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TRANSCRIPT OF PROCEEDINGS

PRODUCTIVITY COMMISSION

INQUIRY INTO RADIOCOMMUNICATIONS

DR D. ROBERTSON, Commissioner
DR N. BYRON, Commissioner

TRANSCRIPT OF PROCEEDINGS

AT MELBOURNE ON THURSDAY, 8 NOVEMBER 2001, AT 10.30 AM

Continued from 7/11/01

DR ROBERTSON: Good morning, everyone. This is reconvening the inquiry into radiocommunications which met yesterday. This morning we have Bramex with Mr Ross Ramsay. I'm sure I don't need to explain to you, Ross, that this is all on the public record and there will not be any interruptions and so forth, since you've appeared before. What I suggest is that you perhaps take us through your arguments first and then we can talk about your submission and what you have to say now.

MR RAMSAY: Thank you, chairman. I'd like to begin by just going through the major points in the submission, not reading it exactly but giving you the general gist of it. The first point I deal with, the high-level points, are the actual legislation and its administration. The actual legislation, that is, the Radicommunications Act 1992, the principal act, I think by and large is a good act. It has generally clear objectives and the right policy emphasis. I think at the front though that it could emphasise right in the top section, in 3B, commercial use of the spectrum more strongly, because the use of spectrum is really fundamental to the operation of a modern economy and this should be very clearly and explicitly recognised.

The associated Taxation Acts I think are a different matter. I think the fundamental policy of spectrum taxation needs a rethink and therefore those acts need to be looked at. One other major point is that the Productivity Commission already has considered the spectrum in relation to broadcasting and datacasting and made an extensive report on that, and I think the time has come to examine whether the spectrum management function in relation to television spectrum particularly ought to be brought totally into the ambit of the ACA. The reason for this is that the reasons for the separation I think are rapidly disappearing with the advent of digital television. The spectrum scarcity, if it ever existed in that area, is rapidly diminishing or disappearing, and the arguments for having it separate are therefore going away.

Regarding administration of the legislation, I think that the ACA generally does this very efficiently. I think it's an efficient spectrum manager and it's consultative. It has good public information activities and that is both in regard to its Web site and its publications. However, nothing is perfect and there are a few holes here. For example, there should be complete and total free access to the radiocommunications database over the Internet and this doesn't exist at the moment. There are obvious exclusions such as national security.

The spectrum auction system, I'll deal with this more later. I think this needs a thorough re-examination, not as to the theory and competence of what is being done but as to the outcomes in terms of overall public benefit. The final major point is that the ACA is a budget-funded organisation. It collects a lot from users in the form of taxes, both radiocommunication and telecommunication. These are not hypothecated and consequently there is no direct relationship between supply and demand of the industry for the services of the ACA. So I think consideration ought to be given to hypothecation of those taxes.

I'll get on now to individual points and the first is on radiocommunication licence fees. In my submission I give a bit of history on how these first

administration charges and later taxes occurred and I happen to know this in fair detail, having been involved in the significant changes which were made, starting in the 80s. They started off as administrative charges, that is, a straight cost recovery, and in 1983 they were turned into taxes. That's when these original taxing acts first were enacted, and it was a straight revenue-raising measure. There was no theory behind it of managing spectrum scarcity. It was sheer taxation and didn't pretend to be anything else.

It started off, from my memory - and I'm relying on memory here but I think it's fairly accurate - around about 16 per cent above cost recovery. I think licence charges now are an example of uncontrolled and runaway and inefficient taxation. They've blown out to more like 250 per cent of the cost of administration of the spectrum; that is, from the 16 per cent in a little under 20 years ago. I don't see any fundamental or defensible reason for this taxation. The industries which rely on radiocommunication are industries the same as any other industry. There is no reason why they are - well, they actually do pay income tax. They collect GST. I have never heard of a good reason why this industry should be subject to this taxation.

It really just flows into the cost base of the economy in a hidden way and the industry itself receives no benefit from it and I don't believe there is an overall public benefit in that, round figures, $100 million per annum which is collected. There are arguments advanced regarding these taxes. I may have even supported them at one stage, regarding spectrum scarcity. Spectrum scarcity, there is some truth in the concept, but it is vastly overstated and, in my view the spectrum is no scarcer than it was 50 years ago and it's about 50 years that I've been involved with thinking about the spectrum. The reason for this is that spectrum efficiency continues to rise and rise, and therefore you are, in a sense, creating spectrum and therefore you are meeting demand in most cases because the effective supply is increasing, even though the spectrum itself has not increased since the big bang.

I think that in summary that whole system ought to be reviewed. What is the alternative about radiocommunications licence fees? Now, there's no doubt about cost recovery being justified. I think the spectrum management organisation costs are of the order of $30 million, as far as I can gather by working it out from the ACA report, and there's an argument for rational balancing of supply and demand, like charging more for spectrum in high-density areas, greater bandwidth used and lower frequencies rather than higher frequencies attract higher charges.

But some of these aims in managing supply and demand can be attended to by things like mandatory technical standards. Now, the example I think which is most relevant is that the biggest rise in demand for spectrum in the terms of licences over the last few years, and it has been quite dramatic, has been in the point-to-point microwave area. That's a direct result of telecommunications deregulation which has allowed a lot of people to set up networks and, for example, the mobile telephony system is very heavily dependent on the use of point-to-point microwave links to connect all the base stations. Now, in that particular area good spectrum management, high technical standards, can achieve dramatic effects in the efficient

use of spectrum, like a city like Melbourne. You can reuse the same frequency for microwave links within the city perhaps 100 times.

Now, if you have poor management practices you might be able to use it only five or 10 times. So that's the order of magnitude that you can achieve. So there is no fundamental need to say, "Okay, let's put up microwave licence fees by 10 times." You can simply get 10 times the productivity by making people spend more money on high-grade antennas. Regarding the actual licence fee schedule itself, it's quite cleverly constructed, given the basis on which it is constructed. I'm questioning the fundamental base. But having said it's quite clever, it's not really what it purports to be at all, a highly exact system, and I've quoted an example here where a fee is quoted to eight significant digits, which is not really very sensible, and at literally the snap of a finger you can change a weighting and this figure, which is to eight significant digits, can double or halve.

So I think that the whole system from bottom to top needs a fundamental rethink, acknowledging that there are some good principles in it and that you can't abolish it without putting something in its place, and I'm not really suggesting totally abolishing the concepts on it. I'm suggesting, first get rid of the concept that you need to take $100 million out of spectrum users, and secondly, then tweak it so that it does take account of some of these sensible factors in it. Now, the next point is the use of radiocommunication licence fees and I've already covered this at the start. I think there's a very good report for these to be hypothecated taxes and the money not just vanishing into the maw of consolidated revenue.

My next point is about sovereign risk and this has emerged, like some unwanted guest at a party, only fairly recently. The levying of those sorts of figures from industry, apart from normal income taxation and so on, is bad enough in the first place. I might emphasise here, in using the PMTS example, the Public Mobile Telephone Service, that I have no current clients using this. So I'm talking from a matter of basic principle and that is, I think it is utterly wrong to, without warning, consultation or anything else, impose a major change, a major rise in taxation, on a particular industry.

The three substantial operators, Telstra, Optus and Vodafone, have invested, just in a rough totting up in my head, over $6 billion in this system. They're long-term investments. They're sunk costs. They've got business plans. Why should these step-functions in fees suddenly be injected? And I'm talking here from - I think it was 20 million up to 50 million, so we're not talking peanuts. They have been portrayed as peanuts in relation to overall revenues, but these revenues are chipped away at in all sorts of ways. They're already paying one and a half per cent in telecommunication taxes on those revenues, that is, under the universal service obligation, and all of a sudden here's another tax goes up like this.

I'm not holding a brief for any of these three companies at the moment. But I think we should all hold a brief for the user, the consumer. There is nobody who will ultimately pay that cost except the consumer. It becomes another figure of tens of millions built into basic business costs throughout Australia, and that is not good for

the economy. In my view, it's straight revenue gouging. But even worse than that are the implications for others. Now, I do have major clients in the satellite industry and that industry is even more lumpy in its investment. An average communications satellite for major service such as Optus or Pan Am Sat or Asia Sat or Mia Sat provides services to Australia, you're talking over $200 million, perhaps a quarter of a billion dollars.

The satellite is normally purpose designed for a particular use and you can't readily shunt it around the orbit to use it somewhere else if you don't like the particular environment you're in, because normally it requires a change of beams, change of coordination, which may not be suitable for the new location. So you're up for a very lumpy investment. It's long-term. Typically you're talking three years for construction and build and up to 14 years for use of that individual satellite. Now, the annual fee for that is about $300,000. Why would this not suddenly become $1 million or $2 million under this principle that has just been used on the PMTS licence fees?

Most of the investment, except by Telstra, in Australia in telecommunication service in the last 10 years has been by foreign investors. I've personally been involved with a number of them and they have lawyers in remote, faraway places like Washington or London and these people are doing business all around the world and one of the things they look at is sovereign risk. What is the risk that the local government is going to mess up my investment? This sort of example in the PMTS is directly translatable into major investments such as satellite systems and mobile telephone systems.

The next significant point is on the length of apparatus licences. Here is where there is confusion in the act and anomalous features. We have five years for apparatus licences, although the government has said it will probably go out to 10. We have spectrum licences for the term of 15 years. We have different expectations of renewal, different expectations of premiums which might or might not be paid on the renewal of the licences. Now, this particular matter was addressed 10 years ago when the Optus and Vodafone licences were awarded. In the Optus bid, in which I was intimately associated, the company eventually paid $800 million and made a lot of commitments to get that licence and a major component of that licence was the access to 8.3 megahertz each way of GSM spectrum.

Now, the company obviously expected to spend a couple of billion dollars on mobile telephony alone and from memory I think the licences, apparatus licences, had only a one-year term. So that was fairly frightening for that sort of investment. So the measure agreed by the Commonwealth and the company was a contractual arrangement and the view was that if the licences were not renewed an action would lie for the inability to carry out the rest of the contract, an action against the Commonwealth, and this was a good and satisfactory system, and I believe it was repeated with Vodafone although I'm not absolutely certain. This is one way of giving the Commonwealth flexibility to deal with major investment situations and give the major investor some certainty about the use of the radiofrequency spectrum.

If the bidder makes commitments and fails to honour them, or commits gross infringements of the licence, that would be a justifiable reason for not renewing, a justifiable reason for breaking the contract. It would allow long-term periods to be made with certainty without changing the entire licensing system, which for good reasons might limit - - -

DR ROBERTSON: Don't take any notice of the background noise.

MR RAMSAY: Somebody's heckling me, I think. It must be the Department of Finance. That wouldn't compromise the system which deals with the smaller licences such as for land mobile radio or whatever. Do you want me to stop?

DR ROBERTSON: No, that usually happens on a Wednesday morning. I guess because we had Tuesday off it's happening on Thursday.

MR RAMSAY: I'll deal with auctions in a moment. But as you're aware, there has recently been a broadcasting satellite service auction in which only one bidder has eventually fronted up, which doesn't make for a very good auction. One of the key things about that is, you don't put up a broadcasting satellite for less than a quarter of a billion dollars and unless you're absolutely sure in your own mind that you've got 15 years, unless you do something which is really bad, that is, you pollute the spectrum, then unless you have that certainty you look very askance at this possible investment. We're talking about very recent examples here, like about a couple of weeks ago. So I've suggested some items in the paper whereby that particular problem could be solved and I know the government and the ACA are wrestling with this at the moment.

Now, regarding spectrum auctions: I think the actual mechanics and the conduct of these auctions has been really excellent. I think Australia has been at the forefront here, not far behind the United States. I personally have been involved in several of them, assisting various bidders. But there is a large and long-term problem which has emerged in terms of public policy and that is, despite all the technical excellence and the good theory behind this the bidders, a number of them, have paid too much. You can say, well, that's their own bad commercial judgment and they deserve to pay the penalty.

Perhaps this is so, but in terms of public benefit spectrum has been alienated for 15 years, in some cases by people who no longer have funds to build what they intended to build. There was no commitment to build on them. That is, they have no contractual obligation to build anything. Two outstanding examples of this of course who bid a lot of money for spectrum are Hutchison and One.Tel. Hutchison is busily restructuring and One.Tel has gone out of business. Now, what is the public benefit in very large premiums having been paid for these auctions when the spectrum doesn't have a prospect of being used for some time?

The difficult question about this is, you get back, in the worst extreme, to government picking winners. You get back to beauty contests. But I think the time has come to go back and see if there is some combination of beauty contest and

bidding which produces a more long-term, satisfactory public policy-type outcome. A lot of market purists would be very uncomfortable with this and I'm a bit uncomfortable myself in advocating it. But it did work, for example, in the Optus and Vodafone bids. The government got a lot of money in terms of that time. The spectrum component of those bids was of the order of $250 million. But both of those companies had build commitments. There were contractual arrangements with the Commonwealth and they actually went out and built networks and a very competitive outcome has resulted with Australia with very good public mobile telephone systems at reasonable prices and a competitive environment.

I think they're the main points that I want to make - there's one other point about the spectrum auctions and these points are made on page 7. They're getting to be too legally complex. If you had to read 350 pages before you bought an office building you'd probably go and buy some other office building and there is uncertainty about tenure, which I've mentioned, in certain cases. I feel there's double-dipping by the government by wanting both the up-front premium and then full annual licence fees, which are then subject to sovereign risk, and with very major investments there ought to be some ramp-up of licence fees if there are going to be annual licence fees, to allow for the fact that none of these investments are even cash positive for about four years, let alone making a profit. I think they're the major points, chairman, and thank you for listening to them.

DR ROBERTSON: Thank you. You've got some very interesting points in there, I think. Neil, do you want to lead on?

DR BYRON: Right, okay.

DR ROBERTSON: It's your turn.

DR BYRON: Could I ask for your reaction on a couple of general points before we get into some of the specifics. You may be aware that there's a review being undertaken in the UK at the moment with Prof Martin Caves, into the market-based reforms in spectrum management there. The impression I've got from their issues paper is that they're largely aspiring to be somewhere like where we are now in Australia while, as you said before, no system is perfect and there's still substantial room for improvement. Is that a reasonable understanding, from your knowledge of the subject?

MR RAMSAY: Yes. Well, I think Australia has been regarded as being at the forefront. In fact I think that Australia was at the forefront of charging fees above cost for the spectrum. We'd be up the higher end, I would say, of charges throughout the world. But I think the British, the same as ourselves, ought to look more carefully at outcomes, look at the weakening of the European telco case, especially as the result of the German auctions.

DR BYRON: The 3G?

MR RAMSAY: Yes, and there are other things which have weakened telcos

of course. But I think that the breathtaking figures that were paid for auctions over there and the resulting weakness of telecommunication balance sheets is evidence enough in itself that something needs to be done, if you like, to - I hesitate to say - prevent business people from committing such folly.

DR BYRON: But would you agree that it's hard to stop them if they're getting carried away at the height of a boom and there's all sorts of passions and imperative - if the government was to, say, set a maximum price, I mean, the frenzy would continue and they'd find other ways to circumvent the maximum if they desperately wanted something at the height of a boom.

MR RAMSAY: I guess here's where the element of a beauty contest comes in, because you look around for an economic justification for having beauty contests and say why is it different from anything else? The only reason that I can think up, and I'm looking for a reason, is that the spectrum is different. It's not like iron ore deposits. If there are 100 big ones in the world been discovered there are probably 100 more out there and somebody can go and find them and dig them up, but these become too expensive. You can't really do that with specific parts of the spectrum because if you're going to have something like mobile telephony you have to have it in specific chunks of the spectrum because consumers have to be able to buy equipment, mass-market equipment, low-cost equipment, that works in those chunks.

