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TRANSCRIPT OF PROCEEDINGS

PRODUCTIVITY COMMISSION

INQUIRY INTO ENERGY EFFICIENCY

DR N. BYRON, Presiding Commissioner
PROF M.C. WOODS, Commissioner

TRANSCRIPT OF PROCEEDINGS

AT SYDNEY ON MONDAY, 15 NOVEMBER 2004, AT 9.02 AM

DR BYRON: Welcome to the public hearings of the Productivity Commission's inquiry into energy efficiency. My name is Neil Byron. I've been appointed presiding commissioner for this inquiry. My fellow commissioner is Mike Woods, on my right.

This inquiry started with a reference from the Australian government on 31 August this year, and covers the potential economic and environmental benefits offered by measures to enhance energy efficiency. We've already talked to a wide range of organisations and individuals with an interest in the issues. Submissions have been coming in to the inquiry following the release of our issues paper in September. The purpose of these hearings is to provide an opportunity for interested parties to discuss and elaborate on their submissions and put their views on the public record.

Following these hearings in Sydney, we will also be holding hearings in Brisbane on the 17 November, Canberra on 22 November, and Melbourne on 24 and 25 November. We will then be working towards completing a draft report for public comment in early April 2005 and we will undertake further public consultation with interested parties after they've had time to read that report.

We like to conduct all hearings in a reasonably informal manner but a full transcript is being taken and, for that reason, comments from the floor are not helpful, but at the end of the day's proceedings I'll provide an opportunity for anyone who wishes to make a brief presentation. Participants are not required to take an oath but are required under the Productivity Commission Act to be truthful in their remarks. Participants are perfectly welcome to comment on the issues raised in other submissions or in other oral presentations.

The transcripts will be made available to participants and will be available from the commission's web site following the hearings. Copies can also be purchased using an order form available here today.

I'd now like to welcome Mr Michael Mobbs of Sustainable Projects to the hearings. Mr Mobbs, thank you very much for your submission, and perhaps you could briefly summarise it - Mike and I have both read it - and then we'd like to ask you some questions about it and the issues that you've raised in it. We've got approximately three-quarters of an hour; if you can summarise for maybe 10 or 15 minutes.

MR MOBBS: Yes.

DR BYRON: And thank you very much for coming.

MR MOBBS: Thank you for the opportunity. Just a bit of background about myself: I used to practise environmental law for about 19 years with a large firm. I worked on the environmental approvals for the aluminium refineries in the Hunter Valley. I did coalmines. I suppose I was essentially in the department of digging in that activity. After that, I moved into the development industry and I do shops, offices, subdivisions and housing, so I speak to you as somebody with a knowledge of the law and also of the development industry.

Just before I go into an overview of my paper, I just might share with you my walk here today from Chippendale, about a 25-minute walk. In four of the blocks that I passed, the lights in the street were on. I walked between 8.10 and I think 8.30, so in that 20-minute walk across say 12 city blocks I saw the street lights on. In my street, there's a street light that's been on for about 10 years, 24 hours a day, seven days a week, and it really sums up to me - - -

PROF WOODS: It's a long-life bulb.

MR MOBBS: It sums up to me the example in your paper about poor signals. The street lights, as you know, I assume, are leased by the council from the electricity company and the cost of the electricity is in my electricity bills, submerged in my council rates. There's no incentive for the energy company to be efficient in the way it turns the light bulbs on and off and its street lights, and there's no information for me. I would say most of my neighbours have no idea that they're actually paying for that through their rates. It's a classic example of poor pricing signals.

If councils were just to make clear in their rating bills the component of electricity for street lighting in their annual reports, there might be some message, and if there were some transparency to the contracts and the service qualities - however, I think that's outside your bailiwick. It's probably IPART's jurisdiction but it's pretty annoying to see it.

The first thing in my paper is the graph that's intended to wake you up. I don't want to go through a paper that you've read but I just want to spend a moment on that graph. It shows the measured amount of carbon dioxide in the earth's atmosphere over the last 400,000 years, and it shows the last four ice ages in that period. It appears to be a fairly self-regulating planet, with the amount of carbon dioxide never getting above a certain level in comparison to those four ice ages. It goes up and down.

In the period from my birth year of 1950 to the date there, we've put about four times more carbon dioxide than has ever been registered into the earth's atmosphere, and it appears that by the end of this century there's somewhere between six to 12 times the amount of carbon dioxide - so it's a great time to be alive. We're part of

a first-time living experiment to see what happens to the planet where we put so much carbon dioxide in the planet. So whatever you do today will directly affect the amount of carbon dioxide that goes into the planet in some way.

Having set the context, what I sought to do in my paper was talk about the projects and compare public sector and private sector infrastructure. On the third page of the paper I spoke about how we don't really associate the activities of public sector developers with the impact in the environment, and it's my experience that they are in many cases far greater than the private sector. I think in my experience, from the projects I've done, all the projects are sustainable offices, subdivisions. The most affordable, least polluting infrastructure we can get is going to come from the private sector, not from the public sector.

For example, Sydney Water is one of the biggest consumers of energy in New South Wales. You can't turn the tap on in Australia or from Sydney Water without burning energy, so it's consuming about 1.2 per cent of the total New South Wales electricity supply, and about 0.3 per cent of the state's petroleum industry. It's one of the biggest single greenhouse polluters in business, and it's in the private sector.

Interestingly, neither in BASIX, the New South Wales energy sustainability index, nor in FirstRate or BERS or any of the state energy efficiency programs is the impact of public sector pollution allowed for. So in my projects, the fact that I'm not using mains water is not quantified by the energy efficiency programs. In other words, the people setting the energy efficiency programs don't measure their own pollution in the equation, and yet a house or a subdivision or an office all consume not just private sector pollution but public sector pollution, such as the pollution generated by public water supply.

The graph on page 3 of the paper shows the amount of energy that Sydney Water uses to pump the water in sewage, and down below there's a graph showing what would happen if every household in Sydney was converted to an on-site water supply. Basically, if we were to give everybody a sustainable house in Sydney, we could cut energy supply from pumping water by about 90 per cent. It's that much more efficient.

You might say, "Well, how can that be with all those pumps?" It's pretty simple. My fingers are a circle say of a mains water pipe. About 80 per cent of the pipe is filled with water which is never used. It's there for firefighting. So when you turn on the tap you're moving around 100 per cent of the water in the pipe, 80 per cent of which is never used. It's a really, really inefficient system in the way it delivers and supplies water. Most of the cost of water supply is to do with firefighting, and the people drawing up the energy efficiency rules just don't count this stuff. They focus on what's happening in the individual household or office.

Just to give you an overview of that, on page 4 I speak about the greenhouse pollution at Noosa, Brisbane and Logan councils. You can see that the pattern there for those councils is that about half of their greenhouse pollution comes from pumping water and sewage, so the way they do business, their water supply authorities - the way councils do business is not regulated by the energy efficiency systems. There's just no counting that in the BERS, the NatHERS, the BASIX and so on. But the planet counts it, and ultimately so do subscribers. Just as I'm paying for the light bulb that shines in my street 24 hours a day, seven days a week, so do I pay for the way these people do business.

In a subdivision in the south-eastern part of Queensland, just south of Brisbane - I'm referring now to page 5 of the paper - I got savings of $10,000 a lot on utilities costs. In a subdivision in the north-west sector in Sydney, say, you can't put energy, water and sewage and stormwater supplies on for less than $63,000 a lot. That's as good as it gets at the moment. It's less in Queensland and certainly in the south-east corner of Queensland, where it's quite competitive.

I'm able to get utilities on in the subdivisions, for example, at Parramatta for about $22,000, just by not choosing the monopoly service providers. When I say "not choosing", it's not a simple exercise not to choose a monopoly service provider. It's a difficult road for a developer to go down. It's also difficult in terms of red tape. I've set out the breakdown of those costs out in the north-west sector over on page 7. I won't take you through that, but basically you can see there what's happening with developer contribution section 94 payments and so on for infrastructure, and I include energy in there.

Can I just slow down and wonder aloud with you on the barriers to getting some affordable energy and water systems - some efficient systems. I cover that on page 7, going through to the end of the paper. The barriers as I see them are that the government monopolies of water and energy are just not sustainable as a matter of environmental assessment, nor in financial terms. I think in New South Wales the price of energy and water has been held pretty much close to CPI since IPART was around, but because it hasn't dealt with the monopoly position of the service providers and it has not addressed climate change, we're about to deal with substantial increases in water and energy prices, and that's to pay for greater investment in those businesses.

IPART and the government and Sydney Water just don't seem to get it, that there are better ways to meet demand without spending more money, without putting up prices and actually allowing some competition from their customers. For example, in Auckland they cut per capita demand in three months just by getting rid of fixed charges. The Auckland success story has never been mentioned in any of

IPART's discussions. I've made a submission for the New South Wales Council of Social Services. It just doesn't register in IPART's discussion of the things. I think of all the people in this, you'd be aware of the barrier that a fixed charge poses to getting some efficient level of services. I won't trouble you about that.

In day-to-day practice what it means is that when I go to a council that's also a water and energy supplier, they simply don't want competition from the developer and they make it very difficult for us not to buy their services. I lodged an application in a regional centre in New South Wales recently for a sustainable office - we weren't going to use the council's mains water or sewerage systems - for a major tenant, a bank; a very conservative tenant. The council was positively hostile to the application. This is a council where there are drought conditions and you would think that they would be among the first people that would want to husband the water resources - the energy resources. It's really hard out there getting applications dealt with sympathetically, and I'm talking about mainstream clients wanting to do offices, but do them sustainably. It's really tough.

On the efficiency of the building and development sector, the private sector, I just want to talk about how inefficient that is and how the rules that are being made in BASIX and NatHERS and the Australian standards enforce that. It's almost completely irrelevant to have an energy efficiency program looking at whether a house is energy efficient if you exclude the method of construction of the house. If you were to stand over the freeway on the north of Sydney at 6 o'clock and watch the army of utes and trucks coming into Sydney from Gosford and Wyong, all these blokes in utes coming into Sydney to build houses - you can't build a house under the current system of construction in less than three to five months and usually a minimum of two people come to a building site. The energy consumed to build a house, which may be five-star, may be top-rating in the BASIX, is far greater than the energy the house will save as a result of efficiencies achieved by the rating program. Talk about missing the forest for the trees.

It's just an extraordinary thing that energy efficiency programs don't look at the inefficiency of the building industry itself. I'm not saying it's a bad thing to have an energy efficiency program that looks at whether a house is cool in summer and warm in winter. I'm just saying - to quote that wonderful philosopher - it doesn't matter a hill of beans because the energy consumed to make it is so inordinately larger compared to the savings won by the energy efficiency scheme, given the fact that the energy efficiency scheme ignores the pollution and the costs of the monopoly service providers. We're playing at the edges of the problem it's causing the planet, to put so much carbon dioxide into it.

I've got a business that covers state boundaries. I go to Queensland, South Australia, Victoria. If I were to practise in those fields and use all the energy

programs, I couldn't run the business at less than an annual cost of somewhere about $15,000 to $20,000. In Queensland I'd have to buy BERS. That's about $1500 to train somebody. In New South Wales I'd have to buy NatHERS and it's still picked up by the BASIX rating scheme. In Victoria I'd have to invest in BASIX. Each state has its own energy efficiency program. They're different.

This is an old story for the commission, I'm sure, but if we could just have one energy efficiency rating program, the impact on housing affordability would be significant, because it's not just the energy efficiency program, you've got to get a hydraulic consultant in some places to do the water analysis. To interpose between a householder and their house the cost of those things, you're probably looking at $1000 to $2000 minimum in the cost of the design of the house just to get those consultancy reports, not including the cost of doing business as a designer or provider of that housing.

So if there is one thing that you could do that I think would be productive, it would be fantastic to promote the programs such as BASIX, but in terms of having a national free-to-air program that you can use off the Web and you don't need to buy a CD and get some qualification. But at the same time, as I point out later in the paper, BASIX is a tragic lost opportunity because it ignores the energy and water savings that can be won by not using monopoly services, such as mains and water provided by government businesses.

I've got a house in Chippendale where, for eight years, I make all my water off the roof - the water is in a dirty, polluted, inner-city suburb - cleaner than mains water. I've got good data that's published in the book that Choice have published: Sustainable House. I've reused my sewage to wash the clothes and hose the garden and flush the toilet for eight years. At no cost to the government monopoly providers, I have increased the efficiency of the sewage treatment plants: given them more capacity in the dam. BASIX gives me nil points. So if you want to imagine a program which is either accidentally or intentionally promoting government monopoly services in that circumstance, well, we've got it.

It gives me nil points for using rainwater for drinking, cooking, washing, showers, baths and hot water. It gives me nil points for reusing sewage to wash my clothes, flush the toilet and hose the garden. And what is it? 2004 and everybody agrees we've got some major resource allocation problems with water and energy. BASIX is a tragic lost opportunity in the way it regulates and encourages private sector use of the water that falls freely on my roof, the energy that falls freely there. Other than that, I have no strong feelings about BERS and BASIX.

I've got a couple of suggestions for fixing things up that I'd like the opportunity to talk through with you. I'm not sure of your relationship with the COAG process,

but one of the things that I think bears serious study - and I haven't got information here today; I'm happy to provide it if you wish it - is that I think the National Competition Policy is not being implemented by the Commonwealth. I think they've made those competition payments when the benchmarks haven't actually been met by the states, particularly for water.

I wonder if it would be possible to have a more transparent process with those payments, so that instead of the payments being made as a result of discussions behind closed doors we could have some public process where there is demonstration that is open to public scrutiny of when a state has actually demonstrably achieved the competition benchmarks that the COAG process describes.

PROF WOODS: Do you read the NCC's reports?

MR MOBBS: Yes, and it is harder to read them. There used to be an annual publication of all the government monopolies across Australia. There was a big book that tried to benchmark all the government businesses - energy, water, transport - and you could read those. The nomenclature changed, so it was hard to get a long-term accurate picture of where the businesses were going, but when those were around you could look at the competition payment issues and work out how they were going with their businesses.

PROF WOODS: But it still produced annually the financial position of all the government-owned monopolies in water, sewerage, electricity, ports, railways, public transport. That's still produced annually, showing five-year data.

MR MOBBS: It is, but it's very difficult to use that in a way which enables you to robustly scrutinise the competition payments. The nomenclature changes within the documents in terms of what was said to be a per capita usage of water say, or whatever - the nomenclature changes - so that it's hard to get a consistent picture of what the level of efficiency is. But that would be the best source of information that I can think of to say whether or not the competition payments are appropriate, and they fall short of that, so I don't know how the federal government forms a basis that the competition payment is due; I just don't know. But if you say those annual reports are the place to get it, I am happy to go back and have a look at that and make a more detailed submission about it, because I don't think they are.

PROF WOODS: The GTE statements are financial reports, not the previous Red Book publications that you are referring to, which included a lot of operational activity.

MR MOBBS: Yes.

DR BYRON: But that's not connected to the National Competition Council.

MR MOBBS: No.

DR BYRON: They're different.

MR MOBBS: That's what I'm saying: is that doing the best I can from the position I'm in - which is as a citizen without access to the exchange between the state and the federal governments - that's the best information I have got and it's inadequate for the purpose. It may be that there are robust documents that travel to Canberra, and they clearly demonstrate that the competition payments have been made, but I am not without some access to these people and it seems to me that that's a major area for review and that we could improve the performance of government monopolies by making that payment not a given. We could actually make it a more public process.

I don't know what a federal body can do with the difficulty that we now face in the states where there are large dividends and tax equivalents paid by these state businesses to states that are hooked on the money. I suppose the best place to try and do something is again through the competition payments because if they are shown not to be efficient and they don't get the moneys then it may give them some greater incentive to be more efficient.

Something that happens on the ground that's quite a problem is section 94 plans, or developer contributions plans; they have different names across the states. They're really not actively hostile but, in the main, they discourage more efficient provision of energy and water on site. For example, if you go up to certain minimum energy usage for a block of offices and you have got to put in an electricity substation, that's not a bad incentive to try and design the offices to be self-sufficient, but it's a pretty crude way and it could be much more efficient, that minimum energy demand could be integrated much better, with the way the approvals processes works.

It's a technical matter and I don't want to go into detail here, but those developer contributions, as I set out, in the north-west sector - which is as efficient as it gets in Sydney at the moment - the private sector is not able to put a block of land on the market for less than $62,000 for energy, water, transport, and because those decisions are made in big chunks for large sectors such as that, there are some key opportunities to deal with these issues that are not being addressed, because most of the negotiations don't involve mums or dads; they are done in one-offs between the big developers when the land is divided.

