not strictly take a position. We are advised by the collection of the balanced representation of technical experts that reside on our committees and we facilitate the environment for those experts to come together and make decisions with regards to consensus outcomes.

Senator LUNDY—How are the representations on those committees resolved?

Mrs Byatt—How is it decided?

Senator LUNDY—Yes.

Mrs Byatt—We have a very robust due process which characterises the development of an Australian standard and for the outcome to be a recognised and trademarked Australian standard. There are pillars within that development cycle that absolutely must be adhered to and we, as an accredited standards development organisation, are audited on such pillars and processes. The three key pillars that characterise Australian standards development are consensus, transparency and balance of representations, as you have noted. The balance within a committee is across key interest areas that include a range of representatives from government, industry, manufacturers, research organisations, academia, et cetera, as is appropriate for the scope of work that is being conducted by that committee. It is audited regularly and the individuals on that committee do not represent themselves, they represent their nominating organisations on that committee.

Senator LUNDY—In relation to the ICT sector, in terms of Standards Australia's workload what portion would represent standards relating to ICT, either telco or software or hardware standards?

Mrs Byatt—It is difficult to put a figure on that. In our library of standards there are in excess of 7,000 standards. I would have to come back to the committee with an indication of what proportion of that sits in telco. It certainly takes up quite a proportion of my role as relationship manager. I am assigned several sectors and one sector is ICT.

Senator LUNDY—To what extent is Australia a leader in the establishment of standards in this area? I am not sure how this relates to your organisation, but I know of the work of the Australian Archive in establishing a metadata standard to apply across government. Is that something that you are involved in or have looked at and established as an Australian standard?

Mrs Byatt—I think the one that you may be referring to is certainly one that I am dealing with. It is with our established technical committee, IT21, which looks at metadata reference sets and that is that we are currently in discussions with the stakeholders who reside on that committee in terms of pulling together a proposal submission to Standards Australia articulating the net benefit of that particular project, and then deciding the best option to go forward in terms of stakeholder pathway with respect to funding, resources and time lines required to develop and publish that particular tool.

Senator LUNDY—Arguably the strength of those standards is their openness and, by definition, their interoperability. How does that inform subsequent decisions of Standards Australia? What I am trying to get to is whether Standards Australia is in a position to evolve and build on your own body of knowledge as standards in these areas are established or negotiated and consensually agreed to and then formalised or whether every time something new comes forward you start from scratch with a reference group and those previous decisions do not inform that body of work.

Mrs Byatt—Part of the project proposal process that the proponent or the stakeholder group will go through prior to a project being approved at Standards Australia and being commenced is they consider the content that may be available that pertains to that particular domain area. That may be national or international. We encourage them throughout the project proposal process to actually consider international standards that may be used in part, or indeed in whole, for domestic use here in Australia. There is very much an eye on the international fora with regards to interoperability.

Senator LUNDY—That is all I have for the moment.

CHAIR—Senator Nash.

Senator NASH—I am interested in your issue around consensus based standards. My colleagues here have been involved in telco for quite some time and I am intrigued about the idea of actually getting industry to agree on some standards, particularly in the telco sector. Is that something that you have looked at closely related to how it would work with telco, or is it more just an overarching principle type idea?

Mrs Byatt—It is an overarching principle. There is a definition of consensus which is adhered to in ISO as well. It does not mean 100 per cent consensus. Obviously that is very difficult to obtain, especially in some domains more than others. It does work on an algorithmic basis so we can get the details for you with regards to what those percentages are, but largely there would not be a sustained objection by a significant majority in order for consensus to be achieved.

Senator NASH—Is that something that you have discussed with the industry?

Mrs Byatt—It is a principle of standards development. That is how standards are actually developed and if conflict resolution is required to get it to that point we certainly engage in that, where appropriate, as an organisation. It is an accepted tenet of recognised standards development.

Senator NASH—Have you had much consultation with the government about where it is at this point in terms of rolling out the NBN? Is there any kind of collaborative work with government between what you are doing and what you are suggesting, or is it more a peripheral ideas type thing that you are hoping government will look at? I am trying to ascertain how close the relationship is and if there has been any collaboration.

Dr Stephens—The best way of looking at it from our point of view is that standards tries not to get ahead of policy. Obviously we are aware of policy as it develops. To the extent that existing standards are relevant to an NBN or new standards are required, we fall into line behind whatever policy develops. In that sense we are interested observers, but there is certainly not collaboration in the sense that you have described.

Senator NASH—Thank you.

CHAIR—You indicate in your submission a role for the Communications Alliance in setting standards for telecommunications, and the department has separately said that its understanding is that the Communications

Alliance is in the process of developing standards or, more particularly, analysing a range of issues relevant thereto. What discussions, if any, has Standards Australia had either with Communications Alliance or the department in respect of developing standards for the NBN?

Mrs Byatt—We work very closely with Comms Alliance. Obviously it is an accredited standards development organisation in the landscape the same as we are. They are audited in the same way that we are, by ABSDO, the Accreditation Board for Standards Development Organisations. Comms Alliance also sits as an observer on several of our committees in the space to make sure there is avoidance of duplication of effort, basically, across both of our scope areas. We are also collectively ourselves and Comms Alliance involved in many communications roundtables, which involve the regulator. The department also sits on some of those roundtables. There is regular dialogue and discussion around the priorities and strategic areas of concern in the area of communications largely. As Mr Stephens said, we also seek to engage with government, if and when appropriate, with regards to where standards can be part of a policy solution.

CHAIR—Are you able to give us any more detail around your liaison with the department or Communications Alliance in respect of the development of standards?

Mrs Byatt—Communications Alliance are accredited to operate in a very defined scope, as are all other SDOs that work across Australia. In summary, I guess you could say that Comms Alliance provides standards that point to the Telecommunications Act, and we develop standards that fall out with that. In terms of scope definition there is very rarely scope creep or we try to make sure that there is not scope creep with regard to what they are doing and what we are doing.

CHAIR—Are you able to give us any more detail in respect of this aspect of proposed standard A; for example, that Standards Australia has had three separate discussions with the department about the issue and, 'Here is the status of the drafting of that particular standard or aspect of standard'? I am trying to get a feel for how progressed the work is.

Dr Stephens—Most of the contact with the department would be where the department is on a relevant committee. I am not sure that there would be much one-on-one beyond that.

CHAIR—So it is by happenstance rather than standard operating procedure?

Dr Stephens—I would have thought so. It is not an area that I am closely involved with. I do not understand there to be regular one-on-one meetings with the department on issues of any standard.

CHAIR—So it is pretty loose?

Dr Stephens—I would think it is pretty loose.

Mrs Byatt—In the relationship management team we are assigned sectors, and in those sector responsibilities we do seek to engage with government both at federal and state levels with regard to areas where standards can be of assistance. That is a proactive action with regard to the department in this case. The action has been engaging in roundtable discussions about strategic priority areas and then seeking meetings, if and when appropriate, after those roundtable discussions around particular areas that require further focus.

CHAIR—Thank you. I have one more question around a different but related area. You talk about your role in establishing standards to harmonise access and ensure equivalent access. What role do you see for Standards Australia in that respect, in terms of assisting to achieve equivalent access, particularly for that sector of the population that falls in the 10 per cent supposedly to be serviced by wireless and/or satellite?

Mrs Byatt—The answer to that question would really come out of the technical experts that sit on our committees. Where there could be a co-regulatory or blended approach to policy direction on certain areas, equivalence and access being one, I guess it is best done on a risk based approach where, if standards or lower consensus documents, such as handbooks, codes or guides, can be part of the policy framework, that can be developed in accordance with ourselves as an SDO or other SDOs in the space, such as Comms Alliance.

Dr Stephens—I suppose you could envisage a situation where the government might decide there was an advantage in building something into the Telecommunications Act in terms of access to telecommunications, and that might be in terms of a standard. There might be a standard universal right to access broadband. I am not sure you would want to do it that way but, for example, occasionally there have been suggestions that the Corporations Act should have a section in it about corporate social responsibility, and hanging off that would be a standard on corporate social responsibility. The Corporations Act, in that case, would be linked to a standard and there would be an issue then of whether you would have penalties for failure to abide by the standard written into the act. I am not sure it is a way you would want to go in the telecommunications field.

CHAIR—Do you think, for example, that corporate social responsibility is the only way that equivalent access will be ensured to that 10 per cent of the population or is it government social responsibility?