So you can't recreate those specific chunks of the spectrum, so they are different in public policy terms. I think it's probably justifiable for government to say, "Okay, here are these chunks of the spectrum. We're going to allocate these. You come up with proposals." Now, you don't want to be too prescriptive about these proposals but people would have to have proposals and commit to carrying out their proposals, and to do that you have to have a business plan because if it doesn't stack up, at the bottom line you don't do it. In two auctions I've been advising people and said, "Stop, pull out. It's way outside your business plan. You're not going to make any money," and they have done that because they've had business plans and in those two instances the spectrum sold for several times that price.

Now, unless those people had some amazing economic magic in their back pockets you could say they will not make money out of this. They might 10 years down the track when there's some new technology invented we haven't thought of for that spectrum, but in the next 10 years they're not going to make any money. With a hybrid system at least you force people to make business plans. I'm not suggesting that the government then makes an economic judgment on whether that business plan is viable, but you would have to do it and you would have to say to the government, "Okay, in this process I want to be in this process and this is what I intend to do."

That's exactly what happened, for example, with the setting up of the duopoly between Telecom as it then was and Optus, the Optus licence. They had to produce a plan and there was competitive business. Optus wasn't the only proposition put to the government. There were other propositions and there was a money component too. But when you had to produce all that to the government, it had to make some sort of business sense and of course the outcome of that was very good. We've

progressed beyond that stage now of course. But we do have a competitive telecommunications environment. We do have a number of sound and viable companies in there, even though others have fallen by the wayside. So I think you're going back to the fundamental question. I think the British ought to rethink the outcomes too and look at their own companies and those of Europe.

DR BYRON: I understand that the FCC in the US is sort of prevented by law from recovering more than their actual costs and so, you know, obviously I guess that raises questions about how you allocate spectrum if you're not allowed to charge for it on the basis of market prices. But one of the things that has confused me about this for some time is the way that the charges for the use of the spectrum are referred to and treated as a tax rather than as a payment for a use of an input into a production process, that companies that have no hesitation about paying for their electricity or their phone bills or whatever, or their petrol bills, think that they shouldn't have to pay for spectrum and if you think this is just another input into their whole process, why not charge it at its full opportunity cost the way we do every other input?

There are consequences of undercharging if use of spectrum is an alternative for using fibre-optic cable or copper wire or something. We know exactly how much that costs to lay. They have to dig trenches and lay cable. Why shouldn't the alternative method of sending the signal through spectrum be charged at its opportunity cost or its replacement price? You know, I'm concerned at the potential consequences of, if you like, selling a factor of production way below its sort of true market value.

MR RAMSAY: It's hard to say what its opportunity cost is, but its actual management cost is clearly identifiable. It's about $30 million according to the ACA's latest public report. So you could say that's the true cost of the resource and in most cases there is no difficulty in getting a licence in the vast majority of cases. If you go to the ACA today and want a microwave link from the top of this building to another one over there, you'll get a licence. Without a doubt you will get a licence. You may not get the frequency band you initially want. You might have to go up to short range, over 20 gigahertz, where you might have wanted for some reason to use 18. But you will get a licence.

So you can't say that there is any absolute scarcity there. Now, the cost of that is either the ACA or somebody else assigning that frequency and it being entered in the database and then maintained, and then the cost of later people assigning around it that so there's no mutual interference. Where you get the "scarcity" - inverted commas - is for example with GSM spectrum. There is no more GSM spectrum because it has all been allocated now and why is there no more GSM spectrum? The simple reason is because the handsets are made only to operate in that spectrum and you can't have cheap handsets unless you make millions of them.

Now, you could create more GSM spectrum if all the world's regulators and companies go into a huddle and say, "We're going to have more. We will now make handsets which occupy that much more spectrum and we will clear out the other people who are in that bit of spectrum. If they're microwave links we'll say, 'Tough

luck, chaps. Three years' time you've got to get out of there but we will give you something else. We will give you another frequency band."' That is exactly what happened with the 1800 megahertz spectrum, with GSM. It became a world standard because 900, there wasn't enough of that to meet big economies like the European economies and in Australia it was all full of microwave links and a few other things, and they've been shifted to higher-frequency bands.

So the theory that you've got to charge a lot of money and there is an opportunity cost, I think you've got to look at very deeply and go back to the beauty contest theory. Now, who's using the One.Tel spectrum now? What public benefit is there of that? The government might have got a bit more revenue, which it has now spent on whatever, defence or social security, and that's at the expense of raising the cost base of the telecommunications industry.

DR BYRON: A few people have suggested to us in hearings, I think in Sydney, that a system of staggered payments might be a way around that, where there's so much up-front and then once the system comes into production, once the services and the cash flow starts, then the government gets the rest of the money that was bid, and that way you don't have the huge sort of debt overhang that your British and German companies have at the moment. But that sort of thing does substantially change the risk profile between the government and the company who has bought the spectrum, doesn't it?

MR RAMSAY: Yes, it does definitely. It would certainly help companies. But what is really happening, the money is being recycled to the government, back to the people, in a different form and to pay for that it's being taken out of the people, that is, the people who use mobile telephones. So what's the basic fundamental reason for that recycling of the money? You could say that's a very inefficient process. Why shouldn't the consumer have that money in his or her own pocket in the first place, in lower charges for mobile telephony, because there hasn't been this huge up-front cost in spectrum, that is, a selective tax on this particular industry?

DR ROBERTSON: Who do you think owns the spectrum?

MR RAMSAY: Ultimately somebody with a big G in front of his name.

DR ROBERTSON: No, I meant in a slightly more practical way. But this is something that always bothers me. I mean, clearly it's a national resource in the sense that it's used by the people. On the other hand somebody has to administer it and then it has to be charged and you've admitted that, that maybe 30 million is a suitable number for administering spectrum. But in fact, in certain ranges there's much higher demand and people will pay a higher price, and really it's a question of whether we can say there is a market, it seems to me. See, One.Tel, that spectrum is currently out of use. But if we had a properly operating secondary market somebody could come in and make an offer and we understand that may indeed be happening.

But what you would then get is One.Tel wouldn't get their money back because they got caught up in what I regard as a speculative bubble and paid a lot of money

for something without, as you said, having a proper business plan. But they would be able to sell it on, at least, you know, the company would get some money back which would go to help pay its debtors. But we seem to be lacking a secondary market. Do you have any thoughts about a secondary market in spectrum?

MR RAMSAY: Yes. There is, from time to time, a secondary market. I've personally been involved in the aftermath of the Australis failure, who'd had MDS spectrum, and I think I may refer to this in the paper. There ended up being two bidders for that spectrum; not just the spectrum, the associated assets, some of them down in the street here in Collins Street, the top of the BHP building. There was all the assets required to blanket Melbourne with that particular signal, similarly Sydney, Adelaide, the rest. Those licences at the time that Australis went belly up had about one or two years to run.

One of my clients was negotiating with Ferrier Hodgson who was the administrator about buying those. But the client, being a prudent businessman, said, "If I buy all that hardware and the licences I want to be assured that I can use it beyond 12 months' time or two years' time, and we had a long negotiation with the ACA and we could not get that certainty, and the bidder walked away from it. Another less risk-averse person bought them up and he won the bet because the system changed. The licences were renewed. But unless you have transparency and certainty in the market you won't have a proper market.

Now, coming back to the point about One.Tel spectrum and the point of the public benefit in having achieved revenue from the sale of the spectrum, there are a lot of public downsides in that sale, like all the jobs lost in One.Tel, a lot of whom would have ended up on the dole, no doubt, for a period. So the government ends up paying for something which, if you trace it back, has at least as a factor the excessive payment for one of their company's invoice.

DR ROBERTSON: But a voluntary action on the part of One.Tel.

MR RAMSAY: Voluntary and very bad business judgment, and that's what I've referred to before. How do you get over the propensity of some people to make really bad business judgments?

DR ROBERTSON: I have a slight problem with consistency. You don't like the idea of the government taxing and I agree with you that there have been some rather strange taxing decisions made, and yet you want to put into the hands of government, because in the end that's what you're saying - put into the hands of government decisions about who should have spectrum. Now, let me just add a rider to that: most of the submissions we've received and many of the questions and the people that have turned up at meetings are from industries where they say, "We are a community service. We shouldn't have to pay at all."

You see the problem? The government is faced then with all these people saying, "No, no, we do a vital service, we shouldn't pay," and on the other side you've got companies providing mobile phone networks and so forth. Why should

they pay either? And you finish up by putting the whole decision in the hands of either a few bureaucrats or basically a politician, at the end of the day. Now, that's why I think I have a preference for leaving it to a market, which at least gives everybody a chance.

MR RAMSAY: Yes. Well, by nature I would have a fundamental preference for the market too. But my observation is that the market is very far from perfect in this. So much as I hate to say it, you have to get bureaucrats involved in the decisions. Now, ministers of course are elected people so there's the basic democratic justification there. You can throw them out at elections if you don't like their decisions enough, or we dislike them enough. But with the bureaucrats (a) you need to have a real control of the bureaucrats by the elected government, but secondly, you can do a lot through industry consultation and I've said in here The ACA is actually pretty good at that.

You've got to draw on the wisdom of the industry and of course other government users of the spectrum to try and get the overall right framework and somewhere in there you have to have people doing a little bit of picking winners. But what I've said is, you don't be prescriptive as to the detailed use. You don't pass judgments on the business plan but you make sure that people have got them and where there is true scarcity such as 900 GSM spectrum or 1800 GSM spectrum, and you can only logically fit three or four people into them, and given what I've said about the spectrum there is a justification for having a process where a judgment is made - and probably the ultimate judgments in the big ones ought to be made by the cabinet - on advice and assessment of officials, that this is an appropriate use for this public resource and if the promisor doesn't carry it out in the prescribed time frame like five years, well, the licence is terminated and we go back again.

As to the point about community services saying that they shouldn't pay anything, I mean, I don't think that argument holds water at all. The ambulance has to pay for its petrol and tyres and all the rest of it. Nobody expects it to go up to the bowser and get filled up free, and it's a user-pay service after all. Why shouldn't it pay its share of the bureaucratic costs of the ACA? But of course the ACA should be subject to efficiency controls and so on, to make sure they don't get out of hand. But I see no reason to say at the moment that the ACA is not doing a good job within the framework that it's operating in.

DR BYRON: You remind me of another point, in terms of the duration of licences, which is a large part of your submission. We had some discussion yesterday about, does it really matter whether it's a month, a year or five years, 10 years, 20 years, as long as you've got a very clear statement on both sides, an understanding of under what conditions the right to use will be renewed and under what conditions it will not be renewed, and if that's known doesn't the operator then have as much certainty as you need or you're ever likely to get, that provided you don't do some gross violation your licence will be automatically renewed. If that's in place, is it, you know, almost as good as perpetual even though on paper it's a month or a week or a year?

MR RAMSAY: I think, de facto, that is in place for the vast majority of licences

already because the legislation, in effect, gives a right of appeal for non-renewal and that the ACA has to give reasons and it's subject to appeal in the AAT. So I think that really exists and for the average run-of-the-mill licence there's not big money involved. You might be up for $10,000 for a microwave link or something, much less for a little land mobile system, and the ACA is not going to capriciously stop people using frequencies and they'll offer them other frequencies if they have to be shifted.

What I'm talking about is the big investment decisions, especially where you've got lawyers overseas going through and saying, "We're going to risk a quarter of a billion dollars. Is the risk profile acceptable?" and that's a totally different deal from a single point-to-point microwave link around the town here.

DR BYRON: But on those major decisions - and we've had a few other people referring to these sorts of things too - if it was clear that, "Even though it's a one-year licence this will be sort of automatically renewed every year, except for the following three very, very exceptional circumstances." That could lock in contractually, the right to use it, and then the price for that would presumably be an associated negotiation of whether it was a fixed price or an index price or, you know, periodic review or linked to something else, or whether it's paid up-front, nearly all those sorts of things are negotiated. But presumably there are other ways of achieving the required level of both certainty of use and the price of that use, apart from saying, "This licence is for 15 years or for 20 years."

MR RAMSAY: I think the issue of price would really go away if you came back to just straight administrative charges, as it was pre-1983, because the prices in most cases would not be of significance. I think again in the vast majority of cases the issue of renewal is not an issue because of that protection of that appeal and AAT protection in the act and the proven administrative practice of the ACA. It does not capriciously refuse to renew licences and I think focusing too much on that probably detracts from the real problem. The real problem is where there are big, lumpy, long-term investments involved and the investors justifiably need the maximum certainty that they can get, and the maximum certainty is, "If I obey the law, if I do what I said I would do, my licence will be renewed," and that's where I think a special approach is needed, either in the legislation - I think it would be very difficult in legislation to cater for every individual circumstance.

I think this is where the making of specific contracts could be recognised. The minister can do this under the common law now. But it would be better if it could offer greater assurances to those who don't know our law and who put a lot of the money into Australian telecommunications. If that's written down in the legislation that the minister may make contracts for this particular purpose and then that particular contract can be tailored for the - whether it's a big mobile system, a satellite system or whatever - you don't get that large concept mixed up with all the run-of-the-mill concepts like the local plumber with his land mobile licence.

DR BYRON: When you said that the ACA doesn't capriciously choose not to renew licences, in terms of the big price increase for the 900 GSM spectrum, was

that - a number of things I'm wondering about that. Are there many examples of that sort of sudden dramatic increase or is that the only one? Would you consider that sort of capricious abuse of market power by the ACA or was it sort of a ministerial instruction or something like that?

MR RAMSAY: I'm not privy to who made the decision but my guess is that the ACA would not make such a decision without consulting the minister or alternatively it came down from on high, possibly urged along by the Department of Finance.

DR BYRON: But those sorts of very dramatic price increases are pretty unusual, aren't they?

MR RAMSAY: They're unusual but this one is big enough and has such a precedent that I think it signals a new era in what - it signals a new era in sovereign risk.

DR BYRON: But isn't an alternative explanation that the real market value of the right to use spectrum had increased substantially over time and the sudden dramatic one-off increase simply took the price up to approximately where a normal market price would have been. In effect, those companies had benefited from having a locked-in price for a number of years rather than having prices gradually escalating at sort of 10 per cent a year over the previous few years.

MR RAMSAY: With respect, I wouldn't agree with that at all. I would have quite the contrary view. Having been personally involved in negotiating the contract for one of those two PMT licences in 1991, the deal was made then, the premium was paid. The deal was for 25 years. Now, in commercial life you would never get away with that. I mean, why should you? You've made a deal and a party with the market power suddenly ups one side of the deal, you would go straight to the courts and it would be overturned. But it also comes back to the fundamental policy reasons why those licence fees exist and what is the basis for them. There is nothing in any legislation anywhere that says that those taxes are related to a market value - unless I've missed some amendment which was made recently - but I'm certainly not aware of it.

So one has to go right back to the policy fundamentals. What I'm saying is, the policy fundamental is that the total quantum of taxes ought to be what it costs the government to administer the spectrum. But there is, because of outcomes which are now developing - and we can only see this in hindsight, we are not getting the maximum public benefit out of the big decisions. The big decisions are things like mobile frequencies, satellite frequencies and so on. So you've got to go back, right back to that fundamental premise. Now, 10 years ago I probably would have beat the market pricing drum myself but 10 years ago we didn't have the benefit of seeing the outcomes as they're now developing.

It's now conventional wisdom that market pricing is the way to go in this. What I'm doing is saying, "Wait a minute. Is that conventional wisdom actually correct?"

DR ROBERTSON: If in fact there is a huge rent that's earned by one of these companies because they paid a price in 92 that is far below the price value of the spectrum in 98, say, wouldn't the government have a right to apply a resource rent tax, for example, because otherwise the huge spin-off that occurs to the company all goes into their profits. If there is not enough competition they're not even under pressure to get their prices down.

MR RAMSAY: I think the key answer there is in the competition because if you've got enough competition you don't get supernormal profits, the price comes down.

DR ROBERTSON: Yes, but in an oligopoly you can work it out for yourself.

