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MET IN COMMITTEE ROOM 2, PARLIAMENT HOUSE, HOBART ON
THURSDAY, 16 OCTOBER 2003**

BRIEFING BY Dr TERRY CUTLER

CHAIR (Mr Fletcher) - I declare the meeting convened and note the presence of Mr Richard Sulikowski from Department of Treasury and Finance and also welcome to the committee meeting Dr Terry Cutler, who has agreed to brief us and provide us with the information that will enable us to better address the challenge before us. Dr Cutler's curriculum vitae has been distributed to all members and, Terry, that's impressive to say the least and it sets quite a challenge for you to live up to that today. I suppose we have very high expectations of how easy you're going to make our work in the future. We do welcome you here.

I explained to honourable members earlier that we will allow you to give your presentation. We will ask questions. I guess it's best at the end, although you might encourage them during the presentation.

Dr CUTLER - Thank you for your welcome. I'm always delighted to come down to Tasmania. I enjoy it more and more every time.

The presentation I've prepared here today really is a platform for discussion. We attempt to provide a high-level overview of what this telecommunication industry is and what are the bits that make it up. Where do questions about optic fibre and so forth fit into the broader industry context and why this is an area of natural and direct interest to governments. Those are the two main themes shaping the structure of this presentation.

I thought it was useful to identify, firstly, the building blocks of the telecommunications industry, a little bit on the history and evolution of the industry in Australia because that shapes a lot of the current circumstances and market structure. Then I'll talk about some of the major changes currently going on in the industry, which make issues about optic fibre and broadband services over those high-capacity networks just so important.

Then I'll briefly to sum up with a few comments about what's happening in some other jurisdictions around the world - just a bit of a reference point.

So that was broadly what I intended to cover and as I go through, particularly if I lapse into technical jargon or obscure industryspeak, do feel free to jump in and ask any questions of clarification or tell me when I'm not making sense.

I should point out first of all that at one level this can become incredibly complicated. When I grew up in telecommunications in the good old days when Telstra was Telecom Australia and had not long ceased to be the Postmaster General's department, it was regarded as one of the most boring industries in the whole world. You couldn't get anyone interested in it. You just had a simple, plain old telephone service that provided a voice connection and everyone could get their head around it.

What's interesting is that in such a short space of time you've gone to a situation where it's far from straightforward. Services that depend upon the telecommunications network affect every aspect of the economy in the community. It is that way in which telecommunications has become a critical infrastructure and affects everything that creates some of the complexity. We will try and simplify it, however, down to its basic building blocks.

The first flyer I have here is simply to say telecommunications networks are made up of a whole range of different building blocks. You have clearly the need for what we call 'access networks', which link a core backbone network to an end customer. Then within that customer premises, whether it be a house or a business, you have various terminal equipment that connects into that access link. Increasingly, although it wasn't in the past, that becomes a bit like a water pipe or an electricity pipe on which you run a whole lot of different appliances, whether it be your household kitchen appliances, your lights, your security systems or whatever. It all plugs into that access pipe.

Then behind that access is what we call the core or backbone network, which is what links a whole range of local networks all together. Of course, networks are all about interconnection. A point-to-point link between just me and you can be used for some purposes, but the more people you have connected then the more utility you derive from a network, which is what we call the network effect. So that the more people who are connected to the network the more economic value to every person connected to that network.

So you have building blocks of local access networks that connect each of us individually, aggregated through core backbone networks to provide the maximum number of possible interconnections. Then over those connections and pipes, if you like, you then run a whole range of services and applications.

In the good old days when I first joined the industry that was basically a single application, which was a voice service. Of course, in the really good old days when it was a party line you picked up the phone and you immediately spoke to someone at the other end.

Now, of course, that service environment is becoming multiservice. So you are having multiple services over the same platform and that is partly why higher capacity and smarter networks are required. So you have these building blocks.

The other thing to note before we go too far is that the business of providing network services is a big business. Already in Australia, telecommunication services represent a market of \$37 billion per annum or close to 5.5 per cent of GDP. In some other economies where the rollout of broadband services is making people more dependent on the networks, that share of GDP is increasing. In fact in Australia it has probably doubled over the last 15 to 20 years. So it is increasing as a share of GDP. The networked content services and applications that run over those networks is also increasing.

It is interesting to note that just content industries in Australia, which increasingly of course in an age of digital content are networked services, represent \$19 billion per annum or 3.3 per cent of GDP. Those application services are currently growing at

roughly twice the average level of GDP. So they are growing at twice the rate of the economy at large.

What we are talking about here is the significance to every jurisdiction and it's becoming a very important part of any government.

Mr STURGES - Terry, sorry to cut across you; would it be reasonable to assume that that growth is also dependent on the capacity of the network to provide that smarter service you've referred to.

Dr CUTLER - Correct, it's a very good point. If I compare the growth in those content services across jurisdictions, for example, going over the networks, Australia has roughly half the GDP share and growth rate of the United States. So, yes, you are inhibited in those application areas, in other words the uses to which you can put a network, unless you have the platforms. That of course is one of the reasons why broadband and next-generation networks are so important for State development and economic prospects.

The points I have been making are reinforced in the following diagram on page 3 that, firstly, shows that increasingly telecommunications networks are part of a complex industry and business environment that links technology components - increasingly computer-software driven - content and application services creating the demand for the networks but also influencing the characteristics of those networks - so it is shaping the architectures of those networks - and of course the communications links themselves. Network businesses are always complex interdependencies between multiple players. They are not single-player environments. It is a bit like other core network businesses. In aviation, you have airlines that run vehicles, airports that provide facilities, so you have a whole infrastructure of interconnected players that you have to optimise the relationships between to have a robust aviation system. It is the same with the telecommunications system.

This is a theme I keep coming back to of why telecommunications is so critically important. Increasingly what happens in this area impacts on other sectors of the economy: manufacturing, in terms of the inputs, particularly with the technology inputs; the content industries that feed the uses to which we put the network; then the important role of telecommunications and the applications that run over it in the wider economy. A very high level of telecommunication sector output goes into intermediate use, so that improvements in those inputs into other areas of the economy, whether it is agriculture, manufacturing, tourism, banking, health or education, improve the efficiency in those other areas of the economy. So the role of infrastructure industries, like telecommunications in intermediate use, affecting the economy across the board is a crucial consideration. In this regard, information and communications technology is being increasingly recognised as one of the core critical infrastructures within what we all now glibly talk about as an information society, knowledge economy or however we describe it. This is the crucial platform shaping regional communities and economies around the world. I really wanted to reinforce that point.

I always think it is interesting to look back in history, particularly in sectors where there has been a high level of government involvement throughout their development. It is very interesting that in the nineteenth century Australia was right up there with the rest of the world in network technology. There was a submarine cable linking Tasmania and

Victoria, eight years after the first cross-channel submarine cable between the UK and France and that was installed here eight years before the first transatlantic cable. So Tasmania started out right at the front of the pack in using the new telegraph network.

The next major pioneering development in Australia was the overland telegraph in the 1870s. Historians like Geoffrey Blainey with his history of pastoral and mining industries in Australia highlight just how that absolutely drove the development of those primary industries in Australian economic development - a crucial linkage - and you can see huge parallels I want to draw with the reinvention of new economies today, 100 years later.

At the end of the 1890s in what some people have described as the Victorian Internet period of the telegraph, Australians were using the telegraph at three times the rate of the US or the UK. So again, as we are now, we were very quick adopters of really putting these technologies to work. I suppose the analogy I want to draw is the challenge today is very similar.

Mr STURGES - Don't worry, my daughter's up to the challenge. I just got the phone bill.

Laughter.

Dr CUTLER - That's why you also need it cheaper.

When we federated we did something that put us on a different development path from a lot of the rest of the world. Really by accident the Constitution gave the Commonwealth total and absolute control over communication networks and anything that happened over them. So in theory under the Constitution any networked application, whether it be in health or re-education, can be controlled under the communications power of the Commonwealth.

Very few jurisdictions around the world have that level of concentration and certainly no other federal system has that same imbalance of power between the national government and the State bodies as we see in Australia.

It seems simple but it really has influenced hugely the way the industry's developed differently in Australia and it also leads us to reflect on the limited scope or range of levers that State governments in Australia have to influence telecommunication outcomes. They are not the levers that are available in other jurisdictions like Canada, the United States or Germany which have similar federal systems. I make that point because I think it's one that's not often noted and flagged.