Dr Stephens—No. I probably jumped a bit quickly from one example to another. I suppose you could possibly build it in as a plank of social responsibility for telco. I do not think it would be a good idea.

There are plenty of examples where this exists at the moment. In a co-regulatory approach, if government did want to build in a section of an act and hanging off it there were some words that had been developed about a standard in relation to access to telecommunications, you could feasibly do it but I am not sure it would be the best policy approach from the government's point of view.

CHAIR—Finally, has Standards Australia had specific discussions with the government or the department about the rollout in Tasmania?

Mrs Byatt—No, we have not.

CHAIR—To your knowledge there are no standards? In your view, what does that mean about what you would normally do in setting the standards in a part of this sector for the Tasmanian rollout? Is it happening in absence of those?

Dr Stephens—Ms Byatt knows more about communications than I do. For example, we can leave with you copies of what is called the Communications Cabling Manual, which is a thick document, partly written by ACMA but from consultation with Communications Alliance, us and others. That is the sort of thing you would expect someone who is responsible for rolling out cable and so on in Tasmania to be following, and there are standards that apply to that as well. There is not anything under way that is particularly about new standards that apply to the connections in Tasmania. There is certainly a body of things around at the moment, both Comms Alliance stuff and our stuff, which you would expect people to be abiding by.

CHAIR—For example, are there sufficient standards to regulate fibre to the home at the moment?

Mrs Byatt—I do not think that is a question for Standards Australia to consider, whether it is sufficient or not.

CHAIR—Are there standards that were developed and in the development of those was it contemplated that they would apply to fibre-to-the-home as opposed to fibre-to-the-node, for example?

Mrs Byatt—There are certainly standards within the collection of documents within the communications cabling manual that refer to fibre and installation standards into the home as well as into commercial premises and they are separated out explicitly in that pack. Some of them were developed five years ago and some of them were updated two years ago by our technical committees.

CHAIR—In referring to fibre-to-the-home or fibre-to-the-premises do they then go on to deal substantively with fibre to the home or fibre to the premises, or do they refer to them and say, 'That is not the province of this standard'?

Mrs Byatt—Could you repeat the question?

CHAIR—I am asking for a bit more detail around your answer. You have appropriately indicated there are some standards that refer to fibre-to-the-home and fibre-to-the-premises. I am just wanting reassurance that that is not saying, 'Yeah, and by the way this standard is not going to deal with those.' Is it a substantive reference rather than a passing reference to say that that is not for this particular standard? I am wanting reassurance that, even if it were not specifically contemplated at the time that the standards to which you refer were developed that fibre-to-the-home or fibre-to-the-premises was an immediate prospect, there are some standards that deal, at least to some degree, in substance with the provision of fibre-to-the-home or fibre-to-the-premises.

Dr Stephens—We can certainly leave you with copies of the relevant handbooks. I refer in particular to the Communications Cabling Manual. Module 3: Residential communications cabling handbook. Without going into great detail, one section covers running cable, cable termination, earthing requirements, CDS at a separate building or outbuilding, earthing of back mounts for surge suppression devices, resistance of the CDS, and earthing of cabinets. That is about 25 pages worth. It is pretty technical stuff.

CHAIR—Let us hope that quantity is quality in this case. I am sure it would be, because it is a Standards Australia document.

Dr Stephens—This is produced by an alliance of people across the sector. Certainly the idea of these, as it is with wiring rules in electrical installations, is to provide something that can essentially be in the back pocket of the person doing the work.

CHAIR—Thank you. Senator Macdonald.

Senator IAN MACDONALD—I refer to the Chair's questions about Tasmania and your involvement in the rollout, which I understood you to say was non-existent. Has the government been speaking to you about whether new standards will be required for the NBN rollout around Australia?

Mrs Byatt—We are in the process of starting discussions with the department around that through the roundtable discussions that we have had. We will seek further meetings with members of the department, as and when appropriate, regarding the issues that emerge.

Senator IAN MACDONALD—You said that you have just started.

Mrs Byatt—We have just started to discuss issues strictly with members of the department.

Senator IAN MACDONALD—What, in the last week?

Mrs Byatt—In the last two months.

Senator IAN MACDONALD—In the last two months?

Mrs Byatt—Yes.

Senator IAN MACDONALD—That is all I had.

CHAIR—We thank Standards Australia. The committee will now take a short break.

Proceedings suspended from 3.12 pm to 3.35 pm

GRANT, Mr John, Chairman of Board, Australian Information Industry Association

JOHNSON, Ms Loretta, General Manager Policy and Government Relations, Australian Information Industry Association

CHAIR—Welcome. We look forward to hearing from the Australian Information Industry Association. Ms Johnson, have you and your chairman, Mr Grant, been in the room for much of today?

Ms Johnson—Not much of today, just halfway through Standards Australia.

CHAIR—The proceedings of the committee are public and protected by parliamentary privilege. It is an offence for anybody to attempt to interfere with evidence given to the committee, as it is for a person to give false or misleading evidence to the committee. If you wish to give evidence in private at any stage you can make a request to that effect and the committee will consider it. We have your submission. Do you wish to amend it in any way?

Ms Johnson—No, we do not.

CHAIR—Would you care to make an opening statement?

Ms Johnson—Yes. The planning, funding and maintenance of a high-speed, upgradeable, universal digital broadband infrastructure is a crucial prerequisite to position Australia for long-term economic growth and international competitiveness. Access Economics, in a report which I will table shortly, has conservatively estimated that adopting smart technologies in electricity, irrigation, health and transport, on the back of a broadband communications network, will—and these are conservative estimates—lead to an increase in the net present value of gross domestic product of between $35 billion to $80 billion over 10 years. Precise estimates will depend on how much spare capacity is in the economy. In the case where the economy is operating at full employment, an increase of labour productivity of approximately 0.5 per cent, as the deployment of the technologies becomes widespread. And in the case where the economy is operating at less than full employment, the impact on jobs is more pronounced as the technologies become more widespread. In 2014 alone Access Economics has estimated that this could result in more than 70,000 jobs being added to the economy.

AIIA welcomes this opportunity to participate in this debate about the implementation of the NBN and we congratulate the government on its recent decision to establish a national high-speed broadband throughout Australia. However, there are costs associated with this decision. The investment cost of broadband technologies is readily apparent and easily understood by most, but we believe a bigger and hidden cost that could hamper the realisation of the benefit of genuine broadband is the cost of an imperfect market structure and insufficient competition in the provision of broadband services. It has been estimated by the Centre for International Economics that over a period of 20 years the economic cost of less competition and higher prices resulting from any degree of monopoly power could be three to four times more than the initial cost of providing the broadband facility. The message is that, if we spend a lot of money building an NBN but we do not get the policy settings right, we may face a double jeopardy. Accordingly, we believe it is essential that open competition becomes a lynchpin of the new NBN implementation and that the ACCC has appropriate and sufficient powers to deal with anticompetitive behaviour by any stakeholder.

AIIA members see this as possibly the most critical decision on infrastructure that this government has made and we are quietly optimistic that widespread access to, and use of, fast and accessible broadband will provide substantive benefits to our economy. That said, AIIA is not beholden to or supportive of any particular technology to be used in the establishment of the NBN. Rather, we see it as critical that the government's approach delivers value for money to business and private users alike because anything less will hamper the uptake of the benefits offered by the NBN rollout.

Universal access to a single high-speed broadband network must be provided without either technological discrimination or capability differentiation. In this regard we note the possible digital divide between consumers receiving lower service speed of 12 meg as opposed to the larger demographic coverage—the alleged 90 per cent—receiving fibre-to-the-premises at 100 meg. We believe this issue will need to be carefully managed throughout the policy formulation process going forward.

Commitment to the aggressive timetable set by the government is essential. Any delay will lessen stakeholder support and compromise investment. Flexible investment settings and an appropriate regulatory

and competitive framework are also essential to ensure ongoing market driven and competitive development of broadband infrastructure. Appropriate access models not subject to any monopoly obstruction by incumbents or others are crucial to success. Open and competitive access will, we hope, translate into business uptake and flow-on applications development that should exploit the efficiency potential of the NBN. In this regard we particularly welcome the government's wholesale-only open access strategy as a major step toward promoting equivalence and open competition in access arrangements. A wholesale-only organisation has little incentive to engage in anticompetitive behaviour, such as unfairly discriminating between or towards providers seeking access to its services.