MR RAMSAY: Yes, granted there is an oligopoly and the government has done its best to remove that oligopoly. That's what happens but some of the new competitors have just fallen over because they paid too much. Now, because of that policy failure - and I won't say its a policy failure - there is now insufficient competition. I don't see that as an argument of saying "Okay, we'll get the old competitors." I would say that somehow you make the market work better so that there won't be supernormal profits. For example, mobile portability is one of the things. Before, once you were locked into one supplier you couldn't get out of it. So you would do all those sorts of things so you increase the pressure on them. But just increasing the taxation on them, I come back to the point that nobody will pay but the consumer.

It becomes built into our national cost base, our national competitiveness and all the rest. If the money stays with the consumer it will be used efficiently. If the money goes to the government, who knows what will happen to it. At least a good chance it won't be used efficiently.

DR ROBERTSON: I do find it strange that you object to the government raising taxes, you say, "That's wrong and I don't like the government for doing that." On the other hand, you want to move away from the market and towards having the government actually make decisions on allocation of spectrum.

MR RAMSAY: I think the government is perfectly entitled to raise taxes. It is entitled to raise this one. All I'm saying is it's a bad tax. I think income tax is the way to go. There is an established system of company tax so if these operators make large profits they will pay large taxes. So it won't all be lost but more important is competition because that improves the efficiency of the whole economy, and taxation, according to the theorists, doesn't. I mean, you've got to have it. You have to have public services but fundamentally taxation is not a good thing in itself unless it produces efficient benefits.

DR ROBERTSON: We're going to have to stop, I think, because we've got a link-up, haven't we, at 10.45? This has been fascinating, Mr Ramsay. I would like to continue but we do have to have this link-up with Tasmania. So thank you very much for coming in and giving us such a stimulating time.

MR RAMSAY: Thank you for listening to these theories at length.

DR ROBERTSON: This is a continuation of the Melbourne hearing, as you probably know. We have a few people in the audience that you can't see, but we can. You realise that what we're about to do is going on public record and may be used in our drafting and so forth.

MS BARROW: Yes.

DR ROBERTSON: There will not be any barracking from the audience; they're very well behaved. I think that's all I need to say at this point. What we usually ask is that people speak to their submission for a while and pick out the key points so that we've got a focus for our discussion. So would you like to sort of have an opening address? Please, one last thing, would you introduce yourselves when you speak so we can identify you on the tape.

MR STUART: Okay. My name is Scott Bailey Stuart. I've only just joined the discussion, so I'm not sure what went on before. If you like, I could just briefly go through the issues that we've raised in our submission.

DR ROBERTSON: Please.

MR STUART: They're all contained in the executive summary of our submission. and I suppose where we'd like to start is in respect of the first issue which is spectrum allocation and availability. Hydro Tasmania sees itself to be in a unique situation. Firstly, Tasmania having the terrain and the dispersion of those assets throughout Tasmania makes it heavily reliant on radiofrequency spectrum for its operations and also for its field operations, so there's not only the monitoring and control of the power stations but there's also coordinating of field staff for maintenance and operations.

We also see the electricity industry in general being an essential service to the community, so therefore I suppose the benefits of Hydro's use of spectrum is distributed fairly evenly throughout the community in Tasmania, and also we operate in a highly-regulated environment, so it's therefore difficult for us to recover costs if they are to escalate quite quickly. So where we see the issues - I'm still puffing because I've just come in from the airport - the electricity supply industry should probably deserve a reasonable degree of priority to spectrum because of the nature of the services it provides to the community and with Hydro being in Tasmania, which has particular concerns and a particular need of spectrum, it's even more so for Hydro Tasmania.

I suppose there's two things that we would raise in that respect and that is that the electricity supply industry certainly has an exemption for a carrier licence under the Telecommunications Act, so a related act, and therefore there's probably a precedent set for us having some sort of special status under the Radiocommunications Act. The ESI obviously also has the special operational needs, so therefore a degree of priority access to spectrum is something that we see as suitable over someone with a purely commercial motive; for example, a mobile telephone provider.

A spectrum reservation system is probably something that would assist also in our planning and procurement cycles and spectrum reservation would allow people, say, a limited time to put a proposition to their boards to actually get funding to proceed with a project and perhaps the opportunity for organisations to maybe horde spectrum and use that as a barrier for others to enter their markets. We have seen a little of that over time as well. People perhaps in some cases may actually take out an apparatus licence and then forget to cancel it, even though they have no use for it in that future time.

We also see that the existing informal arrangements for priority use of spectrum for people like the Department of Defence has been a small barrier to use of spectrum in general. We certainly have spectrum, quite extensive spectrum, at the moment which is from the Department of Defence on a "no interference to/no protection from" basis from the Department of Defence, and we've got quite an extensive investment in our microwave radio system down here. If we were to lose that spectrum as a result of Defence maybe starting an operation down here, we would have concerns. So maybe there should be some sort of formal arrangement whereby if Defence release part of their spectrum, it should be given more formality and that if they want it back at some later time, then we should be compensated and moved to another area of the spectrum that's suitable.

The other thing we have concerns with is that the technical guidelines for apparatus licences seem to not differentiate between the different areas in Australia; that is, metropolitan, regional and remote areas. For example, we are subject to the same constraints with respect to antenna, parabolic antenna sizes, path links, as other people in more densely populated states, and we can often get an exemption on the basis of - you know, we communicate with people from the ACA and give them reasons why we should get some exemption to those things, but perhaps if there was more of a differentiation between the areas within Australia and the way that those rules are applied, we wouldn't need to seek those exemptions. We see that as a problem because in the past, we've had - the ACA obviously had people located here in Tasmania. We could talk to them on the basis of them having local knowledge of our situation. We can't do that now because they're based in I think Melbourne at the moment, aren't they? So they don't have the knowledge they had in the past. I suppose it's a matter of the ACA keeping up with trends in the way that licences are allocated.

I suppose, just moving on - I'm trying to be relatively quick, I'm not sure how much time I've got - we see that in general, making changes to the way spectrum is allocated, to enable us to better plan and migrate systems to share systems where that is economic with, say, emergency services organisations, is also something that should be thought about. For example, Hydro Tasmania has a lot of land holdings in remote areas and our people do a lot of work with the firefighters and emergency services organisations and Tasmanian police. It's very difficult for us to plan joint systems with those people and if thought is put into that requirement as a review is undertaken, then we see that as being useful also.

Security of tenure is obviously an important issue. We need the security of tenure to encourage and justify the capital investment, and obviously, for example, this Department of Defence that we have at the moment, really creates some uncertainty about whether we can invest in these systems and ensure that we have them over their useful life. I think it's definitely mandatory that a system of compensation be introduced to ensure that if the licences are terminated for some reason, then people have very good reason to terminate them, in that they have to pay compensation to Hydro Tasmania and other players for that termination.

I've been in Canberra in the last couple of days and recently spoken to a transmission organisation in New South Wales who had to actually move, and we've had some examples of that as well. But they in fact had to move because of the auction process, so it is commercial gain over an incumbent's right to use, and we think that there's a concern there.

Spectrum charges obviously must be kept to affordable levels. We're not complaining about the charges we currently pay, but again, if the auction process drives the price off of the limited resource, then we would have serious concerns about that and being able to recover our costs from our other electricity industry organisations down here in Tasmania.

I suppose finally we'd appreciate if the review of the ACA's processes and procedures was undertaken. I suppose over time, the ACA has changed what it's responsible for and how it does things. A case in point is the engineering organisations we now get to do our frequency assignment work, I suppose there's areas where the administrative burden could be reduced, and we also have concerns over the way we have to deal with both the ACA and the engineering organisation we engage to do our spectrum planning, whereas we should be able to go through the one conduit to get our spectrum allocated.

DR ROBERTSON: Is that it?

MR STUART: Yes.

DR ROBERTSON: Does anybody else in the team wish to speak?

MS BARROW: Not unless you have any questions of us.

DR ROBERTSON: No, we've got plenty of questions; I just thought you might have something to add. I suppose the first question is to do with your relationship with Ericsson which I find a bit confusing in the submission. It seems to me that you are dealing with them on a commercial basis and then asking for some kind of preferential treatment in terms of licences. Is that correct?

MR STUART: I suppose where we're coming from is we had a choice; we either put in - I suppose the mechanism by which we gain access to the spectrum is something that we're not necessarily focusing on. We're just saying that to serve the broader community generally for an essential service like power, then we need

access to the spectrum. I mean, maybe that's something that also needs to be viewed and maybe that's an exemption to any change you make, the fact that another commercial organisation is in the middle, and that would therefore bear upon future decisions made by us in respect of how we sourced our broad radiocommunications.

DR ROBERTSON: Yes, it seems to me that if you're using Ericsson to provide the service, Ericsson are dealing with the ACA. There's not really a direct link between you and the ACA on this.

MR STUART: And that's a fair comment. Maybe that would impact upon our future planning. I mean, in the past, we utilised Ericsson because that was a commercial agreement; you know, it was the most economic thing for us to do. We didn't want to invest the capital at that time. But in future, for example, if the electricity industry was given priority access to mobile radio spectrum and if it actually put the equipment in and the infrastructure in itself, then that would bear upon how we would go about engaging other people. We'd probably put our own system in, if that was the way it was to be done.

DR ROBERTSON: I'm a bit bothered about electricity being an essential service. We've had lots of proposals from emergency services like ambulance, fire services and even the police, which I see as probably a community service, but electricity you actually charge for. I mean, it's not an essential service in the sense of nobody pays for it. People pay for it.

MR STUART: No, but we all complain if the lights go out, so it's an essential service in that we expect for power to be available to our homes. You're right, it's - - -

DR ROBERTSON: Because we pay for it though.

MR STUART: That's true, we pay for it. But it's not like mobile phone services; if my mobile phone goes off, I don't complain as bitterly because my house - you know, my house is not getting cold as a result of it.

DR ROBERTSON: I wonder if that's true if you use your mobile phone a lot. It's not a question of getting cold, it's a question of not being able to communicate.

MR STUART: I suppose the other thing is though that I can switch suppliers, whereas I certainly can't do that in Tasmania.

DR ROBERTSON: But that's because you don't have an electricity market.

MR STUART: That's correct, yes. Maybe there's some disparities there and some concerns you have, but all we're asking for is during the review that these issues be given consideration. But I think the electricity industry is certainly something - Hobart or Tasmania has its hydro assets distributed over 26 power stations. Some of those - you know, the 300-megawatt station is the biggest and there's some small seven and eight-megawatt type stations. A hell of a lot of coordination is required to

make sure that those assets are running and that everything is operating smoothly, as opposed to in some mainland states where, for example, you will have a one and a half gigawatt thermal power station, and there's someone based at that thermal power station all the time. So that's a special case and perhaps we're more sensitive to that than others.

DR ROBERTSON: I can understand of course if you've got dispersed plants that you need to coordinate, but I don't think it's a reason for saying that the consumer shouldn't actually pay for part of the production process which is the coordination.

MR STUART: We're not saying we shouldn't pay. We're happy to pay the licence fees we're currently paying; we're just saying that we should have perhaps some priority access to spectrum to make sure that we - because we can't provide that coordination function with anything but a radio system, just like the police, for example, or the SES can't coordinate a serious event like Port Arthur, for example, without a good radio station.

DR ROBERTSON: But do you have any reason to believe that your access to spectrum is under threat?

MR STUART: I suppose if you introduce a new mechanism for disposing of spectrum being an auction process, then eventually the first thing to be auctioned off will be that that's more economic and will produce more returns for the government but eventually you will get to the point where you'll say, "Okay, what else can we cherry pick here?" and, "Maybe we should move them out of the spectrum because we want to auction it," and then if we have to start paying, I suppose, rates that are orders of magnitude above what we're currently paying, we would have difficulty with that.

DR ROBERTSON: I think you're painting a pretty bleak scenario frankly, but anyway, we'll take that into account. One specific point you mentioned that we were a bit confused about and that is this question of access to the Defence spectrum. I mean, is this a special deal that you've got with Defence?

MR STUART: Yes, that's correct. It was back in about 1996; I've still got the letter, if you like. But we had to apply for eight gig spectrum. Defence have the right to use that spectrum, so we had to actually get Defence's permission to use the spectrum and the permission - and it's in my submission, I'd have to find it - but it was on a "no interference to, no protection from" defence systems basis that we were given permission to use that and we take that to read that is, the Defence decides to crank up a system in our area of the spectrum or at least that starts interfering with us, we have no rights even though we've invested approximately $15 million in our radio system down here - we have no rights in respect to access to that spectrum, or any rights to have the interference issue addressed, as you would normally through the ACA.

DR ROBERTSON: But this is a private deal between you and Defence. ACA weren't involved.

MR STUART: They were. Yes, they were.

DR ROBERTSON: Did they direct you towards Defence?

MR STUART: Yes, and I'd have to find the letter. The letter was actually from Defence but in my recollection it was to the ACA and the ACA forwarded us a copy of that letter. I'll supply a copy of that letter if you require it.

DR ROBERTSON: I think that might be a good idea, if you wouldn't mind just sending it to us.

MR STUART: Yes. Certainly the deal was done with Defence but ACA were our conduit for that, because I was involved in it. It was back in 1996. We haven't had any problems. I mean, that has been five years where we haven't had any problems. But there is some uncertainty there. Now, we're planning to invest almost an equivalent amount of money to renew our system, to upgrade the system, but we're wanting to reuse the same area of spectrum. So it still impacts - the uncertainty is still there.

DR ROBERTSON: Yes. You're probably pretty lucky to get something out of Defence in the first place, I would have said, having talked to the - - -

MR STUART: I mean, Tasmania is not an area that Defence concentrates on. We're not on the border with any other country.

DR ROBERTSON: No - penguins.

MR STUART: So we're not likely to get an attack from Antarctica. But I suppose the fact is, the uncertainty is there.

DR ROBERTSON: Yes. It doesn't sound like a lot of uncertainty, I must say. I think you might be better to stay with that deal than go looking for another one.

MR STUART: There's certainly no certainty over that licence. If someone could come in and say - the fact is that this approach is there. If we want to get access to that spectrum they'll give us access but they can always take it back. I mean, that's an issue that is there at the moment and that's something that perhaps should be reviewed, irrespective of whether Tasmania is affected by it or someone in the other states is affected.

DR ROBERTSON: Well, you know Defence has a special position in the RCA. You know, they can identify what they want and that's it. So that's what intrigued us about your having access to it. But I can see why, because it is remote and there aren't all that many military stations down there.

MR STUART: That's right.

DR ROBERTSON: But I mean, it was a surprise to us, to learn that you'd actually got access to Defence.

MR STUART: Well, I'll certainly forward you that copy.

DR ROBERTSON: Okay, thank you. Neil, would you like to take it up?

DR BYRON: Yes. You have been discussing earlier in your opening comments and in the submission about the duration of the tenure and it seems to me one of the reasons that we have annual licences, annual apparatus licences, is because the crown reserves the right to non-renew if some other, you know, more socially beneficial use appears. But to move to a 10 or 15-year licence term, would you agree with me that a 10-year licence is worth much more than 10 times the value of a one-year licence because of the security that it confers?

MR STUART: Perhaps it is, but not on the basis of it being an order of magnitude. I mean, we pay on an annual basis because that's just an annual fee, rather than paying - you still get an apparatus licence for up to five years, but you currently pay the fee on an annual basis. So in other words, your costs are amortised over that five-year term. I'm not sure whether the annual payment is necessarily relevant. It's the term of the licence that's relevant.

DR BYRON: Well, no, I was just thinking that if I offered you the choice between a one-year licence which was renewable and a 10-year licence, would the price you're willing to pay per year be different? Because we've had some discussion yesterday and earlier this morning. There's a few people have said to us, "Look, the whole question about duration of licence is a bit of a furphy because as long as it's very clear on the conditions of the renewability, provided you do X, Y and Z your licence will be renewed automatically, or if you do A, B and C your licence will be cancelled." But if you know that and it's all written down on a clear sort of contractual basis, then it's as good as perpetual.