PROF WOODS: Mr Presiding Commissioner, have we sort of drifted from an opening statement into things that we should start to discuss in a bit of detail? Have

you got any wrap-up of your opening statement, as such, because you are going into areas that I wouldn't mind pursuing in a little more depth, but I am just not quite sure where you are heading at the moment.

MR MOBBS: I guess I am wandering, so let's talk. The key things that I would like to see are, I would like to see a minimum energy and water efficiency standard for not just pumps and the few things that have been covered but, for example, shower heads, some other things. That's a national document. I would like to see a serious review of the Australian standards dynamic. At the moment you have to pay to buy them. I think they should be free-to-air on the Web. They make a huge business out of selling the Australian standards. It adds another cost to the provision of housing and development.

A classic example of poor regulation is Australian Standard 3500 that needs to be reviewed. It mentions energy not once, but it deals with water in all its forms in our cities. I will just say again that I think it would be good to have a review of the competition payments system between the states and the federal government. If you wanted to ask me questions or talk to me about some of the things I have asserted, that would be fantastic.

PROF WOODS: You raised a whole range of things and your submission certainly canvasses a range. I'm not quite sure where to start, but I will just pick one, for instance, the land and housing development industry - a couple of things there. You say, for instance, that the industry thinks that government should borrow to pay for a lot of the infrastructure. Well, it's not unsurprising that they would take that view because they want to flog their blocks as cheap as they can and they would much prefer to move the cost of infrastructure to somebody else - - -

MR MOBBS: That's right.

PROF WOODS: - - - but I would have thought that you would have some separation, so main trunks, long-lived, borrow, intergenerational equity, et cetera, whereas reticulation to the immediate block would be a cost of developing that block and, rightly, passed on to the purchaser of the block by the developer and that the developer should bear the financial responsibility as the intermediary on the way through to the final customer, but it doesn't surprise me that the industry would rather not have to pay that and would prefer that it got picked up in rates.

MR MOBBS: Yes. I am just putting the arguments as they put them.

PROF WOODS: I'm just wondering if you were endorsing it by putting it there, because there is no qualifier to that.

MR MOBBS: No.

PROF WOODS: I am having trouble working out what you think as distinct from reporting what a whole range of people think.

MR MOBBS: Okay. Thank you. I tried to say what the different positions are of the players. Let me just run through that. The developers say governments basically should provide it and borrow it. Government says developers should take less profit. There are actually three players in the marketplace. The people who don't get a say are the third players: the householders. By the time they come to buy a house, to build a block of offices or do a subdivision, all these decisions have been taken by the two key players, the developers, but the people who have got to live in them and pay for them and pay for the energy and water, are not part of the debate, so the people who have got to pay for this stuff are basically powerless.

DR BYRON: So what is the solution to that? How do they become involved or exert some sort on pressure on the state or developers to take into account the ongoing cost of those decisions which, as you say, at the moment the landowners are locked out of?

MR MOBBS: To me the biggest way to involve people and to get more efficient use of energy and water and housing, and more affordable housing, would be simply to say, "Here's a block of land we're going to develop. We'll have another city there, call it 'The South-West Sector'. Give us some proposals about how the energy, water and transport infrastructure might be provided." Instead of it being assumed that the main trunks will be government-provided or government/business-provided, see what the marketplace has to offer.

I'm not saying that they control the process, but we need to open this up. For example, it's said that water is a natural monopoly, that governments are natural suppliers, that it was written by God that Sydney Water would exist, like the natural right of kings to rule. I mean, it's just not technically accurate. In America, 37 per cent of all new housing has on-site sewage. In America 60 million Americans live with on-site sewage. It's not necessarily God-given that Sydney Water will provide the trunks. My understanding of the clients I'm dealing with, who are mainstream - some of them are redirecting their businesses. They say, "We're going to have increasing water and energy bills. I want to change the way I design my buildings." These are people providing units and offices. They would love to be able to be in charge of their own financial fortune, and deliver the energy and water services they wish to their clients.

I'm not saying that this would be unregulated in the terms of just have no rules about the standards. I'll give an example of what I think is wrong. We're using the

same thinking to try and fix up the problem that that thinking has caused. So Sydney Water comes out with a plan, so-called, and it's just more of Sydney Water: a desalination plant. What I'm saying is, the answer is to change the planning process so that we allow the private sector to come forward and say, "Can you do this cheaper, better, more efficiently, and still meet the same planning rules for water and sewage and public health and so on?"

PROF WOODS: So are you suggesting that there's no progress towards self-sustained subdivisions where they do treat sewage on site and reticulate it back onto ovals and the like?

MR MOBBS: Absolutely. The best example where we're doing things the same but saying they're breathtakingly new is the Aurora subdivision in Victoria - I think 13,000 new lots. It was automatically assumed that it would be the government or a single government-controlled provider that would provide the whole system, automatically assumed that the government would build all the roads and so on. All of that stuff was written into the plan, and it's basically a subdivision with a third set of pipes in the road.

PROF WOODS: Can we separate out ownership issues from performance issues?

MR MOBBS: Sure.

PROF WOODS: I understand why you keep putting the two together, but I do think that they can be separated out. If you put aside the ownership and look at the performance in that subdivision, is that tending in the direction that you're looking for, or not?

MR MOBBS: No. If you look at the actual provision of water and energy, they're going to run a third set of pipes. It will be a huge user of energy. In Rouse Hill, per capita usage of water has gone up where they've got a third set of pipes. What do they do when the grey water runs out? They top it up with potable water and they sell it for 27 cents a kilolitre compared to 94 cents for potable water coming out of the other taps. I'm just doing what has been done overseas. It's a very small market here. In the American market, you can put water and sewage on for about $3000 a lot, with annual operating costs of about $100. The private sector does that. That's why, as I said, 37 per cent of all new housing has on-site sewage.

PROF WOODS: So what are the constraints to being such a small market in Australia - I mean apart from the fact that we are a smaller market than the US anyway? Within those limitations, are you saying it is directly attributable to the planning development laws, that that is preventing the market from bringing that technology in?

MR MOBBS: And also the health laws. I mean, you would think, for a dry country, that we would be very promoting of water efficiency and new water technology. The same sewage treatment system has to go to each state and territory to get accreditation. It has to repeat the tests seven times.

PROF WOODS: But once it has been through that round, presumably then it's acceptable to each of those. I understand the inefficiencies of that process, but that seems a once-off process, not a "have to do it every time that particular technology that has been approved wants to be reapplied".

MR MOBBS: Once they've gone through the hoop they've got the market, yes. But to come back to your question, can you just give it to me again? There's a point I thought of but I just lost.

PROF WOODS: I was trying to track down what are the specific constraints to the market introducing the technologies that you're looking for, whether it's the planning and development laws specifically, or the size of the market.

MR MOBBS: Right. That's a great question. The constraint is that the people making the rules, opening up these new areas of our cities, are part of the same bodies which sell the services. So take BASIX: you would think that that would regulate energy and water efficiency. In fact, it cements the monopoly of Sydney Water. So when they go to make the new south-west sector or the north-west sector, it's automatically assumed that Sydney Water will be the main provider of water and sewage. It's automatically assumed that the council and the RTA will be the main providers of roads.

PROF WOODS: Mr Presiding Commissioner, I'm conscious of the time, but if I could ask just one final question, and not so much in terms of getting a detailed answer today, but if you could follow up for us. Because of your multi-state practice, you're now familiar with a range of the state-run efficiency schemes and BASIX and NatHERS and ABARE and the like, it would be helpful to us if you could, in a fairly analytical way, give the pros and cons of each of those as you see them, but I think that's too exhaustive an issue to try and deal with in the time we have now. But that would be helpful to us if you could.

MR MOBBS: Sure. That's fine.

DR BYRON: Just coming back to your comment about how councils make it very difficult for you to not use their services, is there a difference between - I mean, a lot of what we have just been talking about is for an entirely new greenfields development, where you have the option of whether or not to install all these major

utility infrastructures, but when it's a question of putting up a new building where there are existing utilities, what are the reasons for councils being so difficult to get on with? Is it partly because they're concerned about stranded assets, for example? I mean, if a whole lot of buildings all went up and then were disconnected from the utilities, would that present some sort of commercial problem to the operators?

MR MOBBS: The experience in Auckland, where they got rid of fixed charges - they brought them down to about $25 a year and they reduced per capita demand by about 34 per cent in three months - was that people became much more confident they could control their water and energy bill, and they did. They invested in shower heads; they did things that showed up in their bills. So the answer is, if you change the pricing of the resource, where people have got control over their bill, they can retrofit and see it as a profitable exercise. In terms of its impact on a council facility or resource, many councils now are starting to draw a link between rainwater tanks and reducing the wear and tear of their stormwater assets.

They understand now that if the water is kept where it is, their maintenance and depreciation costs on their stormwater infrastructures are not as great. So they actually see a link and so they have become more supportive of rainwater tanks. But their hands are tied because of the way the BASIX program runs which, as I said, at the moment gives nil points for somebody using rainwater for drinking, cooking, washing, showers, baths and hot water.

DR BYRON: Do you think that is just an oversight?

MR MOBBS: No, I don't.

DR BYRON: You think it's deliberate?

MR MOBBS: No, I don't. It was the result of some robust discussions within government agencies and the winner was Sydney Water and the loser was Sydney's water resources. It's a real pity, because BASIX is free and anybody can use it. You don't need to be a subscriber to the Australian standards. You don't need to pay hundreds of dollars to get Standards to deal with water. You can go on the Net, juggle your design and get your house up to the standards. So it's a great reform in the way we control buildings. I think BASIX is the single best thing to happen in the way it uses the Web for regulating buildings. It's just that the contents of it cement the place of the government water and energy monopolies. I don't want to end on a sad note, but there you go.

DR BYRON: There is a lot more that we could discuss but - - -

MR MOBBS: Yes.

DR BYRON: Thank you very much for raising extremely interesting issues.

MR MOBBS: You're welcome.

DR BYRON: Particularly the planning and site development infrastructure issues and also the way that houses are actually constructed. I guess there are a lot of other issues we can go into on what happens inside the buildings after they're constructed. That has been really helpful.

MR MOBBS: Thank you, and I'll get that note to you about the schemes.

DR BYRON: Thank you.

MR MOBBS: Thank you very much.

DR BYRON: I appreciate that.

DR BYRON: The next submission is from Mr John Penny. Thank you for your submission. Mike and I have both read it and we have a couple of questions we'd like to ask you.

MR PENNY: Sure.

DR BYRON: But if you would like to summarise the main points for the transcript and the public record, then we can have a bit of a discussion about it.

MR PENNY: Okay.

DR BYRON: Thanks for coming.

MR PENNY: Thank you. My submission is about commercial buildings. Buildings consume more than half of the energy used worldwide, with office buildings among the worst offenders. According to the Australian Greenhouse Office, mechanical systems that deliver airconditioning, heating and ventilation and lighting systems account for the majority of the total energy consumption in the commercial building sector. It's really difficult to get information on Australian buildings. However, examination of data from a number of UK buildings shows avoidable waste - that's waste than can be saved - is in the levels within the range of 25 per cent to 50 per cent. In a well-managed building, avoidable waste levels of below 15 per cent are achievable. There is an obvious opportunity here to achieve significant improvements in the performance of buildings.

I would now like to outline the major barrier that I see that's there that is preventing us from improving energy efficiency in commercial buildings in Australia and then outline recommendations to overcome this barrier.

DR BYRON: Perhaps if I can just comment there, Mr Penny, briefly. The submission as such is on our record, so you don't have to read it into the transcript in its entirety if you want to particularly focus on certain of the features. It's up to you.

MR PENNY: Yes. I specifically wrote it so I could speak it.

DR BYRON: Yes. It's your time.

MR PENNY: It's written in that kind of format.

DR BYRON: Sure.

PROF WOODS: We have already read it.

MR PENNY: Okay.

PROF WOODS: And we have a number of questions that we would like to put to you, to elaborate on that.

MR PENNY: All right.

DR BYRON: Take yourself through and give us the highlights.

MR PENNY: Yes. Well, the major barrier is the de-skilled industry that's appeared here in Australia. Generally, we have a construction industry that is preferring to tender on the lowest costs without appreciating the lifecycle costs of a building. Now, the main reason why that is happening is that the clients - government, property trusts, businesses - don't have any incentive to ask for these requirements and are not involved in the construction industry. They leave the construction industry to do its thing and not get involved in it. The biggest issue within the construction industry that I see that needs to be fixed is the commissioning and testing of building services. At this stage we have regulatory and building codes for testing of fire and smoke systems. They are the essential services of a building.

However, we don't have any mandatory testing or commissioning of the whole building services - the whole systems that are put into buildings - and because we don't have that testing and commissioning, systems are not performing to what they are capable of doing. Because they are not tested and commissioned, people are able to get away with things. There are things that owners don't discover until five or 10 years later, that they have inefficiencies within their systems. So the main recommendation I have is very simple: that buildings should be commissioned and tested and it should be a statutory requirement that a builder prove that he has tested and commissioned his building properly.

There are a number of other considerations that yourselves have put forward and I agree with the majority of them. Probably one of the more important ones is that the public and the tenants and potential buyers of buildings are made aware of the energy performance of the building; that people are aware of it. That's very important.

DR BYRON: I probably should clarify at this point in time that, of course, that was an issues paper where we are canvassing a range of options. We are far from working out which ones we are actually going to actively support, but they certainly are canvassed, yes.

MR PENNY: So just to summarise, I wanted to highlight, because it came as a surprise to me, that buildings are really large consumers of energy. There is a lot of

it being wasted in buildings. In the UK - I have worked in the UK; I've worked a lot in Australia. I can see that they are a lot better at energy efficiency, but they are still claiming waste levels of 30 to 50 per cent in the research that they have undertaken in the UK, and I can only imagine that it's a worse situation here in Australia. So if buildings were more energy efficient we probably wouldn't need this investment that we probably will need to build new power stations and all of those other things that are out of my sphere.

DR BYRON: Thank you very much.

PROF WOODS: I'm just curious. You've quoted some references, you've copyrighted your submission and you've focused on some very relevant issues. I'm not quite sure what your experience is, where you come from, in the sense of what's your underlying skill set in support of these. I couldn't find it anywhere in the document. That would just help me in the conversation to understand.

MR PENNY: Yes, sure. I come from a building controls background. There are the systems that are put in buildings to control the environment: the lighting and the airconditioning. They are also there to make the systems more energy efficient. When they are properly applied they can do that. I spend a lot of my time working in the construction industry; that's on the frontline, basically, while these buildings are being constructed. I have also gone through on surveys on existing buildings to see how they perform. That's my background and that's why my paper is particularly written for that background.

PROF WOODS: I suspected it but it wasn't revealed.

MR PENNY: Yes.

PROF WOODS: Does that mean there is a thriving market of current building owners, whether it's a new building or a second-hand building, that want to improve the energy efficiency performance of those buildings because they see that that's in their interest?

MR PENNY: There's a bit of talk, but when you actually see the specifications and the documents to start construction there is nothing there, you know? They are pretty much the same as they were 10 years ago.

PROF WOODS: Why?

MR PENNY: Why? Because the construction industry is focusing on lowest cost and it's geared up to deliver that. The owners don't seem to want to engage in the industry. They sort of act like absentee landlords. It's all: "Go away, Mr Builder,

and build me a building."

DR BYRON: That's one of the central issues for this inquiry. There are hundreds of things that could be done that would improve the overall energy efficiency and commercial performance of these buildings but for some reason they are not being put in place. One that we are repeatedly told about is this separation between those who design and construct and those who will later own or occupy, whether we are talking about an office building or apartments or houses or whatever. It seems to me that a prospective owner, if they were interested, could say, "Build me a building that will be low cost to operate." For whatever reasons they are not asking.

MR PENNY: Very few.

DR BYRON: Very few of them are asking for that.

MR PENNY: Very, very few, yes.

DR BYRON: Even when you give it to them they don't want it.

MR PENNY: I don't know, there doesn't seem to be an incentive there for the owner.

PROF WOODS: Is it because energy is basically still cheap?

MR PENNY: I can't avoid that. Yes, it is cheap, but still there doesn't seem to be any responsibility or thought put into: "Well, what's the energy going to be like in five years' time? Are we going to have huge costs on our peak demand?" There's none of that thought put into it when they select a building.