For the bulk of industry development time line this sector had been controlled and directly owned by government. That made it very different and in this it was similar to Europe whereas, of course, the United States has always been controlled by a private monopoly. That's a very significant difference between the United States' line of development and Australia and most of Europe.

Then around the world we suddenly, as part of a whole OECD program of micro-economic reform, not only in telecommunications but in a whole lot of utility areas in the 1980s developed the mantra of market liberalisation and privatisation in these sectors.

Then in a very short period of time we've had this massive period of structural change in telecommunications with the introduction of competition only in 1991, a seven-period where that was a very regulated duopoly between a merged Overseas Telecommunications Commission and Telecom Australia against a new entrant Optus which acquired the national satellite assets. A very short period of time has elapsed since the introduction of competition and the way in which that competition was introduced has significantly influenced the industry structure and market outcomes we live with today.

Mr STURGES - Terry, are you going to go on - I haven't read the presentation paper that you have in front of us - and talk about the influence of competition and where they have gone with it - fixed lines as opposed to mobiles et cetera?

Dr CUTLER - Yes. On page 6 I wanted to sum up key points about the legacy of some of that sector history. Firstly, throughout sector development, governments have played a crucial role in the development of the sector and the industry-very directly. Because the role of government was exercised through direct government ownership and operation of telecommunications assets, alternative mechanisms to secure public interests were not of course developed, because there was no need for them. It means that we don't have a tradition, as they do in the United States in particular, of very strong State-based regulatory bodies around telecommunications, where they have their public utility commissions, which give a local focus and face to policy and regulation, which is missing here. We don't have the public research agencies in this field because the Telecom Australias of the world always did that in the past. We don't have the rural and regional development authorities like the US Rural Electrification Authority, recently relabelled the Rural Utilities Commission, which for something like the entire post-war period in the US has provided soft loans to regional stand-alone telecommunications carriers. It has played a crucial role outside the main centres in the United States. So we don't have a tradition of those alternative methods for government intervention.

As I said, because of the constitution, this sector developed out of kilter with other utility sectors like water, electricity and gas, all of which were essentially driven at a State level. I am just reinforcing this contrast because I think it is one that is often not understood and appreciated.

Finally, because of the process of deregulation and market liberalisation, and the way that that was shaped by very conscious policy decisions about what were then seen in the late 1980s as desirable outcomes, we have had the creation of a market that is not the result of natural market forces. It has been very much a shaped market. The key element of that is the role of Telstra, or the combined Telecom Australia and Overseas Telecommunications Commission which merged in 1991. The intent of that was to counter fears that were expressed by opponents of deregulation, that deregulation would cripple the incumbent Telecom Australia and that what we needed was a globalising industry, a strong national flagship carrier which could play an active role in expanding regional and global markets. This national-flagship-carrier principle shaped the policy decisions about the type of deregulation that took place.

The other significant factor which is relevant to the analysis here is the decision to provide sector-specific regulation of telecommunications rather than having it under the general scheme of National Competition Policy, as applied to all the other utility areas that were being deregulated, liberalised and restructured at that time - gas and electricity. That was the only really significant carve-out from the National Competition Policy framework adopted by the Federal and State governments in 1993-94 following the Hilmer Report. That I think is another significant point to note -

Mr STURGES - Very significant.

Dr CUTLER - because that has led to a lot of the regulatory problems and different structural outcomes that we see today.

When you look broadly at the Australian market the crucial observation to make is to remind ourselves that in global terms Australia is a small market in telecommunications as in everything else. It is a just a fact of life that we often forget. It is also a heavily skewed market, as we know, with a huge concentration around south-east Australia, which I affectionately call SCAM Australia - Sydney, Canberra and Melbourne - and the rest of Australia in non-SCAM Australia. In many senses, there are two markets for telecommunications: one is the high-density, metropolitan markets of south-eastern Australia and the remaining regional markets of Australia. In practical terms, in terms of servicing, they are not similar markets but we try to pretend that we have one national market that in many ways is a hangover from the days of a single government-owned monopoly provider.

Because it is a small market we have - and I will keep coming back to this - in global terms a naturally-high level of vertical integration with our main telecommunications providers, of which really only have three - Telstra and then a very long way behind is Optus, and AAPT, Telecom New Zealand. Unlike other regional markets around the world, these are vertically integrated in that each of those players provides not only the basic network connection and operation but also an increasing range of content services over those networks, including pay television. That happens in virtually no other OECD country - and I want to keep making that point.

The thinness of the market environment in Australia means that it is a low-density market environment. We often talk about the tyranny of distance; I think more important in shaping industry outcomes in Australia is the tyranny of density and the tyranny of having low-density environments because they are not attractive markets for suppliers in any area. The unfortunate community and economic development context of that is that if you have a thin market - a low-density market - you try to provide one solution provides all services to that market. You don't recognise in fact the inherent different market segmentation within that market because if you look at the vast size and different economic activities across regional Australia and even within and across Tasmania, there are very different market needs which are often camouflaged in the approach to low-density markets. It is a fact of life but it poses some really important challenges.

Mr STURGES - Terry, an issue that I think is important is the cost of providing that service to the thin market. You talked before about having a big bank to provide the service; you were talking about numbers determining access to service.

Dr CUTLER - Yes.

Mr STURGES - But you've still got one line and one line can service thousands or it can service hundreds or tens.

Dr CUTLER - This is going to get me later on to the issue of market failure and where government needs to step in.

Mr STURGES - Good. I will leave it alone for the time being.

Dr CUTLER - On page 8 I simply reinforce the point that this is one of the most highly concentrated sectors in the telecommunications world. Within the Australian context it's not very different from a whole lot of other sectors, like aviation and so forth, where we have duopolies or quasi-monopolies. Again, this is a function of scale but we do need to recognise that this makes us quite significantly different from the rest of the world.

The chart of 2001 reported results shows the huge difference in terms of scale between the market leader, Telstra, and the whole rest of the pack.

Mr WILKINSON - Are those figures still the same now?

Dr CUTLER - Yes. In fact the gap has probably increased not decreased.

Ms GIDDINGS - Are all these operators still in existence as well or are some redundant?

Dr CUTLER - A couple have changed hands or merged. One of the interesting things is that since full market liberalisation in 1997, Telstra's market dominance has increased in the last few years. You've got to untangle whether it's a result of that market dominance or the fact that there's been a major economic downturn in whole tech sector; the number of market participants has decreased. So the competitiveness of the market has decreased over the last five years rather than increased.

Mr STURGES - Terry, if I can just for the sake of clarification, you've got 14 players on this graph, but that doesn't mean that there are 14 sets of infrastructure in the ground.

Dr CUTLER - Correct. You've got the incumbent, Telstra, the ex-monopoly who previously was the only provider and builder of infrastructure. Ten or so years ago with the introduction of competition - and ten years is not a long time in terms of building infrastructure - Optus acquired the domestic satellite, which it was going to borrow from Aussat. So it had satellite infrastructure, which Telstra did not have directly, and it started to build optic-fibre coax in networks in basically Melbourne and Sydney, a bit in Adelaide and a bit in Brisbane. That was largely driven by its desire to get into the pay television network. As a result, Telstra basically built the same fibre-coax network in exactly the same areas to compete with it.

That network building of fibre coax has stopped where it was in about 1990, partly because no-one was making any money out of pay television. You have now dramatic market rationalisation with the effective merger of content deals between Optus and

Foxtel, in which, of course, Telstra is a 50 per cent and controlling shareholder. That has stopped that building. So that's what we've got in terms of fixed network competition.

We then had people putting some backbones around the country. IP1, which is in receivership, and the east coast one, Nexgen, which is also in receivership. It's partly because of the economic downturn and the post dot.com bubble correction. It's also partly the shrinking of competition. So the customers for those backbone networks basically have disappeared.

CHAIR - Terry, I just need to get the picture right with regard to vertical integration. Telstra is providing content and transaction-based applications, and signalling and control applications, so it's vertically integrated that way and it is the dominant player. Are you saying that each of these other 14 players is similarly vertically integrated or is the most recent argument saying, 'No, that's not the case; they are buying services off Telstra'.