MR STUART: So if I get a five-year licence - I mean, maybe that's the case. If I get a five-year licence and I'm an incumbent then I have more rights over anyone else who's - they have clarified that with me and I'm happy.

DR BYRON: That's a good question. But the reason that we've been told why we don't have perpetual leases or, in effect, freehold over spectrum is because the technology is continuously evolving. There are new uses coming up that hadn't been imagined, you know, 10 years ago and so the crown reserves the right to not renew certain licences because some other more meritorious or more profitable new user has emerged.

MR STUART: Is there an objective way of establishing what that merit is, like for example is it called the auction process? "How much are you willing to pay?" Is that where the merit is, or is the fact that you're an electricity supply industry participant and you're providing what we call an essential service or even, say, in the case of emergency services - is that given a priority over someone who's just going to

use it for mobile telephone use and just commercial gain?

DR BYRON: Yes. Up till now I'd say probably 90 per cent of the submissions that we've had are from organisations that see themselves as a special case and are afraid that they're going to have to pay for the use of the spectrum something like what the mobile phone companies or even the commercial broadcasters pay for the use of the spectrum.

MR STUART: But shouldn't there be a tier system that basically gives priority to emergency services for example where if spectrum is needed - sure, people shouldn't go overboard and just hoard spectrum they don't need. But an emergency service organisation, I would see them as being above - well, we would call it essential service organisation in priority for appropriate use of spectrum. But then I would see keeping the lights and the power on at people's houses as being more important than a mobile phone service, where you've got the choice of a lot of different suppliers, for example.

DR BYRON: Yes. So basically you're getting back into a merit or value judgment system of deciding which is the most worthy application rather than relying on ability to pay, as through an auction system.

MR STUART: Yes, only where there's community benefit. Define community benefit - safety of people, for example.

DR BYRON: Yes. On the subject of compensation, which you mention in the submission, in the event of a licence not being renewed, would you see there being some relationship between the amount of compensation and the - - -

MR STUART: Sorry, I didn't say in the event of a licence not being renewed. We just said in the event of you being turfed out before your licence term is up.

DR BYRON: Okay, sorry, in the event of being turfed out, yes.

MR STUART: When the licence turns up for renewal, no compensation is payable. It's all up to themselves I suppose.

DR BYRON: So let's consider mid-term. I mean, what I'm getting at is that you've established very clearly that the access and the use of the spectrum is an extremely valuable input for the whole Hydro business and operation.

MR STUART: Yes.

DR BYRON: So the very substantial costs of having stranded equipment, technology that has cost a lot of money to set up, and if you haven't got the spectrum to use it fully and efficiently there's really serious losses there.

MR STUART: And a lot of time to set it up as well.

DR BYRON: Yes.

MR STUART: It takes a few years in a planning cycle.

DR BYRON: Okay. But what I'm getting at is that would you expect compensation of a million dollars for the loss of a licence that you pay $100 a year for?

MR STUART: No, just restoration of the service in some other way.

DR BYRON: So it's compensation in kind to maintain the service, rather than the cash compensation.

MR STUART: Yes, for the loss suffered. Yes, the Hydro would want to be sure that it can maintain service. It doesn't want to make a profit out of this. So I suppose what that does is, it encourages accountability. If someone from the ACA says, "Okay, we are watching this bit of spectrum and we have to remove these people from this area of the spectrum to auction it," then they would have to know that they're going to incur some costs and weigh that up before they go out and actually do the auction process, rather than just doing - I mean, it might be an election year and we might want to raise a heap of money just by auctioning off an area of spectrum, I don't know. But I suppose if there's some accountability before people are removed from the area of spectrum, people think twice about it.

DR ROBERTSON: There's actually usually a very long warning period. It's not as if they suddenly overnight go in and say, "We're going to cancel your licence." It usually takes anything between five and 10 years. So that threat is a pretty remote one. I mean, we're hearing a lot of this uncertainty from people and it's sort of seeing the ACA as a bit of a big, bad monster who can just do what it likes. In fact of course they have a public image as well.

MR STUART: But maybe you can overcome that problem by the ACA having a mandated period that they have to warn people.

DR ROBERTSON: Well, I think there is.

MR STUART: I'm not sure if that is the case, is it?

DR ROBERTSON: Yes, it is. I think it's two years or three years. But that is after they've already been warned that something like, "The ITU has just set aside this frequency range and therefore we'll have to abide by that in five years' time." So you've got quite a long period. I don't want you to think they just move in and say, "Sorry, you're out tomorrow." That's not the impression we've formed anyway.

DR BYRON: Coming back to auctions, it is said that the purpose of the auction is to discover who's willing to pay the most. It's sort of an allocation question. But it's also a revenue raising mechanism as well. The question, if we don't use auctions as the allocation mechanism, what are the alternatives, and the one that we've been

talking about is a beauty contest where you actually decide who's the most worthy applicant for the use of this.

MR STUART: No, I'm not talking about - yes, I agree with the auction process. I'm not saying don't use them. What I'm saying is, maybe have a combination of the beauty contest and the auction whereby there is some priority there before you actually go and - or some assessment made of that area of spectrum before you actually go and auction it, and in the limit - I mean, once all the revenue has been raised, are people going to look further, to areas that perhaps aren't as suitable for that purpose, "But maybe we can auction it off anyway and maybe make the incumbents pay more for it by auction, they can auction amongst themselves."

DR BYRON: You mentioned in the submission about licence amalgamations. I think it's on page 11, yes, the second-bottom paragraph.

MR STUART: Hydro Tasmania, we have someone continually processing invoices from the ACA. So I suppose it's a matter of bundling it all onto one bill and itemising them but saying, "This is the total dollars at the end of the day." I mean, it's just the administrative burden of paying individual amounts, small amounts for each licence that we currently own.

DR ROBERTSON: We thought you meant putting apparatus licences, class licences and spectrum licences in the same package but you're not.

MR STUART: No. Well, there may be some scope for reviewing that. We're not saying change it necessarily but there may be some scope for reviewing that, but more or less the administrative burden of the apparatus licences. We get probably 100 of those come in in any one year and we've got to pay our little cheques for each one of those. So that's a start, the start of the administrative burden.

DR ROBERTSON: Yes, okay. Do you have any other problems with the ACA?

MR STUART: We try to be, I suppose, constructive in relation to the ACA. I don't think we have any problem with them as an organisation. I think perhaps over time the environment has changed, like for example the ACA doesn't have the engineering expertise it had and now that's an outsource. An organisation like us now employs a middleman to do our frequency assigning. So I'm not entirely sure that the ACA has moved with those times, even though that has happened and maybe a review of their procedures, not destructively but a constructive review, in the light of the changes to the environment would be something that we'd appreciate.

DR ROBERTSON: But nothing more than that?

MR STUART: No.

DR ROBERTSON: That is one of the tasks we're supposed to look at. So rest assured on that one.

MR STUART: Okay, we support you.

MR AVALON: It's Peter Avalon. One of the issues we've been struggling with over the last six months or so is, we go through an engineering company to allocate the spectrum. We get a quotation from the ACA which isn't really an invoice or anything we can pay. We get a quotation from the ACA through this engineering company. Our accounting system, we have to pay the ACA on a quote that isn't from the ACA but through another company and then there's issues of the quote not being right and we get refunds and there's a whole mess of administrative processes there that are causing us grief and we don't have an invoice from the ACA saying, "Pay this," and we don't have actually an order with the ACA. We have an order with our spectrum engineering people.

DR ROBERTSON: Okay.

MR AVALON: If that could be looked at and addressed, that would be a good outcome.

DR BYRON: Could I ask the real sort of speculative one: do you know if the state government as a whole, or departments, have ever considered buying some spectrum licences and then sort of becoming a landlord for all the state activities that happen under that umbrella rather than having a whole bunch of individual apparatus licences?

MR AVALON: Is it being done anywhere else in Australia?

DR BYRON: I just thought Tasmania might be a perfect place to try it out.

MS BARROW: Jane Barrow. I've talked to various representatives of government and as far as I know they haven't given that consideration at all.

MR STUART: It's easy to do, considering that some of our applications, if you like, are in different areas of the spectrum so you would have to buy little chunks of spectrum everywhere and you wouldn't necessarily suit the need of the various people. It depends on the application I think.

DR BYRON: Yes, that's a good point. I guess I was thinking that what you were using and state emergency services, police et cetera and other government agencies with their own networks, if there was a fair sort of clustering rather than sort of leasing whole little fragments, the state government might like to buy a big chunk and then manage the allocation within that.

MR STUART: I suppose if we had a clean slate and no-one had any spectrum then that might be easier to do but because you've got to fit around other users, I suppose it's just the way that historically it's happened, it's perhaps different.

DR BYRON: I won't pursue that one any further. On the reservation system, you're concerned about the ability of other people to horde or sit on bits of frequency,

but are you basically asking for the ability through a reservation system to make sure you get the bits that you need or may need in the future? I'm just looking at - - -

MR STUART: We've been in the position in the past of having to really order the equipment before we know we can definitely have the spectrum. Because what we have to do is do all the design, we have to make sure we've got the right-sized antennas for the path links. if there was a spectrum reservation system then there would be a limitation on how long you could have it reserved for.

DR BYRON: Is it possible that some of the other people that look to you like they're hording are in fact going through that same process?

MR STUART: Yes, absolutely. But because they've bought the licence there's not a trigger there to say, I suppose - apart from the annual renewal - "Do you still need it?"

DR BYRON: Yes. I guess if the licence was expensive enough, you wouldn't hold onto them unnecessarily.

MR STUART: Well, there's merit in that.

MR ROBERTSON: Do you have anything else?

DR BYRON: No, I don't.

MR ROBERTSON: Look, I think that's been helpful. Would you like to add any comments of your own before we close? Any one of you - as long as you don't all three speak at once.

MS BARROW: No, I think we've said enough.

MR ROBERTSON: All right. Well, thanks very much for sending the submission and for attending this inquisition by Spectrum.

MR STUART: Thanks very much.

MR ROBERTSON: I declare the meeting closed until 1.30. Thank you.

(Luncheon adjournment)

DR ROBERTSON: On reopening the hearings on the radio communications inquiry this afternoon, we have the Bureau of Meteorology who are making a presentation. You know the rules I think. I mean it is going on the public record. I am sure Don has told you all about it. What I would like, if you wouldn't mind, is if you would like to make some introductory comments to draw out the main points of your submission and we can discuss it. When each of you speak for the first time, would you please say who you are, so we can identify you on the tapes.

DR BROOK: Thank you. My name is Bob Brook, I am Assistant Director (Observations Engineering) in the Bureau of Meteorology. My colleagues who are here: starting on my right is John Beard, who is the consultant with the bureau, an expert in satellite communications and satellite meteorology; Michael Hassett, who is in charge of our communications section; Dennis Herrmann, the person who is operating our Powerpoint, but is the supervisor of telecommunications in the bureau and Don Gunasekera, who is senior adviser in meteorological economics.

First of all, let me very briefly introduce the Bureau of Meteorology. It operates under the Meteorology Act 1955. It has a mission which is essentially to observe and understand Australian weather and climate and to provide meteorological and hydrological and oceanographic services in support of the national interest. There are four elements in our mission. First of all, monitoring. You will notice it's monitoring meteorological conditions essentially for future generations in understanding climate. The second one is research. We are charged with undertaking research to advance our understanding of Australia's weather and climate. The third one is one which most people are probably more familiar with, a provision of range of meteorological and related services. The fourth one is to meet our international obligations.

The bureau is essentially a public interest organisation and just a few of the things that we do in the public interest is clearly public weather forecasting, provision of severe weather warnings, flood warning services. We produce hydrological and meteorological services. Just a quick explanation, that touches on things such as dam design and run-off engineering and things like that; climatological data for a range of purposes, including seasonal forecasting. We also give national policy advice on a range of issues related to meteorological activities. I have mentioned a couple there such as ozone and climate change. We are very heavily involved in natural disaster mitigation as they relate to meteorological events. We provide support to emergency services, for instance the State Emergency Services, Country Fire Association and those sorts of things, and we undertake research into weather and climate.

I would like to briefly touch on a few of the activities which will illustrate why we are involved in radio frequency issues. We in fact are involved in quite a lot of use of the radio spectrum and I have a couple of examples on this slide. First of all, weather watch radars. Australia is covered by a network of about 50 weather watch radars operating in several bands of the spectrum. In addition we collect data from remote stations, particularly things like automatic weather stations set in locations throughout the nation and throughout the territories. In the oceans around Australia

we have drifting buoys. We also have activities such as radiosondes which are a small radio transmitter sent off with a balloon to send back, transmit back, the information on the atmosphere; and tropospheric wind profilers, without going into the specific of that, that's essentially a vertical pointing radar which returns information on the wind structure up to about 10 or 12 kilometres.

Very importantly we are involved in satellite meteorology, and satellite meteorology is not solely communications. We have both active and passive sensors on meteorological satellites which operate in very discrete parts of the spectrum. Finally, just by example, we have flood warning systems requiring use of the radio spectrum and also we use the spectrum to broadcast marine warnings and forecasts to shipping and other uses. I think it is very important for us to emphasise once again that a lot of the use of the radio spectrum by the Bureau of Meteorology is related to the characteristics of the atmosphere. It is not related to telecommunications, and as a result, very often it is impossible for us to reallocate the use of the spectrum to alternative frequencies.

In addition, the use of the radio spectrum for meteorological purposes is determined on an international basis, firstly for the reason I have just mentioned above, but secondly, because many of the uses of the spectrum cut across international boundaries. For instance, satellites will be transmitting meteorological data to virtually every country in the world. There's a schematic of roughly what we are on about, (referring to powerpoint image) but just to fill you in, the Bureau of Meteorology's use of the spectrum is about - we have 320 licences for about 1200 devices and we pay an annual fee for the use of these of about $86,000. In our submission we have given details of the spectrum. In the attachments are values of the spectrum.

So probably the key issues that we see in respect to your inquiry are essentially access to the spectrum and the access charges. Turning first to the access to the spectrum, we certainly recognise the policy objective of the Australian government and other people involved in this is certainly the efficient allocation of the spectrum amongst commercial and non-commercial uses. We also recognise that economic instruments such as market forces will help to achieve the effective allocation of the spectrum, but market forces on their own will not take into account the public interest considerations that I have mentioned before.

Efficient non-commercial use requires considerations of factors that are certainly not going to be reflected in the market. Public interest, national security and public benefit have a value which can't be determined through market forces. The bureau believes that we essentially operate in the public interest part, access the spectrum for public interest. So to carry out its mission, we require a secure and uninterrupted access to relevant parts of the spectrum. The access to the spectrum, there are a couple of concerns and threats that we perceive. First of all, as I have mentioned, a purely market-based approach to band allocation has a potential to override public interest use of the radio spectrum. We probably see the potential for a conflict of interest in the ACA when it has both regulatory function and a revenue generation function and we feel that has to somehow or other be addressed.

Finally, I would like to mention that the World Meteorological Organization, which is a specialised agency of the United Nations, has taken a very keen interest in the allocation of radio spectrum and it has noted that although the last World Radio Conference recognise and included meteorological requirements for the radio spectrum in its deliberations, it still sees pressure on the use of these from other users, on the use of the parts of the spectrum which is of interest to meteorological by other users. So the WMO, at its last Executive Council meeting, has urged members to ensure that national radio communication authorities are fully aware, and I suppose to some extent that is one of the reasons we are before you today.

Can I now turn briefly to access charges. In the paper you have asked about, in section 2.6, what sort of criteria should be used to determine non-commercial spectrum users. We would suggest public sector non-commercial service provider, public interest services, services aimed at the safety and protection of people and property, national security - and I mention this specifically because our act requires that we provide meteorological services to the defence forces and certainly the meeting of our international obligations. We would suggest that there are probably three options available, at least from our viewpoint, of levying access charges.