PROF WOODS: That disconnect might apply between construction and ownership, but what happens about subsequent ownership? So somebody has a building that has already been built, but you are also putting to us that they themselves then are not operating the building to maximum efficiency. There is already some cost; the building exists and it has certain mechanical equipment and the like. Why aren't they saving themselves money by operating it more efficiently, by having engineers tweak the airconditioning or the heat load or the - - -

MR PENNY: I know it goes back to when the building was constructed.

PROF WOODS: Only?

MR PENNY: Well, it starts there.

PROF WOODS: It would be useful to understand what percentage of inefficiency happens because the building is built cheap, versus how the building is operated.

MR PENNY: There is so little research done on that area. It's just unbelievable. When there is research done it's not made public and it's all confidential.

PROF WOODS: But from your experience - you said you've done inspections and assessments and surveys - can building owners, who have a building where it's already predetermined what the mechanical load is, improve the efficiency and save themselves money?

MR PENNY: The building generally hasn't been commissioned properly at construction, so it's a lot more difficult for the owners, a lot more expensive and time-consuming to get it fixed later on. What happens is that it's too hard. Their main priority is the essential services, the fire and safety systems in the building.

PROF WOODS: Keeping up with all the regs that are required for occ health and safety and fire and - - -

MR PENNY: All the regs. Yes, that seems to be a lot of what these owners and facility managers are really concerned about.

PROF WOODS: Because the savings aren't very big on the energy side?

MR PENNY: There's a lot of work to get it fixed properly. It's a lot more difficult to get these things fixed afterwards because when the building is getting constructed you've got everyone there: you've got the architect, the consultants, the contractors and all of that can be fixed at that point, but it doesn't and it gets carried on through the operations of the building.

PROF WOODS: By testing and commissioning you don't just mean firing up the equipment, you mean the balancing of the loads and the slight change in the vent structures and where the partitions go.

MR PENNY: Exactly. There are different seasons, for example, and you can't commission a building within two weeks of it being finished.

PROF WOODS: It might be a hot or a cold day.

MR PENNY: Proper commissioning would allow what they call a 12-month post-occupancy period, where there is finetuning and adjustments are made so that the building is performing as it should have been when it was designed. Because these things are not done, people can get away with things. They are not doing

completely what they should do.

DR BYRON: Unlike other areas where we have mandatory labelling for vehicles' fuel consumption or for appliances in terms of electricity consumption and so on. These are items that are mass-produced.

MR PENNY: Yes.

DR BYRON: Whereas the sorts of buildings we are talking about, every one is unique.

MR PENNY: Exactly.

DR BYRON: So you can't just test a sample of a certain type of appliance. So it's likely to be fairly expensive to do a detailed and thorough testing of the - - -

MR PENNY: Not when you compare the overall cost of the building. You are talking even less than 1 per cent. It's not a lot of money to test these buildings, but what it might do is frighten people into thinking that the building is going to be tested and they've got to do it properly. Then what will happen is that the costs of the overall services and systems may start to go up in price because the people are being - - -

DR BYRON: Am I right in thinking that an important part of what you are telling us is that because it's so expensive to retrofit, it's even more important to get it right the first time.

MR PENNY: Exactly.

DR BYRON: And that goes right back to the design specs.

MR PENNY: Yes.

PROF WOODS: You mentioned a 1 per cent cost for proper commissioning and testing. Is that what you are saying?

MR PENNY: Yes.

PROF WOODS: Of the construction - I mean as a broad order. I'm not pinning you down to whether it's one, one and a half or two.

MR PENNY: It might even be a half. It's below that, yes.

PROF WOODS: But in that order. Is that of the overall construction cost? What's the 1 per cent of?

MR PENNY: Of the overall construction cost, yes.

DR BYRON: That leads to the obvious next question. How would that compare with the savings, in terms of future energy or water usage?

PROF WOODS: What's the payback period? I mean, do you never get that back anyway, or does it come back to you in two years, one year?

MR PENNY: Well, just going on the wastage levels from the research in the UK, 30 to 50 per cent of the energy is being wasted.

PROF WOODS: If energy is cheap then the payback period is a very long time.

MR PENNY: The client is getting what he paid for in the first place as well, because they are not getting what they are paying for today.

PROF WOODS: You talk elsewhere about incentives, that's all. I'm just trying to track through the incentive flow. I mean, if it's 1 per cent of your construction costs but you don't get it paid back for 10 or 15 years, then that's why you haven't got an incentive. But if it's paid back within one year the question is, "Why would government need to intervene?" There seems to be enough market force, provided there is good education and understanding, for it to happen without government.

MR PENNY: There's definitely not a payback in the order that you've highlighted there.

PROF WOODS: Which one? The short end or the long end?

MR PENNY: 10 to 15 years. My feeling is that it's down in the order of three years, or something like that.

DR BYRON: This is what a lot of other people are telling us.

MR PENNY: Because there's so little research done in the buildings in Australia - - -

DR BYRON: If in fact your intuition is right and the payback period for these sorts of energy efficiency measures, the commercial viability of taking these measures seems to be fairly obvious, it still begs the question: "Well, why isn't it happening?" I mean, surely the people who are commissioning these buildings - they are not fools;

they are very sophisticated investors.

MR PENNY: Yes.

DR BYRON: If they can spend an extra million that's going to save them tens of millions over the life of the building, you would have thought that they would be queuing up to do it.

MR PENNY: You would, but the problem I have in the industry I'm in is that it has become very de-skilled and there aren't the people there to come here and advise clients and have real case studies to say, "Look, if this building was properly commissioned" - there are a lot of people who have left the industry. It's not an industry that's rewarding people to use their brains.

DR BYRON: We've spoken to a couple of people that were in the energy performance contracting business and they basically will go to the owner of the building or the factory or whatever and say, "Well, we think we know how to save you X hundred thousand dollars a year on your utilities bill and we are willing to do that for you for a fee or a percentage," and so on. It seems to me that that's a classic case of where the people who have the knowledge are actually making money helping somebody else make money or save money.

MR PENNY: Yes.

DR BYRON: And that's just a commercial transaction where not only do both parties win but it's good for the environment as well.

MR PENNY: It is.

DR BYRON: Again the question is, why aren't we seeing this happen?

MR PENNY: Yes.

DR BYRON: It's happening a little bit. Why aren't we seeing it much more widely?

MR PENNY: It's just if you tried to apply that in the construction industry - I am familiar with the energy performance contract in concept and it's a lot more difficult, there are a lot more people involved, a lot more parties involved - builders and contractors - and there are a lot of things in there that would complicate the whole thing, but yes, there is just a lot of disconnection between the various parties; between the owners, the builders. The thing is, they want to keep building buildings cheaper and the running costs are not being considered when they build these

buildings, and generally the building is built and on-sold to someone else, so there is no ownership there at the beginning.

DR BYRON: I was just thinking building a jumbo jet is fairly complicated but somehow the people who are going to use it have a way of telling the people who are building it that, "By the way, you make sure it will do this, this and this and its operating costs will be within a certain envelope."

MR PENNY: Yes. Again, I'm sure they have access to a lot more analysis and data but in building you don't. Owners don't want to allow surveys to be done because each one is a one-off; it's a unique thing. It's so hard to - - -

PROF WOODS: Don't want to allow them or just can't see the payback from doing them?

MR PENNY: A whole raft of reasons. They don't want the pro formas of their building being made aware probably. They might have some confidentiality issues.

PROF WOODS: Like it might affect market value.

MR PENNY: Market value.

PROF WOODS: That's a pretty strong incentive.

MR PENNY: Yes. So we don't get in there to actually put the numbers there, whereas energy performance contracting, they are going in to replace a capital item that's gone beyond it's use date and it needs to be replaced, and it's a bit easier for those people to do this.

PROF WOODS: Presumably you could do your surveys on behalf of the building owners so that they retain the information and tweak the machinery in response, rather than you doing it for an external party. I can understand a building owner not wanting it divulged to a third party, but something that they get done themselves seems to make sense, because you talk incentives in a couple of points in your submission. You talk about no incentive for clients, and we have discussed that disconnect, but you then talk about "have to be incentives for facility managers and building operators".

MR PENNY: Yes.

PROF WOODS: What particular incentives did you have in mind when you wrote that? Is this the taxpayer somehow subsidising the facility manager to become more profitable?

MR PENNY: No.

PROF WOODS: That's a slightly sceptical comment.

MR PENNY: Yes. No, look, it goes back to the projects that I have been involved with. The better energy efficiency projects that I have seen were done in the late 80s and that was mainly a financial thing, I believe, because of the energy costs and concern at that time. But at that time, the facility managers were being driven by their top management in the organisation to deliver energy savings and were being targeted and being rewarded. Those projects were the more successful projects, and the projects that didn't succeed were where the facility managers weren't being given any incentive. They weren't being rewarded by their management. It was just another thing; it wasn't important. When you put in the exact same system delivered by the exact same people, these facility managers - because they weren't incentivised - their performance failed miserably.

PROF WOODS: That's a very important point you've raised. You're telling us from your experience that when the cost of energy went up and therefore the savings became more relevant to management - and you identify a particular point in history - you're saying that then permeated down through to the actual individual engineer or plant operator.

MR PENNY: Yes.

PROF WOODS: And that they were therefore rewarded as a response.

MR PENNY: Yes.

PROF WOODS: Does that lead to a suggestion as to appropriate policy in the future then? You can go one of two ways: either you can create a sufficient financial incentive through energy costs or you can attempt to regulate the behaviour of all of these multitude of plant operators and engineers. Is the regulation pathway likely in any way to be effective to actually try and influence their day-to-day behaviour?

MR PENNY: I don't think so. I think they have got so many other concerns with their fire and safety testing and - - -

PROF WOODS: All these mandatory requirements for other reasons.

MR PENNY: Mandatory requirements, yes. I just noticed at that point in time there was a real sudden change in people's attitudes. Not in everybody, but in certain

organisations they made energy efficiency a priority at top level and it was a real cost thing. They were able to bring on board their facility managers and plant operators to bring about those energy savings - because it's not just the equipment you put in and the systems, it's actually the people who operate it as well. They have got such a big impact on the day-to-day operations and how well that building is going to operate.

PROF WOODS: Would you rank the potential regulation of energy efficiency equally with fire safety and occupational health and safety?

MR PENNY: Yes.

PROF WOODS: So would you see therefore government should regulate to change behaviour on an equal ranking with those or is it something where you should let market forces through energy pricing permeate the behaviour?

MR PENNY: I think it's mostly market forces. Safety is in another - - -

PROF WOODS: Is paramount.

MR PENNY: Is paramount, yes.

PROF WOODS: Non-negotiable.

MR PENNY: Non-negotiable, and I think it's somehow changing behaviour of people and policy. I believe, though, the testing and commissioning of a building should be done on the same level, yes.

DR BYRON: Can I just come back to the point - following on from that - that you make in the submission about more efficient cost-reflective price signalling, particularly at peak times. I've been told that there are a number of buildings where the different tenants or occupants may not be individually metered and so if you are just going to pay one-tenth of the total building electricity bill then you have much less incentive to economise on how much you use it.

MR PENNY: Yes.

DR BYRON: So that suggests to me that one of the first prerequisites, if we are going to have occupants being energy efficiency conscious, is that they have got to have their own metering. They have got to be aware of how much they are using and how much they are paying. Is that right?

MR PENNY: That's right, but it's a little bit more complicated too. Let's look at

the airconditioning systems, which is the biggest consumer. That's generally a base building operated service and the tenants don't generally have control over it. They can't adjust it; it's just on.

DR BYRON: If in our office building in Melbourne we decided that instead of having the temperature at a steady 22 degrees or whatever all through the year we were going to let it get a bit warmer during summer and we would let it get a bit cooler during winter, then this would greatly reduce the energy efficiency loads, but (a) we may not be able to do that - - -

MR PENNY: Generally, no.

DR BYRON: - - - and (b) even if we could, we wouldn't actually get the cost saving as a result.

MR PENNY: Exactly. It wouldn't roll into your budget. The tenants can't do a lot. They're very limited, even in today's most modern office buildings in the CBD. They're very limited in what they can do to affect their consumption.

PROF WOODS: They still can't open the windows.

MR PENNY: No. Even if you try to alter the conditions on one floor, it would affect the whole building, so it's very difficult.

DR BYRON: That raises the whole scope for sort of demand-side management and shifting of peaks and those sorts of things. I guess if a building has thermal mass or something then it doesn't need - - -

MR PENNY: Although it is getting worse, because they're getting less and less, as all the glass and other materials that are not very good at holding - - -

DR BYRON: Yes.

MR PENNY: But generally, if people understand the - - -

PROF WOODS: Sorry, just as a sideline, that is an interesting point, isn't it: that when you think of the old concrete and block-built buildings - whereas these days it's all an internal spine with glass cladding - the thermal mass is going down. What is that doing, though? That means it's not overheating late summer afternoons, but it's also not retaining heat overnight for your startup in the mornings.

MR PENNY: That's right, yes. First thing in the morning - - -

PROF WOODS: So is it adding to the energy load, the loss of the thermal mass?

MR PENNY: I can only go on gut feeling, but I'm sure it is. It's not a good thing. I'm sure in the morning times, at startup, there's just such a heat load in the building that it's using a lot more energy at peak time in the morning.

PROF WOODS: To kick-start it.

MR PENNY: To kick-start it. It is like starting a cold building after a weekend, you know.

DR BYRON: I guess the reason we have gone for those sorts of designs is that as long as electricity has been very cheap there hasn't been the incentive for people to design a building that would be highly energy efficient, so other things like having big windows with a big view or something tend to be much more important.

MR PENNY: Yes. Natural light is a great thing and people like that. The priority is thermal comfort. That's what systems are designed for. The airconditioning is thermal comfort. They're not designed for energy efficient operation. There are attempts to try and fix that but it's not making an impact. There's a lot of great equipment around that has been made in Europe and America. It's very energy efficient. That equipment can be used in Australia. On the technology side there's nothing holding us back. It's the practices that we have; it's the incentives. They're the problems. When someone can solve that, it's not going to be one thing that is going to solve this. There's going to be a raft of things, a raft of policy.

That's why I like some of the commission's considerations. I thought some of those in there would help the situation and obviously the pricing is the number one thing. That's the thing that is going to make a big impact. I can relate to that in history.

DR BYRON: That has been very helpful. Did you have any other questions or anything you would like to say by way of wrapping up?

MR PENNY: No. That's basically what I wanted to say. I supposed I just wanted to say testing and commissioning should be - - -

DR BYRON: Yes, we got that message. Thank you very much for coming, Mr Penny. We will take a short adjournment now and resume about 10.45 with GridX Power.

DR BYRON: We will resume the public hearing into energy efficiency. The next presentation is from GridX Power. Gentleman, could you just introduce yourselves for the transcript and then take us through the PowerPoint presentation, and then we can have a question and answer session. Thank you very much.

MR COLIN CHAMBERS: Thank you. My name is Colin Chambers. I am the CEO of GridX Power.

MR CRAIG CHAMBERS: I'm Craig Chambers and I'm the corporate development manager of GridX Power.

DR BYRON: Do you have a presentation you wish to make?

MR CRAIG CHAMBERS: Yes, there is. I have made a submission.

DR BYRON: Yes, we do have that, thank you.

PROF WOODS: We've read that.

DR BYRON: And we've got a few questions we'd like to ask you about that for clarification later on, but it's probably best if you want to highlight the main points in 10 minutes or something like that, and then we can talk about it.

MR COLIN CHAMBERS: We want to thank the commission here for giving us the time to describe what are GridX's concerns and what its opportunities are. I think I'll start with some of the regulatory issues, and Craig may be able to interject in some of these, but state by state we've got different regulations, we've got different licensing requirements and we really have not at this stage got something that really encompasses what GridX is proposing. So that's one of the concerns that we have. The building energy efficiency standards are also something that we see state by state where there's a differing attitude towards some of those that we believe we can also encompass.

MR CRAIG CHAMBERS: Just some of the BASIX programs and Energy Star programs in Victoria: there doesn't seem to be a flexibility within those programs to incorporate some of the things which GridX is willing to offer, and we'll present those in a minute, but GridX has innovative ways of providing energy efficiency to households in an all-encompassing solution, and the BASIX programs - although there are public inquiries going into that at the moment - seem to be a little inflexible to allow all the types of different innovations that are out there for the consumer.

DR BYRON: Somebody else has made that same point to us earlier this morning, too. Thanks.

MR COLIN CHAMBERS: The next position is with grant assistance. We have for some time been looking to actually be offered the grant assistance that GridX believes it deserves. We've been speaking to AusIndustry. It's always difficult in an industry which is specific to a cause, as energy is, and to find recently that we had a person who is adjudicating on our future - it was out of the biotech industry - that had great difficulty in understanding some of the intricacies that face the energy industry, yet that is the person who is going to present up the GridX case, and I think that is going to give us great difficulty in being rewarded with that, that we feel that someone better attuned to our industry could deliver.