Dr CUTLER - No. They have all followed the same model, so the main fixed-network players are Optus and AAPT - which is owned by Telecom New Zealand - followed in the way they have to follow the same model as the market leader. In fact Optus was obliged to because its original licence called upon it to be what was called a full service provider. That again reflected a policy decision to introduce matching competition. The result is that makes it very hard for a person to enter just providing a niche or particular service because of the mismatch in market structure. The best example of that, on the mobile network side, is that Hutchison Telecommunications with its fancy new 3G network, marketing that as its sole network offering, find it very hard to compete with the others because they can bundle their service offerings in a way that it can't.

CHAIR - I need to think about that a bit and get back to you at a later stage, I think.

Dr CUTLER - We will probably keep coming back to that because this is one of the areas that makes the Australian market very different from virtually every other overseas market where in fact the trend has been the other way, to breaking down vertical integration either on policy grounds or for normal commercial reasons of business specialisation.

CHAIR - So you are saying that there are a limited number of players providing vertically integrated services to the broad but thin market, that there is, if you like, a market anomaly that is the outcome of policy decisions or inadequacies or structural deficiencies at an earlier stage over which we have little control and they are not likely to change in the foreseeable future?

Dr CUTLER - A perfect summary. Page 9 I am not even going to attempt to explain -

Mr STURGES - I thought that was the circuitry for a MIG jet.

Laughter.

Dr CUTLER - because I could make it much more complicated if I tried. I have just two observations about this. First of all, it reinforces the point that regulation in this sector is totally controlled at a Commonwealth level, unlike other jurisdictions and other Federal jurisdictions which gives State governments no direct involvement or leverage at a

regulatory level, unlike other utilities like gas or electricity, water and other infrastructure, which are the siblings of telecommunications. Telecom is the odd man out here compared to other infrastructure.

In terms of regulatory issues, because of the industry evolution and the regulatory frameworks that have been put in place, there continues to be major problems essentially arising from just the sheer market dominance of one player and the market power that then accrues to Telstra. These regulatory issues revolve around the bottlenecks of new entrants trying to interconnect and interwork with the Telstra network, so access is a fundamental issue and it is a problem that will not go away. The ACCC and others effectively have conceded they cannot solve it under their current powers and frameworks.

The vertical integration creates serious anti-competitive effects through bundling. Telstra can come to you and say, 'Buy your pay television, your voice service, your Internet service et cetera off me and I'll give you this single price'. Other players can't do that and that is a huge anti-competitive effect.

The other more intangible regulatory issue that flows from that market structure that we have of unnatural concentration and dominance is the information asymmetry that flows, so that the dominant player, particularly being an erstwhile incumbent monopoly, has huge information resources. It knows the whole Australian sector inside out. Regulators don't know that, governments don't know that and new entrants don't. So that creates a huge competitive advantage and barrier to the operation of competitive markets.

Mr STURGES - Terry, before you move on if I may, if I can come back to your SCAM, and I like that one -

Dr CUTLER - You can quote me.

Mr STURGES - If you don't mind I'm going to use that from time to time but if I can come back to your SCAM and link this to the regulatory issues, it's my understanding that Telstra is obliged through regulation, through legislation, to provide a telecommunications service but in relation to the value-adds, if I can call them that, they're not obliged to necessarily provide that to Tasmania. Let me take outside a SCAM area. What specifically is the legislative requirement? Is that just to provide voice service, basic copper service? I just need to get my mind wrapped around it, if you don't mind.

Dr CUTLER - As part of licence conditions and it was also part of having a safety net with the introduction of competition there was a standard service definition introduced which meant that the nominated universal service provider, which by definition was Telstra because it was the only ubiquitous one, had to provide a minimum level of service. Over the last 10 years there has been a lot of attempt to lift that bar so that a new digital data service standard was introduced at pitifully low levels to cover nationwide access to -

Mr STURGES - Is this ADSL you're referring to?

Dr CUTLER - No, no this is to dial up Internet services. A very low bar. So it's a long way away from anything broadband. It is linked to the requirements for Telstra as the only

ubiquitous player to also provide emergency service connections and capabilities. So the 000 type services.

Mr STURGES - I'm not trying to lead you but I think it's important for our future deliberations to have an understanding -

Dr CUTLER - You do a good job.

Mr STURGES - I'm sorry if I am but I really do think it's important as we deliberate this matter further.

So there is no regulatory requirement on Telstra who essentially is the monopoly provider of fixed lines service in Tasmania to roll out optic fibre cable or roll out any other form of broadband service in this State?

Dr CUTLER - No. Key point. In fact to provide anything below that lowest common denominator standard service.

It has been one of the unfortunate consequences of that market concentration around -

Mr STURGES - Thin market, yes.

Dr CUTLER - south-east Australia that you've typically had this disparity in terms of the roll-out of new services and innovation between that high-density market and regional markets. So in the 1980s with the introduction of ISDN and other special data networks of course you first of all deploy them in Melbourne and Sydney then you might have a five or 10-year gap before they become available in regional markets.

Mr STURGES - If at all.

Dr CUTLER - If at all, and a lot of services don't become available, and that happened even before competition was introduced. It's simply that function of high density versus low density.

Mr STURGES - Versus cost of provision of service.

Dr CUTLER - And also issues that I will get back to about differential rates of return. If I have a limited pool of money, do I put it in a high-growth dense market or do I put in a low-density market? It's a no-brainer -

Mr STURGES - Not if there is not a regulation there requiring it.

Dr CUTLER - Precisely.

Ms GIDDINGS - As technology has developed, has that bar lifted at all then?

Dr CUTLER - I think the penalty of having that, if you like, innovation gap in terms of the roll out of new services and capabilities, has become higher because as you move into an information world - and you think about the Internet and broadband services - the economic penalty across the economy of not having access at the same time as other

people is now growing exponentially. To me that is one of the main challenges of regional Australia in remaining economically viable and internationally competitive.

Page 11 is a bit difficult and a bit hard but essentially it explains one of the inherent reasons why you might have market distortions and market failure in this sort of network game. With networks that connect people want to provide services and content over those networks or between the end users of those services you have this network hype which can become a bottleneck. From the point of view of service providers or end users, the best network in the middle is a dumb network that is just a huge capacity and all the activity happens around the edges. That makes it a commodity like a water pipe and an electricity connection. For end users and service providers a dumb, simple, high-capacity network in the middle is the optimum outcome. If you are in the network game, of course that is not the optimum game. If you control a network bottleneck, you have an interest in actually capturing as much of that monopoly control as you can to preserve the value.

Mr STURGES - You bottle the content.

Dr CUTLER - Correct. Just typical monopoly behaviour.

I want to make the point on page 12 that - and I should point out this relates to Telstra prices for voice services - even where you have seen - and the greatest impact of competition so far has been in the voice area rather than the data, Internet or mobile phone areas - even in those areas where there were real price decreases as a result of competition after 1997, it is slowly creeping back to where we were. We are seeing real and significant price increases in those areas where Telstra essentially has monopoly control, which is the Access network. To me it is quite a telling slide about competitive outcomes.

Now I will just make life harder for all of you and explain why this industry and this sector is going through a profound point of change at the moment, as significant as the change from telegraph networks to voice telephony around the turn of the century. The change we are going through in the Internet world and the networks that support an Internet world is as big a change as the change from telegraph to the telephone. On page 14 we can already see what is happening over the last bit more than a decade where 1991 voice services represented 53 per cent of Telstra's monopoly turnover. In 2002, if I take out the aberration of fixed-to-mobile calls, that had dropped to 17.5 per cent. There are huge structural changes going on in this industry. All that reflects is just the huge growth in non-voice service applications, so the channelling of more and more other services over these telecommunications networks. The key driver there has been around online services and the Internet because more and more applications can be delivered on a networked basis. You can see that in education, health, banking - everywhere. The nature and reliance on that telecommunications network is changing.

At a technology level what you have is the disconnection of the application from the underlying platform. In the good old days you couldn't have a voice call if you didn't control the copper cable link. Now you have these big pipes and you can have voice calls, pay television, banking transactions, all going down them. Those different application channels can operate, and in fact logically do operate, independently of the underlying network of the cable. So you have a layering happening in terms of the

technology. Increasingly, in large markets like Europe and the United States, you are getting telecommunications reverting to the utility models we know in electricity and water and so forth, with the utility commodity provider of the pipeline connection and separate providers providing the application services over that pipeline. It is becoming more utility-like that it used to be.