The first option would be charging commercial rates for non-commercial use through possibly an auction system. As I mentioned earlier, this would certainly lead to a sub-optimal outcome as far as the Bureau of Meteorology would be concerned. The second option would be exemptions or discount access, possibly based on the charge of providing the service and we would suggest that could be argued on the public interest ground. The third option is a level playing field which would then have budgets of organisations such as the bureau, funded through matching grants from the government. I think in general the bureau would probably prefer option two.

So if I can just in summary mention that the bureau, through the process, is seeking to have a secure and uninterrupted access to the relevant parts of the spectrum used by meteorology and the Bureau of Meteorology essentially is seeking exemption from spectrum auction process of those parts of the spectrum that we need. We are not saying that we are looking for free access to it, but certainly we perceive it to be difficult to compete with the commercial sector. Thank you very much. That is our presentation.

DR ROBERTSON: Thank you. Can I ask you one question to start off with. Do you feel you are under threat from losing any of your present spectrum licences? Have you had any suggestion - because on the whole the WMO I imagine puts its case to the ITU and the ITU says, "Right, these are for this group of individuals, meteorological officers and so forth" and once that is done it puts a pretty tight band on what the ACA can do. So I am wondering if you really feel you are under threat from something that is going on?

DR BROOK: The brief answer is yes, we feel that parts of the spectrum we use are eyed by commercial areas and commercial areas seek to use them. In terms of the specific details, I suppose John Beard would be able to answer the specificity. But

certainly in general we do and I think WMO considers it certainly not a finished exercise even now.

DR ROBERTSON: But are you not covered by the ITU?

DR BROOK: Yes.

DR ROBERTSON: But you still feel under threat?

DR BROOK: Yes.

MR HASSETT: If I could just perhaps develop that point. The WMO is very active in the various organs of the ITU in terms of the allocation of the spectrum, because there is definitely competing demands for certain parts of the spectrum that is used by meteorology, particularly the band used by radiosondes. They are the balloon-borne transmitters that operate around 400 megahertz. There has been pressure on that particular band for a number of years. There has been a lot of action through the ITU to defend the existing allocations to meteorology in that area. More recently, in the area used now by the meteorological satellites that provide the pictures you see on your television each night, around 1.6, 1.7 gigahertz, there seems to be definite competition for that part of the spectrum, particularly from the emerging mobile satellite service.

So the WMO has been very active in the ITU in defending those two particular areas and as well as those, there are others used for remote sensing. Bob alluded to that in his presentation. The radio spectrum is of interest to us, not only for communication purposes, but for remote sensing. Remote sensing is based on the physics of the atmosphere and so certain bands are particularly suitable for remote sensing. Again, there is plenty of detail available and we can provide you with information on what these bands are, but there has been a lot of effort also to defend allocations in those bands so that remote sensing activities won't be prejudiced. So I suppose it is true to say that there is a lot of pressure and it is mainly being addressed in the forum of the ITU, but I suppose we would hope that national spectrum allocation policies don't make the situation worse for us at a national level.

DR ROBERTSON: Presumably you talk with the ACA, do you, on this?

MR HASSETT: We certainly would and we participate - my colleague from the other end of the table there - participate in national study groups that help develop Australia's position in this international body.

DR ROBERTSON: The reason I say this is because on the whole the ACA sticks by the ITU. I can see that you might want them to argue your case in the ITU, but I don't think they are likely to go against the broad plans that they decide on in world radio conferences and things like that, and I am just wondering why you are worried.

MR HASSETT: Often there are sort of national allocations made at a national level in the broad framework of the ITU allocations, but there are certainly special

allocations made at a national level. I remember some years ago now - this is old hat nowadays - but there was a lot of problems in Australia many years ago with television Channel 5A interfering with meteorological satellite downlands. So that was a particular Australian problem, because of where that TV channel was. So there are sort of national issues that the ACA deals with in terms of applying the ITU broad framework on a national level. So just because it is okay in the ITU framework doesn't necessarily mean everything is fine from there on.

DR BYRON: Are there actual examples where you have actually been bumped?

MR BEARD: There is an example that the new earth exploration satellite downlink band at 25 gigahertz - that is an internationally agreed band - goes from 25.5 to 27 gigahertz. That is for the satellites to broadcast data down to receiving stations. The Australian Communications Authority has spectrum licensed that recently. They have spectrum licensed the top end of that band, about a megahertz of it I think it is, from 27 upwards. So there is some overlap between what has been spectrum licensed and what is used for earth exploration satellite downlinks. The bureau was concerned about that, expressed concern about it, and while the ACA didn't make any law about it, they produced some guidelines to the spectrum licensees, suggesting that they follow certain guidelines to try and reduce interference in earth exploration satellite downlinks. I agree that is a good thing, but we do feel under threat, or the bureau does feel under threat, because the spectrum licensing has occurred.

DR BYRON: The interference management is working so far.

MR BEARD: Actually, it probably won't work yet, because it is a new band that hasn't yet been used.

DR BYRON: So it hasn't been tested?

MR BEARD: No, that's true. But just to expand a bit on what Mike Hassett said, there is certainly a threat from mobile satellite uplinks to meteorological satellite downlinks and that is the subject of a number of studies that have been done under the auspices of the ITU, to work out whether sharing is practical, and if sharing is practical that will go ahead. We do suffer interference already and any sharing will make the matter worse.

DR BROOK: Another example would be the 406 band for our radiosondes. The 400 to 406 was allocated for meteorological use. Without consultation with the bureau, the predecessor ACA removed the 403 to 406 and severely hampered our ability to use radiosondes in that area. That is an example of an internationally agreed band being taken over nationally without involving the bureau.

DR BYRON: What was the use that displaced you on that 403, 406?

MR HASSETT: Allocation to the Fixed Service - - -

DR ROBERTSON: That's right, that's that emergency service one. Is that two competing public services?

MR HASSETT: I think it's Fixed Service. I'm not sure.

DR ROBERTSON: You think it's fixed. Do you mean it has been resolved?

MR HASSETT: No Fixed Links, no, it hasn't been resolved.

MR BEARD: Used by all sorts of people, including emergency services.

DR BYRON: I think we will pursue this first question of access a bit further and then we will get on to the price of access. There is a very interesting statement on page 5 where you talk about the use of economic instruments for allocation of commercial use, but how do we get efficient allocation of the non-commercial parts of the spectrum, whether it is non-market values and public service types of functions?

You have listed at the top of the next page the five bullet points that were on your overhead transparency. There's a suggested way where an authority having to make allocation decisions with the rights to access might decide, without using commercial criteria. Could you elaborate a bit more on how you see those working? Would an applicant need to meet all five of those or would there be a point system, or would you, you know, score each out of 10 and, you know, provided you've got more than 35 out of 50 you qualified. I mean, have you thought any more about how those sorts of criteria might be operationalised?

MR GUNASEKERA: My name is Don Gunasekera. I think the idea of the sort of filling out of this list is to highlight the key functions of the bureau in a sense. I think your question in section 2.6 was, "Look, can you spell out the criteria that you think that the ACA could use to identify non-commercial use?" So it's hard to really give weights to different parts of the criteria, if you like. But I guess the most important thing is, our work is mainly for this thing on public interest and public good, and that's a very sort of broad area. It's very hard to really give any weights in terms of a national interest, defence versus protection of people and property.

DR BYRON: But the problem, as I see it - it's been made clear to us from so many submissions that we've received from organisations who basically do meet all those criteria, ranging from police and emergency services and CSIRO and Defence and Maritime Safety Authority and Air Services Australia, and this morning we had Hydro Tasmania, and there are so many - - -

DR ROBERTSON: Yesterday we had the four-wheel drivers too.

DR BYRON: The Four-Wheel Drive Emergency Service in Central Australia. So there are so many who might equally meet all those sorts of attributes and, as you say, with that 4.0 through to 4.06, the alternative user that took some of the spectrum that you'd been using was another organisation that would probably meet those five

attributes as an emergency service. So in terms of giving clear guidelines for an organisation with a fairly difficult job that the ACA has to do, is decide who to allocate this non-commercial spectrum to and if we decide a priori that we're not going to use commercial measures because it's non-commercial uses, as you've got competing organisations that still meet all your five criteria, we haven't helped them very much.

MR GUNASEKERA: I guess my understanding is you can use these criteria to basically differentiate the commercial use versus non-commercial use at a certain level. Then the question is, you have a number of non-commercial users and their use of the spectrum can vary. For example, in the case of meteorology we have specific requirements within the spectrum based on the physics of the atmosphere. So I mean you can use some of those technical factors to differentiate between the non-commercial users, if you like. Our intention here was basically to highlight the criteria that we can use to differentiate ourselves, the Bureau of Meteorology, from the commercial users.

DR BYRON: I don't want to push that too far but I mean as a related question to that, it's actually raised in the paragraph below - that one on page 5, that:

> The bureau believes its current use of the spectrum is undertaken efficiently and effectively, fully reflecting the social and public benefit of the usage.

I'm wondering if you can give us some examples that demonstrate the argument you're making about using the spectrum efficiently because if we say this is sort of in a quarantined non-commercial area where there aren't economic pressures sort of putting pressure on the organisation to only take as much spectrum as you absolutely needed to use it all very efficiently, are there any examples where you've decided that something is no longer required because of improved technology and you've handed it back, for example?

DR BROOK: I think that there are two aspects to our argument that we use it effectively and efficiently. First of all, the fact that virtually all the spectrum specifically used by us, we have to argue that against some fairly strong opposition in the ITU and I would suggest that probably in that forum it's harder to get a couple of kilohertz there than just about anywhere else. The second thing is that when we use our spectrum for telecommunications in the conventional sense, we actually pay licences and we're actually virtually in the commercial world when we do that. We argue that in some cases we'd prefer not to have to buy that spectrum at auction but generally our licences are obtained like anyone else obtains a licence.

MR BEARD: To give you an example where we've handed spectrum back is the APT transmissions, round about 137 or so megahertz. That's been overtaken and interfered with by other things and we don't use that band any more and we use a higher frequency band near 1.7 gigahertz for meteorological satellite downlinks. I think just a little thing about your question about efficiency, as far as meteorological satellites are concerned, they're designed by overseas organisations such as the Japanese and Chinese and American manufacturers and they certainly

take efficiency considerations into account when designing the transmissions.

DR BYRON: Although the Chinese probably don't have the same commercial pressure. I mean, in all sorts of other areas we've been told that equipment can be designed to be very profligate in its use of spectrum as opposed to being very, very sort of thrifty and economising on the amount of spectrum it uses and I think something designed in China if spectrum is basically free - - -

MR BEARD: I think to be fair to the Chinese, they're fairly with-it in terms of designing these things, although their satellites are fairly new. I think that they try to design it so they can make their ground stations as cheap as possible and so do the Japanese and so do the Americans. So certainly the WMO generally and the meteorological organisations generally want to try and provide data not only to their own organisations but other developing countries who have limited money. So they try to make it efficient, if you understand what I mean.

DR ROBERTSON: That raises the point about technology. I mean, there must be a lot of improvements in the equipment you use which either enables you to reduce the range of frequencies you need or indeed to move, as you've just said, and I wonder how do you manage those transfers, as it were? Is that easily done when you go to the ACA and say, "We want to give this back but we need a bit more of that," or don't you ever say that?

DR BROOK: Those devices which use fairly, what we'd probably in this context call broad pieces of the spectrum, are by their nature often not capable of being more frugal in the use of spectrum. For instance, radars, by virtue of both the nature of the beast but also the ability to maintain high-powered transmitters on a very, very precise frequency is not on. Radiosondes; these have got a cost basis. To, say, introduce a very stable radio transmitter into a radiosonde we've been advised that it could be as much as 50 per cent higher in the price, which in bureau terms would mean several million dollars a year, and the worst in that, what you touched on, a lot of the developing countries who at present use radiosondes and those data go freely to the rest of the world, would not be able to afford to use them. So in probably the areas which we'd be looking for technology it's really not at this stage feasible for us to introduce technology which wouldn't use as much of the band.

DR ROBERTSON: So you would really need to do it by going to the ITU, wouldn't you, because you want other countries on the same bands.

DR BROOK: Very much. Many of the meteorological uses of the spectrum are really international. They are international. Take for instance radiosondes. There's only really one or two manufacturers in the world so they have a captive market. So individual countries don't make radiosondes. They mainly come out of Finland. So it's not really a feasible option to - - -

DR BYRON: To change the region set-up.

DR BROOK: Yes, or the technologies probably.

MR HERRMANN: Just to answer - Dennis Herrmann here - your question about handing back frequencies or bands, that the most major change the bureau has had is probably in the last 15 or so years where we actually cancelled a lot of HF radio licences. We had a huge infrastructure of radio licences for HF communications for backup networks for cyclones and actual communications for getting observations out of remote areas. At reefs and islands where there are automatic weather stations, HF radio at the time was the only way of getting it out. So a lot of that's now been cancelled in favour of using satellites and it's the data collection platform technique on the satellite that's used. So that's probably the most dramatic one that's made efficient use because of change of technology.

DR BYRON: But, I mean, it seems to me that the Met Bureau is doing far more and to a far higher standard or far more ambitious in its scope and scale and everything else than it was five, 10 or whatever years before, and that most of those additions, the new product that you're delivering to the public at large, has come through spectrum-intensive new technologies that enable you to do things or to do them more accurately than would have been possible previously. Is that right?

DR BROOK: Probably the radio spectrum hasn't been our entire reason for improving our services but my guess would be that, yes, we're making much better use of the - much more full use of the spectrum in, for instance, weather watch radars. In the last 20 years we've gone from virtually none to a network covering the whole of the country. But in each instance I don't think that we have required to take up any more of the spectrum than had been allocated at the time. There are virtually no applications where we've sought to increase our access to the spectrum.

DR BYRON: I guess what I was getting at was that the public demands and expectations have probably grown enormously and that the public now expect a level of coverage and a level of accuracy that was sort of undreamt of before, and it's partly the new technologies and also increased computing power and all sorts of things like that.

DR BROOK: Exactly. The number of hits to the bureau's web site per day is - does anyone have a comment here - three or four million a day, of which half are to access weather watch radar. So that says the public expectation of our performance in these areas is very high.

DR BYRON: I guess the point I was leading to was that you said you were delivering these new and higher standard services but still using basically the same amount of spectrum and I guess the question is what's the next 10, 15, 20 years going to look like? Are you still going to be able to provide more and better services to the public and still working within the existing band allocations?

DR BROOK: In terms of the actual physics of the atmosphere and its requirements, they're not going to change - I don't think.

MR HASSETT: Wouldn't it be true to say that in the next 10 or 15 years the

science of remote sensing will progress and there will be a need to use parts of the spectrum for remote sensing that we don't use today. John alluded to one - - -

MR BEARD: Yes, the new satellites, Terra and Aqua, are multi-spectral radiometers that measure the atmosphere - - -

MR HASSETT: Yes, there are new satellites coming on stream that are going to use remote sensing techniques that are not in use today, so that will give us better observations that we don't have today that feed into the analysis process that we run, that will result in better products. So in one sense, we'll be looking for some of these areas of the spectrum for remote sensing to be preserved and guarded into the future and it would be a terrible tragedy if they were lost, having been auctioned off and that spectrum sold for some other purpose which would then render them unusable for remote sensing. In traditional communications terms, technology gives us advances and the shift away from HF radio to satellite mentioned before is an example of that. But then, on the other side of the coin, you've got advances in remote sensing happening, which means that we want access to these others areas of the spectrum that mightn't be in use today.

DR ROBERTSON: What areas of spectrum are they?