In closing, I remind the committee that AIIA is Australia's peak ICT industry body. Our role is to lead and represent the ICT industry in Australia, to maximise the potential for the Australian economy and for its society. Our membership encompasses all sectors of the ICT sector, including hardware, software, service and telecommunications. We have large and small member companies. We employ over 100,000 Australians, generate combined annual revenues of more than $40 billion and export more than $2 billion in goods and services every year. Our national board of directors comprises the CEOs and senior management of major multinationals, such as Microsoft, IBM, Google, Fujitsu and Intel, as well as thriving local Australian organisations such as Data#3, e-Centric Innovations and SMS. Thank you.

CHAIR—Thank you. Senator Nash.

Senator NASH—You mentioned with the NBN that we have to get the policy settings right or we might end up with double jeopardy. Can you expand on that and talk about what you think those policy settings should be?

Ms Johnson—Yes. At a very high level we believe in fair and open competition, as I alluded to in our opening statement, equivalence, which we believe will be promoted by the wholesale-only organisation and the open access direction the government has taken, minimal duplication of the infrastructure, and a network design approach that will be able to deal with the patchwork thickets of local networks which are springing up reasonably around the country at the moment in various states, and at local and state government levels. In our opening statement we also alluded to the need for sufficient and appropriate anticompetitive powers, that is, powers to deal with anticompetitive behaviour that should vest with the ACCC. As I said, we are quietly confident that, although it is not going to be easy and we do not see any major structural or technical barriers, there is a lot to be done in the regulatory framework to deliver those policy settings.

Senator NASH—You mentioned that there should be minimal duplication. In mentioning 'minimal' I take it you might be able to live with some duplication. But in terms of duplicating the infrastructure where would it be that it would not have an impact?

Ms Johnson—I am sorry, can you repeat the question?

Senator NASH—You mentioned the phrase that there should be minimal duplication. If the network is going to be a level playing field with an open access network where would any duplication be tolerable?

Ms Johnson—Sorry, I see what you mean. Yes, you are correct. In an ideal world any duplication is an inefficiency. Not being a network designer, I cannot give you a guarantee that there will not be duplication, given that we already have a copper network, some fibre network and wireless network, but I think the NBNCo and the policy settings have to be such that decisions will need to be made as to what to do with that current network, say, whether it will be vended in to NBNCo and used. If that is the case there will have to be some regulatory and policy settings to deal with the sufficient, appropriate and fair payment for that vending in to the NBNCo. As I said, I would be reluctant to say 'no duplication', but we would prefer minimal duplication.

Senator NASH—That is true. If you have a situation where Telstra did not vend in their infrastructure I would expect you would have an enormous amount of duplication. Do you think the ACCC is well enough equipped now to deal with the anticompetitive environment we occasionally see, and how is it going to end up in the future?

Ms Johnson—AIIA would certainly believe that on its past performance the ACCC has shown that it can certainly deal with anticompetitive behaviour in any economic sector, not just this one, particularly retail.

Senator NASH—Can you see any improvements either within the ACCC itself or within the legislation that guides it?

Ms Johnson—With respect to detailed analysis of that legislation, no, we have not done that. I am happy to take that on notice and do that work for you.

Senator NASH—Thank you.

Ms Johnson—At the moment we would see that the ACCC certainly does have fairly wide powers. Whether it needs wider or deeper power or the ability to set prices itself rather than the arbitrate/negotiate model would be left in the hands of the policymakers.

Senator NASH—I would appreciate it if you could take that on notice. I was very pleased to see the reference to irrigation and the potential benefits that the NBN will have for that. Can you advise where the information that you have provided in your submission was sourced from?

Ms Johnson—In relation to the use of smart technology in agriculture?

Senator NASH—Yes, and the figures that you use in terms of reduction of water use. I am very happy for you to take that on notice.

Ms Johnson—I will table that report. It is a report done by Access Economics commissioned by IBM, which is one of our member companies, as I mentioned. It was released in April of this year. It is titled *The economic benefits of intelligent technologies*. It is an analysis of the four sectors that I read out in our opening statement—health, transport, agriculture and education—on the back of a smart NBN. It is not a cost-benefit analysis, it is an analysis of the possible economic benefits that can be delivered in those economic sectors across the nation if NBN was structured a certain way. I will table that report for you.

Senator NASH—That would be really useful.

Ms Johnson—The other report that we have relied on fairly heavily is one I am sure you are familiar with by the Centre for International Economics. That is a very short note on the impact of genuine broadband for Australia. It is a similar sort of analysis, but not a cost-benefit analysis.

Senator NASH—That is tremendous. Thank you.

CHAIR—Senator Lundy.

Senator LUNDY—We heard from Jim McKerlie this morning, whose submission was titled something along the lines of 'The firm of the future', which was quite pertinent to today's discussion. His evidence surrounded what the company operating in a high-bandwidth network would look like, which is a terrific question to be asking. Your association represents the companies that are probably the early adopters in every sense of the word, because their business operations are more likely to tap into the benefits of the ICT tools currently available to them. I am really interested in the AIIA's view of how the government needs to do work now to make sure that small businesses in particular but also large businesses are in the best possible position to extract the benefits of a high-bandwidth network in Australia. I am seeking your input into the sorts of things that ought to be occurring now to make sure that we optimise that opportunity.

Mr Grant—That is a great question. The debate about NBN exists at the individual household level at the moment.

Senator LUNDY—I am really worried about that. I think we need to be talking more about small business.

Mr Grant—I look at it from a business point of view, not in terms of whether I can download movies faster. That is not the name of the game for me. I think the NBN is about the business of the future and the way business of the future is done. There are many examples throughout history that we should recall, and I am sure you have heard them put to you in this inquiry. You can go back to the railroads when they were first built and what happened as a result of that. You can look at the outcomes every time we build a freeway. These are not predicted and not taken into account in the justification for their construction and expenditure, but they change the way things are done.

I think the charter for government, and our industry association, is to paint the vision of the future. The government has taken a very solid leadership position. If we reflect on how the Labor government came to power, it really was around painting a vision, a large amount of which was technology inspired. I think that is the job of government going forward—to paint that vision. My belief is that this is one of those things where 'build it and they will come' will apply. Again, you have only to reflect on things that have happened in recent times. Five years ago, effectively, Google did not exist. Where are we today? It is a Google dominated world. People do things differently because they can. Five years ago Amazon.com did not exist, yet the whole way that business is transacted now has changed. There are many examples and we will continue to see dramatic

examples once we have the capacity to do it. The SME community is very quick to move. Sometimes we think they are not as agile as we would like them to be.

Our business at the moment, Data#3, is a mid-sized business with 800 people nationally, but when I joined the company there were 14 people, and I know how agile the small to medium sector is. Again, I think if you provide them with the opportunity they will respond very quickly. That is one part of the question. However, the bigger question is how large organisations will also work. I have heard discussions about NBNCo. To me NBNCo should be the firm of the future. Why is everyone preoccupied with where the head office is? I just do not understand that.

Senator MINCHIN—That is a good question.

Mr Grant—Why is there this preoccupation? There should be a different view. NBNCo should purposely be constructed as the firm of the future. It should have its functions discretely and appropriately placed, based on a whole bunch of different criteria, around this country and it should be made to work. I can tell you from an industry point of view that our members have the technologies today to allow that to happen. It needs two things. It needs vision and drive, and in this case definitely from the government, which can make NBNCo the example firm of the future, and it needs broadband to do it. It is really quite simple. I am sorry to make it simplistic, but it is quite simple. I think then you then get all of the spinoff benefits. If you chose to have the operating centre for NBNCo, for example, in a particular location what you will then have building around that is firms, small to medium enterprises, educational institutions and so on, geared into providing the skills that are required to do that in the area where they are required and you will have that repeated throughout the country. Again, the business community will move very quickly around the opportunities presented to it, provided the framework is appropriately set. This requires us to be visionary and to set the agenda at that level. I believe we will get very early take-up. The other challenge is to actually do it. It has a long timeline and to me anything that can be done to accelerate that timeline has to be good. We will get more economic advantage out of that the earlier we can bring this thing to light.

Senator LUNDY—I like to draw on what occurred when the GST was introduced as an example of how governments can do things and how business responds. In that case there was a more complex accounting requirement. There were software and hardware subsidies. The tax office tried to have online lodgement, which it eventually got right. It had the effect of dragging everyone into the digital age, from a small and micro business perspective.