CHAIR - While the simile here is the disintegration of our hydro-energy business where we have Transend providing the pipeline and Aurora, another private sector, will eventually buy the service to use that.

Dr CUTLER - Correct.

CHAIR - It is a bit harder to understand in your business, a bit more complex it seems to me.

Dr CUTLER - The model is exactly the same. If telecommunications hadn't been carved out of National Competition Policy, the Hilmer recommendation was to treat telecommunications in exactly the same way as we treat electricity. With hindsight it probably would have been better. We have this layering happening. That is what makes the issue of vertical integration so crucial.

CHAIR - Terry, compare that model with what we have now again and clear up in my mind what is happening at the moment. There is still the pipeline there - the pipeline is controlled by Telstra?

Dr CUTLER - Correct, despite the increasing function or separation between the pipeline and the services, which it makes it possible for different people to own and operate each level. In the case of Australia, Telstra, through vertical integration, continues to control the whole game. That is why vertical integration is such a crucial issue in this game. It is as if in electricity you reverted to end-to-end control of the whole system. I think that is a reasonable analogy.

CHAIR - So our transmission of energy is a high-turnover, low-profit regulated market and you are suggesting the same, that whoever owns that pipeline in the telecommunications field ought to provide access to all the players at an equal price?

Dr CUTLER - The OECD, in terms of its current thrust to structural separation in telecommunications, is really imposing that similar model to electricity and other utilities by separating out the service provision from the underlying infrastructure, ownership and carriage.

Mr STURGES - Just to step outside the model that you're referring to now, I seek your opinion on putting our own pipeline in and generating your own power. The model that you're talking about now is sharing that main trunk. Step away from that main trunk and put in an independent trunk; what's your opinion on that?

Dr CUTLER - It's a good point, a key one, because this gets me back to network effects. Unless I can do that, unless I can interconnect so I can reach everyone else, I don't get any benefit.

Mr STURGES - That's right. But you can have the trunk and then reticulate as long as you're able to provide that service?

Dr CUTLER - As long as you can interconnect.

Mr STURGES - That's right.

CHAIR - Isn't this the nub of what our committee will work upon, whether the State would be better off with one regulated trunk providing access to all parties at an equal and fair market price as opposed to having a second trunk which will have infrastructure problems of its own?

Dr CUTLER - No, I think the nub is under what industry structure is Tasmania going to have the greatest prospect of acquiring end-to-end, high-capacity services broadband. There are going to be a number of options that could be available at any point of time. So under what circumstances can you get that? The flip side, I suppose, is the 'do nothing' scenario; is it likely that next-generation, high-capacity broadband services would be deployed throughout Tasmania within a time frame that makes you competitive with global markets? If the answer to that is 'no' then what are the key bottlenecks to that occurring.

The second question then is will particular market structures provide access environments to third-party users and providers, or do you need regulated structures to provide that open-access use environment? I probably haven't made that at all clear.

CHAIR - I'd like to expand that. It's too complex for me. Perhaps we should go on with your presentation and I'll get a chance to develop that.

Dr CUTLER - I'm sure we'll keep coming back to that.

CHAIR - Yes, okay.

Dr CUTLER - The point I'm trying to make about this is a point of sector discontinuity, with the impact of next-generation, Internet-protocol-driven packets which network revolving around broadband services. This fundamentally changes the old game in terms of network architectures and hence the question of who are the natural owners and operators of networks and who has a natural interest in those networks.

So we're getting more and more people delivering applications over a network. The technology enables more of the smarts of operating that network to be at the edges. So you've got more people with a vital economic interest in the outcomes of network two or three and also potentially different roles emerging and then different ways of structuring service delivery that may or may not, depending on how they develop in a regional market, change previous bottlenecks and hurdles or up the ante in terms of the need to have intervention and regulation.

So in this new network environment there has been a breakdown of the way in which you can structure your network business models ranging from a whole lot of interrelated interdependent players, as we've seen in a whole lot of other network markets like transport and so forth.

The question then is one of who controls the emerging market structures? If it were a greenfields environment you would have a very different-looking industry structure and range of market participation than with the non-greenfield environment where you go in for the highly concentrated structure with extreme market power, which is the legacy effect.

Mr STURGES - And limited regulation.

Dr CUTLER - And limited leverage at a local level.

Mr STURGES - Yes, that's right, sorry. 'Leverage' is a better word.

Dr CUTLER - So we know what's driving these emerging networks. It's as different, let me remind you, as the voice network was from the telegraph. The networks for this century are going to be totally different from twentieth century networks.

What's driving them? Suddenly the underlying technology changes. The demand for huge capacity changes so that high bandwidth networks are what it's all about.

A lot of people say what is broadband and try to put a number around it but this is infinitely expanding. So broadband is high capacity that caters for whatever we're trying to do with it at a point of time. So it will keep growing.

It's also always on so it's this moving from a dedicated service like the voice network to a water pipe and a electricity pipe where I can do a whole lot of things with it from running my fridge to my security system. So it's changing the structure. It's going back to a commodity input as the basic pipe over which I do a whole lot of things. So it's a fundamental change in industry model.

So two implications that I've highlighted on this page I think are vital. One, that the underlying infrastructure business is a commodity business. That used not to be the case and so incumbent operators don't like giving away the sort of cash flows they got from non-commodity businesses. They will hang on to them for as long as they possibly can. Anyone would. That's key point number one.

Key point number two is that the existing local reticulation copper network is obsolescent. It cannot be infinitely upgraded to meet a broadband high-capacity demand environment. It's running out of time.

The big con job in this game is the belief that ADSL, an upgrade of copper network, is the solution and to say ADSL equals broadband so if you've got ADSL don't worry. You don't need next generation optic fibre or whatever. It's an absolute hoax. The reason it's an absolute hoax is because there's a physical cap on how much capacity you can get out of that copper cable - a matter of physics. It will not meet and cannot even today satisfy the needs of most people.

Secondly, it's an inherently unreliable service so that only a percentage of existing copper lines can be conditioned to ADSL so it could never be a complete solution anyway.

Mr STURGES - Can I come back to this copper network just for the record. You talked about a cap on the capacity of the copper network. I want you, if you can, to comment on the use of pair-gain systems on the copper network because in Tasmania we have many, many thousands of Telstra customers hanging off pair gain who can't get access to ADSL or to modem Internet connections.

Dr CUTLER - That's the underlying problem with ADSL because -

Mr STURGES - It needs a dedicated line.

Dr CUTLER - and those traditional networks were not configured, and copper itself is not capable, so there's a cap on its capacity and it's only available to particular groups of existing subscribers. It can't be an across-the-board complete solution. It hasn't been in Telstra's interest to talk about ADSL limits. In fact it is in its interest to get as much life as it can out of its installed infrastructure.

Mr STURGES - If you could just touch on the pair-gain systems because I'm talking from a regional perspective now. It's a concern to me that a number of constituents of mine are hanging off pair-gain systems and will never get access to twenty-first century telecommunications in that situation.

Mr WILKINSON - Before we start, what are pair-gain systems?

Dr CUTLER - There's a whole range of local network technologies that have been developed to try to increase the capacity of an existing installed line -

Mr STURGES - A fancy double adaptor.

Dr CUTLER - Correct. That's a nice way of putting it. So instead of saying you've got new services being demanded in a particular suburb or street and going in and putting in a new line, it's a way of splitting the existing lines so you get double the number of service connections.

Mr STURGES - But you diminish access to the service; is that correct?

Dr CUTLER - What you do is inherently diminish the bandwidth of that line because you're dividing it. That works for a voice service, which doesn't require a great deal of capacity, but not if you try to run a high-speed Internet service over it. I would also like to talk about the problems with reinvestment in the network; there is a good discussion around that.

Mr STURGES - I'd like to come back to that after lunch; I think that's very important.

Dr CUTLER - It's a crucial one because that goes to the heart of the matter before this inquiry. This issue of 'why broadband?' is just so important because that goes to the heart of why government has a natural interest in this matter. Then I think it is interesting to look at some of the developments in other jurisdictions - again, to reinforce the point of why this is of natural interest to government.

Mr STURGES - And USOs and CSOs. That is a big concern to me being in regional Australia, that we are being denied access to twenty-first century telecommunications services.