State grants: we've also had some concerns here. In the state grants we did cover a grant through - which was SEDA, in May of this year. We first were seeking what we believed was a meagre amount of money of some half a million dollars after the funding that we had spent. We were told in fact during that particular investigation as to the grant being offered to us that we had a very good chance of having that sustained. We found in fact that later, as we were progressing down towards June, the grant would be reduced to some $100,000, and at that time GridX had spent approximately $38,000 in preparing data for that, so it's something I think that needs to be realised, that when you are offering - and we do budget as a business - to go toward a grant, we look at how much funding we allocate to it and the reward that's due. The $100,000 on the eve of June was again withdrawn. We were told in fact that they were very sorry but there were budgetary cuts and not even $100,000 could be offered us, even though we met all the criteria.

Now to what GridX does in on-site generation: what we have aimed at is - and this is something after some seven start-up businesses that I've presided over - it became very clear that the industry is looking for an alternative that doesn't provide an ongoing lien or requirement of support by the government. In doing so, we have designed a technical solution with an innovative ability to be able to provide generation that is going to be able to be sustained over a long period, with only the early start-up requirements necessary to get some support. In doing that, we've delivered highly efficient generators to the sites. We generate the power using primarily natural gas, and we then export the excess power back into the grid. In doing so, we've provided what we believe is the most economic and technical solution to meeting the deployment and take-up of the mass housing sprawl.

The next part is with hydronic appliances. Hydronic appliances basically are probably next to high energy efficient lamps. This is probably the greatest change in the way that energy can be saved. The heat that we use that replaces the resistive elements in appliances such as dryers, clothes dryers, washing machines and dishwashing machines has been replaced with hot water which is the by-product of making electricity. So instead of wasting this energy into the atmosphere, as we see,

or in the case of large systems that are using generation, where they're using dams or fresh water in order to cool those generators, we're using that energy as a means of replacement of using electrical energy to do the same job. We have a position here, and I'll let Craig handle some of those functions that he's more attuned to than I am, in how we're addressing them.

MR CRAIG CHAMBERS: One of the things with the appliances is that the energy star rating on appliances doesn't take into account the efficiency of the energy source used. It only takes into account the efficiency. Say for a clothes dryer, say it uses two kilowatts to dry the clothes: it doesn't take into account what source of energy you've used to dry those clothes. We are replacing all the electrical elements in clothes dryers with hot-water elements, and that hot water can come from a gas boiler or a gas hot-water system or it can come from our cogenerators, so your energy for your carbon footprint for these appliances is a lot lower, and we're finding that the rule book for energy star ratings, as well as the BASIX programs and the building codes, really don't fit into this.

I think one of the reasons is that appliances are seen as a portable item and it's very difficult to rate a house with a portable item that can be moved. These products would have to be hard-plumbed, for want of a better word, into these houses, and so they would be an integral part of that house. By taking say 1.5 kilowatts out of a dishwasher, washing machine and clothes dryer, you're negating a good four and a half kilowatts out of a house, which is a substantial reduction in electricity load, moving that from coal power generation to say gas, which is a good change.

MR COLIN CHAMBERS: I might add to that that also for solar hot-water systems it's a very good use on days like today. Instead of having that water boiled off at the moment, as would currently happen with a number of hot-water systems after they've serviced the morning shower, that hot water from those solar hot-water systems could be utilised for the same job.

MR CRAIG CHAMBERS: These appliances have really been born out of what we're trying to achieve in our on-site generation where we're recovering waste heat. We're trying to make these estates through on-site generation the most energy efficient we can. For every one unit of electricity we generate on site, we get two units of heat, and instead of dissipating that heat through a heat dump, we want to use that for hot-water systems, comfort heating and these appliances. But it can also be used with a boiler.

The last one is certificates. We do qualify under the NGAC scheme for energy efficient certificates, but there doesn't seem to be a framework throughout Australia for energy efficiency. There's been some talk in conferences regarding white certificates. It would be really good for a system to be set up for energy efficiency

where certificates could be generated by companies like GridX to be sold to utilities. It's happening in New South Wales. It's an expensive process to be registered for smaller projects, say for 100 homes. It's more suited towards a larger utility. It's not suited towards the small incremental changes which GridX is looking to offer.

PROF WOODS: By "expensive process", do you want to qualify that with some actual figures?

MR CRAIG CHAMBERS: To register I think it's around $20,000, and then there's the managing process. I know organisations like the Department of Energy, Utilities and Sustainability do do that for you, but we did an assessment on what we're doing as a trial at the moment, and it was just for say $20,000, and you're saving maybe $100 to $200 worth of credits per year per customer. It's a lot of customers you need to regain just the registration fee. In saying that, I might just put through this. This is on our web site.

(Slides shown)

MR COLIN CHAMBERS: I'll speak to this, because it has captions, but it's silent. What we've been faced with is that the developers have looked for something that would set them apart, but also didn't provide any visual problems as far as giving them something that would detract away from the site over others that they may offer. So the streetscape was to remain exactly the same.

We have decided - and have gone through, to get the agreement through Campbelltown Council - to place concrete pits under the pavement and in those concrete pits we actually operated with machinery. All the machinery is generated and is using primarily natural gas as its source, and these generators are a patented means by which we can utilise all of that energy, including the heat, the electricity and chilled water; we manufacture the chilled water as well, as a by-product of the actual energy production.

These units all ventilate up poles, and these poles are the same type of poles we've got in the centre of the city of Sydney. They're slightly larger in diameter but they're aluminium poles that are used for the purposes of street lighting and also the ventilation of these pits, which are pressurised under the ground.

Each of these homes is fitted with what we call a hydronic meter box, so we actually service all of the energy into these homes and we meter the actual energy in degrees litre, meaning that in fact the litres of water that are put into the house is then measured and then weighed against the temperature it enters and what it returns to us, so we can calculate it in kilowatts. All of the services for those homes are met by the energy that we produce, including the services of electricity, airconditioning and

all of the refrigeration requirements.

The heating of the hot-water system is heated by means of separating the potable water from that that is used by a heat exchanger, but it uses the hot water that's the by-product of making electricity. The airconditioning systems in these houses are all using chilled water or hot water that we generate out in the street.

All of these systems communicate with each other in cells. The patent we have is over what we call a cellular grid. Each cell has between 20 to 50 homes in it and that determination of how many homes are in it depends on the socioeconomics and the actual demand for refrigerated cooling, primarily. These systems communicate under a global controller and the practical number, for these to be as a cluster, is not less than 100 homes.

The systems all are communicated back to a base. This base is currently in our Newtown office, and we then provide the reliability and dispatch the systems only as according to the load. All of the bills that are then generated are bundled and then generated in service back to the homes. So we don't put any cash imposts on the developer, nor the home owner, and we in fact are discounting the actual cost of energy consumed to all of the householders.

The discount is in the order of 10 per cent. That 10 per cent is as long as they're using the appliances we have. If they don't use the appliances we have, they get still a 5 per cent reduction over the published tariffs in the neighbouring region. So we think it's one of the first offers where we're not putting any requirement of an extra cost to have something which is a lot greener, and we are also paving the way for any technology that may move down our space, including fuel cells or PVs or wind. We are willing to integrate any of those if it becomes commercially and technically viable as an opportunity. That's where we finish showing that.

MR CRAIG CHAMBERS: That's just an overview of what GridX is doing. We are in the process of doing a trial at the moment in the Campbelltown Shire, with Mirvac Homes. Mirvac will give us 1000 homes. We have a contract for that. We are putting this submission here. We've got, I think, about 16,000 homes already in the pipeline of developers who are interested in doing this. This is not something that is a pie in the sky at the moment; it's something that we are doing. We'll have people in these houses on a pilot project in the new year, and expect to roll out commercially towards the end of next year.

DR BYRON: That was going to be my first question, because this sounds absolutely fascinating. From the submission, there was a lot about the promise of what it can do and what it will do. But you're just getting to the stage where you've actually got people living in these houses and using these appliances and getting their

total, all-inclusive utility bills and so on?

MR CRAIG CHAMBERS: We're going through the civil works now for this site out in Glenfield, for the Campbelltown Shire, and the people should be in the houses in May of the new year.

PROF WOODS: Can I just clarify. You talk about installing three natural-gas-fired systems. But if you're talking 50 to 100 homes per system, that's not the 16 dwellings that you then talk about; I can't reconcile the two things.

MR CRAIG CHAMBERS: The initial trial is only 16 homes, so you're looking at one cell. We try to localise the hot-water network and the cold-water network, but then we bolster the cells by distributing electricity, so it's a honeycomb. But each cell will have around three generators, depending on the distance between the houses, the size of those houses, how many bedrooms, the heat loads, the electricity loads of those houses; so we'll size the generation to the actual load requirement of the houses.

PROF WOODS: Presumably you're doing common trenching, so that's saving costs there, but the cost of putting piping - insulated piping for your chilled and hot water and - so you've got electricity, which would happen anyway; you've got your gas which would happen anyway. Presumably they're connected to the town water supply separately anyway. So in effect you're putting in a fourth pipe, which is your chilled or hot water?

MR CRAIG CHAMBERS: Fourth and fifth.

PROF WOODS: Fourth and fifth?

MR CRAIG CHAMBERS: There will be one dedicated for hot, one dedicated to chilled.

PROF WOODS: Okay. Sorry, yes. That answers the other question of how do you change for variability, but you've solved that. So you've got fourth and fifth pipes, so there's extra capital cost there with energy saving. What's the ratio? What's the payback for that?

MR COLIN CHAMBERS: I think I'll answer that. This has come from about 12 years of adjudicating on exactly that question. The situation is that any deferral of capex that's necessary by the builder to endure at the moment as part of his side of the ledger in building and development is to the account of GridX; that's in our contracts. So when the electrical cables are put past the house they pay, what, $3100.

Because we defer the need for the airconditioning plant to be in the passageway of these homes - which has always been a difficulty for them, and also the noise for the neighbours - should they choose not to have an airconditioner, we do away with that. Between those two items we save $3800 worth of costs in the airconditioning; $3100 worth of costs in the actual electrical services; we save $270 only on the airconditioning requirement. All of that is paid to GridX. That goes a long way towards paying for the capex requirement for us to put in the services as required to provide that particular application to those homes.

On top of that, for any other services where - and we've looked at these, where they have been run in the Netherlands and there are numbers of applications happening in the UK at the moment. The difficulty a lot of them have is that there's been a lean towards people putting an appliance in their home in a stand-alone application, very much like the solar village out here. The difficulty is to get all those persons to cooperate. The further difficulty is, how are you going to - if it's solar it's very different, but if it's a gas-driven appliance, you will pay the retail price for your energy - for your gas. Collectively we're able to offer and buy at an industrial price for a whole of an estate. So the economies of scale come into play only when we own the assets because we can buy them in bulk, we can buy the fuel at an attractive industrial buy price and we can then collectively decide the actual export of that power.

The benefit that also gives us is that the export of power during the time when those persons have gone to work is one of the most attractive periods for us to be able to provide that exportable commodity. Because these homes are all on community or neighbourhood title, after GridX has recovered its capital involved in this process we will also have these parties on those estates be part-beneficiary to any of the carbon savings, any of the exportable power and opportunities to be able to have discounted energy.

MR CRAIG CHAMBERS: One of the other things about the airconditioning: a domestic reverse cycle airconditioner has a coefficient of operation of around 1 to 3, so for every one unit of electricity you're getting three units of chilled out. For our centralised plants we're getting COPs of between 8 and 10, so you're getting a lot better energy efficiency out of a centralised plant for a whole lot of houses. You're reducing the noise of having the compressor in the passageway of these houses, so you're getting the added benefit of having a more economical chiller.

PROF WOODS: So is that factor of 10 at production point or after transmission loss back to the house?

MR CRAIG CHAMBERS: At production point.

PROF WOODS: What's the transmission losses?

MR COLIN CHAMBERS: By the time we get it delivered, when we take the losses in for the pumps and transmission, we're down to a deliver-to-the-home just above 5.7. So we're more than double the efficiency of the best inverter style airconditioner.

PROF WOODS: Okay. It's just that 5.7 is different from 10.

MR COLIN CHAMBERS: Yes. 5.7 is the average delivered COP at each home.

PROF WOODS: Yes. Thanks. That's the relevant figure.

DR BYRON: Would this work better in a sort of denser population than if you've got houses on quarter-acre blocks?

MR COLIN CHAMBERS: When you get to acre blocks - and I've looked at this via my cousin who is on the land and they're just dividing their homes up in Bathurst into, I think, something like 13 or 14-acre lots. They're already looking at cost of establishment in the order of $15,000 up to $30,000. Now, wherever those costs are, it's something that we can build into an opportunity, and look at those. All of the estates we're seeing that are going close to capital cities are all attractive for GridX. Anything that's on a radial line where there is a possibility of the developer not being able to service that estate with the essential services of power, sewerage and water, it's an attractive opportunity for GridX. We think that probably the last stage will be going down into built-up areas where we're providing a refurbishment program, but we can definitely defer the requirement of energy into all of these new satellite cities - - -

DR BYRON: It would be cheaper to service 100 apartments or 100 town houses, rather than 100 conventional - - -

MR COLIN CHAMBERS: Yes, it would. That's right. Conventional homes are fine, but the conventional homes on these estates that are in the city area now being built are ideally suited to what we do, but the next most attractive would be apartment buildings. We decided to go for greenfield housing estates first, primarily because there is a little longer term in roll-out for us to get everything right and, quantitatively, the faith that would be necessary for people to vary apartment buildings at this stage: that we wanted to prove our case on that, that we felt more comfortable with it.

MR CRAIG CHAMBERS: In saying that, we are being approached by some commercial operations. ING Real Estate Entertainment Fund has approached us

because they're not being able to be serviced with enough energy within the Kings Cross area with their Bourbon and Beefsteak hotel and they've had an area there that they have to put out to the substation, and they're looking at on-site generation. They have a fairly high heating load, they aren't being able to be serviced with enough energy in that area, so they're looking at on-site generation as well.

PROF WOODS: Is that just the substations and things have reached their load and so, therefore, they've got - - -

MR COLIN CHAMBERS: I think there are a number of factors coming in. For a company like ING, which is an insurance company, a finance company, it's the OH and S concerns where they're operating the premises, where they've already been told by the authorities that the supply can't be sustained. There is the land that they must give up for the substation and also there is the trading loss should there be an interrupted supply. But OH and S is becoming a primary concern for people where they've got large opportunities for persons on their premises, where they might be all plunged into darkness with maybe some exit lights only, which may not be adequate for the purposes of supporting an exit from the building safely.

PROF WOODS: Okay.

DR BYRON: The GridX system still has to be connected to the existing electricity grid?

MR CRAIG CHAMBERS: No.

DR BYRON: But if you want to be able to sell peak power during the day back into the grid you have to have some connection to it.

MR COLIN CHAMBERS: We're seeing a number of estates now where the service to provide the supply is not adequate. So should there be a supply there, we only want to export. The reason for that is that we would have all of the cost associated with the transmission service and the transmission service would have to be adequate for our purpose at the gate, and we'd only take from it on an as-required basis, which would be unattractive to the network owner. So we only want to be able to provide an opportunity to export at this stage.

MR CRAIG CHAMBERS: In saying that, these inset networks, there are some developers that want to have that choice of the mains grid. If, say, Mrs Jones, for example, wanted to have her energy from Energy Australia, then there are two options: Energy Australia run their own cable to Mrs Jones' house or they use our distribution network and pay us a charge for that. But we are finding that throughout the legislation - we've spoken to IPART and to the SE in Victoria. They've both

confirmed that inset networks are something that can be done. They're grappling with the choice factor if choice isn't available in the retail choice for customers.

PROF WOODS: What does "grappling with" mean? Does that mean they're favouring, or haven't decided, don't know?

MR CRAIG CHAMBERS: Well, if the choice isn't available, if it's an inset network where you cannot have any other energy than from a GridX system, then that's all they can have. So where the act says customers must have choice, if choice isn't available, then what was decided - what's been the discussed between IPART and ourselves is that when a person buys a home on, say, a Mirvac estate that has the GridX minigrid on it, then they will be making their choice for their retailer when they buy that house and land package.

PROF WOODS: Okay. It's locked in.

DR BYRON: On the hydraulic appliances, those are readily available now?