Mr Grant—Yes, it did.

Senator LUNDY—What are some of the possibilities that government could do as far as pushing the technology at the small business sector that might present itself as having a similar upgrading effect on how small business does its thing in an environment of a higher bandwidth network? You do not have to answer it now, but I wanted to put it to you because I think there is an opportunity for government there to push it along.

Mr Grant—That is a good question. There is no doubt government has the levers to make change. Philosophically our association would say, 'Let's understand what the levers are. Let's make sure we put them in place and then let's get out of the way, because that is when things will happen.' Provided it is not heavily bureaucratised, the business world and SMEs will move very quickly. We will take that on notice. That is a very good question. I talk about visioning. What we need is real life examples.

Senator LUNDY—Showcasing things?

Mr Grant—Yes, showcasing things. The AIIA definitely has a role to play here. Our membership includes the global technology players. These things can only happen because global companies are developing technologies for wide-scale adoption. There are examples globally now of smart transport systems, smart electricity grids, and smart irrigation systems that need to be brought to life to provide the modelling that is required for people to say, 'I can do that.' In terms of what the government can do, I could say purposefully, 'Engage with the AIIA to bring these things to life.' That would be a nice outcome. Responding immediately off the cuff to you, that is the sort of thing that we need to really kick into.

I have just taken the chair of the IT Innovation Industry Council under Senator Kim Carr, and the discussions we had at our first meeting were very much around this sort of thing. We need to get models going so that people understand what it could be like. I think they will be very powerful. That is one of the things we are focusing on. But if you do not mind, we will take that on notice to give you a further response on that.

Senator LUNDY—Yes. I would be interested in your response.

Ms Johnson—One of the things that we did support in the last budget was the announcement that funding would be made available for SMEs to make them online savvy and to assist with bringing them online. We think that is one of the very good levers government can use. However, we do make the point that not every SME and micro business is business savvy anyway to get online, and just pushing them to be online when their business operation or their processes are suboptimal will merely digitise suboptimality.

In terms of skilling them up, that is something the government could consider as well. Skill them up as a business and then skill them up to be online savvy, and then you will not have that sort of double jeopardy of digitising suboptimal processes or practices in business. As Mr Grant said, we will do some more research in that area and get back to you.

Mr Grant—We cannot save everyone. The fact is there will be some businesses that do not transition. That happens whether it is an NBN, a legislative change or a change in business models. I think we are all obligated—you through the policy levers that you can put in place, associations such as us through the sorts of things that we can do, and the business community generally—to provide people, organisations, SMEs and business owners with a potential new way of doing things. You can take them to water, but they will not necessarily drink. I do not feel a responsibility, if you like, to make sure that everyone gets it. I do feel a responsibility for our industry and for your government to put the opportunities in front of people and to provide them with the incentives to take up, and then really it is up to them to do that. What will happen is you will get new business models. The book retail of the past that relies on the High Street store only will not continue to exist. You will get the Amazon.coms or the book retailer who integrates the online book selling world and paint a different business model. They will integrate. This happens. This is the way things have to change.

Senator LUNDY—Or we end up getting more bookshops that also have excellent coffee shops inside them so people still have a reason to go there.

Mr Grant—And they become different things. That is exactly right. Garages are not garages anymore.

Senator LUNDY—It is funny how it works out.

Mr Grant—Yes. People are very creative.

Senator LUNDY—I know it is hard to predict. I just want to draw the distinction between the AIIA's advocacy of the transformative effects of ICT and ICT businesses and the ICT sector per se and ask you: what sorts of policies are needed right now to boost that sector per se given it is that sector that then facilitates all of the other transformative effects across our economy?

Mr Grant—My favourite subject. That is a question which should be asked. You can provide the policy levers and the incentive, but unless you have the capacity to do it then it is going to happen slower than it should. I think the sector is very important in the mix of things and the sector's contribution needs to be really strongly understood and articulated.

I could respond on two levels. Firstly, it is for leaders within government, business and our industry to be painting the picture. The picture that needs to be painted is to have the people who make the decisions actually enlightened enough to look for different ways of doing things. We have developed a term inside the AIIA that we are now taking out, and we call it 'technology first'. It says that if you have a business problem and you would go about solving that business problem in what could be a relatively conventional way, stop for a moment and think about whether if you actually took technology and said, 'I'm going to make technology the implicit and foundation element in my solution', what different outcome will I get? It is quite interesting.

I will just reflect for a moment on the first $42 billion stimulus package. I cannot remember the name of the fund, but there was $500 million allocated for libraries in tertiary institutions. I sit in Queensland on the Premier's jobs task force and we put submissions to the Queensland government about how the technology sector can contribute in job creation. We will not go there, because that is another whole big subject. We had a discussion around this element and the Premier, at one of these meetings when I was batting on about the technology industry and recognition for what we can do, said to me, 'You guys are never satisfied. We've got this library thing and there's going to be technology in that. The Department of Public Works now has the mandate to build the libraries.' I said, 'This is probably not what we want to do.' The alternative view is to say, 'Let's do technology first.' How would we enable library-like circumstances to tertiary students and how would we hit many more and provide many more features? What we would do is create a virtual library. We would not build bricks and mortar, we would create a virtual library and a technological environment that

actually allowed people access, from PDAs and laptops, irrespective of whether they were a member of the library. We would do it differently. That is what I mean by 'technology first'.

I think the challenge for the government is to start communicating and articulating that sort of vision, because that sort of vision will then play back into the sector. Our fundamental belief is that, if that vision is understood and articulated, the sector gets involved and the sector will grow. We are philosophically about creating a bigger pie for our industry, and the best way to create a bigger pie is to get a shift in understanding right at the start of problem solving as to the part technology can play.

There are many examples of that sort of thing, but that particular one I gave you is an example today of what I would call legacy thinking that would be applied to spend $500 million when new 'technology first' thinking would spend it totally differently and get a totally different level of outcome. That can happen in many things that we are spending money on today.

Senator LUNDY—That is interesting. Thank you.

CHAIR—Senator Macdonald.

Senator IAN MACDONALD—Ms Johnson, I noticed you deliberately said in your opening statement the 'alleged 90 per cent coverage'. Could you elaborate on the 'alleged' bit?

Ms Johnson—Yes, I can. It is a somewhat loaded term and it is perfectly innocent. We understand now that, having moved on from 7 April, the 90 per cent/10 per cent division is really a rule of thumb, and AIIA does not know whether it will be 90 per cent coverage for fibre-to-the-home or more or less, or whether the 10 per cent is correct either. Having spoken to Treasury officials, we are now satisfied that really was a rule of thumb. The bigger picture, of course, is that we are moving towards universal coverage of some manner, shape and description and the 90 per cent 'alleged' terminology that I used was really to try to push home the point that decision makers need to be careful of the apparent differentiation between the two service delivery channels or the two types of services that are being delivered to the 90 per cent and the 10 per cent. That is just a loose sort of use of those terminologies that came out on the 7 April announcement.

Senator IAN MACDONALD—What do you mean by 'rule of thumb'?

Senator MINCHIN—Do you mean that it is an approximate?

Ms Johnson—Yes, it is approximate.

Senator IAN MACDONALD—Or just rhetoric?

Ms Johnson—No, it is certainly not rhetoric. The 10 per cent figure was explained to us at least shortly after the announcement as relating to those parts of the country that are populated by smaller groups of people, perhaps 1,000 or less. That was said to me to be a rule of thumb. Whether that has moved on or not AIIA is not sure, but the point we are trying to make is that decision makers need to be careful about the perceived differentiation between delivering to what we are assuming will be the rural and regional areas—that is, those with 1,000 or 2,000 people or fewer, the 10 per cent part of Australia—and the more urban areas.

CHAIR—On that point, some weeks ago Minister Conroy was quoted in the *Australian* newspaper—and I think I have this right; I do not have it to hand—saying that the 90 per cent was 'minimums we can reach rather than maximums you can deliver'. Assuming I got that right, 'minimums we can reach'—'we', as in the government—rather than maximums you can deliver, would you reflect on that given what you have just said in response to Senator Macdonald about the so-called rule of thumb?

Ms Johnson—The 'rule of thumb' phrase was used to describe to the AIIA at least that the 10 per cent figure in the decision on 7 April related to those communities of 1,000 persons or fewer. AIIA is not at all aware whether that is mutable. That is what I meant by the 'rule of thumb'.