Dr CUTLER - But ironically, some of those safety net mechanisms have the unintended consequence of keeping other people out.

Mr STURGES - That is right. Yes, I acknowledge that.

Dr CUTLER - It is fascinating with universal service obligations because it means that under this standard service provision I, Telstra, cannot offer you a service unless it is 100 per cent nor can I, new entrant, who can offer you something that provides 90 per cent offer that service. So you go without rather than getting 90 per cent.

CHAIR - Terry, I want to go back. It seems to me that you have built some sort of an argument in my mind to suggest that the single carrier - the single transmission line, if you like - regulated and providing access to all the providers is the ideal model but there may be reasons, you will argue, that that will never come about because of the factors we have talked about at an earlier time and because that will never come about, we need to do something else. I want to hear that argument a bit more when we have an appropriate time.

Dr CUTLER - So, without a shadow of a doubt, a monopoly in the local network is economically rational. If, however, you cannot get open access and competition off a single pipe then - and in high-density markets it is economically sensible actually to have duplicate infrastructure. If the ownership of an existing monopoly pipe means that you do not have any levers to force structural change through regulation then duplication has the same effect and can be the only alternative.

CHAIR - It can be the only alternative, albeit a high-cost alternative. We are looking at a small population with a thin market. The cost of doing that may well be quite high. It may be a worthwhile cost anyway.

Dr CUTLER - The economic cost of duplication would be very different at a backbone level versus a local reticulation level. No-one in their right brain would have two optic fibres running from the street into my house. In that situation, the first person to put an optic fibre into my house will be the last one.

Mr STURGES - And if you can do that in tandem with another utility service, why wouldn't you grab the chance?

Dr CUTLER - That has been the important issue around the unique opportunity of having the major utility reticulation, like gas, in Tasmania because opening the trench is the biggest cost.

Mr STURGES - An interesting argument, that is right.

CHAIR - Thanks for that morning session. I will now suspend the meeting until 2 p.m. and we will proceed at that stage.

The committee suspended from 12.14 p.m. to 2 p.m.

CHAIR - We will reconvene now and I will hand back over to Dr Cutler for him to continue his presentation.

Dr CUTLER - The next couple of slides are looking at what has happened with investment patterns in the industry as it has moved into a competitive environment. This one is a summary of OECD countries, so it gives the global picture before we turn to Australia. Key takes from this are that firstly incumbents have typically done pretty well; in fact, across the OECD profitability of incumbents has increased. The main reason for that has been reduction of capital expenditure and operating costs. You face competition, you drive your fixed assets harder and you are not reinvesting as much. That would be fine as long as someone is investing and so you look at what is happening with new entrants and you see that the new capital investment sector has shifted from the incumbents to the new entrants. You say, 'Well, that's great because the net outcome is fine', until you look at where that investment is going, which tends to be into the most competitive markets from the point of view of new entry, which isn't the fixed network. It has been the wireless, data and Internet markets.

Mr STURGES - Would it be fair to say, Terry, that that is for a quick return on capital investment?

Dr CUTLER - Of course.

Mr STURGES - A very low level of investment and infrastructure but higher return and higher yield?

Dr CUTLER - Particularly in mobile networks because relative to fixed networks the capital infrastructure is low and very high margins have been maintained. In the case of Australia, apart from the aberration due to the licensing framework around Optus during the duopoly period when a condition of its licence was that it have certain coverage and be a full-service provider, which encouraged it down the path of going into the pay television rollouts around fibre rollout in the metropolitan areas. Apart from that, none of the new entrants have invested significantly in fixed network in Australia.

If you look at page 20 about the level of reinvestment in the network over time, looking at this it looks as though it has been going down ever since I joined Telecom Australia. There is no correlation.

CHAIR - We are heartened by that.

Laughter.

Dr CUTLER - There is a frightening timing overlap. You would expect high levels of reinvestment in network infrastructure when network penetration is still being rolled out and growing, so you would expect that to tail off as you reach saturation, which of course we are pretty close to with the fixed network.

Mr STURGES - Again, Terry, I can see that there is a significant downward trend on the CAN as opposed to wireless. Is that the way I am seeing it?

Dr CUTLER - Correct. The top line is total capital so it includes wireless data as well as fixed network and international, whereas the little bit right at the bottom is just the investment in the customer access network. That is the crucial last link copper network, which you can see is at incredibly low levels for what is the core of the network.

Mr GUTWEIN - Terry, can I ask a question - and it may even sound like a fairly ignorant question - about the satellite technology as opposed to a fixed network. With Doherty Hotels and their relationship down here with Sharon, would you take a moment to explain the differences between those two and the need for the fixed network versus what might be possible with satellite?

Dr CUTLER - The short answer is two-fold: one is cost structure and the other is scalability. Satellite was great for site specific solutions. So if you had a hotel in the middle of the tablelands or something or the wilderness, a perfect solution filling gaps.

Where it's not good is as an ubiquitous solution. The reason for that's really simple. To put a satellite up there, a fixed number of transponders and there's only a certain amount of capacity that each transponder can handle, you quickly fill it up. When you exhaust that capacity you can't upgrade it so you have to put another satellite up. So because there's a constant relationship between transponder capacity and utilisation capacity you've got high fixed costs, whereas if I put a fibre optic in I can upgrade the capacity on that fibre optic hugely, almost exponentially so that I can scale demand over a fixed asset which changes the price points hugely.

Mr GUTWEIN - For example, say with the Sharon satellite at the moment, do you have any understanding what capacity may have been reached on that particular system at the moment or not?

Dr CUTLER - There are two issues there.

The capacity around the particular equipment installation, whether it's one-way or two-way, because a lot of satellite links have the download and then use the terrestrial network as the up link which is limited for business use.

Mr GUTWEIN - Why is that?

Dr CUTLER - Because businesses in big commerce or re anything tend to want to up load as much as they down load because it's transaction processing so the optimal broadband network is symmetrical where you can send out as you pull in. Traditional telephone network is symmetrical.

The asymmetrical nature of things like ADSL and satellite systems are basically to minimise the cost and gear it to particular sorts of usages which are much more entertainment related or high down load oriented. So hotels are fabulous and that's satellites have been used to point the multipoint distribution of broadcasting as a prime usage because that's the economic use of a satellite.

Mr GUTWEIN - I'd be asking you to use a crystal but I might do it anyway.

Technological advances with satellite technology into the future are they available or not?

Dr CUTLER - Again, because of the physical nature of the asset satellite asset it's hard to see where you're going to get the ability for scaling and cost reductions that you see in other areas.

The track a lot of people were going down for a while with satellites was using different breeds of satellites so the interest in low and middle of the orbiting satellite so we had dozens of them moving in patterns around the service which give you fabulous coverage but the economics of those just didn't work.

Mr GUTWEIN - Can you just, again forgive my ignorance, the exponential growth that you suggested was available with a fibre optic cable how does that work?

Dr CUTLER - It's basically how you light up with fibre. So it's the electronics. In this game everything revolves around the electronics you put in either end. So that's why we talk about data fibre. So that's just passive fibre sitting there to light it up. It is a function of being more sophisticated about how you shoot the signals down the optic fibre - and the technology for that has improved over time - as well as just the smarts at either end which get more out of it. So the sunk bit of link you ramp up. It's not different, but hugely different in scale, from an original copper pair going into the home. You add a software card at the exchange and that gives you ISDN over that line - or now ADSL.

CHAIR - Terry, I need to understand this graph on page 20. Am I right in assuming that the red line represents a decreasing level of capital expenditure, stated as a percentage of turnover, into capital growth, capital requirements, and that has been decreasing over the last 40 or 50 years? That might mean that there is a decreasing amount of money going in; it might be a rapid expansion of turnover that influences the outcome, or might be a combination of both.

Dr CUTLER - As this network in Australia has matured and as we have gone pretty close to universal penetration in terms of coverage of the population with existing basic voice services, of course the investment to connect those customers has gone down - and that is what you would expect. But if you link that to my previous proposition that the local access copper network is essentially obsolescent and entering the end of its natural service life and is not upgradeable to provide the sort of broadband-service capability that people are going to expect, then the question arises about how you replace that obsolete network.