MR HASSETT: They're in the much, much higher frequency band than we have traditionally been dealing with, up and tens and hundreds of gigahertz, but there are particular bands there that are suited for remote sensing and the meteorological community would hope that those bands will be left free because - - -

MR BEARD: They have been identified.

DR BYRON: We've been told that the main reason for having fixed term licences, whether it's one, five or whatever, is so that the crown, via the ACA can re-allocate use if something better comes along. So just hypothetically, what you're suggesting may be some piece of very, very high hundreds of gigahertz spectrum hypothetically is put up through a spectrum auction and then 10 years from now there's this fabulous, new "you-beaut" technology comes along that requires that bit of spectrum. Wouldn't it be possible to claw it back? Wouldn't the divine arbitrator say, "Well, obviously here's a great new technology that didn't exist when we allocated this for something that seemed like a good idea in the year 2001. There is some flexibility built into the system, I'm saying.

MR HASSETT: Yes, and I think you have to look at each system; what were the specific characteristics of each system and often sharing mechanisms can be found.

MR BEARD: Can I add something? I've been to a couple of world radio conferences where there's been quite strong conflict between the meteorological and earth exploration and satellite people wanting to use the laws of physics to look at the atmosphere and people wanting to communicate, and the people who want to communicate usually have a pretty long, strong voice. They're very strong commercial pressures. They have got systems in place and they don't want them upset by earth exploration

satellite people. So what happened at the last WRC was quite a large number of frequencies were allocated for earth exploration satellite remote sensing, looking into the future to try and cope with that.

DR ROBERTSON: But if you're in the hundreds of gigahertz there must be plenty of scope to have both in there.

MR BEARD: Yes, you'd think so.

DR ROBERTSON: Comparing it with HF for example.

MR BEARD: True, yes.

DR BYRON: But that sort of leads us into the question of your second main point about the price of that access and the commercial users and whether it's television or mobile phones or something like that, that have a far greater capacity to pay than an organisation like the bureau. But I was just thinking, if any other input that you use in your whole system was to suddenly increase in price - whether it was petrol, electricity, phone bills or office rent or something else - wouldn't the government increase the budget that provides it by the required amount so that you weren't forced to close down or rapidly withdraw services.

DR BROOK: Let me answer that by saying that in general the government does have a budgetary process to cover those. Whether that means closing down the service or extra funding, it is a government decision.

MR GUNASEKERA: I guess the issue there is when you talk about electricity or gas or other services, in a sense we have a rough idea in terms of the pricing mechanism, but here we're talking about shifting from administrative charges that we have at the moment to auctioning and there's a difference here in terms of the scaling up. The scaling up could be quite significant.

DR ROBERTSON: I think we can probably say that there are some doubts about auctioning that have arisen in the last couple of occasions that they used it. So I don't think it's likely that there's going to be auctioning in every frequency range. I mean, there will be particular ones where clearly there's commercial competition and it's where you come in touch with that commercial competition where it's likely to be a problem and because we've had so many people who think they're special cases, we would certainly choose, I think, the third option, which is you pay market price and the government then has to decide, and since you're a government organisation - the government then has to decide on the value of the services provided. I mean, if you're getting however many millions of hits of use a day, then clearly that service is good.

Incidentally, 50,000 of them come from him because he's a pilot. But that's why we would prefer that approach, partly because I think much of it will continue as administrative prices over a broad ranges. Some of those, however - the ones that

will be auctioned - could easily fall in the areas that you have interest, but as I said, if you are talking about hundreds of gigahertz it shouldn't be impossible to fix something up and I would have thought it probably fixed up at WMO and ITU anyway, so we would certainly prefer the latter so that you're in there paying a competitive price and then the government then knows the value of the service they're getting.

MR HASSETT: Yes, that can be awkward in practice, though, I think, to actually get that recognised in the funding process. The way in which we're funded is subject to a lot of haggling between the bureau and the Department of Finance and we certainly don't go back to them and say that we need a little bit more because telecommunication charges have gone up and something has gone up. The totality of it means that our budget is always under strain and so if there's a - although it may sound simple, in principle, to say that the government, if we're working and if we happen to purchase the spectrum commercially, the government will simply top us up. I think the reality of our budget negotiations are that that will be a far from smooth process.

The second issue would be that our ability to actually go to the auction. I mean, if a part of the spectrum that we, for arguments sake, use to receive satellite data in was to be auctioned, I can just imagine the problems we'd have in getting the okay to go and participate in the auction and up to what level could we bid and how would all of that budget planning be done. I would think that in a practical sense it would be very, very difficult.

DR ROBERTSON: Well, let me take it that way first. I think that what would happen there, any resumption of frequencies you have a lot of notice and there would be a lot of discussion so it wouldn't be just tomorrow you go to the auction, otherwise you lose it. It would be much more drawn out than that and you'd be able to put your case. On the other one, of course, if you're forced to pay by giving up some of your other services, presumably overall you're meant to be more efficient anyway. So that's the reason we would prefer to go that way, but it's a big problem for use because, as I said, there are an awful lot of people who say, "We're a special case and we shouldn't have to pay for the use of spectrum and we've got a problem to struggle with."

MR GUNASEKERA: I guess from the bureau's point of view, another constraint would be that, say, you go to auction and there's another bidder. You're not able to basically get that part of the spectrum that you need for meteorological purposes and that's going to be a huge technical constraint in terms of the bureau meeting its obligations under the act. I mean, unless we have some sort of - I don't want to use the word "restrictions" - but some specific issues or some specifications covered, that's a physical constraint, if you like, in terms of not having that part of the spectrum for the bureau to meet its obligations under the act. I mean, that's going to create - I'm sure that will apply to probably emergency services and in other areas. I don't think that's unique to the bureau. I mean, here is a situation where the provision of the meteorological services is dependent on having access to that part of the spectrum and we go to an auction market and we are outbidded by somebody else, do we

have - - -

DR ROBERTSON: I think the bureau has got a unique problem in that you have lots of bits of spectrum. I mean, a lot of these people that come and say, "We're a special case," just need a bit of it, you know, one band. So there could be an occasion in which perhaps somebody thought of auctioning off a lump of spectrum in which you have an interest, but it doesn't mean to say they couldn't cut out the bit you want. You see, that's what I'm saying. It's not as if it happens overnight; it takes years, and you're getting cover both ways. You're getting cover internationally and you would get cover at home in the sense that you could then negotiate with the ACA.

MR GUNASEKERA: In other words, I can see your method being applied in a situation where there's some overlap, if you like. The bureau can use that part of the spectrum and also somebody else can use that also. There's some commercial value if you like. In other words, even if the bureau loses, there is another way of meeting that requirement for the bureau. So if you have a case like that - I don't know, technically I'm not so expert in that area. So I guess that's what you alluded. Is that correct?

DR ROBERTSON: Yes, I think there's enough time to handle a lot of these problems. I understand your concerns, but I think when we look at the overall picture we've got to look at the administration of the act and the system by which the spectrum is disposed of and the special interests which are obviously major players and we'll have to look at your problem, and I think yours is a rather broader one than theirs.

DR BROOK: I would like to come back to that particular point that we emphasised at the beginning. Some parts of the spectrum we just can't move somewhere else. For instance, if we lose the auction, there is no other option for us to go, and maybe one of the things you might consider is identifying and recognising those parts of the spectrum which we don't have the opportunity to move somewhere else.

DR ROBERTSON: Wouldn't there be a significant difference between the level of competition that you might get in the VHF/UHF compared to what you get if we're talking about hundreds of gigahertz? There may not even be anybody out there who will even bid against you if you had to go - I mean, there wouldn't be an auction because - it's pretty exotic.

DR BROOK: I'm thinking of areas like, for instance, some of the weather watch radars operate at the same frequencies that, say, aviation surveillance radars operate. Weather-watch radars I specifically picked because of the characteristic of the reflected signal from meteors; that is, particles in the atmosphere. Whereas for an aircraft it's not quite as sensitive to that and we might find ourselves denied access to specific wavelengths that are critical for us to make sensible weather watch radar surveillance, and there are others of a similar ilk. They are in the S and C bands, so they are found in commercial areas.

MR GUNASEKERA: In your system are you going to basically - I don't know whether it is

technically feasible or not - the central reserve - in other words, okay, you have an auctioning system but still the government keeps part of the spectrum as like a reserve pool, if you like. In other words, there is a critical need, there's an emergency or, for example, if radio is out in a certain area, are we thinking about having some sort of a reserve or some part of the spectrum for future use or - is that - - -

DR ROBERTSON: I mean, a lot of the spectrum is not in the market, as it were, at the moment, like these very high frequencies. That case is outside the present discussion really. But you do have occasion when there is clearance of spectrum. But, as I said, you get nine years to negotiate that at least, with all sorts of people, and if there were no alternatives I'm sure that it could be arranged that that bit was not covered. Well, when you say "our system", it's not our system.

MR GUNASEKERA: No.

DR ROBERTSON: We're just reviewing the system and even when we have, we won't take responsibility for the outcome, I'm sure.

MR BEARD: Dr Robertson, I think our concern is that once the part of the spectrum has been auctioned and sold to some private user then they can almost do with it what they like and in the case of the 25 gigahertz, the ACA put out some guidelines saying if you're going to use it for low mobile distribution systems - or whatever it was called - then you should follow these guidelines in order to protect the earth exploration satellite service, which is good, but it's not as good as it not being auctioned. It's better if it wasn't auctioned and there's more control of it that way.

DR ROBERTSON: As I understood it, it was the top end of what you wanted, wasn't it?

MR BEARD: Yes, that's right.

DR ROBERTSON: So it was really the margin that was - - -

MR BEARD: No, there was an overlap.

DR ROBERTSON: It was an overlap.

MR BEARD: I think it's 25.5 to 27; earth exploration satellite and then the 27-gig band has been auctioned. It goes from 26.5 to 27, to there's about a half a megahertz overlap. Just as a case in point though, just recently about three or four years ago the ACA were talking about selling off the part of the spectrum just above the meteorological satellite downlink which goes from about 1690 to about 1710 megahertz. They decided to sell off the band above that and it's called DCS1800 and it's a higher frequency mobile phone system. Before that happened we didn't have any interference with our whole orbiting satellite reception systems which look all around the skies. The satellites go over - Christmas about two or three years

ago, all of a sudden, on the spectrum analyser there was this brick wall of interference just above our band and it was affecting the highest frequency satellite, so we had to redesign our receiving systems almost overnight to cope with this.

Now, you might say we were a bit slow in trying to cope with it and we did some studies to try and show the ACA what would happen, but even so, the commercial pressures were such that the auctioning went ahead and we had to do some ameliorating things to get over it. We were able to survive, but if, for example, the mobile satellite people are successful in the next World Radio Conference of using the same frequencies that we do, then the sharing problem is going to be much more difficult.

DR ROBERTSON: No, I appreciate the problems, that I think there are lots of layers before it actually happens. That experience obviously would be very chastening.

MR GUNASEKERA: When you talked about expecting the government to basically fund through the budgetary process, are you thinking in terms of a CSO payment or community service obligation-type payment? Is that- - -

DR ROBERTSON: I hadn't really thought about it that far. It's just that we're leaning towards trying to get a market going rather than having all the allocation that goes on, and if you do that, you clearly want the prices to apply as far as possible, and then compensation made through the budget process or by other kinds of economies within a budget.

DR BYRON: Some people have said it was a waste of time setting up a system where the Department of Finance gives you an extra million dollars so that you can give it to the ACA so that they can give it to the Department of Finance. One thing that that would do would be to make it clear to everybody exactly what the value of the spectrum that you'll deploy is, and it's much more transparent than having one of the resources that you use on the books at a very low administrative price that doesn't really reflect its true scarcity.

MR GUNASEKERA: I guess if you are going to introduce a pricing system or market base system in the non-commercial use area, I guess the assumption there - the initial assumption there is that you think there's inefficient allocation of the spectrum in that area. Am I correct?

DR ROBERTSON: Yes, probably. It's a very bitty process, and it's only in the early stages. In my opinion it's, what, four years since the act came into effect. In that period we had a huge speculative boom in particularly the mobile frequencies, and we got up to an incredible height and we've now taken a nose dive. That needs analysis, too.

DR BROOK: I think the bureau's position is we don't disagree with the philosophical case you are taking, that our preference for option 2 was that it allowed us to fit within the process much more comfortably, but clearly we don't disagree that

you really have got to justify why you are using the process, and we'd be quite confident that we wouldn't be selling too much of our - not licensing parts of the spectrum we already have. As Michael said, the real issue that we have is we are not confident that the budget process will enable us to get the funds back. It really is going to depend on what the sums are, and of course you don't know that at this stage. If we're talking of numbers which are approximately what we are - you know, the low six figures of what we're paying now, that probably is a completely different exercise if we're suddenly finding ourselves with a $5,000,000 bill.

DR ROBERTSON: I don't think spectrum prices are going to stay up there for too long.

DR BROOK: Yes, but you understand that expectation and the realities often are not the same.

MR HERRMANN: Just a point with the auctions is that we wouldn't want to be buying at auction - I don't think so, we wouldn't want to be, at an auction, buying spectrum and having to buy a lot, say, of which we're only interested in a small section of it and then having to be the administrator for other commercial users. That would be against our act and being a sort of a - - -

MR BEARD: A landlord.

DR BROOK: Definitely not.

DR ROBERTSON: Yes. We don't find too many people keen on being landlords. Is there anything you'd like to add?

DR BROOK: Thank you very much for hearing us.

DR ROBERTSON: Thank you for coming along.

DR BYRON: Very informative, thank you very much.

DR ROBERTSON: We will take a short recess

DR ROBERTSON: Good afternoon, gentlemen. I'm sorry we're a bit late starting. We had a long session. I think you probably know the ropes. What I suggest is that you gave us a summary at least of your submission, provide us with some key points and we'll take the discussion from there.

PROF ERGAS: Thank you very much. Let me just say at the outset that I'm here with my colleagues, Tony Warren and Olivier Renard just to my side, and that we welcome the opportunity to present our view to your inquiry. The way we wish to proceed is this; we have some slides that I believe we've made available to you.

DR ROBERTSON: Yes.

DR BYRON: Yes.

PROF ERGAS: Good, thank you, and my colleague Tony Warren will briefly run through those slides and then we will proceed to happily answer any questions or comments that you might have.

DR WARREN: Is that okay?

DR ROBERTSON: Yes, sure, please do.

DR WARREN: Basically the submission which I apologise for getting in so late - and I'm not sure if you've actually had a chance to look at it, but basically it highlights four separate questions if you like. The first section of the paper - and I'll go through each of these in a bit more detail, but the first section talks about the context in which the review is being undertaken from our point of view at least, and really asks the questions why reform of the allocation mechanism of the spectrum is increasingly important.

The second section looks at the economic characteristics in the market for spectrum, sort of asks the question what are the market failures and characterises the market spectrum and what intervention does this necessitate. The third section is really a quick critique of the current allocation model, and really we ask the question there why there is a need for greater use of price signals to determine spectrum allocation as well as assignment, not just the assignment process which we think is really what the current system does, and then finally we really briefly touch upon secondary markets which I think as you realise we think there is some scope to use at least cross-plot block trading as a means of improving the efficiency of the allocation process.

Just going on then to the context slide - we really argue that the complexity of the spectrum management process has increased dramatically over the last five years. I'm sure this is probably something you're more than aware of. Basically of course there's the fact that we've got a finite resource and that demand for that finite resource has grown dramatically. There's also some if you like forecasts that are around that probably are looking a bit optimistic post-tech rec, but they're still out there that there's going to be massive growth in demand for band width intensive

services as we go forward. We then talk about the fact that technology developments of traditionally enhanced spectrum availability - a point that Henry made in our earlier meeting that the ITU or the various WRC meetings have always had this terrible fear about a shortage of band width and yet technology seems to always come along and saved the day.