Senator IAN MACDONALD—As the peak information body, are you telling me you are uncertain as to where this 90 per cent is and what it is going to constitute? Are you in the belief that if you are in a community of fewer than 1,000—it is hard to work out what is a community—

Ms Johnson—That is correct.

Mr Grant—It is very hard.

Ms Johnson—It is difficult to work out what is a community.

Senator IAN MACDONALD—I live in a place called Ayr in North Queensland, but there is a little village 10 kilometres outside of Ayr called Brandon, which has fewer than a thousand people. Is it part of Ayr or is it part of Brandon?

Ms Johnson—I have a very similar situation myself, living 25 minutes from the national capital in what I suppose is called a rural/urban area. I am unaware whether that would be a thousand or more, but I was merely using the terminology that was used when the announcement came out and we were making inquiries as to what the 90 per cent and 10 per cent would cover. What does 10 per cent mean? It was put to AIIA that as a rough rule of thumb it would be those parts of Australia that are populated thinly—for example, fewer than a thousand people.

Mr Grant—With respect, I think our 'alleged' word is innocent and I think the 'rule of thumb' is innocent as well. If correctly quoted, if Senator Conroy has said a 'minimum of 90 per cent', that implies that is a minimum and it could well be more. There is no doubt that the proposals force us to think about where fibre-to-the-home stops and where wireless starts. Frankly, from a technology point of view, I think that is more to do with how the technologies can be deployed cost-effectively rather than the numbers of people at the end of the line.

Senator IAN MACDONALD—Firstly, I am pleased that it is not just me that cannot conceptualise where the 10 per cent is. I am pleased that an august organisation such as yours is equally uncertain. I know from visiting lots of communities of a thousand or fewer that those sorts of people are a bit up in the air,

'Are we part of this or aren't we? Do we have to get different equipment?' and so on. I guess some of your members would be involved there. Have you been given any indication by the government as to when this will become clearer?

Ms Johnson—No, we have not.

Mr Grant—That may be an oversight. We are potentially not engaged often enough to be able to understand what clearly has to be some moving experience, if you like.

Senator IAN MACDONALD—We have asked this question of a lot of people today. You are in constant contact with the government about the NBN rollout. Some others who have given evidence and whom we might have expected to have been in contact have not been. But you are, I take it?

Ms Johnson—We are, but probably not as much as some of your previous witnesses today from other organisations. The reason for that is, as I tried to indicate in our opening statement, we do not get hung up on the technology so much as the economic benefit that using it will bring.

Senator IAN MACDONALD—Of course. But you have an expertise that I would have thought the government would have been falling over itself to avail itself of, and similarly with CSIRO, which surprisingly has not been consulted terribly much, as I understood from its evidence this morning.

CHAIR—Senator Minchin.

Senator MINCHIN—Just on that point, as I understand it, the government is committed in a policy sense to a 90 per cent-10 per cent, but I think the implementation study is the means by which they determine exactly what the 90 per cent and the 10 per cent will be.

Mr Grant—I agree.

Senator MINCHIN—I am interested in pages 2 and 3 of your submission. You state at one point that 'commitment to the aggressive timetable set by the government is essential', but then you state that your organisation has some concerns with the long lead time to completion. Is it aggressive or is it a long lead time? Just on the face of it, they sound contradictory. I was wondering what you meant.

Ms Johnson—Eight years does sound like a long time to us, as Mr Grant has alluded to in some of his earlier comments. It is an aggressive timetable from the point of view of very shortly after the announcement was made on 7 April almost the rubber hit the road straightaway with backhaul rollouts and so on in Tasmania. Bearing in mind the submission is now more than a month old, we are pleased to see quick movement, and we would like to see the government sticking to that MO of quick movement, fixing the backhaul problem, black spot rollouts and so on wherever it chooses to start that. But overall eight years to us in a fast moving industry sector sounds like a long time. That said, this is a unique, very large and complicated infrastructure activity. It really is.

As we tried to allude in our opening statement, again, all the bits have to be right, all the ducks have to more or less be in a row and preferably on the same pond or we will have a double jeopardy problem where we spend a lot of money on very innovative fibre in the ground, but if we do not get the other part of the equation right then, as we indicated, we do have a double jeopardy. It may take eight years. To be frank, we would like to see it take less.

Senator MINCHIN—I would prefer it to take longer.

Ms Johnson—But not at the expense of taking shortcuts or getting anything wrong.

Senator MINCHIN—Yes, exactly.

Mr Grant—The comment about 'aggressive' is to maintain the rage, so to speak. It has been a long time getting to this point. If you think about it, it has been a very long time. Now that we are at this point and now that we have presumably agreed on the opportunities that exist and the rationale for why we should be doing it, there are lots and lots of opportunities to get stuck down rabbit holes—say, with negotiations with various state governments, all of the policy settings that have to be done and all of the regulatory framework. There are plenty of opportunities to get sidetracked. I think our comment about 'aggressive' could be taken in light of, 'Let's keep driving it so that we make it eight years, not 10 years.' Remembering that in a build sense it is probable that we will get a large lump of the real benefit with a lesser implementation than 100 per cent. We have an opportunity to get a return quickly, with urgency around the processes to get the trenches dug and get the fibre in the ground.

Senator MINCHIN—I presume that you are concerned that four months after the grand announcement the government still has not appointed a lead adviser or begun the implementation study. They are forecasting that being at least nine months. I suspect that could be longer. And then nothing can start until after that. On the government's timetable it is still at least nine years away from rollout.

Mr Grant—I think our comment about 'aggressive' remains.

Senator MINCHIN—Something else in your submission intrigued me. On page 4 you stated that competition makes a difference. I could not agree more. You state:

US research indicates that policies which facilitate competing facilities based providers to deploy broadband with PPPs or highly public investment will spur investment.

Can you clarify that? We have had a succession of witnesses telling us that we must not have facilities based competition; that it would be quite wrong; that we must have a monopoly provider of the fixed line service; and that it would be a disaster to have competition. What is the evidence to which you draw our attention and are you saying it would be better if we do have facilities based competition?

Ms Johnson—It is an example drawn from a paper—again from a different jurisdiction, from the US—called the Economic Benefits of Broadband and IT, by Patrick Brogan. It is specifically focused on the US environment. Not being an expert on the US telecommunications environment, I was really pointedly using that example to support the point that competition does make a difference, whether it is in facilities based or non-facilities based. I do accept that the US is a different jurisdiction from this. It was really simply just using that example in Patrick Brogan's article, which I commend to the committee, about the effect of competition in any sector, facilities or non-facilities.

Senator MINCHIN—I think this is one of the big issues. Everybody is telling us that this will only work if the NBN is a monopoly provider of fixed line services; that it is essential that Telstra stop providing a fixed line service and rolls its whole enterprise into this company, and we cannot have facilities based competition. It is quite a big issue. I do not know whether you have a policy position as such on this?

Ms Johnson—No, we do not on that particular point. We can develop one if it is required. Again, as I said, I was really pointing to Patrick's very good data. The US market is an unusual market and I am not an expert on it by any stretch of the imagination.

Mr Grant—Therefore, our example could be misconstrued, because it was more an example of competition than it was of facilities based competition. Our position would be that this country's resources, that is, the amount of money that we have to get outcomes, are limited and in the provision of the infrastructure we should actually have no overlap if we could avoid it. That is not what is going to happen because of what exists currently, but the degree to which we do have overlapping in the provision of the base infrastructure we should minimise totally. That would be our position on that particular point.

Senator MINCHIN—I was also interested in your reference to what you describe as 'network thickets' being established around the country and the problems that apparently causes. Can you explain that a little? What is happening? What is the problem?

Ms Johnson—I would not indicate so much that it is a problem. It is an issue for network design, as we understand it. I alluded earlier to the fact that, not unlike Senator Macdonald, I live in a rural/urban area. The local council wants to perhaps get prime first-mover advantage and set up its own network. There are similar moves in Goulburn, nearby.

Senator MINCHIN—An optical fibre-to-the-premises.

Ms Johnson—And the nearby locality of Goulburn is doing the same thing. I understand over in South Australia similar things are happening, and also in Queensland. Mr Grant is probably more across that than I am. It did occur to AIIA that from a network design point of view if you can imagine these localised thickets or patchworks of networks around the country, not unreasonably state governments and particularly local councils are moving to serve their constituents. From a network design point of view the only point we would make is that it is yet another issue for NBNCo or whoever has the network design responsibility to ensure that those thickets or patchworks of local networks do integrate eventually, after eight years or six years, into the national NBN without unnecessary duplication and therefore higher cost to the end user. It was merely a network design comment, but it is something we are noticing around the country as we talk to our constituents and our members who are operating in various states, and something that we have observed, as Senator Macdonald has observed, just as users living in a rural/urban area.