The dilemma that poses is that suddenly you start that rollout curve again. But you have now essentially privatised and reintroduced competition into this industry. There are two fundamental industry-wide and global questions here: can any one player in this industry now afford to invest at the levels which they did 50 years ago in rolling out a new network and remain competitive; and will capital markets and shareholders accept the transfer from dividend to reinvestment in an environment where they have bought all these shares in privatised companies? Market share value has basically been driven by the extent to which Ziggy and Telstra and every telco around the world can pull costs out of the system. That has included driving down new capital expenditure, so the stock market was actually saying, 'That's good if you do less of that'. In that market

environment, can you turn that around to get the market supporting a really significant - and it is significant in terms of quantum - shift in the capital profile of these telco organisations. We are posing that as an industry-wide big issue for the next 15 years. It's no different from the electricity industry and a whole lot of other utility areas. It has to date been almost completely unaddressed in telecommunications. It is not even on the table.

Mr STURGES - Could I argue, Terry, that it is slightly different. The way I am viewing the world at the moment it is slightly different to the provision of basic utilities - electricity and water, I will just use those two as an example - to major rural and regional areas of our country in that those levers are there at a State and local government to do that but the lever is not there at the State or local government level with telecommunications services. All capital expenditure is driven by commercial return. Is that a reasonable argument to put?

Dr CUTLER - Absolutely, and I totally agree with you. That is exactly the point which I then make in the next line.

Mr STURGES - And I have not cheated - I had not read it.

Laughter.

Dr CUTLER - Against that environment, this is just straight commercial economics 101, that whatever capital is available is going to go into high-growth, high-density and highly attractive market segments, not lower density - that is, regional or customer access network markets.

Mr STURGES - Terry, do you see a form of market failure then without government intervention in some of these regional areas? Is that one of the challenges?

Dr CUTLER - The logic of this would be that in the absence of any Government fiat or intervention, you would have shrinking penetration of next generation networks or next generation networks would not roll out to the extent of the existing network - without a shadow of a doubt. The second angle to that is that even if they did, they would do so over a time frame that introduced a major economic penalty for regional areas, just because you are getting the benefits late and therefore everyone is ahead of the game before you are in the game. Does that make sense?

Mr STURGES - It does because I think it comes back to the point you made earlier on this morning about telecommunications being a big driver of business.

CHAIR - Terry, can I just take you back to understand that graph on page 20? I understand the red line. The other is just a statement. The blue line says that during this period of time the cost of fixed services - what do you describe as fixed services?

Dr CUTLER - That is to contrast with 'mobile'.

CHAIR - Right. Mobile versus fixed services. So the cost of providing the fixed services has gone up as percentage of -

Dr CUTLER - No, it is penetration of fixed services that has gone up.

CHAIR - Right. Where does it say that?

Dr CUTLER - The blue line is services as a percent of population.

CHAIR - The blue line is - ?

Dr CUTLER - The blue line is installed services.

CHAIR - Oh, per capita.

Dr CUTLER - Yes. That is why - see, when it gets up it is at a level of almost universal penetration. Every household has a phone. So, not surprisingly, capital is going down.

CHAIR - Okay. Then I will need to understand there -

Dr CUTLER - Right down the bottom where I have 'CAN', that is the subset of the total capital expenditure that is spent on the Customer Access Network, which is the local - currently copper - wires.

Mr STURGES - The wires going into the house.

Dr CUTLER - Yes, the key bit.

CHAIR - The amount of money that is going into capital expenditure may still be growing?

Dr CUTLER - No.

CHAIR - So the turnover through the industry is not growing that fast?

Dr CUTLER - It is going down in real terms.

CHAIR - You are saying, 'We have reached a mature market therefore there is no need at this stage to invest into the capital growth of that market'.

Dr CUTLER - Which is logical.

CHAIR - It is logical. Isn't it just as logical then that the board of Telstra as the major player would be just as well aware of this as we are and they would be derelict in their duty if they were not making some plans to address this in the future?

Dr CUTLER - It would be a really interesting question to put to the board of Telstra. What I suspect the answer would be is that we have done a pretty good job of convincing everyone that broadband is the same thing as ADSL and we can provide a large chunk of the population with ADSL services - it's a pity if you are one of the poor people who really wants it but can't get it, and there is going to be a lot of those. We have captured the agenda and therefore we can dictate the timing of any reinvestment because no-one is coming in and investing in fibre around us or pushing us to match them. We can determine when it suits us to go the next step.

Mr WILKINSON - You've got a captive market, haven't you?

Dr CUTLER - A good parallel with that in the past - let me give you two examples. I must be careful of what is recorded. One of the main arguments used for the introduction of competition in the 1980s was in fact that Australia and Telecom Australia was very slow to introduce mobile services compared with the rest of the world. I think we started up our original analogue network in about 1987 or 1988 and that was a long time behind everyone else. The reason? Because no-one else could do it, so it was really the old monopoly thing of no imperative to do it today versus tomorrow.

The second line of defence for a dominant incumbent, particularly in a technology business, is to convince the world that you have the answer coming tomorrow. I remember vividly when I was in Telecom Australia and people were talking about liberalising things like satellite services and so forth. It is pointless doing that because we are going to roll out optic fibre soon and anything you do with alternative technology will be redundant. We now can upgrade the copper network with ADSL and who knows what the next wave of technology will provide. There are inbuilt reasons to put off those decisions, particularly in an environment where the capital market, the stock markets, are putting overwhelming focus on your short-term performance. I suspect everyone in the sector, like every other sector, is suffering from this focus on short-term returns and putting no value on long-term value creation.

CHAIR - Do you think Bill Gates would be saying the same sort of thing as you are saying?

Dr CUTLER - Bill Gates is doing exactly the same sort of thing because his business is the closest to an incumbent Telco of any vertical integration issue, which is all the anti-trust issues in the US. There is an ability, if you control the operating platform, of controlling the rate of rollout of innovative products and services. They are interesting parallels.

I was at a wonderful international forum a year or so ago where there was a fabulous debate about open-source software versus proprietary Microsoft software. A few of the Microsoft rivals around the table, like the CEO of Sun were all in this room. So there is this argument between Microsoft and its competitors. The only person in the room who immediately jumped in and supported Microsoft was a non-computer industry person. He said that open source was the equivalent of interconnection and open access to telecommunications. He drew the parallels nicely but I never thought I would hear anyone actually say it so blatantly. So have I explained this confusing chart 20 enough?

CHAIR - Yes.

Dr CUTLER - It really is about putting some of those, what I think, are emerging major industry issues on the agenda but I do not expect anyone else is going to put them on the agenda. Then that is reinforced by the point made in the following slide about the return on investment always going to the higher-growth markets. Of course you see this with the way in which Telstra has put significant chunks of capital into what it has seen as growth markets in Asia and other areas that you can argue are all a trade-off against investment in the lower-return markets like Tasmania. But that logic of its own volition I doubt that Telstra would ever allocate scarce capital to the rollout of optic fibre in what is less than 2 per cent of its market.

So then what was going to be the great culmination of this presentation, we will just go back to the fundamental question of why is broadband important. It is really to enforce some of the broad points I made at the beginning.

Firstly I drew the lessons of history and talked about the demonstrable role of the telegraph in driving the opening up of our pastoral and mining industries here in Australia in the nineteenth century, so the connection you can see with 20:20 hindsight between infrastructure rollout and economic returns I think is paralleled rather neatly by the link people are seeing between the rollout of broadband capability and the reinvention of existing industries on a network basis through electronic transactions and so forth as well as the development and emergence of next-generation industries. What are some of those - let me just give you an example of one I have been closely involved with, the computer games industry. It did not exist 20 years ago. It really started taking off about 10 years ago; today, in terms of economic value, it is bigger than the film production industry and most people are really surprised by that, but it actually is.

The next step with computer games is actually when we go into multi-player massively interactive online games. You cannot do it without a broadband environment but that has been one of the major drivers that take up broadband in markets like Korea. What has been the flipside of that? Ten years ago Korea probably did not have one computer game company. I think we have about 30, if we are lucky, here in Australia. They are all relatively small. Korea has gone from zero to about 300. Korea, like Australia, is not a large market. Most of that is capturing export share. Because they have a local capability on a broadband platform, the real risk for the computer games industry in Australia, which everyone gets quite excited about, is that we will have no local experience with this next generation of online, multi-player and massively interactive game industry. We simply cannot do it here. The range of next-generation industries that are going to leverage off broadband -

Mr WILKINSON - When you talk about multi-player, people are playing and competing against each other all around the world -

Dr CUTLER - In real time. At the moment you go and buy your shrink-wrapped DVD computer game and stick it in your GameBoy or whatever. It is fascinating. There are some games where the number of players is now probably bigger than the population of Tasmania, all subscribing to be part of this game.