MR COLIN CHAMBERS: Yes. We are pioneering that. GridX has the ability to be able to manufacture and have manufactured the products ourselves, but we are now looking to partner with some principals in order to be able to meet the obvious demand that we can see that will ensue. We have patents over it for Australia only and at this stage we're looking to seek the level of interest necessary to meet that demand. I would say that's the stage we're at now.

MR CRAIG CHAMBERS: It's only that we'll be putting it into these 16 homes in this Mirvac estate - Mirvac trial - and past there, hopefully we will raise the interest of both regulators. I think companies such as Rinnai are very interested in pushing the energy star ratings at no extra cost to the developer as a marketing strategy for these types of products. It's a good fit with the Rinnai Infinity product, as well as these appliances, to be given as a package to the developer as an opportunity where they can get the extra points without actually paying any extra for them. These appliances won't be any extra. We'll probably be able to provide them cheaper than the electrically driven appliances.

PROF WOODS: And maintenance and repairs and spare parts?

MR CRAIG CHAMBERS: That's one of the reasons we want a partner with one of the larger organisations like Rinnai, Whirlpool.

PROF WOODS: Yes, because if I was a householder I'd be a bit concerned about being locked into something where there is only one supplier of it.

MR COLIN CHAMBERS: There shouldn't be any more maintenance required, I don't think, than a standard system and perhaps less.

PROF WOODS: You say GridX wants greater incentives given to builders, home owners and innovators. Just what do you mean by that? I mean, what's the incentive beyond the fact that it's going to be more profitable and they will make more money? Why do you need any other incentive?

MR CRAIG CHAMBERS: I think anything new needs a little bit of a shove along and that's where I think government comes in. Government needs to be there for the incentive to be given for an adoption of these type of things. Developers are fairly risk averse, they don't understand the energy industry, and for them to be given an incentive to then build a level of comfort - that's not saying that GridX feels that it needs a subsidisation going on, but it would help to have, say, in the appliances, some kind of incentive for developers to put these types of energy efficient appliances in.

PROF WOODS: Does that mean taxpayers are paying developers to provide these services? Is that the sort of incentive you mean?

MR COLIN CHAMBERS: I would rather frame it in a way that it will defer the capex and the taxpayers' burden if they don't, because we're trying - I mean, the campaigns that have been afoot now for energy efficient lamps has been around for a long time and the maximum that you're going to save on the average household would be 300 to 400 watts if you adopted it totally. This is something that saves six kilowatts of energy into a house.

We have already done a submission into 1000 home applications in the ACT with Mirvac and the deferral - even when you take a diversity calculation into account, it's four megawatts of power in that home site. We think with the level of push that has got behind energy efficient lamps that this is something which is markedly different and it is something that needs to be exposed in order to give those developers that are adopting something here, which are not - and I think the beauty of this is the fact that it's not going to mean that in fact you are going to pay more for something that is going to be of benefit to the taxpayer overall - that will defer the requirement of network augmentation that is already under stress.

PROF WOODS: So have you quantified the size of this taxpayer grant that you are proposing? I mean, how big? What size are we talking about?

MR CRAIG CHAMBERS: We're looking for a grant from AusIndustry and the Commercial Ready grant for $1.5 million. It is, we have been told, a six-month process to go through. GridX is a fairly small, nimble company, but six months is a

long time for us to go through that process. There are a lot of dollars involved in that process. We've been given a case manager who has no understanding of the industry and so therefore it's a lot more time for us to school her up on the intricacies of the energy industry and where there are failings and it's something that we need to really be mindful of where our shareholders' money is coming from. We have had no government assistance to get us to this point and it's something that we have been given grants and they have been taken away from us because of budgetary constraints from the government. It's something that we would like a clear path forward from government.

MR COLIN CHAMBERS: I think there is another part to that, too, that is going to give anybody who is going to look at granting - and it was only delivered to me in this last round where we basically spoke to AusIndustry, and that was the fact that they expect that the entrepreneurial spirit is going to be able to time the funding to match the grant. In the past there was some retrospectivity offered, so that if we were - and it's no easy task in attracting 2 million or 3 million dollars to a cause like GridX, especially as a private company where they are locked in with their money until you either float or sell the company, so it's a large ask, but it's a larger ask to get your timing, so that your timing that money to get the maximum benefit from the matching funding being offered, and I think without having any retrospectivity - I can understand that they can't give a carte blanche, but I think that there should be some leniency for at least a quarter - that gives you the ability to be able to have some level of retrospectivity. I could understand from the commercial aspects why an accountant might decide that, but the practicality behind that is an impossible ask.

MR CRAIG CHAMBERS: Not only that, but I mean we hear things in the paper that there's 30 billion required for the energy infrastructure. If GridX is given a measly drop in the ocean of a million dollars we could move from the stress electrical assets a lot of the energy load over to the gas assets, which are underutilised - - -

MR COLIN CHAMBERS: During the summer period. It's one of those positions, I think, that we have been applauded by Campbelltown Council and the mayor there - it took us a year and we funded it all the way through - all the legal challenges that were put, getting that to occur. It got through to a final contract.

PROF WOODS: Who submitted legal challenge and on what sort of grounds?

MR COLIN CHAMBERS: Basically from all of the councillors and the council itself to be indemnified against any risk assessment. We had to go through an independent risk assessment, independent engineering studies on what we did, and then through a contract now with the council, and then we have to put up the actual levels of surety against any claim that may be there, so GridX is going through these

costs that in fact, on being successful here, we are really helping the state and federal governments in their ability to sustain that ongoing path of energy as the actual people are taking up home sites especially in the actual rims of the Sydney to the Blue Mountains area.

DR BYRON: Is this just natural caution on the part of councils or is there - - -

MR CRAIG CHAMBERS: I think it's a bit of both. Councils are inherently slow and conservative. It has been something that has been good that we've had Mirvac behind us. If we didn't have a big name like Mirvac I don't think we would have got through council. Mirvac has a fairly good relationship with council and we got to meet the mayor and present the idea. The mayor in fact two weeks ago put a press announcement out in the paper, so I think for him it is also a vote winner - anything emotive like this - but it's not something that has been an easy process. Although he puts his hand up to say it's great, the whole process has taken a long time.

DR BYRON: Has marketing of this begun. I mean, are customers already queuing up, interested in living in a residential development that has this sort of hard-wired into it, or is it too early to say what the consumer demand is going to be like?

MR COLIN CHAMBERS: Are you asking me what the demand is like now to sustain that?

DR BYRON: Yes.

MR COLIN CHAMBERS: The demand is there where GridX needs to be. GridX can probably do one more developer well. If we were to spread our ability over the amount of opportunity that sits there with the available cash we've got today we'll fail, and something basically in my business life tells me in fact that we should keep it tight until such time as we do that. The only thing that is really holding us back is funding and the funding that we're seeking is very - we believe is something that is not spreading it too far past where the initial opportunities are, but this is something that, Australia-wide, we have an opportunity to operate but, until we are appropriately funded - I mean it is going to be something that we'll be held back in probably one or two estates - - -

DR BYRON: I guess what I was getting at is that a number of people have told us as we have been going around that a lot of households aren't particularly conscious of, or even interested in, being more energy efficient and so I guess my question is, are there people out there who are already expressing interest in being one of the owners of one of these houses here who have this package of services that is not only environmentally preferable, but is also going to deliver them a real cost-saver?

MR CRAIG CHAMBERS: We haven't got to the stage with the 16 homes as yet where we are actually marketing to the customers. We have to go through the Mirvac track to make sure that we are aligning with what Mirvac's vision for this is, as well as what GridX's is. We are only now going through the civil works for this estate, so it will be in the coming months that we'll be marketing these to customers. This trial will win only on the customers feeling comfortable with this in their houses.

I have been speaking to one of the marketing managers at the display home village for Mirvac and she was saying that people don't really understand what energy efficiency is all about. They don't understand what water conservation is about. She said one of the biggest push-backs for water tanks on people's houses was that the wife didn't like washing her clothes in rainwater. She didn't think it washed the clothes properly. These types of things. People really haven't come to terms with where all this comes from.

They don't understand how if they turn a switch on it comes from somewhere. There's a lot of ignorance in I think the wider community about how energy actually gets to the customer and, by GridX putting generation on the estate, it's putting that in their face, and we will only win if the customer feels comfortable through this and that's what is in our contract with Mirvac. It's not the technical viability. It's not the economic viability of this. It's whether the customer has a smiley face when he walks into a Mirvac estate with this system on it.

DR BYRON: So you have got to go from a position where they are either apathetic or even hostile to a position where they are actually positive, in support of it and proud of living in an environmentally beneficial and more energy efficient environment.

MR CRAIG CHAMBERS: I think that people in these 16 homes will have to be transparent that they are part of a pilot project and I think we will get a cross-section of people who are interested in energy efficiency and conservation. I think once it grows out into the wider community we'll have to get a lot of feedback from these 16 home owners and then move forward, so there will be a lot of market research throughout this whole project.

DR BYRON: Yes.

MR COLIN CHAMBERS: I think they have even passed that - two things I have been told by the developers. They said that 20 years ago there was no understanding of energy efficiency. They're telling me now that in the order of 14 per cent of the people who are coming through the door are keen to know just what is in their homes that is energy efficient.

I think that the education program for a lot of these people that are younger, coming into these homes is definitely something that they want to know. Just by comparison - and I think this is something the education process hasn't reached - I asked my mother, who is in her 80s, and my father, "Where do you think the energy comes from?" They said, "The hydro-electric scheme, of course," because it has had such a focus. They don't consider that in fact it's off coal - until you go off to the coast and see the stream down. But I would suggest to you that a lot of the population would still think here - especially the older population would still think - that it's coming out of something like a hydro scheme. I can understand why that situation may be upon people, and our largest exporter of anything out of Australia - and was a shareholder in our last business - is Mitsui. The largest export we have from this country is coal.

So we understand that that situation is something that's an impact position, but I think I should say something else here, that when we were looking to seek out a developer, we spoke to the Campbelltown Council last. We spoke to the actual Blacktown Council, and we spoke to the Hills Shire Council, and they were telling us - very, very common was the answer that they were told that there wasn't enough energy to sustain the development that was moving ahead; that they were either going to be looking at the opportunities of being involved in either brownout or blackout conditions in the future. Already we're seeing that in states in South Australia. We're already seeing it up the coast in the central coast areas. It's something that has also been very, very prominent right throughout the east coast of the United States, where the actual application is something that people want some security in buying a house. We do know that it's not there yet, but not far away is going to be the duty of care when selling a house and land package, to give some surety behind the essential services, and I can see that there will be things that the court - the developers are already seeing this as part of the future, that they will have to make some statement about the security of supply of electricity, sewerage and water.

MR CRAIG CHAMBERS: I don't know if you saw 60 Minutes last night. There was a good 20 minutes on the wind industry and wind farms going out into nice, beautiful, pristine country land, and there was a big backlash from a lot of the farmers having to have that type of infrastructure in their backyard. I think the presentation tried to remain objective, but it was pushing towards these infrastructures would ruin the countryside, and this is what GridX could be up against also: that people don't understand that energy is generated from coal. These types of solutions have to fit in around our lives. Coal is affecting the climate and it's affecting people, and I think it's something that we have to build awareness of.

If the government could develop some kind of awareness-raising, that would be

really good for both the wind industry and our industry. By bringing these technologies closer to home, people have to have a change in the way they're thinking. GridX has taken away the financial burden, but there is that infrastructure close to their house, and that is a mind-shift for people. People don't want to change, it seems like.

DR BYRON: You've mentioned the MRET and renewable energy and so on, and in your submission you talked a bit about energy efficiency white certificates that come out of a national energy efficiency target. Have you thought any more about how that might work, because one of the things that has occurred to us is that energy efficiency - how you measure it - depends on what you take as the base for comparison. Because you talked about the costs of getting into some of the other schemes, would you be worried about the costs of being involved with a white certificate trading scheme?

MR CRAIG CHAMBERS: I think a lot of these schemes are suited towards large chunky savings, and GridX - if it comes with its hundred homes - is a small - although, you know, we are trying to make an incremental change in what we traditionally use, which is coal. I'm not sure what a lot of the other schemes used internationally for this type of arrangement, but I presume it's what the alternative is in that area. If it is coal power, power stations. If it's brown coal in New South Wales or black coal, then that would be the alternative. If you're using gas - then you need to look at what - I mean, I can't think about it. I'm sure there are a lot of schemes in international arenas where this type of arrangement is already working.

MR COLIN CHAMBERS: Germany, for example. You know what's happening there. In Germany, for example, any parties that are putting in cogeneration products get a rebate of the order of 23 per cent of their energy bills.

MR CRAIG CHAMBERS: How that's calculated though is - - -

MR COLIN CHAMBERS: But it's in the order of 23 per cent. That's a saving. That's an incentive for those parties to actually invest in those products. What GridX is doing is we're bearing that burden to basically provide that with the least amount of requirement of any intrusion into the homes in order to operate these, and we believe that those home-owners that have got this, even though we're offering all the incentives - we're offering the reduction in the supply costs - but we want, I suppose, some initial support, in order to make sure we've got a larger impact in this market than something that we're able to sustain today.

MR CRAIG CHAMBERS: I think the point was more not so much the how, but the what. We already have a REC scheme for renewables. It seems that the lowest-lying fruit is the energy efficiency, and the renewable energy is down the path

a little bit more. It's not there yet. It's not commercial yet. GridX is providing energy efficient holistic estates, and it would like to enjoy - like the renewable industry does - in a certificated framework.

DR BYRON: I'm sorry, but I think we're going to have to leave it there. But thank you both very, very much for coming. It has been fascinating, and I look forward to hearing a lot more about GridX in the future.

MR COLIN CHAMBERS: Thank you.

MR CRAIG CHAMBERS: Thank you.

DR BYRON: Thank you very much.

PROF WOODS: Thank for the time you've given us.

DR BYRON: Let's continue. Next we have Mr McGregor. If you could introduce yourself for the transcript. The normal format that we have here is if you can summarise or highlight the main points in your submission, which my colleague and I have read very carefully and then we have some questions that we would like to ask you, to elaborate and to draw out some of the points that you have made. Thanks very much for coming.

MR McGREGOR: Thank you. My name is Paul McGregor. I have a consultancy firm called McGregor and Associates and we primarily operate in the building services and energy efficiency areas and energy management. But my role partly for coming here is to illuminate on that area but also the schemes that were available in Australia a few years ago which we called in Australia the CADDET program, which I thought was beneficial to Australia. We exchanged knowledge around the world on our energy efficiency techniques but also learnt from others in that area and I wanted to illuminate on those particular areas of particular benefit, if it was possible, please.

PROF WOODS: Please proceed.

MR McGREGOR: That was under the implementing agreement for the Energy and Environmental Technology Information service, which is international in aim today. The name CADDET we kept in Australia because we felt we had done a lot of work in getting that up and making it an identifiable name. To go and change it to EETIC a few years ago would have been much harder to accommodate something like that. The other one I was going to illuminate on there was also the heat pump program which also is another IEA program and has correspondingly other efficiencies in there.

When Australia withdrew from the CADDET program the investment for Australia was, from what I understand, about $600,000 per annum and I think I have illuminated some of the costs - well, how that was distributed - in that submission. If not, I can probably go through it again. The main part that I felt was missed on that submission was that the return on investment to Australia was potentially there in a number of different focuses. One of the things that I got into the CADDET program was a pyramid skylight that Skydome Industries had developed with the Queensland University of Technology and that was written up in a similar one of these colour brochures and Skydome really liked that.

They took a few free copies and then they said no more free copies, so they went and got copies of the plates from the Netherlands and used it in advertising here in Australia and overseas. From what I understand they were getting sales overseas in excess of 100 G's so there was a return on investment to Australia already at that time. At the last national team CADDET meeting we had in Brisbane, one of the things I said was one of the great strengths of CADDET was that people could get in

contact directly with each other because their names were on the back of the brochure and they didn't have to go through a third party. That meant you could sort of kill all the false factors - yes, you could talk directly to people and get the facts.

These things were all the good stories and you also wanted to know what the limiting factors were, and I thought that was good. But therein lies also its greatest weakness, that we didn't know how many people were contacting each other. At the last national CADDET meeting, when I went through Skydome Industries' things, the Northern Territory representative was the engineer at the Northern Territory University and he said, "Well, I'm going to a meeting of the engineer that designed our chilled water storage system because he has had an inquiry from a Middle East country to put in a submission for the chilled water storage system in this Middle East country," which reputedly was the largest one in the world at that time.

Where did they get his name from? It was written up in that article in CADDET, which is also in the CADDET result sheets, and they got his name from the back and they were asking him for a submission. The fees out of that would have been at least 100 G's - $100,000.