But the issue really now with technological change of course is that whilst it may enhance spectrum availability - for example digitisation and broadcasting - it introduces a whole new series of complexities; how do you give people the incentives to buy the digital TVs for example, how do you give the broadcasters the incentives to invest in that? Then of course there's the big issue that we're not working in a policy vacuum, we have a whole series of legacy policies out there which distort the way spectrum has been allocated and distorted the way spectrum really needs to be used. There's also of course a number of side deals which we're only really vaguely aware of, terms of which basically say that some people are given guaranteed access to spectrum, others are not. Hence really we're just in that section concluding that we think your review is pretty important and we think hopefully offers a chance to at least put out some policy advice that may lead us towards a more efficient spectrum allocation process.

Moving along to the economic characteristics of the spectrum market, basically what we tried to do here was we tried to ask the question what are the market failures that are out there and hence what would be the potential role for government in this process? We looked at what we considered to be a couple of red herrings - and this is the public good argument and the scarcity arguments which some people have out there for regulation of spectrum. We basically said - and the details are in the paper, but we basically don't think those arguments hold terribly strongly as reasons for government intervention. In fact we don't even think there's a public good-type argument at all.

But we do agree of course that there is congestion and interference issues, and that these really are good examples and negative externalities and could be potentially problematic in the spectrum market, and here of course just using the standard analysis we're more than - we propose that this necessitates an active role for government in the definition of enforcement of the spectrum property rise. So really to some extent we think the congestion and interference problems necessitate government's role as a titles office in relation to spectrum.

We then go on to discuss what I think is probably the more harder part of the whole issue, and this is the coordination failures that arise from non-complexities and the transaction costs associated with the spectrum. We would suggest that the role for government has to go beyond this simple definition in enforcement of property rights and that there may be some residual roe for government in the spectrum allocation process akin to a land plan, planning office-type role. The examples we give in the paper, a new technology comes along, basically to make that technology work you need to have access to a whole series of different parcels of spectrum that are held by a whole group of different people. The marketing failure flows through because each individual parcel in and of itself is not worth a great deal, it's only in

their totality. So there's always a problem getting over that hurdle to get a few of the parcels and of course once you reach a certain amount, the final holders of the parcel are able to hold you to do your classic hold-out type problem.

That brings us to really the next slide which is the hold-up versus hold-out problem. What we basically say in the paper is that in defining the spectrum property right, there are good reasons to avoid time delimited leases and instead grant perpetual rights. This is really going over the ground that I know Telstra spoke to you about yesterday, and the reasons why we think there are - the problem with time delimited leases is that there's a potential there for government to act in a hold-up type manner and to people that invested in some investments using the spectrum.

So kind of if you like, there's the hold-up problem associated with time delimited leases, but if you go back to our coordination problem, there really is this role for government perhaps to avoid the hold-out problems. Time delimited leases are quite useful for that because you can do band clearing or relocation can occur at the point of the lease expiration. So there's a trade-off if you like here. Our view is probably that the ideal option is to have a perpetual right - so grant perpetual rights, but have some kind of compulsory acquisition process similar to that applied in property law. That's our tenure concluded. The issue that then arises is what do you do about compensation? Well, presumably what you need to do is have some kind of compensation perpetual leases so if there is some compulsory acquisition of a perpetual lease, you're going to need some form of compensation mechanism. If you're talking about time delimited leases, the argument for compensation is presumably somewhat less clear.

Moving then on to our critique of the current allocation process. Basically as you know, the government has intervened much more systematically in the spectrum market than simply a titles office and a planning office role and basically allocates the spectrum and has in recent years grafted onto this administrative allocation process some auction process to do what we refer to as assignment to basically dole out the spectrum rights within the overall administratively planned block. We basically think that this could lead to some inefficiencies in the sense that you are not using the pricing mechanism to determine the block allocations in the first place. Really what you're doing that is - you're doing that on an administrative basis and then using the market mechanisms to do your assigning, and if you think about it, we run into the standard problems there of administrative allocation processes, the information asymmetry problem which means that it's very unlikely that the spectrum managers, however well intentioned, will allocate blocks efficiently.

Currently what this leads to is - well, one of our concerns is that we have different shadow prices, effective shadow prices across each of the spectrum blocks, and this is inefficient insofar as the relocate or reallocating spectrum so as to equalise shadow prices across applications would increase aggregate social welfare. The point we're making here is that if the spectrum blocks were in effect separate economic markets, then the fact that they have different shadow prices is really neither here nor there. If to some extent there is substitution possible between these

blocks, then presumably that opens up a range of allocative efficiency-type problems.

Finally we touch on - and I'm afraid only very briefly - the fact that secondary markets could at least be a partial alternative to the administrative allocation process, and by this I don't mean secondary markets within blocks, I mean secondary markets between blocks. There's no doubt that at the moment usage patterns continue to be determined mainly by ITE standards, and the feed through into the equipment manufacturers, but technological developments are allowing drift from these standards, and we expect - if you talk to the tech people, they expect this to become more and more administrative; that greater development of multi-band equipment and software radio is going to allow countries to drift outside of this ITU-imposed allocation.

At the moment this is still very much in the early stages and it's almost a catch-22. There hasn't been great demand for this because of the allocation process, et cetera, but we think that talking again to the technical people they say, "Well, look at the 700, 800 megahertz bands and the 2.5 gigahertz bands all of which are currently allocated to the broadcasters but all of which would probably have more efficient economic use elsewhere. There is some scope you would imagine, absenting from the legal rules, for some form of trading to go on there, giving the broadcasters the incentive to give this stuff up, and the telco operators or the integrated disaster relief suppliers some opportunity to take that up.

There are issues with this - these aren't unimportant issues. There is of course the problem with the initial allocation of these rights, and I'm sorry we only really just touch on this, but our view is that these probably are not intractable problems. They are problems we deal with in many other walks of life. So that's the initial statement. We look forward to any questions, et cetera, that you may have.

DR ROBERTSON: Thank you, Tony.

DR BYRON: Thank you very much. It's a very interesting submission and I look forward to reading it again at a slower pace and maybe taking more of it in. One sort of question, comment in the first section of the paper, the context where you were talking about predictions of spectrum shortage that had been made at all these WRCs for the years reminds me that in many areas of resource economics it's been said that either rising prices or fears and expectations of rising prices has stimulated a lot of R and D which leads to much greater efficiency of use and finding commercial uses for previously non-commercial resources; in other words expansion of both the intensive and extensive margins, and that supply response stalls the scarcity that had been feared originally. So Malthus once again is proved wrong.

What you seem to be saying in your opening section is that that applies pretty much in spectrum, too, that - so the question is to what extent do you think that the R and D that's led to much more efficient resource use has been stimulated by this fear of an impending global shortage of spectrum.

PROF ERGAS: I think that's true to some extent that the major drivers have been

twofold. The first is the fact that operating within assignments and locations of spectrum has been an issue of availability and constraints on spectrum availability. These are translated into what is effectively a rising shadow price for spectrum even though there's obviously not been a market price for spectrum, and that rising shadow price for spectrum has driven quite a bit of the R and D. So if you look, for example, at the pattern of development in semi-mobile telephony, there is being driven by the very rapid growth of demand relative to projections of demand that in turn put severe pressures on the ability of the networks to meet demand at acceptable quality levels given the constraints on spectrum that in turn has led to very substantial R and D effort and at improving spectrum use in mobile telephony.

There have long been very long-term fears that have driven this. I think we have had a process to date where broadly quite a bit of progress was driven by much more immediate concerns as they emerged, and one of the benefits of having a secondary market in spectrum is that it would make expectations of long-term prices more apparent, and hence allow those expectations of long-term prices to act more effectively as a guide to investment including investment in R and D.

DR BYRON: I guess the question is whether we can rely on continuing technological improvement to be able to get - to satisfy ever greater demands upon the spectrum and the role of the secondary market in indicating those prices as a stimulus for ongoing technological change. So I think you have probably already answered that question.

PROF ERGAS: I believe that there is a very significant potential in terms of further technological change that could greatly enhance the efficiency of spectrum, and it could do so, as you said in your opening remarks, both in terms of the intensive and the extensive margin; in other words, they are very large parts of other radio spectrums that are underutilised and where there will be scope for greater utilisation to occur, although that would depend on development of technologies that can make use of the features and capabilities of those bands in the spectrum.

So from my mind, there is very little doubt that the scope for technological improvement is there. How would having better pricing affect that? I think it would have a very significant effect (a) because it would allow those expectations of future prices to be clear, but also it would provide a more sensible guide to substitution decisions that need to be made in network planning and investment. So in most of the telecommunications users of spectrum I would say arguably much more widely, there are significant trade-offs that are faced by network planners between relying on additional spectrum or replacing it with physical capital, and to give you an example of that, if you're tightly spectrum constrained when you're designing a mobile network, then you need to have more and more efficient - much more sophisticated base stations, and so there's a pretty sharp trade-off as a network planner has to be faced in terms of substitution of spectrum for other factor inputs.

Now, at the moment those decisions are guided by estimates of, to an extent, shadow prices, but those shadow prices that are guiding those decisions have problems to them that the first problem being that the shadow price is purely latent as

it were - is a latent constraint - and the second is that the shadow price is not equalised across applications. So even if a network planner can construct a network model for that network's own allocation of spectrum, correctly estimate the value of writing the spectrum constraint, there is no social mechanism that yields at the margin equalisation of those shadow prices across networks much less across different applications areas. So even within a single service you will get differences in shadow prices, and between services you will have further differences to shadow prices.

So all of those investment decisions that are being taken are distorted, be it the immediate investment decision about substitution of physical capital for spectrum and the longer term investment decisions about the amount of investment that should go in to trying to secure more efficient technologies for spectrum use.

DR BYRON: The desirability of the thriving active secondary markets, we've had some discussions in the hearings over the last few weeks about whether or not the secondary market in Australia is likely to be inherently very thin. Are you confident that a viable secondary market could emerge in Australia?

PROF ERGAS: I think that there are constraints that would affect the depth and perhaps efficiency of such a secondary market. By their nature spectrum allocations have a geographical component which means that you're looking at a resource that is less manageable than if you were dealing with say secondary markets in claims on wheat, and additionally of course the Australian market is likely to be a small one with relatively few players, relative to the scale of the markets that you might get in a larger economy, but even so, it's very difficult to believe that if you had a secondary market there would be a loss in efficiency relative to the current situation.

It's difficult to imagine how such a market could lead to outcomes that were less desirable than the types of outcomes you would have in the absence of such a market, and that's especially the case when you bear in mind that first the provisions of the Trade Practices Act would apply to such a market, and so if there attempted anti-competitive conduct, it would be either a breach of the price fixing provisions of the act, section 45; or a breach of the provisions of the act that deal with anti-competitive unilateral conduct section 46; or of the provisions of the act that deal with anti-competitive effects arising from the acquisition of assets, ie section 50 of the act.

So you would imagine that given those constraints, even though the market might not work in a perfectly competitive market, it would have significant and substantial safeguards against the market outcomes being distorted by anti-competitive practices. Additionally in the policy approach that we've recommended, there would be powers of compulsory reacquisition. So if the secondary market alone were insufficient to carry out the job of for example major reallocation of spectrum as between it, there would be reserved powers that the Commonwealth could draw on to effect the changes that were required.

DR BYRON: Sorry, one more on the coordination issue, in the submission you're

talking about internalising, coordinating to manage interference, hold-up and hold-out, et cetera. Do you think that the band managers in New Zealand are doing that sort of coordinating or function, internalising problems there? Is that possibly what you had in mind?

PROF ERGAS: No. What we were referring to was internalisation essentially within the firm.

DR BYRON: Okay.

PROF ERGAS: The risk that we saw was that if you have a situation where there are significant externalities or coordination problems associated with an input, one of the ways in which market forces may deal with that is by in effect treating it as an economy of scale, and solving that problem by encouraging the aggregation of property rights over those inputs into a single economic entity and in effect creating a monopoly over the downstream service because that monopoly then fully internalises all of the upstream externalities associated with the input, in this case spectrum. To an extent when you have Telecom or the Postmaster-General's Department as the sole supplier of radiocommunication services, which we basically had to a degree in the 60s, to a lesser degree in the 70s and then diminishing very rapidly thereafter, but when you had that there was much less of a coordination problem because the bulk of use was internal to a single entity. So to the extent to which there were gains from making reallocation, it could do so internally. It's obviously not the world we're in but you could conceive of ways in which such a world might come about, and there's two that I think are of some relevance.

The first is that you may get - if coordination problems are not dealt with by standardisation bodies and by administrative procedures you may get mechanisms of voluntary coordination or standardisation, and we see quite a lot of that in the form of consortia of major firms that are involved in producing, for example, equipment that relies on radio spectrum. They will pool their skills and capabilities to develop technologies that benefit from coordination in the sense that Nokia, Ericsson, Nortel, whoever else, will have developed a technology with a particular band or region of the spectrum in mind, and they will, through a consortium technological joint venture - which may just be an informal cooperation - do that together, and in that sense they will replace or reduce the need for administrative coordination.

Quite significant technologies have really been developed that way. I mean, I think you could say that that's the way CDMA has been developed, and even to a fair extent UMTS, IEW, CDMA. The benefit there is that you, as I say, avoid the need for administrative allocation but the obvious risk is that those coordinated ventures will also act as the basis whereby some degree of market power can be acquired and exercised. So you can see that kind of internalisation occurring. The other type of internalisation that to an extent has occurred is that where there's a supplier of a complementary input - there is essentially a complementary input or a very significant supplier of that complementary input and who because the value of that complementary input is greatly enhanced by coordination in respect of the spectrum resource, will be willing to undertake the current - work out the other costs

involved in both designing and then implementing a new area of spectrum use.

That's to an extent what Microsoft has done with some of the aspects of the interfaces between operating systems and wireless plans, where it alone accounts for such a substantial installed base of operating systems, and the gains to it from enhanced efficiency of operating systems are so great that it will internalise the costs of coordinating the range of downstream uses. Neither of those models though is going to solve the entirety of the problem, nor is it always clear that it's socially desirable to rely solely on those models. That's why we say you need in addition to that type of internalisation, you do need some continuing role or the types of administrative processes that we have had today.

DR BYRON: Thanks very much.

DR ROBERTSON: I'm probably going to ask a question to which the answer is simple but we've been talking about spectrum licences. Do I take it from that that you would do away with apparatus licences and just go to spectrum licences or would you continue with both?

MR ERGAS: I think we would probably - look, I'll have to give that some thought but my inclination would be to do away with the current apparatus licence.

DR ROBERTSON: And you would favour Tony's - did you want to say - - -

DR WARREN: You can see why. I mean, it's got a simplicity to it. You can see there's some advantage to an apparatus licence.

MR ERGAS: The current ones though are very short renewals.

DR WARREN: Yes, whether the current system - we really haven't looked at this, I'm sorry, but the current system doesn't look like it's operable. In fact you can see why there would be some sense in having it, at least with some residual products, I imagine.

DR ROBERTSON: Yes, we'd been thinking of course about the terms of these licences, whether you should increase apparatus licence to 10 years or whether you should do away with it altogether and have a more flexible licensing system that would give you different durations and so forth.

DR BYRON: It was also suggested to us that if the terms and conditions under which licences will be renewed and under which they will not be renewed are made perfectly explicit, then perhaps the actual duration doesn't really matter in terms of the security for the operator of the equipment.

DR WARREN: So this is almost an automatic right of renewal, subject to a set of defined conditions?

DR ROBERTSON: Yes, and it becomes effectively like a perpetual licence

barring those defined and rather exceptional conditions.

DR WARREN: Presumably that's the other way of doing it rather - or it's a complementary way of doing it than having a sort of resumption-type process. Either way I think you'd want to be putting into place quite strong guidelines to say, "It is for only these kind of exceptional circumstances that resumption will occur," and presumably that's a quite good insurance policy, and probably just as good an insurance policy as some kind of resumption process, some kind of compulsory acquisition process that may depend because there's a defined contractual process.