Mr WILKINSON - At the same time.

Dr CUTLER - Not necessarily at the same time but it is a sign-up model.

Mr WILKINSON - Oh, I get you.

Dr CUTLER - Typically, they play the game for about five years, rather than the latest DVD off the shelf, which probably has a shelf-life of about three months.

CHAIR - This will have a bigger impact on the State economy than gaming machines.

Members laughing.

CHAIR - I can see a major problem building up there.

Dr CUTLER - So you look at that and then you say, 'That is the same environment and the same technologies around e-health and e-education'. One of the really interesting things - as an aside - is that computer games are actually now the key technology driver of innovation in these other markets, including a whole lot of defence applications. So this is a critical infrastructure, both in terms of maintaining competitiveness of existing industries through being the key lever for innovation as well as being the necessary precondition for the next generation of emerging industries.

Ms GIDDINGS - Can I just ask a very basic question? I take it then that we have cables that are joining countries to countries? Is that how this broadband works as well?

Dr CUTLER - How networks work.

Ms GIDDINGS - Yes. Because I had it in mind that in New Zealand they are actually able to develop their film industry a lot more now because they have the connection with America. So they can move their film through the optic fibre cable to the States within a couple of days work. So they are capturing a lot more of that Hollywood market.

Dr CUTLER - We are part of that same -

Ms GIDDINGS - So we are part of that same network?

Dr CUTLER - Yes.

Ms GIDDINGS - But is it an actual physical cable that is linking us to the States, for instance?

Dr CUTLER - Yes. You have this spider web. This is what I was saying before; the network is only as good as the end-to-end link. Intercontinental cables carry the bulk of communications, supplemented by satellites, which are good for back-bone things. A cable of course can carry much more.

Mr STURGES - They are supplementary not complementary?

Dr CUTLER - One of the challenges with Australia has always been that, because we are at the end of the line, no-one other than us has the incentive to build those international cable links. At the moment we are not doing badly but they are crucial. It is not good me having a really good connection from here to Melbourne if I cannot get from Melbourne to New York.

Mr STURGES - Are those links already in place? Broadband?

Dr CUTLER - It is really interesting. International telecommunications evolved on a completely business model from domestic telecommunications because traditionally it

was on a fabulous monopoly-shared infrastructure basis. So you had consortium ownership of these international cables where ownership gave you rights of use to capacity. So, if you like, it was a monopoly link across the Pacific shared by competing players. It's a good model for the fibre-driven local loop. In that case it was underpinned by consortium ownership.

CHAIR - The size of the network still challenges me, more so since your last statement, but am I to conclude that there are a number of fibre-optic cables across the Tasman Sea linking Australia and New Zealand?

Dr CUTLER - Two.

CHAIR - Two? Right.

Mr STURGES - I'm not a technical expert but I've done a bit of reading on the capacity of a fibre as opposed to a copper pair? It quite astounded me.

Dr CUTLER - There's a fabulous paper that Richard showed me this morning from Alberta, and we might circulate it.

It was contrasting capacity in terms of, for example, a common garden hose building up to a fire hydrant then water pouring out of it. It really is that different. We're not talking about just minor differences. This is the difference between your personal computer of today and the one you would have played with 10 years ago and which you just would find unusable now. So it's that scale of difference.

The other thing that I think is always a really good reminder of things is that 10 years ago most of us wouldn't have been saying the Internet is the biggest thing in communications. So another 10 years on, as we move into the world of all these applications going online, it's going to be equally different and the stakes are going to be hugely higher. The rate of change in this area is not going to go away.

The analogy of the hose to a fire hydrant captures it very nicely.

Finally, what's the role of government and what are other markets doing. I think first point is that in telecommunications, if you look at its history, except for the very short-term - a decade or so - aberration, government has played a pivotal role in the development of the sector in Australia since the beginning. So non-government involvement has been the exception not the rule.

Secondly, if you look at other jurisdictions with a different development path, particularly the United States, there are long-established and quite significant government incentives to promote infrastructure outcomes. The US, with infrastructure right across the board also with telecommunications in particular, there are huge infrastructure tax incentives that remain unquestioned in the US environment. You do not see anything on the same scale here in Australia as you do in the US the tax incentives around infrastructure for the tax incentives around infrastructure. We always think of the US as the land of the free market but it is quite an interesting comparison.

Secondly, since the Second World War you have had a very crucial role for the Regional Utilities Commission in rural and regional communications in providing extremely concessionary soft loans, so effectively providing money at government cost to capital, which is like a government bond rate. So this changes the return trade-offs for providers specialising in low-density markets.

The other thing one notes, apart from direct interventions, is the way in which in the US you had a long tradition of anti-trust regulatory powers - most recently notably deployed in the Microsoft case. Some of the major applications had been in telecommunications; the original break-up of the Bell system came out of the anti-trust regulatory tradition. You have not had that so much in the European and Australian tradition. In fact, one of the weaknesses of the ACCC structure is that you have the Trade Practices Act provisions with respect to merges and acquisitions to control market dominance and so forth, but not the flip side in terms of divestiture. Recent reports from the ACCC to the Federal Government on Australian regulation have pointed out the absence of those powers, which makes it difficult for them to address issues of vertical integration. That is a major difference from other jurisdictions, which has led to different market outcomes.

What can you do here in Tasmania or what can a State government do; what are its points of leverage? Unlike any other federal jurisdiction, Australia has a total concentration of policy and regulatory power in the Commonwealth Government; states have no role - tax is the same. So those sorts of levers which are available in other jurisdictions are not available at a State level. What is interesting is the number of jurisdictions, both in North America and Europe, where you are seeing a return to direct utility-style government investment in fibre infrastructure. A lot of that has been at the municipal level, but we are also talking about some very large municipalities. When we talk about Montreal, Ottawa or Chicago, that is not very much different from talking about Tasmania. There is an interesting number of examples and a growing list of these models of direct investment. In most cases that has been as infrastructure open to use by third-party service providers. None of these cases is as a full-service operation. The investment has gone purely into the enabling platform infrastructure. I think that point is relevant to raise; initiatives like those that this committee is looking at are not novel in world terms. That is really as far as I got, Mr Chairman.

CHAIR - You've done very well. Are there questions relating to any aspect of the latter part of Dr Cutler's presentation that members would like to ask? Could I ask, just for the record, it seems to be that your proposition is that the future market is so expansive that it scarcely matters what Tasmania does in the way of capital expenditure, there is going to be a market to take up that infrastructure in the future? Would you comment on that?

Dr CUTLER - Sometimes the line of argument is the field of dreams - build it and make sure they are going to come type of argument, even though I probably would argue that. I think we have seen enough in terms of what is happening in other jurisdictions which have moved much more quickly with investment in the next generation of networks and broadband to be confident about the nexus between that investment and take-up and the economic nexus between the availability of broadband networks and significant industry development and productivity returns. It is not a courageous case to say nominated returns will flow if Tasmania proceeds down this path. In political terms I would say it is not courageous.

CHAIR - The significant driver for acquiring the fibre optic to this time is the synergies with the rollout of gas. I wonder would you make some comment in relation to that matter?

Dr CUTLER - I wish I had the exact quotes and figures with me. It is very clear that the actual trenching, digging up the street, is a huge fixed cost in the rollout of any new network or its replacement. The ability to co-locate new network rollout with rollout of our greenfields utility is a bit of a no-brainer because it is actually addressing one of the major cost components.

Mr GUTWEIN - So there are obviously massive savings by being about to roll it out. You said that the decision by a government to invest in this type of infrastructure would not be courageous - and I presume because you see, from what you have said, that there will be quite a take-up of this and that obviously returns would flow. The cable that we are looking at was originally owned by a private company. One would have thought that they would have been prepared to have waited to get those same returns. What has changed?