DR BYRON: Were they successful, do you know?

MR McGREGOR: I don't know. I didn't follow that up. But even to get the inquiry would have been that half the work would have been done. The biggest problem usually to get a job is getting somebody coming to you to ask you to put in a submission. So even if he wasn't successful, part of the thing was that there was the potential there. I looked on that as there were potentially two areas of return on investment to Australia from that sort of area of work. The other one - in the CADDET scheme they had a whole range of things; they had these results sheets, they had the normal database that you could look up. We had these maxi-brochures that were freely given out.

The other one was what they call the analysis series books and this one here is Learning from Experience with Energy Savings in Schools. This is written overseas but the photograph on the front there is from an Australian entry that was in the scheme and that was written up and mentioned here in this article. So it gave Australia opportunities in a multi-faceted sort of area and these were quite good. The other part for Australia is that we could get all these books and learn from what others had done, equally as others had done from us. They covered a whole range of technologies. In the additional book I have given there today which I didn't send through before there is a list of the maxi-brochures and a list of these books and the technologies they covered.

Mainly it shows ways that often you get - a bit like GridX that have just left

here - many in Australia want to know if it has been done before. You know, how many times has it been done before? Has it been done anywhere? Then you have to get through the problem of has it been done in Australia. The thing is, if it has been done you can say, "Well, here it has been done by these people and this is how it has been applied. This is what they have done." These analysis series books went through a lot of those processes where they could help get through the process of getting over the hurdles in applying technologies - new technologies, different technologies.

That's where I think Australia has sort of benefited from these participating in what we call the CADDET program and learning from those experiences from others. Equally others learn from those. That's what I think it had in that article there about those cartoons I had done about building better wheels instead of reinventing the wheel. I go through that frustration on many a day myself, about people always wanting to reinvent the wheel and the waste of effort in doing that.

DR BYRON: Just for clarification there, the EETIC is still running?

MR McGREGOR: EETIC is still running.

DR BYRON: Australia is not part of it?

MR McGREGOR: Australia is not part of it. We withdrew in 2002. Notice to withdraw was in 2002 and we actually officially withdrew as of March 2003. So the CADDET program, the EETIC program, the GREENTIE programs are still functioning. Their Web address now is just caddet.org - not .ee, .re. I illuminated there they were going to combine the energy efficiency and renewable energy sides. I went and looked on the Web and they have done it in very, very recent times. So yes, it's still functioning. There are still a number of countries involved in it.

DR BYRON: So Australia's withdrawal - I'm sorry, we're moving into the conversation part now - that means that we no longer feed Australian case experience into the international arena?

MR McGREGOR: Yes.

DR BYRON: Can we still get access from the web site and so on from what everybody else in the world is doing?

MR McGREGOR: Yes, we can still get access to that. What we miss out on, though, and it's not part of the original submission but one of the things that I put into this, and this is at the back of this other one here - when they talk about the Internet in 1999-2000 and they talked about the number of hits they had on the web site in

that time, and at that stage - it says here in this report from the international CADDET program - the most popular technical brochures in PDF forms that were downloaded, the number one with the result of 954 times downloaded was an Australian entry on energy efficient cold storage. So Australia took the top in the downloads.

Our inputs into the CADDET scheme were pretty bad. We didn't get a lot in but we obviously got some good quality and recognisable quality. So the most popular newsletter article in PDF form downloaded was "Energy efficiency in Australia" - 160 - an Australian special, and that was in this year that that was downloaded - the most popular. The most popular energy efficiency register entries on-line downloaded was "Energy efficient housing Australia" - 442. The next closest was 202.

PROF WOODS: When you take these issues up, what response do you get?

MR McGREGOR: In Australia?

PROF WOODS: As to why we're now no longer signatory to these programs? Cost-effectiveness or - - -

MR McGREGOR: Well, I think the cost-effectiveness wasn't even part of the argument in 2002. The DITR were asked to make budgetary cuts and the budgetary cuts came in, with respect, in areas where energy efficiency wasn't in the top pile and resources were in the top pile. So the resources got the majority of the funding, because that's where our income came from. When you see energy efficiency it often was not accountable in the DITR's basket because it probably came into another basket.

It's almost if you put the funding for CADDET into Austrade, you might have found it would have been more recognisable - "We're doing this and we're getting these returns; this is good," but the DITR weren't in that particular area. This is unfortunate. I still get many inquiries about - "Can we get this information?" and as I say to people, "You can get the information on the overseas entries," and they're still going in but the ones that were coming up for Australia are no longer there. I'm just looking for the other ones. But those were just not coming to Australia's benefit.

DR BYRON: The other interesting thing from those download numbers that you just read us, it suggests to me that Australia is incredibly innovative and creative, imaginative, coming up with really good ideas that are recognised internationally, and yet one of the reasons for this inquiry - in fact it's in the preface for our terms of reference - is the observation that Australia's improvement in energy efficiency is much less than the average for the rest of the OECD. So on the one hand we've got

the evidence you just gave us about there are lots of really exciting, innovative, creative, energy efficiency things happening here that the rest of the world thinks are interesting and important but overall the level of adoption within Australia is pretty underwhelming. Is that a paradox?

MR McGREGOR: I think you actually hit the nail on the head. Underwhelming is actually probably putting it a little bit of good light on it. I just think it's abysmal. I'll give you an instance of that and what you say - and this is similar to GridX who just left here - is a colleague of mine - one of the things I went looking for in the CADDET thing was to get entries into the CADDET program from Australia and we in Australia, when we were doing it, wanted to get excellence all the time. We want to dot the i's and cross the t's and we took a long time getting the entries in. The Europeans and the Americans, "Gee, it's up there. Let's get it in." So they are promoting themselves.

An instance of that was a few years ago we had the manager of the CADDET renewable energy centre came to Australia and we held a little seminar for him over at the Department of Energy's offices in St Leonards at the time, and we called it a conversazione. It was more than a chat but less than a seminar. So we had this conversazione for invited people on wind and all those sort of things. The people in Australia were interested but they said they couldn't get the things up and couldn't get them going, and it wasn't long after that that one of the renewable energy brochures came back, similar to this thing but they had a green part up the top there, and there were two entries from the United States about the use of photovoltaics for generating electricity in rural areas in Honduras, and I thought it's okay for the Americans to put that in; they are close to Honduras, that's in the Americas; I can accept that one.

The one that didn't seem acceptable to me was the use of photovoltaics in rural areas in the Philippines submitted by an American company - an American entry, and they were getting the benefits from it. Australia had sort of done them there but we hadn't been active in getting it through. We were hesitant because we wanted to make sure it worked for the next 20 years, and after 20 years we would make sure it would work really well. Meanwhile the opportunities are gone, and then the other one that really grabbed me - and this is more common in Australia - there was the use of thermal energy - solar energy for heating a swimming pool in Norway. Australia didn't have a commercial swimming pool heated by solar at that stage, but Norway had one and they don't have sun for quite a lot of the year, but they had done these things and Australia had these things, but we hadn't applied them.

Our use in photovoltaics is very, very high. We are exceptional in that area. Yet we have been hesitant about illuminating our goods and that was one part we found about getting the things out. The other part was in Australia, as I said before, we want to make sure it's been done before and it's been done quite a number of

times before and everything like that, and this colleague of mine from South Australia, when I went looking for things - it was in the airconditioning side, and he built this indirect evaporative cooled heat pump and they built it for ETSA in South Australia, and it had been operating for quite a lot of the time and got some very good numbers and everything like that, and ETSA had used it but Australians didn't want to take up the technology because, "It cost more and our return on investment in energy has to be recovered in two years and our energy costs are low, so we're not going to go into that area." He got more interest overseas in that technology.

PROF WOODS: Is that one of the drivers, the fact that our energy costs are low?

MR McGREGOR: It is. It has an impact on there and Australia's focus - I was just putting down some notes for the GridX part - is our focus is on energy costs in the first instance. Another instance of that - and it's rather sad, this one - I did a job, let's say for an institution that should be doing better. We were looking at this job for this institution and they didn't want to put a cooling tower into their building. That was a problem, and then I said, "If you put an air-cooled airconditioning plant in there that is going to use more energy. It's going to have problems with noise at night and so on," but underneath this particular institution there's an aquifer, 19-degree water going underneath it, but they wanted a study done on this and so we had to put $30,000 into paying their own study group to do a study on it. It was really quite funny. We had to fund that into the recovery, and the payback on this thing - think an institution, they are going to be there for 50 years or more, and the payback on this, including the $30,000 extra for the study as an experimental thing, was seven years.

This institution had a project manager who, when the job came in under budget and everything like that on the tender process, reckoned you could save $50,000 by doing something that really killed the benefits, and they took the $50,000 saving because that was a one-year saving, but before the job was even finished it cost them $100,000 for upgrading electrical power into the building because they all wanted airconditioning and under the scheme we had they wouldn't have had to do that, but they made a $50,000 saving in one year; cost them $100,000 to do it, and they are still there - that was 1993, they are still there with the same building.

So if institutions are making that sort of look at energy costs and things like that and the recovery of seven years is too long and they are still there after, what, nearly 12 years - - -

PROF WOODS: So what are the incentives that you've got to put in place to improve energy efficiency performance then?

MR McGREGOR: That's an interesting thing. I think that what we have got to try

and do is make - particularly the other drivers these days - and I will just come back to this because your point is a valid one - that the same sort of thing with the GridX part is coming out of not so much energy efficiency but energy demand. If you look at the growth in our electricity usage it's quite high and our generating capacity is going down - it's not going down but we are not increasing it, yet the demands for it are going up; equally the infrastructure that delivers it also is being stressed.

So what we need to do is look at methodologies - and this is probably coming from utilities and the like - to fund, almost, these energy efficiency techniques for their benefit because you can then offset the upgrade to facilities, upgrade to the generating capacity because you've got energy efficiency techniques built into the places. So you reduce the demand and reduce the usage. Sometimes you can do demand management things without energy efficiency, but the two can come hand in hand, and they can give you quite enormous benefits but the capital cost might have to be assisted to get over that little hurdle of Australians looking at maybe a two or three year payback, because in Europe and other places their energy costs are three to four times what we are - even the US. We are only around about 60 per cent of the US energy costs, but they are doing it; they're doing assistance. So what we need to do it probably more assistance to get over some of the financial hurdles of making these things attractive.

DR BYRON: You talk quite a lot in the material you have given us about the first-up cost bias and other people have spoken about that to us also, but does that only apply to energy efficiency or does it apply to other areas of business or to construction where people commissioning major projects are only interested in the lowest bottom line at the outset, and they are completely blinkered in terms of longer term recovery costs?

MR McGREGOR: The blunt answer to that, in the main, is yes. I think it's a philosophy that Australia needs to sort of try to educate ourselves out of. I may well note here - and I just said - awareness needs to be made of energy efficiency, but also good practices. I did a job on a project for a client back in 1982, and I describe it as the best and worst job we ever did. It was the best job because we were involved at the third coordination meeting; we were with a client that was driving it. He was interested in getting good outcomes and we built a damn good Holden. Because we built a damn good Holden - didn't build a Rolls Royce; built a damn good Holden - the job came in under budget and under time.

We were interested there right at the beginning; we stayed right through to the end. We put a lot more effort into the design - you know, getting the things right - and the job came in under budget, under time. That was 1982 and NEPC left the country here in 1999. They sold all their properties to AMP, but they were still working it then, and it was still working as a good place. Part of the problem -

coming back to what you said - the first cost was part of their exercise, but they didn't go for the lowest first cost. They went for a reasonable quality first cost that built out problems that they foresaw, as an owner, that they were going to be sort of operating with.

A lot of times our developers - and it's not just developers; I just mentioned an institution that's done a similar sort of thing - don't get over that first hurdle about looking at what it is going to be working like in five years' time, 10 years' time, 15 years' time, whereas in other places they're interested in the longevity. You know, the replacement cost might be greater, the repair cost might be greater than the first cost and philosophically we've just got to change that. I just said here awareness needs to be made of EE. For example, 20 years ago you chopped down a tree and nobody worried, but today, people take more concern about chopping down trees. That does not mean to say that they still don't chop down trees, but there is a greater awareness about the benefits of it.

I don't think we, in this country, have been sold on the benefits of forward planning, whether it be for energy efficiency or longevity of the product or anything like that. I am sorry to say it, but it's almost a cultural thing we've got built in there, that that is not important. There are a lot of people around who do think like what I'm saying - probably like yourselves - but the awareness of the benefits of long-term planning are often not there and the benefits you can get from long-term planning. Energy efficiency can come out of good planning - as a result of; it becomes part of the process. It doesn't have to be dragged along as one of the things that you're aiming at, but good design, good practices often result in good efficiency.

PROF WOODS: But I guess the question is: does government need to do something on behalf of the economy as a whole, or is it just a progressive education campaign? Or do we have to wait until energy costs go up, or do we sit here and say it's not happening but that doesn't matter? Or do we say it's not happening, it does matter and something should be done? And if so, is it a market thing, is it a price thing, is it a government thing?

MR McGREGOR: That's a good question. Why I like the CADDET part is that in that we could give examples of what has been done. Sometimes in Australia, the best examples of what would be done is often practised by governments in doing some of their process work, some of their building work, some of whatever their processes are. But some of the projects that have been done by government unfortunately often have come back to first cost. So, you know, the sainthood part is not always practised by government.

That, to me, is rather unfortunate. It's often sort of a dollar then comes out on top. You know, you come through about what is going to be done, whether it's going

to be done as a good process, but just somehow it gets lost because the dollars didn't come up in there. If governments should show by example and by doing, then they can not just mouth the words, but put in place the actions and then there are good examples from that being done.

DR BYRON: Just to build on what Mike was saying - that if the government decides that there is a problem and there is something the government needs to do about it, then the standard measures they have got are sort of information dissemination, extension and so on about using market incentives and financial penalties and rewards, or regulation where you just require mandate; certain things are banned or compulsory - if we get to the situation and agree that there is something not quite right in the area of energy efficiency, and if we were then to agree that governments need to do something to address that, do you have any views on whether it's likely to be information or regulation or sort of financial incentives and penalties?

MR McGREGOR: It's a bit of both, or all those things. When we were giving an example of Australian projects and why they haven't got up, often the Australian economy - as much as I'm very proud of it - is small. In terms of scale we're often small, so you're not going to get the unit rate of production down, particularly when somebody is developing a product; it's usually at the front end of things when they are probably going to be most costly. What actually happens is either the thing never goes ahead at all, and that's happening in many an instance, because there's been no support out of this country; or it may end up being offshore.

Regulatory things always worry me because it becomes, "You've got to." It's dotting the i's, crossing the t's, and the whole thing becomes a process instead of an outcome. That's even the problem with giving financial assistance, because that becomes driven by the return and a whole lot of process. But if financial assistance could be given for making sure that some of these Australian technologies were processed and given the opportunity to show their wares in this country - let's say we're talking about energy efficiency being an aim. It could be done: giving some assistance to make sure that these things were processed and were given a favourable approach, a first incentive approach.

I've just recently been to Italy and they were talking about a particular product over there that was very good on water saving. The government were giving them assistance over there, making sure that these were treated favourably, but they've got to be careful over there because of the EU issues, but the same sort of thing - they give favourable approaches to EU products because it's out of their part.

So it's almost like you get a points-driven - I don't know the numbers. That's not my area. But if you had a factor coming through that Australian innovative

products were a multiple to make them attractive for a project so that they just didn't get built out on first cost only, and particularly if they were energy efficient technologies, or Australian technologies developed out here that gave us an opportunity of selling our product overseas, so that there was going to be in the long term a benefit for Australia - that's where I found the CADDET part helped us on that process of getting Australian technology shown to the world.

PROF WOODS: So it's an inefficiency in the information dissemination exchange that you're targeting?

MR McGREGOR: I'm targeting that, but also your other part was how you could then make sure that some of these technologies didn't get beyond just doing it once and, "Gee, that really looks good" - a nice, warm, inner glow approach. And that's where a lot of them end up being, because of the limiting factor of just getting over that financial hurdle every time, particularly with new products. But even with the sorts of products here that they're talking about, Australia is, as you say, full of innovation, but we don't get the incentives that they seem to get in other places to make sure this knowledge and these innovations can be processed and go forward.