Senator MINCHIN—Some, of course, assert that that is a better way to go. Professor Joshua Gans from Melbourne University has written lengthily on this subject and he asserts this is in fact the way we should allow this to develop.

Ms Johnson—Yes. I have read some of Professor Gans's papers. Not being an economist I am probably not prepared to comment on whether economically it is. We really make the point from a network design point of view. It is yet another issue that NBNCo or whoever will need to consider.

Mr Grant—It does underlie the need to maintain a proactive and aggressive position that would cause local governments or state governments to think twice before they make their own investments. That is really what the challenge is. The reason that these thickets, as we refer to, exist is that there has been an absence of an overall plan that would actually void them existing. What we immediately have is duplicate expenditure potentially.

Senator MINCHIN—I will not pursue it, but one of the risks in all of this process is in effect an investment drought. With $43 billion in the offing, nobody spends anything on anything.

CHAIR—Why would you at this stage?

Senator MINCHIN—Who is going to put in DSLAMs and things? Anyway, that is another—

CHAIR—We are not talking about that at this stage. Thank you.

[4.23 pm]

INGRAM, Mr Graham, General Manager, AusCERT

CHAIR—Welcome, Mr Ingram. Have you been here for much of the day?

Mr Ingram—Yes.

CHAIR—I will not repeat the committee protocols.

Mr Ingram—That is fine.

CHAIR—We have your submission. Do you wish to amend it?

Mr Ingram—No.

CHAIR—Would you care to make a brief opening statement?

Mr Ingram—Not so much in terms of the submission. I think the submission states the case as we see it quite well.

CHAIR—In respect of the others do you wish to make an opening statement?

Mr Ingram—There are two things that I would like to say. AusCERT in itself does not want to be a wet blanket on the whole issue. What we are really suggesting is that security and the issues related to security need to be one of the primary considerations of any development of a high-speed network. I suppose that is why we are grateful for the invitation to put a submission to the hearing, and hopefully we have articulated the case as we see it. Apart from that, I am more than happy to take questions on this matter.

CHAIR—Thank you. Senator Minchin.

Senator MINCHIN—Perhaps you could just tell us just a bit more about your organisation. You say you were the national Computer Emergency Response Team. Do you have some sort of ordainment, some sort of formal government blessing to be this or have you just set yourselves up? You say you are non-government, independent, self-funded and not-for-profit. Are you a provider simply of advice, policy advice, or are you actually hands-on? Tell us just so that we can understand your organisation a bit better.

Mr Ingram—AusCERT is based at an educational institution by virtue of history. Our peers around the world are largely government agencies and we are, for the most part, an operational agency. We fix the problems.

Senator MINCHIN—Is it a fee-for-service basis?

Mr Ingram—Generally, yes. We have members who pay us fees and the whole of the Commonwealth, for example, is a member of AusCERT. So that would be one member. We have several whole of government states. AusCERT is one of the oldest CERTs in the world. We are part of a global community. Back in 1993, when AusCERT was first thought of, the internet, as it existed, was an academic network. What was happening at the time—and I was not there at the time—was that there were a number of attacks from Australia launched at US defence installations and also NASA. When the Australian Federal Police and the Australian authorities were contacted to try to prevent this, because the US, from what I understand, was not very happy, a group of engineers got together with the Australian Federal Police and chased down a number of hackers who were responsible for it. They were operating from universities in south-east Queensland and, from what I am aware, these were some of the first successful prosecutions.

AusCERT is the national CERT by the fact that we do the work. There is no-one else in this country who does what we do. We work with law enforcement; we work with intelligence agencies; we work with industry—more importantly industry. We have been doing it for 15 years, which makes us one of the oldest CERTs in the world. We are connected to the global network. And the other thing, just to answer your question, is that we have an MOU with the Australian government which currently recognises us as the national CERT. However, you may have picked up also in the submission that that is currently under review as the federal government has decided that it would like to be the national CERT and would wish to take that responsibility from us.

Senator MINCHIN—Is that a federal government decision?

Mr Ingram—Yes, it is. It came out of the review of e-security national agenda.

Senator MINCHIN—I presume that is something you would seek to resist?

Mr Grant—No. We put a submission into the e-security national agenda where we suggested that the level of malicious activity in this country, the rate of development, was such that AusCERT, as a self-funded organisation, was no longer able to essentially subsidise the Commonwealth, or the government, for the work we do. What we requested was funding. What we got was slightly different, but I think it actually does give us the capacity to negotiate, and the Attorney-General has also released media releases on this; a new national CERT will most likely be a combination of AusCERT and the existing Commonwealth infrastructure into a new organisation.

Senator MINCHIN—Okay.

Mr Ingram—For your information, we are currently negotiating with the Attorney-General's Department to have the new national CERT co-located with us in Brisbane.

Senator MINCHIN—You are generally supportive of that, given the developments in cybercrime, et cetera, becoming a government agency.

Mr Ingram—I think the proof is in the eating of the pudding, but the end goal is the correct goal.

Senator MINCHIN—Yes.

Mr Ingram—I just hope we get there, that is all.

Senator MINCHIN—You are an emergency response team, so do you deal with the consequences of cybercrime and then systems to put in place to prevent it happening, or do you operate more at the starting point to ensure that companies and governments have systems in place to prevent it ever happening?

Mr Ingram—The best way to describe our organisation, the way I describe it, is that we are the fire brigade. People call us when there is a fire and we basically go in and put it out. We have spoken about cybercrime. AusCERT is an organisation relating to information security systems. Cybercrime is a reasonably recent aberration of some very significant and very, I suppose, concerning activities, but ultimately we deal with the attacks themselves. For example, if there is a denial-of-service attack on an Australian institution we would normally get involved because, my guesstimate is, probably 80 per cent to 90 per cent of the attacks impacting on Australia are sourced from overseas. AusCERT has the capacity to go offshore to the source of those attacks and detect them and mitigate them at their source.

For example, we work very closely with Australian banks and we have been responsible over a number of years for shutting down the phishing sites which are generally located in locations which are unfriendly for liaison via normal channels. The other thing is, being an operational organisation, we are very much real-time. So we do not have the luxury of days or weeks trying to sort this stuff out; it is really on the phone or email to people who can sort this stuff out.

What I was trying to say from our submission is that we are not looking at this from a top-down policy, we are saying that this is what we see here and I suppose, if you want to summarise our submission, if we connect the same compromised PCs in Australia now that are currently connected, and we simply pull out the current connection and put in a faster connection, I suppose that is my ultimately—

Senator MINCHIN—Yes, will go down and be in trouble?

Mr Ingram—Yes.

Senator MINCHIN—Your proposition is that the relevant security measures have got to be built into the system to start with, not at the end-user point; is that what you are really saying?

Mr Ingram—This really is IT 101; you always integrate the security into the design and architecture. Most of the disasters we have seen in IT result when the system has been built and there is the idea, 'Oh, I forgot about security. Let us bolt on some security.' I think that the internet itself is a great example of where that has not worked.

Senator MINCHIN—Can I ask you what discussions have occurred between you and the government to this point about the design and planning of this NBN since the April announcement?

Mr Ingram—We have many and varied discussions with Commonwealth agencies, not necessarily specifically on the NBN, but certainly on the issue of cybercrime and information security more generally. I have been fortunate enough on a few occasions to have met with Senator Conroy and I have—

Senator MINCHIN—You regard that as good fortune?

Mr Ingram—Look, he is a very busy—

Senator MINCHIN—I am being cheeky. Sorry.

Mr Ingram—In terms of the issues that relate to a network such as this, it is massive and I think just being fortunate enough to say to him, 'We have a security issue', and from I can understand Senator Conroy's comments have been, 'Yes, I get it. Yes, it will be part of what we want to do.' Now I have not seen enough, and I do not believe anyone else has seen enough, substance around planning and architectural issues yet to be able to determine whether it is in or out or is sufficient or insufficient. We just felt that here is our foundation document and it worked for me.

Senator MINCHIN—The government is apparently going to initiate an implementation study at some point—we are all waiting eagerly for that—but I presume you would expect to be consulted in relation to that implementation study, would you?