Dr CUTLER - My short answer to that would be that a sufficient explanation is one of timing. You are looking at a situation where at the end of the 1990s, at the height of the dot.com boom, you had a market euphoria around this sector and others where people were making probably over-optimistic investment decisions. Examples are all the backbone infrastructure like next.gen IP1 on the mainland. The severity of the dot.com collapse and the more enduring technology sector downturn of 2000-03 were continuing as a cyclical impact on business plans and investment in this area. You cannot underestimate the impact of that.

Mr GUTWEIN - What about delays in getting the infrastructure in the ground? What sort of an impact would that have on the decision by a private company to pursue it or not?

Dr CUTLER - It depends a lot there on the nature of the infrastructure investor and whether it is an ancillary or core business. Most core infrastructure investors tend to be people with long-term investment horizons.

Mr GUTWEIN - But do you think that if the previous owner of the cable was caught up in the euphoria of the dot.com boom made a bad decision or that they reviewed their decision based on the length of time it might have taken them to get the infrastructure in the ground?

Dr CUTLER - I am sure that is a question they would be much better position to address than I. I think what I wanted to say is that regardless of the basis on which they might have made a decision, I was simply noting that the economic circumstances, including the cost of capital, changed dramatically over the period involved. Do not forget the parallels on the mainland with next.gen and heavily debt-financed infrastructure investment.

CHAIR - Dr Cutler, you had a period of time as Executive Director of Telstra and during that time you oversaw the regulatory change and the introduction of competition - real competition. If we were to invite the present Executive Director of Corporate Strategy

for Telstra to meet with us, would he be in agreement with the basis of your propositions today?

Dr CUTLER - Probably not. If he was serving the company well I would probably say that I sincerely hope not. In the same way, my biggest regret looking back as an Australian was that what I did as Executive Director with Telstra was probably not in the national interest, even though I thought it was in the corporate interest in promoting the competitive regime of merging a Telecom and ATC-regulated duopoly. My rationale at the time was to ensure that Telstra had an ability to control a competitive framework. I think my strategy was quite successful but not in the public interest.

Mr STURGES - If only we could wind the clock back.

Dr CUTLER - Oh, absolutely.

Mr STURGES - Get that on record ten years ago.

Mr WILKINSON - Terry, you had a copy of our terms of reference?

Dr CUTLER - Yes.

Mr WILKINSON - For us to properly investigate what is involved in those terms of reference, who do you believe we should be speaking to? What would you do if you were in the position of the Chairman in relation to proceeding; what do you believe would be a proper way of proceeding with those terms of reference?

Dr CUTLER - That is a tricky question, isn't it?

Ms GIDDINGS - Surely, that is up to us as a committee?

CHAIR - To make it simpler for you we could break it into component parts. The first component part might be: who are the authoritative commentators, other than yourself, on this section of the industry in Australia?

Ms GIDDINGS - Can I just butt in though because our terms of reference are very specific and really it's pretty clear that it has to be government and EDI who help answer those, I would have thought.

CHAIR - That's a discussion we ought to have in committee at a later stage.

Ms GIDDINGS - Yes, it is. I think it's a bit unfair to ask Dr Cutler to answer that question when really it's pretty clear how strict our terms of reference are.

Dr CUTLER - I was going to fudge it a bit anyway.

Laughter.

CHAIR - Dr Cutler, of course if you don't want to answer the question you simply can say, 'No, I don't want to answer the question'.

Dr CUTLER - I think it is important to have the sort of discussions we've had today about establishing the context.

The challenge in what reminded us all at the beginning of a small subscale market - because in fact you don't have a huge number of independent players and one of the problems with industry debates in Australia is the babble of vested interest. So very limited independent voices.

Mr WILKINSON - That's why the question was asked in the first place. Who do we speak with? We can sit down and say, 'This person is independent, we can gain a proper view from this person', without realising that there is a vested interest as well.

Dr CUTLER - I think the issue of really ensuring that the vested interests are identified is always very important in understanding the line of argument you might get and that's no brain.

I find it hard to nominate anyone but I'm sure Richard and Treasury and the other areas of government will probably be a fabulous source.

Mr WILKINSON - Some might argue this would be proceeding anyway therefore they might have a vested interest. That could be an argument.

Dr CUTLER - I'm sure you'd qualify that point of view.

Mr WILKINSON - Yes.

Dr CUTLER - Any points of view that came out of government are quite properly as well.

There are probably more people around the traps in terms of the technical engineering consulting side, including some who I know have worked for the Government, on which to test views about the role of either optic fibre and the way in which network architectures are developing. I think it would be easy to identify a number of firms of considerable independence in that area. I think where it gets trickier is in terms of independent strategic and industry analysis.

Mr WILKINSON - If it's an unfair question please tell me. You're the expert in the field. In order for us to properly investigate a matter the first point of call I'd go to is the expert and I'd say to the expert, 'How do we proceed from here? Who do we speak with? What areas do you believe we look that?' We get that answer from a number of different experts and then it's up to us which way we go from there. That's why I'm still posing the question to you to see if you're able to answer it.

Dr CUTLER - I think going back to the quite specific terms of reference, I'd probably suggest that it would be useful to consult with the Treasury and Government about the merits of talking to some of the consultants they've used in this process.

Ms GIDDINGS - I think we're going to have to have a debate in our committee about all of that anyway but to move it on a little bit, I'm not sure if it was just over lunch or whether you've stated it in this room as well about the greenfields fact, that this is the unique

opportunity for Tasmania when the trenches are being dug to lay a cable down. Is there anything else that you can say about that or just your thoughts on that?

Dr CUTLER - Just to reinforce the point I think I made around the table while I was at lunch -

Mr STURGES - You did.

Dr CUTLER - It is a pretty unique situation to have any greenfield utility rollout such as you have with gas. That does provide opportunities for economic co-location that are unusual and attractive. I cannot resist your invitation to comment on greenfields, that if one were starting with a greenfields network situation in Tasmania or Australia you would end up with a very different architecture and industry structure than the one we have inherited as a result of history. I think we need to keep reminding ourselves of that.

Ms GIDDINGS - Is there any further information you can provide the committee as to what cities like Chicago and Montreal are doing in terms of municipal or government involvement in this form of infrastructure?

Dr CUTLER - You mean in terms of further background material?

Ms GIDDINGS - Yes.

Dr CUTLER - Absolutely. I am sure a lot of that is already around that could be made available or tracked down.

Mr WILKINSON - Should we be looking at any country, state or province, and saying 'This is the formula that we should be following'? You mentioned Ottawa, Stockholm and Chicago.

Dr CUTLER - They are all really good case studies to look at but - as I tried to highlight - because it is not greenfields, and we have all come from very different backgrounds, there are limits to the usefulness of international case studies, which I think are often forgotten. You forget those very different contexts in which solutions have emerged.

Mr STURGES - You have to compare apples with apples. If you looked at connections in Chicago, for example, as opposed to connection in Hobart there is just no comparison. We will have this discussion through the review process.

Dr CUTLER - I think what is important about those references is what it implies about the role of government, and what people perceive as the appropriate role of government, in a different range of jurisdictions and backgrounds.

CHAIR - Dr Cutler, on 4 October the *Mercury* quoted Paul Buddle as stating that:

Tasmania remains a haphazard affair compared to other states which have specific plans and strategies

Do you know Paul Buddle and do you agree with his proposition?

Dr CUTLER - I know him well. It is a small industry playing field. I certainly do not agree with his proposition but I sympathise with him because occasionally I have said things publicly that I have come to regret as well.

Mr GUTWEIN - Do we know that he has come to regret those comments?

Dr CUTLER - Paul Buddle runs an industry analysis service - one of the very few in the country - which is very valuable in pulling together overall industry statistics and analysis of telecommunication markets. That is his core business. He has been very active in trying to work with utility organisations around Australia to promote various new investment models in the sector. He has clearly spent a lot of time talking to electricity and other players. Whether that influences or shapes his views in any way I am not sure.

CHAIR - What would lead him to say that Tasmania was a 'haphazard affair'? Do you know where he comes from in regard to making a comment like that?

Dr CUTLER - I would assume he has spent too much time where he lives in New South Wales and not enough time in Tasmania.

CHAIR - On behalf of the committee and support staff can I thank you for your presence here today and the generosity of your advice to us and the generosity of the time that you have allocated to us as well. We appreciate that. Also, Richard, we appreciate your unit's efforts in making Dr Cutler available. We thank you and wish you well in the future.

Dr CUTLER - Thank you.