DR BYRON: That's probably a suitable note to conclude on. I think you are right. I'm reminded, while you are talking - and somebody said to me once - that designing things properly the first time doesn't cost, it actually pays. That's one of the take-home messages that you've given us today. Whether we are our own worst enemy when it comes to adopting some of these innovative ideas - - -

MR McGREGOR: That job, when I said it's the best and worst job, is the worst job, because we went back there after 10 years, when Fujitsu moved out and Sega AussieSoft moved into this building, and that's why it was the best job: because we only went back there once. We only went there once. That's why it's the worst but also it's why it's the best, because it was a good team effort, not just on my part but by the team. We had a good team leader and we had a good approach and it was facilitated by somebody who was interested.

That's why I think we want to try and make sure that we come out of this - whether it be government or whether it be a process that we do in Australia - we just try to get along from this approach of the first cost, doing it quick, because often doing it quick doesn't mean to say it's done better or any quicker in reality, because you've often got to go and fix up all the stuff behind you. But this job was just done well. It was a good design, but it wasn't a Rolls Royce; it was just a good product.

What you said there is very much the process, but we do need to facilitate that process. Like I said, I earnestly believe that the CADDET Australia and that one there, the Australian special issue and the other ones that were in that other stuff that

I gave you there in those last info points - I don't know if that traffic light mob got any more sales out of that, but gee whiz, showing your product to an international audience, whatever forum it is, is always going to be beneficial to us.

DR BYRON: So we've cut ourselves off from the showcase?

MR McGREGOR: We have. It's still out there but others are getting the benefit.

DR BYRON: Thank you very much, Mr McGregor, that has been extremely interesting and helpful. I think we can adjourn now and come back after lunch.

MR McGREGOR: Thank you.

DR BYRON: Thank you very much.

(Luncheon adjournment)

DR BYRON: Good afternoon, ladies and gentlemen. We can resume the public hearings of the Productivity Commission's inquiry into energy efficiency. Our next presentation is from the Housing Industry Association. Thank you very much for coming. If you could just introduce yourself for the transcript and then summarise the main points of the submission, which we've read, and then we can discuss that for half an hour or so.

MR GERSBACH: Happy to do so. My name is Wayne Gersbach. My position within the Housing Industry Association is as executive director of planning and environment. This submission was prepared in conjunction with my counterpart at HIA, the executive director technical services, Ray Loveridge. Just as a summary, the issues that the inquiry will be looking into are very, very broad and very, very detailed in some respects, and a lot to do with market responses, et cetera. We've decided to concentrate more on those issues which are core to our member services, et cetera, and focusing on the role of regulation, which we see as a rather large barrier to overcome; and hopefully this inquiry might be able to shed some light as to how to do that.

First of all we've looked at the relative contribution of greenhouse gas emissions from the residential sector and energy use, although I must say that these figures aren't necessarily easy to come by, and I can furnish the commission with some more detailed breakdown of that - I think it was a 1.6 per cent contribution figure to greenhouse gases that we state in the report. So I'd be happy to provide further information there. It comes as no surprise that we say that the residential construction industry is heavily regulated, and we think that the purpose and responsibilities that hang off that degree of regulation in relation to energy efficiency are really quite confusing, and create a difficult scenario for the industry to operate in.

We have hopefully shed some light on what we see as a distinct difference between cost-effectiveness and housing affordability. Housing affordability, or the unaffordability of housing, is sadly a characteristic of just about every housing market across the land, but particularly in this capital city, in Sydney. We'd like to make that distinction that certain elements, certain technologies, certain introductions can be cost-effective in themselves, but when totalled with the array of other regulatory requirements that go to the make-up of how you construct a dwelling, they can make the product unaffordable and therefore less attractive to consumers, or for those particular elements. It makes it difficult to sell elements of housing design when the bottom-line price that you have to pay is so high, and trying to highlight particular attributes about an energy efficient home in a marketplace which is price constrained is very, very difficult.

Regulatory inconsistency is another matter that we've addressed in our

submission and we believe that that is indeed a cost driver and underlines cost efficiencies in construction. We've pointed to the proposed reforms of the Australian Building Codes Board and to other inquiries that the Productivity Commission is currently involved in. In those, we had called for a bit more grunt and a bit more teeth to be installed into the ABCB, and we had suggested that it really needed to take the form of a new statutory commission, perhaps overseen by a ministerial council, just to give it that grunt, et cetera. We highlight - within that sort of chat, if you like, about regulatory inconsistency - the role of planning legislation; the fact that planning legislation can be introduced in the absence of a regulatory impact statement, which means that often cost-effectiveness is not one of its desires, and indeed it can have very significant cost implications on the way that the industry goes about its business.

Within planning legislation, of course, there's the role of state governments, who tend to compete with each other, particularly in the energy efficiency stakes, to see whose regulation or whose sustainability index system is better than others. Then, of course, there is the additional layer of local government regulation which tends to be a little bit more ad hoc; recently brought into line in this state with the advent of BASIX legislation, but certainly running amok in other states around Australia, so we'd certainly suggest that local government and their role in setting energy efficiency standards needs to be looked at. With planning legislation, and in current years, there really has been quite a deal of confusion about the purpose of the regulation.

When it started, around about five, six, 10 years ago, it seemed that we were reducing our energy use in order to reduce greenhouse gas emissions. It now seems that we're being asked to do that but at the same time to factor in peak demands, and obviously in order to save state governments spending money on the infrastructure which is needed to provide these services in the first place. When that begins to creep into regulation, it's no surprise that industry is asking the question, based on its relative contribution, "Then, why are you only focusing on the residential sector alone when there are other, much larger, contributors that need to be tackled?"

Then, of course, one of our concluding points is in relation to the lack of government borrowing and the lack of infrastructure investment which is occurring across Australia at the moment. We've seen a litany, really, of state governments falling behind in their expenditure on public infrastructure assets; whether that be rail, whether that be energy infrastructure, whether that be other sustainability-related infrastructure such as water, et cetera, which is obviously not a concern for this particular inquiry. We say that there's an underinvestment in that type of public infrastructure but we would suggest - and we haven't done any detailed analysis of this - but we would suggest that there's a much bigger bang for buck to be gained by focusing government attention on what they can do to provide, as we coin the phrase,

the infrastructure that enables Australians to live sustainably, rather than focusing on the efforts of the industry to build sustainably; because I think building sustainably and not being able to partake in some of the other infrastructure gain is something that, again, needs to be addressed.

Then finally we finish on incentives and rebates, and we point to the success of our GreenSmart program, where we are attempting to educate the designers, the builders, the manufacturers and suppliers that come on board as GreenSmart partners and have partaken in our two-day GreenSmart course in order that they can skill up in order to know what energy efficiency is about and how to build it, how to design it in, et cetera. We also, in that particular initiative, have a range of things such as the training course, such as GreenSmart Awards, which are there to reward industry endeavour in these fields. We also have a GreenSmart magazine and a GreenSmart web site.

I've brought with me today a copy of the GreenSmart magazine that I thought I might leave with you, just to give you an idea of how we're trying to communicate with consumers and builders directly, and I suppose skill them up so that they can have that dialogue and that conversation themselves about what they can and can't do in their house designs, et cetera. That's it in a nutshell. I can go through and - - -

DR BYRON: That's excellent.

MR GERSBACH: I wasn't quite sure - I must admit, I sent it through in a bit of a hurry on Friday and I got emails saying today, "Can I have Word copies?" I've brought extra copies of that submission, just the text part of it at least, if you need those.

DR BYRON: Thank you very much, Wayne.

MR GERSBACH: No problem at all.

DR BYRON: You've raised a number of very interesting and pertinent points there. Could I start from the one that you said last, about there seems to be increasing consumer demand and greater interest among developers and builders to supply green - or more sustainable housing and so on, and you've got GreenSmart and programs like that to accommodate and facilitate and encourage that sort of thing. To what extent do those sorts of voluntary measures - or the fact that more prospective home buyers are interested in or asking about sustainability, energy efficiency, et cetera - reduce the need for government regulation to require certain levels of minimum energy efficiency?

MR GERSBACH: I wish I could advise that it totally does away with the need for

regulation, but I think in the world - and we were just having a quiet chat before about what drives consumers, et cetera, and I think it's probably more to do with the bottom line, the price that they're being asked to pay for a particular house rather than the particular attributes of it. Of course, in the renovation market I think it's a little bit different. I think consumers are a little bit more aware about the comfort levels within their house if they've lived in that particular house for a little while; but buying something new is a bit different, a bit difficult. They're probably buying more on a locational basis and kitchen design and some other features which might be a little bit more trendy or a little bit more modern, et cetera.

PROF WOODS: Are you saying they'd trade off and prefer the granite benchtop to the greater insulation?

MR GERSBACH: Yeah, we hear about that anecdotally and I'd certainly say in the research that I've investigated, that would still be true across Australia in all markets. GreenSmart is important, though: it gets a message out there of an industry's willingness to embrace some of these ideals and the practicalities about how to put them into practice, into design and construction. So they're still very, very important, although that's also assuming - or your question is assuming that the role of regulation is to set minimum practice. Perhaps that has been a fault of the BCA, because the BCA does talk about minimum standards, or indeed standards that eliminate worst practice; and I don't think that that resonates quite clearly enough with the planning fraternity, because the planning fraternity is about trying to drive best practice.

They quite honestly either don't bother reading the BCA, (2) don't understand the context in which it was prepared, or (3) think that it's really not the regulation that suits them, sort of thing. I do think the planning and building worlds need to be brought a lot closer together so that we can get an overview and an appreciation of the importance of each. As I say, I think that eliminating worst practice - it's the right terminology but I think it just sends a negative message out there to other regulators about what it's trying to achieve.

DR BYRON: Well, that's a nice segue into the next question I was going to ask you. Assuming that governments have decided that there are issues about energy efficiency and that governments need to act because users and so on are not well informed or not sufficiently motivated to act, then the question is, okay, governments are going to act, and assuming that they're going to act through regulation, where should that regulation lie? Should it be things that are in the Building Code, or are there other places where you can have regulations about minimum levels of energy efficiency; or should we be looking as well at non-regulatory measures to encourage greater energy efficiency? It's not clear to me that just because you say that there's a problem somewhere with regard to energy efficiency, therefore we should amend the

Building Code of Australia to mandate - and then whether you mandate minimum or best practice.

MR GERSBACH: Yes, or somewhere in between.

DR BYRON: There's a whole lot of steps that you need to unbundle in there somewhere.

MR GERSBACH: I think you'll probably find that - and the role of regulation I think is something which is a topic that really hasn't been investigated, I think, by the state governments. They're very keen to either outdo each other and/or to set standards that they think are best practice, but they sometimes forget the role of regulation, and I think that it needs to be reconsidered in the context of where all the players are coming from. But as I said before, the role of regulation - it would be nice to say that we didn't need it but I do think that the BCA up to date has struggled. Some would even ask or consider that energy efficiency is not necessarily within the domain of the BCA as it's presently worded, sort of thing, because it's dealing more with safety standards and amenity; although energy efficiency sort of sneaks in under the amenity banner, but not necessarily the sustainability one, which is a matter that the Productivity Commission has remarked upon in its other inquiries.

So it's a difficult ask but I do believe that there needs to be some marrying of that minimum standard requirement with what is an acceptable community standard, and I think that's where the planners have perhaps lost sight. I think they feel that they have a need to set that community standard for the benefit of communities, but not necessarily engaging communities before those standards are actually drawn up. I think that the basic example in New South Wales is a classic case in point, where a 40 per cent reduction as a target for energy efficiency - and for water consumption, by the way - was essentially plucked out of the air and announced by the utilities minister overnight with absolutely no opportunity to comment and no public debate about where that standard should be, and consequently no real recognition of the costs associated with achieving a 40 per cent reduction.

DR BYRON: Well, as you said before, the articulation between planning controls and building controls is not very good.

MR GERSBACH: Indeed.

DR BYRON: And we need to be very clear about how much bang for the buck we can get by looking at planning improvements as opposed to the actual shell of specific buildings on that site.

MR GERSBACH: Yes, and we would say that the domain of planning is to look at

things which are outside the actual - what happens on site and what happens to do with the construction of a dwelling, whether that dwelling be a detached dwelling or a multi-unit or a high-rise apartment sort of thing. So planning is more - - -

PROF WOODS: That puts energy efficiency squarely on the BCA, then.

MR GERSBACH: Yes, exactly, but I would think that there still are some gains to be had in the way that we plan our new suburbs and plan our cities.

PROF WOODS: In terms of street orientation and - - -

MR GERSBACH: Transport use and transportation, et cetera, and street orientation and lot orientation, things of that nature; walkability in suburbs, grid designs, connectivity in the cities, where employment is located, how you get access to that.

PROF WOODS: But not through planning to interfere with the fabric of the individual dwelling.

MR GERSBACH: Yes, I think it's just overstepped the mark and I can understand where they're coming from. As I say, before recently, before the introduction of energy provisions in the BCA, there really wasn't anything that looked at this; and if you talk to the design fraternity they will tell you that they've known about the secrets for energy efficient housing since Adam was a boy, sort of thing. So they've been a little bit frustrated as to why it hasn't been incorporated into good practice. I think the BCA's role as a design tool is a little bit misrepresented around the places and not clearly understood, and I think perhaps it needs to take a better and greater focus on design, as opposed to how you sort of nail two pieces of wood together and stitch up the window frame, et cetera, and that's where planning has crept in, but once planning has got a foothold there, it's been very, very hard to shake it and, increasingly, they have sensed or the planners have sensed that the community wants more in this respect, and have been driving it through planning regulation, where you don't have to go through the regulatory impact statement provisions. It can almost be done overnight and very, very quickly, as compared to the very slow process, as you know, of getting things through the ABCB and into the BCA.

The structure of the BCA has actually been a thorn in its own side, and whilst it's been there, whilst it was obviously successful in getting everything into the one document and under the one set of rules in the first place, it's been very hard to maintain it, hence we're suggesting that it needs to be given a little bit more grunt and teeth by the way that it's run, as opposed to reconsidering the purpose for why it was there in the first place. We still think it serves that purpose and it's very, very important to the industry nationwide.

DR BYRON: I think there's a plea recurring throughout your submission about governments generally sort of picking on the housing industry and demanding substantial energy efficiency and greenhouse gas emission reduction there, without it having been demonstrated that this is the area where the greatest payoffs can be achieved per unit cost.

MR GERSBACH: Indeed.

DR BYRON: Or bang for the buck.

MR GERSBACH: Yes.

DR BYRON: I must admit now that you've raised that, I don't think we've seen any analysis yet that says this is how much bang for the buck can be achieved in energy efficiency by looking at residential housing vis-a-vis manufacturing, vis-a-vis transport or electricity generation or transmission, whatever.

MR GERSBACH: Yes.

DR BYRON: Have you seen anything that suggests residential housing - apart from the appliances - is a major or minor part of the whole operation?

MR GERSBACH: As I said before in my introduction, it's very, very difficult to actually get your hands and get your head around some of these figures. We had to go fishing and looked at some of the information which has been produced by the Australian Greenhouse Office on their web sites in relation to governments' statements about Kyoto achievements and progress reports to date, so to speak. And then of course the residential sector is grouped with other sectors in stationary energy, and when they talk about that, you sort of wonder what's stationary about it, and you try to work out exactly where houses fit.

But we have provided, and not in the submission that we provided to the commission - but we do have a bit of a breakdown - this is only in relation to greenhouse gases. It's not energy use per se. We looked at the energy sector, industrial processes, SolveIT or other product uses, agriculture, land use and land change and waste, and found that the energy sector contributed 67.5 per cent, and then when you go to break down the energy sector of course it's comprised of the stationary energy sector, the transport sector and fugitive emissions. As I said before, residential is grouped in stationary, and stationary accounts for 47.5 per cent of total.

And then you go down and the layers are sort of there. You look at electricity,

energy production itself, which in fact is the major contributor, 33 per cent of total emissions. You look at other energy production industries; they're only 3.2 per cent. Fuel use in manufacturing and construction is only 7.9 per cent, and other sectors is 3.1. We're still in the other sectors. And then commercial, residential, agriculture, military vehicles and lubricant combustion: within that, residential sector is 1.6 per cent of total emissions, so you have to ask yourself, in that sort of layers and layers and layers of regulation and the focus of the BCA on housing to date, why? I mean, they really could have regulated energy efficient refrigerators and hot-water services and it would have been a hell of a lot easier.

DR BYRON: It's interesting to see that breakdown of it all.

MR GERSBACH: I can provide that to the commission.

PROF WOODS: And what's the source of that data?

MR GERSBACH: That's AGO. It's government information.

PROF WOODS: Yes, that's fine.

MR GERSBACH: They're not invented figures.