Mr Ingram—I think so. I am hopeful.

Senator MINCHIN—You have not had any indication yet that you will be, have you?

Mr Ingram—No, and I think it is too early for that, but what I will say is that the NBN is not in isolation. There are a number of currently moving e-security changes in the environment, as you are probably well aware, such as the implementation of the e-security national agenda; the creation of, for example, the national CERT; the Defence response; and the Australian Federal Police. So these things have been happening now for some time and I presume that there is going to be some coalescence with the NBN and the security of the NBN. So, these effectively did predate the NBN and the NBN discussions.

Senator MINCHIN—You mention that Finland and Japan are good examples of what needs to be done. Are you able to briefly describe what they did that we should do, and does this relate to the rollout of an optical fibre network?

Mr Ingram—I think it does. One of the concerns that AusCERT has had over a number of years is that the approach to e-security in this country is very much fragmented. We have different agencies with different responsibilities.

What we saw in Japan, for example, was that a number of departments decided that they were going to cooperate and put in place a national response which involved the ISPs, the national CERT and a systematic approach to dealing with compromised machines in Japan. At the moment, if I was to look in Australia, I see ACMA doing one thing and the Australian Federal Police doing another thing. We seem to be fragmented in our approach.

If I could crystal ball, the Malaysians, for example, have perhaps the best approach to national e-security that I am aware of in the world, and I do travel significantly. They have taken a national approach to e-security. They have created a thing called Cyber Security Malaysia which coalesces a lot of the responsibilities across government and industry into a central, unified framework. I think that is possibly the model for the future for this country, but we are probably about three to five years away from it.

Senator MINCHIN—Thank you.

CHAIR—Senator Macdonald.

Senator IAN MACDONALD—I would like to go back to Senator Minchin's question. With your organisation, what you are expecting will happen is that it will be the same personnel doing the job, but you will become somehow accredited to the government. Is that what you are saying? Will you become public servants rather than university staff? Should I not be asking you that?

Mr Ingram—You are making it very difficult for me. I think, 'Watch this space', would be the answer that I would give at this stage. AusCERT is a unique organisation that is globally recognised for the work that we do. If, at the end of this process, we have a lesser organisation, for whatever reason, then I think it will be a backward step. If we have a better organisation as a result of this, better funded and capable to dealing with the problems, then I will be a very happy person. I guess I do not know at this stage.

Senator IAN MACDONALD—You obviously have the best expertise in Australia in that field.

Mr Ingram—Yes.

Senator IAN MACDONALD—Again, the answer is self-evident, but clearly your people would be in some way screened. I mean you would obviously almost have to be the purest of the pure.

Mr Ingram—I would like to think we are, yes.

Senator IAN MACDONALD—You would have your own internal security checks. How do you know Osama Bin Laden is not one of your people working in your section of the university?

Mr Ingram—The key criterion that I look for in staff as the general manager is passion. That is passion for the work. It is very hard to infiltrate if you do not have that passion. Also, the staff we employ are not university staff. These are people who have industry experience who come in and believe in what we do. They are generally well known for what they do. The other thing is, because of the nature of the work that we do with the government, the staff generally have security clearances to secret level and also have police clearances for protected level with the Australian Federal Police.

Senator IAN MACDONALD—I will not go any further. Thank you for that.

Senator LUNDY—I have a couple of questions. Notwithstanding the fact that the implementation study has just been put together, at what point of the implementation of the NBN would be the right point for AusCERT to convey to the government what the design elements of the NBN ought to be like to optimise its capacity to be the kind of secure network that AusCERT would want to see?

Mr Ingram—That is probably the next question that I do not really have an answer for. Let me say that the first issue is that we have to have an understanding of the threat environment in which we are placing this NBN. I honestly believe that that knowledge is not well understood. Fortunately though, and I will just mention this, in front of me I have a House of Representatives standing committee on communications inquiry into cybercrime submission that we have just done which relates to the cybercrime element.

Senator LUNDY—Who would be the body or entity to ask what the extent of that threat is?

Mr Ingram—At this point I do not believe you have anyone else to ask except us. You could individually approach some of the banks, but there is no-one I am aware of in this country that does the work that we do that has the insight we have. One of my frustrations over a long period of time is trying to take the information that we have and, I suppose, to get people to understand the nature of the threat. For example, if you talk to people in industry, that is where AusCERT is looked at. We have been very heavily engaged in the malware issue because malware is the problem itself. The OECD paper on malware, which we have referenced, says quite clearly the threats to the economy of that. It took AusCERT a long time to get the government, for example, and the general population to understand that malware is a significant issue. The banks understood it, but the banks are not in the business of educating the community, particularly when you have this conflict of interest. If you are trying to encourage people to be confident online, you do not want to be telling them, 'There are issues out there that will bite you.'

The government is in the same boat. What we have been able to do is develop the threat work, put in submissions and try to educate. I think that is our primary goal at this stage. If people can go into the NBN with an open mind as to the nature of the threat that we are dealing with and the increasing level of threat, then hopefully that will then make people think twice about it. You do have the enormous benefits of this, but if we simply build a dual-purpose lethal weapon for criminals to use, I do not necessarily see that we are going to get the chance to back out of it. I do not know whether I have answered your question.

Senator LUNDY—Let us break this down to an example, one that I am familiar with, that is the concerns about the way the kernel of the Windows operating system works. Tell me about that as an example of how systems can be designed to be more secure or not.

Mr Ingram—I like the way you think.

Senator LUNDY—I am happy for you to give us an overview and take it on notice. As I am familiar with the work of AusCERT, I think it is very important for the committee to have on record what you mean, because it is about the actual design of the very fundamentals of software and operating systems. It is in the code, isn't it?

Mr Ingram—Yes, very much so. To answer your question, I would like to read something to you. I am reading from the submission we made to the cybercrime inquiry. In this submission the National Security Agency in its paper 'The inevitability of failure, the flawed assumption of security in modern computing environments', dated 1998, summarised the key aspect of the problem as follows:

The goal of this paper is to motivate a renewed interest in secure operating systems. The NSA argues that the threat posed by the modern computing environment cannot be addressed without support from secure operating systems.

Any security effort which ignores this fact can only result in a fortress built upon sand.

That is from NSA, which you would have to say would be globally one of the best, and that answers the question. The issue is that a number of years ago we had what we call secure operating systems. We had a thing called the kernel. The kernel was god and anything that happened on the computer had to go through the kernel and the kernel would say yes or no. At some point, particularly with newer operating systems—and by the way I am not a computing expert, but I am giving you my view of it—for a number of reasons it was decided that we do not want this cumbersome kernel in the way. We want to allow applications and hardware to work more quickly and faster. For example, games have direct access to hardware. This idea of a secure kernel was moved to one side. What happens now is that if you have malware, if it can take control of the kernel, it owns the machine; it is god and you cannot move it. This is what we call a kernel level root kit. It is malware that you cannot remove unless you are a very skilled IT security expert.

One of the things that we have seen over a number of years, particularly with the botnets, is that we started off with what we call user mode root kits, but now most of what we see is kernel mode. It really does mean that our ability to protect the operating system, the computer itself, is limited. That means that every time we connect one of these machines to a very fast network—a compromised machine being connected to a fast network—such as an NBN, it creates enormous problems. As you have probably picked up in the submission, the criminals value speed much the same as we do. They are no different. The faster the speed we give the criminals, the more they are going to basically make use of it. The machines based at the end of the fibre are potentially where our problems really start.

Just going further, in the paper what we have tried to do is say there are a number of things we could do at the protocol level and at the policy level that would actually reduce the dependence on the security of the end point, which we cannot put in place at the moment.

I do not know whether that has helped.

Senator LUNDY—Yes, it has. I think it is an important point to make. Just to take it a step further, can you explain the relevance of scrutiny of the kernel and openness within the coding at that level of software to be able to enhance, check and monitor the security of the technology?

Mr Ingram—I am not sure if I can go there, because I think that is very much a technical debate at this stage.

Senator LUNDY—I am happy for you to take that on notice.