DR ROBERTSON: Yes, that's another way of putting it, that it becomes a contract.

DR WARREN: Unless something in this list of exceptional circumstances occurs, this is a perpetual right. Whereas, if you just say, "Well, you've got a perpetual right subject to a compulsory acquisition process," depending on how you define that, there may be greater or lesser risks.

DR ROBERTSON: One of the other interesting things that came up earlier today was the suggestion that - I really ought to put this the other way round but let me carry on - that the government in fact is using licence fees like a tax, particularly when it increased the fees to Vodafone and Optus last year, and that this is creating uncertainty, if you like, in the spectrum market. The suggestion then was that perhaps auctioning was being undermined because you didn't just pay it a fee and then you got the rights to something.

You were paying a fee and then you paid an annual fee and along came the government perhaps and threw in a tax as well, and that there should be a move back towards administration of the allocation of spectrum. I'm intrigued that in fact you're suggesting that there's quite a strong need for administration in the allocation of spectrum licences. Am I correct in thinking that?

MR ERGAS: The view we've taken is that we can see an argument for a continuing significant role for administration, and the essence of that argument is the need to be able to coordinate major change in the (indistinct) of spectrum use. Again, our view there is that the issues are similar to those that arise in the context, for example, of zoning or of land utilisation, that there are interdependences in the decisions made in respect to use and that some means needs to be found to coordinate across those interdependences. Our concern is to find a way of meeting that need whilst at the same time having a right associated with spectrum vested in its users which is sufficiently certain to encourage the appropriate level of investment in the exploitation of that spectrum and sufficiently flexible to allow that right to be allocated to those who put greatest value upon it.

We see a tension between meeting those goals of having a right that is certain and flexible and the goal of ensuring that from time to time coordinated change can occur. In trying to resolve that tension, the model that we have at this stage sketched out - I wouldn't claim we do more than that - is a model in which there is a long-term

right but there is some continuing right of resumption that is vested in the Commonwealth, that right of resumption being subject to a number of constraints, and the right itself - ie, the spectrum right - being tradeable across usages.

As Tony pointed out in his overview of our submission, we agree that that model doesn't address the questions of initial allocation, ie initial assignment if you want or attribution of the rights. I don't think that we are hostile to the auction process as it has occurred. We can see benefits in using that mechanism to determine the initial attribution of the rights, and there may well be significant advantages to that mechanism relative to the alternatives; the alternatives being, say, either beauty contests or types of lotteries that have been used in the United States or informal processes, grace and favour-type processes that have been used with respect to the broadcasting. So when you compare those mechanisms with auctions, I think it's quite likely that auctions come out doing I think very well.

If you have an auction and you then have the sorts of methods that we have suggested, would it be inappropriate for the government to tax the continuing use of spectrum? To my mind there, it is useful to distinguish between two issues. The first issue is that there are some parties to whom spectrum is currently allocated in substantial amounts and who under most politically feasible scenarios would retain that spectrum, and in our model those parties would benefit from a windfall gain if they were attributed now a transferable right as they could then transfer that spectrum into more profitable use. We don't think there is anything particularly wrong, at least at an analytical level with the Commonwealth imposing windfall gain taxes if that were to occur.

The second issue is, putting aside this question of the windfall gains to some level would come in the transition from one set of arrangements to another, once you have gotten to a stable, new, more efficient set of arrangements, should the Commonwealth tax spectrum? I think that's an issue very much like any other tax issue that if the Commonwealth were to find that spectrum was essentially in elastic demand and had a relatively high willingness to pay, then they would have to trade off the excess burden of taxing spectrum relative to the access burden of taxing cigarettes. There's no reason that I can think of in principle why they shouldn't decide that they can tax cigarettes (indistinct) spectrum a bit more or vice versa. That's just a policy decision they would take.

I agree with you though that when they do that, the owners of spectrum presumably have rational expectations; they will capitalise that into the big prices for spectrum, the extent to which they will do so really depends on degree of competition in downstream markets, and if the downstream markets in which spectrum is being used are imperfectly competitive, maybe even with a spectrum auction, there's still going to be a bit of producer surplus left. It depends on how the auction works, the gap between the first price and the second price, and maybe you can tax away that gap, even if you have a second price auction, you can tax away that gap whilst leaving the second price unaffected, and hence the Commonwealth will be better off and the owners of spectrum will be worse off.

DR ROBERTSON: Especially those who paid too much for the second price.

PROF ERGAS: Indeed, and the beauty of it is that presumably they weren't even the ones who bid the second price.

DR ROBERTSON: No, that's right.

PROF ERGAS: If they were the winners, there was someone else who bid the second price, and so their own bid was even more foolish than the bid that went in, but I remember being told that the great Italian statesman Cavour who was one of the founders also of public finance vintage 1860, 1870 argued that the most just form of tax was a tax on lotteries or gambling, and he said that it's a very just form of tax because it's a tax, the incidence of which falls entirely on stupidity, and if spectrum auctions are like gambles or lottery, then taxing them may prove to be an efficient thing, too.

DR ROBERTSON: Fortunately we're not doing the gambling inquiry, Henry. I've lost my place now; you've quite put me off.

DR BYRON: Could I ask a question about the compensation issue that you briefly mentioned in the submission that - I've been reading something in a different context about property law in Australia, and the general conclusion was that governments in Australia have paid compensation on the acquisition of property, but not if regulation changes the bundle of property rights that reduces the value of the property or the benefits of ownership to the owner. So that there's compensation if land is acquired for a new freeway or something, but there's not compensation if a change in regulation in some way reduces the benefits of ownership of a piece of property.

There are dozens of exceptions, but that seems to be the general rule. Would something like that extend into spectrum? Would that be a - I mean, we've had a number of submissions of people suggesting that if their licence is revoked mid-term or in some cases even if it's not renewed, they would expect some sort of compensation. I'm just wondering to what extent that sort of general property law might apply to the question of compensation in spectrum.

PROF ERGAS: That's a good question. I'm not sure there is an easy answer to it, and the difficulty in my mind is perhaps also in this context in drawing in practice the distinction between a freeway development-type resumption and the regulation change-type resumption. If I clear an area of spectrum for the purpose of deploying a new technology, is that analogous to taking your house to build a freeway or is it analogous to a regulation which says this area of town used to be zoned for commercial purposes and I now rezone it to industrial purposes. Even if you accept that distinction and level of principle when you're trying to apply in practice in this area, you might have considerable difficulty in actually making that distinction work.

Then there's the wider question of whether that distinction corresponds to an economic justification, whether you can plausibly construct an explanation as to why you should get compensation in the one case and not get compensation in the other,

and it's not obvious to me what that basis would be. I know that it has been argued that the distinction is that in your first case there's - the acquisition is related to the provision of a new good whereas the change in regulation would be intended to prevent the bad. So hence the acquisition for building a freeway is a contribution that you make to extending the benefits available to society, that contribution being your home has been taken for the purpose of building a freeway, whereas in the second case, if you have a factory that's emitting pollutants and the regulation is enacted that prevents you from emitting pollutants, then that regulation is not reducing the value of your property for the sake of expanding the benefits available to community, but allegedly for the sake of preventing a nuisance or harm.

But I have never found that distinction terribly convincing because presumably if I regulate to prevent pollution, it's because I think that the gains from the prevention of pollution outweigh the losses that will be inflicted on your factory and that's exactly analogous to - if I decide to resume your home so as to build a freeway. So I must say I haven't seen a clear analytical foundation for drawing that distinction and converting it into then a difference in the treatment, but it may be that there is such a distinction and we are simply unfamiliar with it.

DR WARREN: Can I just say also, I think that one of the great beauties of the secondary market approach is that the compensation issue here - I mean, obviously if you can sell your property, there's your compensation.

DR BYRON: Yes.

DR WARREN: So the compensation issue really does become one of these kind of abnormal circumstances where you really have to do a major rearrangement, whereas in the current system, there may be (indistinct) choice to do this because you're just basically reallocating from one use to another, and you really couldn't imagine that would need to be the circumstance where there would have to be some compensation because obviously someone is benefiting directly from that, whereas in a secondary market, that's priced in. I mean, the price is the compensation.

DR ROBERTSON: One of the questions that we keep having to face is that we get lots of people coming along saying, "We are a community service, we shouldn't have to pay for the use of spectrum." Some cases are stronger than others. How would you fit them into your - well, two questions really: how would you fit that into your model; and (2) what sort of prices do you think you should charge or not at all. Maybe you want to just assign certain frequencies.

DR WARREN: Yes, I think if you look at a secondary market model, apart from the initial assignment, social policy is the next question people ask, and to my way of thinking, you can deal with this through the initial assignment by essentially giving the ambulance for example their spectrum, and then I would have thought what you say to them is you have the right to sell that on and you get to keep all the benefit, as long as you continue to provide service - you have to define the - you can't just let the ambulance directors take the money and run. You basically say to them here's your spectrum, do with as you will. You may decide that you really don't want to be

running your own network and that you prefer just to sell this on and buy in these services in maturity from a specialised supplier of communication services.

So I think to some extent there's not really a great problem with all the existing holders The issue is of course what happens if a new social policy comes along that requires access to spectrum? The government is then going to have to presumably fork out to buy it. To my way of thinking that's not a bad thing because that makes transparent the actual costs of that spectrum allocation for social policy purposes. That makes it a nice transfer and social policy subsidy. So that's how I would - I think you have to overcome those problems. I also think that the great view, the secondary market process is that if you assume the broadcasters are in that group of social policy types, if you say to them you get to essentially capitalise your spectrum, they're much more likely to see this as a change they're prepared to go with than many of the other alternative models where they have to pay for it for example.

DR ROBERTSON: You haven't been talking with the same people as us.

DR BYRON: Can I come back to what you were saying earlier about the titles office and possibly the planning office, the defining property rights role and the very exceptionally coordinating role. I'm just wondering about whether other roles and functions of government might actually influence the way you think about that. For example, the international obligations treaty and coordination agreements and maritime and satellites and aircraft and so on, the fact that the registers maintain the interests in the spectrum, we've got classified uses of spectrum for defence and security services and so on. Do any of those other functions of government in any way influence your conclusion that it's really just the definition and occasional coordination as the role of government?

PROF ERGAS: I can certainly see the need to take account of those other functions of government and particularly of our international obligations in designing any viable system for spectrum management, and clearly any system for spectrum management must be consistent with meeting our international obligations, but even though we have attempted in our commission to explicitly set out the way in which those obligations could be dealt with under such an approach, it's my impression that you would find that we could go a long way from essentially the administrative allocation model that we have now towards the type of model that we have outlined without in any way compromising those obligations.

So I agree there is a need to fully take those into account. I would also readily accept that we have not in our submission attempted to address them explicitly, but I'm not convinced that they would be a substantial obstacle to find far-reaching reform.

DR BYRON: Thank you. Can I ask on a slightly different tack about auctions and competition limits. You're a bit critical in the submission about the government use of competition limits in determining who can bid for what, et cetera. Are you suggesting or implying that there has never been case for imposing competition limits even in the early days of telco industry, et cetera? Is the important thing

whether or not ex ante and ex post - you know, before and after the auction, rules are the same or at least pretty consistent? I guess the main answer is competition limits are uniformly a dumb idea.

PROF ERGAS: Well, I think there's two questions there. The first question is can one conceive of circumstances in which competition limits might be sensible, and then the second question is in reality of the competition limits that have been imposed, were those competition limits such as to meet criteria which you might want competition limits to be at an (indistinct) level.

DR BYRON: That's exactly what I meant to say. Thank you.

PROF ERGAS: I think there's a couple of points there, but let me say by way of preface and in the spirit of truth in advertising that we have not in this respect specifically, but on a range of other issues done a fair bit of work for Telstra, and Telstra has been significantly influenced by those limits. So it's only fair that you should know that. However, the views that we would express here are not in any sense to be attributed to Telstra. They're our views.

In turning to the specific questions, my own sense of it is hollow. I can at an abstract level conceive of cases in which imposing such limits might be sensible, and really the case for having those limits in some situations is that it provides a short cut relative to the application of a section 50 of the Trade Practices Act. In other words you can - by imposing such a limit, you are in effect saying that rather than have to rely on the ACCC or private enforcement subject to the allocation of the rights taking proceedings under the provisions of section 50 of the Trade Practices Act, you will in an ex ante way rule out certain bids as being likely to breach the government's competition policy objectives. So rather than have an ex post process of review, you'll have an ex ante determination of what is in, what is out, and I can see at an abstract level there may be situations where that can work.

My own view of it though is that those situations will be very rare and that it is by far preferable to - if what you're worried about is the competition aspects of a spectrum allocation or assignment process, to simply ensure that the actual transfer of the spectrum is conditional on all regulatory obstacles and requirements being met, and what that would effectively say to bidders is that the bidder is responsible for ensuring that if they bid for the asset, that that bid will be compliant with the requirements of the Trade Practices Act. You can either make that an implicit requirement that must be met by the bidders prior to the actual assignment of the right, and typically that's done by requiring bidders to obtain a clearance from the ACCC prior to the assignment of the right, or simply by requiring the bidders to notify the ACCC of their intention which then gives the ACCC the scope to secure a court order in the event that it believes that the acquisition would be such as to result in a substantial lessening of competition, and bear in mind that other than the Trade Practices Act, the ACCC and it alone has the power to seek injunctions in instances where it believes that an acquisition will result in a substantial lessening of competition.

The experience to date is that when the ACCC seeks such injunctions, it secures them. So my own fairly strong view is that it would be better to rely on those economy-wide instruments rather than have one regime determined for a spectrum with particular limits on bidding, and another regime applying to all other factor inputs in the economy.

DR BYRON: I was going to say that what I was thinking of, the case where there was one incumbent and that incumbent - for example Telstra - and then there was an option for a new piece of technology, for example a wireless local loop hypothetically, and the incumbent was to bid for all that hypothetical spectrum and get it, it wouldn't actually trigger section 50 of the TPA because there was one before and there's still one after. So you haven't actually got a lessening in competition, you've got the failure of new competition to emerge, and is that actually a different test so that if you start with one and you end up with one after the auction, is section 50 even triggered?

PROF ERGAS: Yes, section 50 would be triggered because the test under section 50 is not a comparison of the future and the present or the past, rather the test under section 50 is a comparison of future with and without the acquisition. So what the court would need to look at is would the future without Telstra acquiring that spectrum be more competitive than the future with Telstra acquiring it.

DR BYRON: Okay. Thanks.

PROF ERGAS: In that instance, in the example that you give I think, if the incumbent were to secure the only bridge that crossed to the alternative island, then the (indistinct) couldn't find that there was a likelihood of a substantial lessening of competition. In respect of the actual instances of limits on bids, my own view of it is that those have been to a substantial degree rather arbitrary in practice, and it's very difficult to make out a case when you look at the particulars of those situations that the limits themselves really adequately reflect a concern about a potential for acquisitions of spectrum to lessen competition.

DR BYRON: Thank you.

DR ROBERTSON: I don't have anything else. Have you?

DR BYRON: No, I think you have covered everything that I was going to ask, either in your opening comments or in subsequent discussion.

DR ROBERTSON: What we might want to do when we've had a chance to read the submission more carefully, perhaps we'll come back to you.

PROF ERGAS: Maybe just in conclusion then, we would say that we would be very happy to have further discussions. We look forward to the material that your inquiry will generate, and last but not least, let me thank you for generosity in organising this video link, for being so accommodating in that respect. That has been very helpful to us. Thank you very much.

DR WARREN: Thank you.

DR ROBERTSON: Thank you, and we will be in touch. Thanks for all your help. I declare this meeting now closed until tomorrow at 11 o'clock.

AT 4 PM THE INQUIRY WAS ADJOURNED UNTIL
FRIDAY, 9 NOVEMBER 2001

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