Mr Ingram—I will take it on notice. I can say that one of our real concerns is secure software. Although the machine itself may have inherent problems, it is the insecure software that allows vulnerabilities to be exploited. What we have done in the document is mention the standard of software that we are currently running in today's market. This is not something Australia is going to fix. For example, Microsoft have done a tremendous amount of work in hardening the systems from being exploited from attack. They have moved from the operating system itself, which is now quite hardened and resistant, to the browser, which is actually much better, but the attacks are actually coming from things like Adobe Flash; it is the third-party applications that people have on their machines and run. If your Adobe Flash is vulnerable and attacked, your computer is compromised on the basis of a third-party piece of software that perhaps does have the security issues.

In discussing the whole of this approach to security, it starts with the machine itself, the kernel. It then moves to the software we operate on. The users, themselves, in many cases are a significant problem in terms of social engineering.

Senator LUNDY—Or they might open the wrong email.

Mr Ingram—It is the social engineering aspects of it. They click on a link and they are infected. It is quite worrying. Also, what we have tried to say is that we cannot expect every user to be an IT security expert just to be on the internet.

Senator LUNDY—No, but I think the key point that your submission makes is that there are some areas of government policy that could be enhanced to design a network that is more resilient to malware and to these kinds of attacks and problems.

Mr Ingram—Yes, I think so. At the nub of it, that is where it comes from and it is that leadership role that we are depending upon. I am not sure who currently as it stands takes that role. It certainly should not be us.

Senator LUNDY—Point well made.

CHAIR—Senator Macdonald.

Senator IAN MACDONALD—With these problems, if you put an axe through the laptop sitting in front of me, then that will not fix the problem.

Mr Ingram—No.

CHAIR—Take mine.

Senator IAN MACDONALD—We have all felt like that on occasions. It is the software that has infected the system, rather than this piece of equipment sitting in front of me.

Mr Ingram—In a very basic sense, yes. The operating system software that you are running on that machine at the moment is very complicated. Computers, by their nature, are extremely complicated. It is very hard to write code that does not have vulnerabilities in it.

In about 2003 the world changed for me. We changed from having hackers to having criminals who have worked out how to make money from the internet, significant amounts of money. This has created an underground economy of criminals for e-crime. There is tremendous motivation for these people to get into your computer. More so, the criminals are now realising that the value of the computer is the information that is on that computer, which ultimately goes back to you.

One of the disturbing things I was talking to the UK banks about recently is that we see tremendous amounts of compromised data. If you think about some of the things that you do on that computer now, if you honestly felt comfortable with Russian criminals, for example, or eastern European criminals having access to that, that is the way you have to think. What we have recently seen from the UK banks is that we have maybe one infection here. So, a certain amount of data has been compromised and stolen which could have been, for example, your Centrelink, tax or whatever it is. You can regard that as being in the marketplace. What we are now seeing is that the multiple infections are being correlated by criminals, which does point to the fact that they are starting to develop a capability that is significant. What that leads to is that if they want to target individuals, they are able to calculate things like net worth, value, influence and position and target individuals. This is what we are also seeing in the Australian marketplace at the moment. For example, executive officers of companies are being specifically targeted by criminals. That, to me, is an example of where this can go, and I am quite concerned about it. The reason why it is chief executives—for example, I mentioned this yesterday—a chief financial officer for a company may well have on their computer details of merger and acquisitions that could be very valuable in terms of share market manipulation and things like that. For example, if I had the current plans to the NBN that are probably sitting on someone's computer in Canberra, I might have a significant market advantage in terms of positioning my company. This is what we have seen starting to happen. As more information is stolen, the true value of that information is starting to be realised.

A lot of people are still catching up and thinking that the value of compromised data is the user ID and password to a banking account. I have moved past that significantly. The bank accounts will happen and are still happening, but the banks deal with that. It is this access to identity theft. It is the wholesale marketing of personal data and information—identity data—that we are starting to see happening.

My point, ultimately, is where does it lead? One of my theories that I have spoken to government people about is that if, over a period of time, you can get all the information you need to be another person—in other words, I can get their birth certificate, passport data and utility data—I can be that person in every sense of the word. That is probably beyond the scope of this inquiry, but I am just saying that projecting forward.

CHAIR—It has a bearing.

Mr Ingram—It is very scary.

Senator IAN MACDONALD—I should not have sent you that email about Mr Swann. That is sensitive information. The criminals might have it.

CHAIR—Yesterday a different Senate committee conducted an inquiry into the government's Telecommunications Legislation Amendment (National Broadband Network Measures No. 1) Bill. That is a bill that proposed to increase, in the broad, the government's powers to require suppliers to provide information, if you like, that is then able to be used by those participating in the NBN build. It essentially builds on and expands the existing information access regime set out in the Telecommunications Act. I note that your organisation, as far as I understand, did not make a submission to that inquiry and I am wondering whether there is a reason, given I thought you may have, at the very least, some peripheral observations to make that might be of use?

Mr Ingram—True. My problem is that we are a group of 20 people who have a day job and we are very selective.

CHAIR—So, it is the capacity. Are you aware of the bill?

Mr Ingram—No, I was not aware of that one.

CHAIR—You may care to make yourselves aware of that. It is accessible online through the Parliament House website. That particular committee has to report by the 17th of this month.

Mr Ingram—I will certainly take note of that.

CHAIR—You may care to contact the secretariat of that committee if you wish to express some views. You can do so in writing.

Mr Ingram—Yes. This is the first time that AusCERT has ever given evidence for any parliamentary committee.

CHAIR—Were we scary enough?

Mr Ingram—You were good. We do not do it very often. Again, the only one we have ever done is the cybercrime one, so we would like to see how things go as well.

CHAIR—Very much appreciated.

Senator MINCHIN—Are we staying ahead of the crims or do you see a real risk that the internet could be completely and utterly compromised by criminal activity?

Mr Ingram—We are losing big time. The reality is that people do not want to know.

Senator MINCHIN—You could reach a breaking point where people will not use online banking, shopping or anything.

Mr Ingram—Exactly. This is the conflict we are in. I am the bearer of bad news. I am the person that you do not want to listen to because e-government and e-business are all on the premise that this is trusted and you can have confidence. I can tell you now that platform does not exist. Again, I am the doomsayer.

Senator MINCHIN—We need that voice.

Mr Ingram—We have done a study in Australia as AusCERT and we have determined, roughly, that about one in five computers in this country are infected with something. I am not saying a data stealing Trojan, but it is one in five. My question to the government per se is: where is the threshold of pain where we realise that this is unacceptable? If you are going to say to me that it might be 50 per cent, I would suggest, based on my discussions with the privacy people, that 50 per cent, if it was to be that, of computers infected with a Trojan that was stealing data that could not be removed and that data was going to criminal organisations—underground economies—around the world, as a nation or as a government is that going to be acceptable? Because it is on the internet we have this growing threshold level of pain that changes. We are accepting the fact that 20 per cent of computers may be infected with something. I am seeing nothing that is going to say that when we get to 80 per cent we will be able to do anything about it.

Also, the malware that we are seeing at the moment continues to develop in its capability in terms of it being harder to detect. If it cannot be detected then it cannot be removed. Also, if you listen to some of the antivirus vendors at the moment, they are seeing something like 10,000 new pieces of malware per day. That is the volume of malware we are currently seeing. If you look at some of the figures that AusCERT has at the moment, the stuff that we get, which admittedly is some of the worst of the worst, across the antivirus platform, which in many cases that is the only protection you have on those computers, 50 per cent is detectable when we get it.

Senator LUNDY—Just to put this in perspective, I remember raising the issue about critical infrastructure protection with respect to the internet, software and hardware in 1998, around the time when the then government started putting in place some of its national strategies to address it. The challenge, as always with everything new, is that you try to keep up with the threat that is imposed.

Senator MINCHIN—I did mention that in my question.

Senator LUNDY—Yes. I think it is important to insert a measure of perspective that this is a constant investment, and the recent increase in the capacity of the AFP to pursue cybercrime is a great example of trying to keep up with that. I had a briefing, and I am sure they would be happy to brief any member of

parliament who went down to the unit to see what they are doing. The real challenge is having the kind of knowledge that Mr Ingram is sharing with us today fed in right at the start of the process.

Senator MINCHIN—I agree.

Senator LUNDY—I think the evidence that we have heard today will help.

CHAIR—Thank you, Mr Ingram. May we have emboldened you to feel equipped to make submissions in the future to this committee or others. It does not have to be so intensive, but you can do so by rote, rather than by your wonderful physical presence as well.

Mr Ingram—Thank you. I appreciate the time and I hope the committee does well.

CHAIR—Thank you. The committee will adjourn for today.

Committee adjourned at 5.03 pm