DR BYRON: It sort of suggests that a 1 or 2 per cent reduction, in this case greenhouse gas emissions, or 1 or 2 per cent improvement in energy efficiency in terms of power stations might be huge compared to everything we've been able to do in other, including - - -

MR GERSBACH: Exactly. I see that in Victoria just recently there's been a gas-fired power station which has just been commissioned, so the technology exists. One would have to ask why isn't it being invested in, because there are quite substantial gains to be made from obviously attracting or targeting some of those bigger generators.

DR BYRON: But when we look at NatHERS and BASIX and the Green Star - - -

MR GERSBACH: AccuRate and FirstRate and BERS and Green Star and - - -

DR BYRON: Yes. All of these programs and the number of them in all states are sort of focusing on improving the performance of the residential housing sector.

MR GERSBACH: Indeed they are.

DR BYRON: It seems like an enormous amount of effort on the tail of the dog,

while sort of not doing very much about the rest of the dog. Am I putting words in your mouth?

MR GERSBACH: No, no, you're not at all, because I would hope that those words have been expressed in our submission. And then when you get to what happens within the dwelling itself, it's even more remarkable because our analysis there was showing that space heating and cooling contributes 14 per cent of greenhouse emissions; cooling 5 per cent; water heating 28 per cent; and electrical appliances 53 per cent. In appliances, if you break it down, refrigeration actually is 37 per cent of that. So if you were able to target energy efficient refrigerators and water heating, you'd get a lot more than what you've got out of the fabric of the building, which has been the focus of the BCA to date, so it's a question of, I think, policy - policy intent being a good thing, but policy and practice having gone wrong.

DR BYRON: Well, in that case one might conclude that we decided to look at improvements in that area not because we have compelling evidence that it's where you get the greatest bang for the buck, but where it seems to be easiest to do something.

MR GERSBACH: Indeed, and I think it has been - I think unfortunately housing is just an easy target for government policy because particularly over the last 10 years people have grown used to the expectation that house prices will rise, although they're not necessarily aware of what factors are causing house prices to rise, so these regulations certainly add to the cost of buildings. It's true that once they're in for a while and the technologies are well known, that builders being builders and suppliers being suppliers will begin to compete with each other, so the prices do eventually come down, but there's absolutely no doubt that their introduction causes a spike in house prices, but that of course has been wrapped up into the spike in real estate, which has really been driving house prices across the cities with land scarcities, et cetera, for quite some time now.

DR BYRON: If there's been a major change in the requirements of electricity generators and it had resulted in a 10 per cent increase in electricity prices across the board, that would have been very visible, very transparent to everybody exactly what had happened and why it had been done.

MR GERSBACH: Exactly, almost too visible.

DR BYRON: Yes. But if you impose requirements on either planning or building and it sort of gets buried into the price of a new home and, as you say, people were expecting that to rise anyway, then it looks like it's sort of a costless way of achieving those benefits that we're after.

MR GERSBACH: Indeed, and home ownership is still regarded by the majority of Australians as the most important investment decision, so they see a return to that - and a good investment, of course. But that's certainly the case, so it's interesting to see how that has unfolded. And then of course there are government returns associated with the price of housing. Stamp duty collections on a state level are certainly tied to an increase in value in transaction, and what goes around comes around, and unfortunately they have.

One of the things I must say about planning legislation of course is that a lot of these charges when they're introduced through the planning legislation tend to be focused on - and they're called developer charges, developer contributions or words to that effect, and I think there's a general community misconception out there that the property developer just takes a bit of a whack and sort of absorbs those costs et cetera, but they don't actually think - they're really not developer charges, they're development charges and they go to the cost of housing. Of course profits need to be made and banks need to be satisfied, so they certainly don't relate or transfer to a reduction in house prices.

PROF WOODS: But you're not thinking presumably that by government borrowing it suddenly turns it invisible or something?

MR GERSBACH: No. I think there's a developer acceptance of a level of contribution associated with private benefit infrastructure that comes with - - -

PROF WOODS: Yes, the on-site reticulation - - -

MR GERSBACH: Yes, exactly. We're not suggesting that the days of government-subsidised estates are long gone, sort of thing, but there is a very fine line there and there are other processes. I was only talking the other day with a chap, and I have no formal evidence of this, but in this particular city now Integral Energy are asking that developers contribute to high voltage electricity, so the running of the big powerlines, which has traditionally been the domain of - you know, the trunk infrastructure that you don't contribute to - you often run obviously and pay for the connecting lines, et cetera, but now they're asking for that.

And then of course in a new greenfields subdivision estate, who do you need to liaise with? The energy authority, and they say, "We don't think we can do this. We've got to provide trunk infrastructure there and that's going to cost you extra." "Oh, I didn't think of that." So getting behind the logic of those sorts of charges is also very difficult for the industry because upon investigation you can actually whittle those charges down and you have to go through a fairly lengthy negotiation process, but if you're a novice in the business, you'd probably say, "Okay, Integral has asked me for X amount and I've got to pay X amount and the price has just gone

up," and it's now a sad reality that there are a few people around the industry whose skills are challenging those sorts of charges, and they're in pretty hot demand across the industry generally. I know they come under the banner of IPART, et cetera, but it seems to me that there's still a lot of horse-trading that goes on, and the results are there to be gained if you've got the time and energy and expertise to question.

PROF WOODS: One of the things that this inquiry is producing is people who are coming to us saying that they're willing to create or contribute to subdivisions where energy loads are a lot less, that they'll have mini gas turbines and the like so that you disconnect from the main grid, and that they'll recycle sewage through packet treatment and recycling onto open space and the like. How openly is that accepted by the industry, because we get a sense from some of the promoters of these things that the industry is fairly conservative and doesn't want to take risks and is more interested in churning out standard product, or is there scepticism founded on reason on behalf of the industry?

MR GERSBACH: A bit of everything. I think long gone are the days though where industry can just get by with churning out standard product, as you put it. I think there's a great deal of competition in the industry these days, and product differentiation is certainly a factor. That comes with the design of new housing estates or new infill housing projects, et cetera, so the design has picked up its game.

Certainly our experience from those who have attended our GreenSmart training course is that the main purpose for being is that they want to market it; they don't necessarily need to be experts in grey water recycling systems or PVC plug and play sort of power systems, et cetera, but they want to market it, and marketing has become a really big driver, so it's of no surprise in that context that some of these more innovative developers and capable developers are coming up with these package type solutions.

The difficulty that they're facing, however, is not so much - well, it's a couple of things. One, it's getting the local government authorities to get their head around what these package solutions mean, because I think they see them as rather large septic tanks for suburbs, if you like, and I'm not entirely sure what comparison I can use from an energy point of view, but a lot of the resistance is coming from the utility agencies themselves, because they have a pipe which has been delivered to a particular edge of town or edge of subdivision and they have an expectation that someone is going to be tapping into that pipe and/or extending it to the subdivision on the other side as development occurs, sort of thing.

So there is a great deal of reluctance I think from the utility agencies to get their heads around how these sort of little package things can hang off on the side, although you'd have to argue from an efficiency and a pollution and/or greenhouse

gas emission point of view that they're probably better off by doing their own package treatments and having a distributed solution to the provision of energy. There would always need to be the backup, of course, that if you push the button and the water doesn't come out or the power doesn't come, that they are connected to the grid in some way, but I don't think that governments generally have really got their head around how that should play.

PROF WOODS: So what's the incentive structure to make that happen? Is the market clamouring for it or is the market - - -

MR GERSBACH: Certainly as the cost of providing these sorts of services and achieving these sorts of targets have been set by government, the 40 per cent which is the target now in BASIX, although currently it's 25 per cent for houses - it will ramp up to 40 per cent in July 2006. Typically these days in most markets there are a few players, a few land developers. A lot of those land developers are house builders also. In Sydney you'd have Austral and Mirvac, LandCom. A couple of the bigger house builders have got land, but not many of them - CPG would be another one; Clarendon - I'm just trying to think. I'm sure I've left somebody off the list there. Delfin LendLease, of course, who haven't traditionally been a big player in this town for a long time, but obviously with ADI and some other estates, they're certainly ramping up there.

As they're coming on board, and as they are responsible for the construction of houses, rather than go through the actual design and construct phase of a house, and how do we increase the insulation, or how do we hot-wire the electrical appliance so that we can achieve the 20 or 25 or 40 per cent reduction, are there better ways of doing it? They're now beginning to take that sort of metro subdivision estates view of the world, so I think that regulation to a degree has helped. They've always had the innovation and the know-how to do that. Traditionally they have come up against that utility disconnect but now, driven by another arm of government saying that you must achieve these efficiencies, I think the utility agencies are coming more on board and beginning to listen to these types of solutions.

PROF WOODS: Where does the utility come into the process in terms of having a determinative role on what happens in these subdivisions?

MR GERSBACH: Most utilities, most processes - development approval processes - would require that very early in the phase you would either seek the concurrence of the utility that's responsible in that particular area and/or there are other sort of more - - -

PROF WOODS: Because it's predicated on you automatically fitting into them - - -

MR GERSBACH: Exactly.

PROF WOODS: - - - as distinct from predicated on making - - -

MR GERSBACH: I mean, for instance, in Sydney Water you would need a section 173 certificate, and if you don't get the certificate, you don't get the subdivision. The 173 certificate is evidence that you have paid Sydney Water a contribution for the extension of their services. So in other words, if you don't get the certificate, Sydney Water say, "Well, we're not ready to go in that area yet, and you're leapfrogging ahead, and we need to sit back and consider this." If you do get the certificate, then the services will be provided. There are various ways - not necessarily around that, but associated with the negotiation process, as part of the land development scenario, that have a role to play there.

For instance, there is a grey water recycling service in the north-west sector, which was a large release area in the 90s in Sydney, and there it was indicated by Sydney Water that they weren't ready to go, but we could be ready if there was grey water recycling. So the developers, in conjunction with landowners, basically farmer-financed the provision of that particular service, so that the subdivision could go ahead. Sometimes developers take those risks. There's not so much of a risk there because the market was as it was in the 90s in Sydney, so it was a matter of really meeting the market demand as quickly as possible. But there certainly are some up-front costs associated with it, reflected again in the price that people pay for land in the north-west sector in Sydney these days.

So there are ways around it. Grey water recycling is done in the north-west, and we would certainly like to see a lot more of that done elsewhere, but we're beginning to ask the question that developers - or have been asking it for quite some time now - can't always be expected to finance it, particularly when there are greater benefits associated with that sort of hook-up, because essentially what it means is that it's guaranteeing a water supply and an energy supply for the rest of Sydney, by some particular developers being more innovative than others, or they are more innovative than they were required to be in the past.

DR BYRON: One of the things that this inquiry I think really has to focus on is why aren't measures being adopted when all the evidence says that these measures are immediately cost-effective to individual consumers? Even today, with current technologies, current energy prices, et cetera, we're being repeatedly told that there are all these energy efficiency measures that are ready to go, save money, and yet still, we don't see them being very widely adopted.

PROF WOODS: Or there are calls for taxpayers to subsidise their introduction or regulation to enforce their - - -

MR GERSBACH: Yes. Rebates on water tanks and what have you.

DR BYRON: But if they're already commercially attractive, why do they need to be further subsidised by the taxpayer?

MR GERSBACH: I think it goes to the mind-set of people buying houses and the way that they are produced. It's a bit like the analogy that, you know, the BMW - surely it wouldn't be made if it wasn't a cost-effective vehicle, but it's not affordable, and therefore not all of us have one. We would all like to have one because it's probably more cost-effective than the car that I'm driving around, but cost-effectiveness is underpinned by the affordability of the product.

I think to a large degree, house prices in lots of capital cities, particularly in this one, have been really kept in check by the effectiveness and efficiency of the building industry, because land prices have absolutely gone sky high in the last 10 to 15 years, and if it wasn't for the efficiency of the industry being able to deliver a product on the $500,000 block of land that you just bought in western Sydney, you wouldn't have any houses being bought at all. In that market, you have builders competing with each other to deliver more bang for buck, and as soon as you're adding to the bucks, you're getting less bangs for the thing, so it has become a very price-competitive industry in this major city, and we're beginning to see signs of that again around the major cities in the nation.

PROF WOODS: So anything that adds to the front-end capital costs that may have a longer term - - -

MR GERSBACH: Yes, which has to be absorbed by the builder - not by the developer, by the builder - is certainly - - -

PROF WOODS: Well, passed on to the consumer.

MR GERSBACH: Yes, passed on of course, but it's just very difficult to market.

PROF WOODS: "Absorb" is not quite the right word.

MR GERSBACH: Not quite the right word, that's right. It is passed on, but it's met in that construction process, if you know what I mean.

PROF WOODS: Yes.

MR GERSBACH: It's not met before that. So, yes, it's an extremely price-sensitive market at the present. Even still, there has been a downturn, or a

softening of the market in capital cities across Australia, but given the high benchmarks that had been set before, it's still very price-sensitive, particularly to battlers and punters. It's very difficult to get a start. They want that house, and anything else that's going to add two or three or four or five thousand dollars to it is not seen in the context of a seven-year payback for your hot-water service or your PV cells. It's seen in the context of, "It's another two or three years to my housing loan, and it's money that I may not be able to get from the bank in the first place." What they see out there as the house that they want, it's the question of whether they can afford all the add-ons and you-beaut trimmings that are continually being asked to come with it.

DR BYRON: Yes, but if some of those features are going to substantially reduce the cost of living in the place.

MR GERSBACH: You would think that banks would cotton on to that. Certainly Bendigo Bank has and they offer a GreenSmart home loan for those who are able to prove that their design has met GreenSmart standards, so that's a great innovation. Certainly if other banks were able to do that, if there was some discount in that financing cost of the house associated with those sorts of innovations, that wouldn't be a bad idea.

DR BYRON: People in the Community Services Department that we met in Adelaide were saying that people buy a very energy-inefficient heater because they can't afford to buy an efficient one, or they will buy a very cheap uninsulated house, or they'll rent a very cheap uninsulated house because they can't actually afford to rent a better insulated house. But it's just going to cost them an extra - you know, hundreds of dollars a month, which they obviously can't afford.

MR GERSBACH: I think you've raised - and NFEE had raised - some of those barriers, and I think consumer information was one of those significant barriers. Certainly on my energy bill, the last one, I get a great little ready reckoner of how much I used in the last quarter, and this time last year, but I don't know what's driving the bill, and whether it's the swimming pool filter or whether it's the heater that I use or the hot-water service, et cetera.

PROF WOODS: Teenage kids.

MR GERSBACH: Teenage kids, certainly.

PROF WOODS: It's always the answer.

MR GERSBACH: Indeed, but that sort of breakdown of information, that sort of level of understanding, I think, would help the consumer to make those choices.

DR BYRON: All that comes back to the split incentive problem, that often the people who are building the house - - -

MR GERSBACH: Aren't the beneficiaries of the innovation.

DR BYRON: Yes, and not the same as the person who is going to have to run it and pay the ongoing bills. That seems to apply whether you're talking about office buildings or rental properties.

MR GERSBACH: Yes.

DR BYRON: I guess, a spec-built house - - -

MR GERSBACH: Exactly, yes. The owner and operator of that is different to the builder, and they don't necessarily have the same thing in mind. A lot of the product in most capital cities is just that. It's spec building or project housing, sort of thing, so there is a disconnect there, and that's something that needs to be addressed, but again in a price-sensitive market, it's very difficult to do. I think consumers are wiser and a little bit more discerning too than we give them credit for. I think they are now beginning to ask questions of state governments. "Well, wait a minute. Are you telling us that we can only water our gardens on Mondays, Wednesdays and you know, one day next week, sort of thing? We're being asked to cut back on our airconditioner use, and we're being asked to do this and being asked to do that," yet they're not necessarily seeing the big investments and the solutions for the future. "What are the kids going to do when they grow up?" et cetera.

So I think that lack of information and lack of public debate about these issues - I think consumers feel a bit hard done by. I think they feel, you know, "Why should I give that priority when it's obviously not being given priority by our regulatory agencies," et cetera. I think they see things in context very, very quickly.

PROF WOODS: I'm conscious of the time, but can I just ask: you've been talking about consumer awareness, but you say that you're unable to support the energy rating scheme in the ACT. Is that because it's not working, or it is working and you don't like it?

MR GERSBACH: There's no evidence, there's no empirical evidence of how good it is working. Indeed, the feedback that we had in the ACT was that it wasn't necessarily well enforced until around about six months ago. I think it took a court case from a consumer to actually get the government thinking about whether they should be enforcing it or not, because the court case - as I understand it, they bought a property that was high star rated, and found out later on that it was really a poor

performer and began to ask questions why. It's really just anecdotal evidence. It's only disclosure, and we note that the NFEE recommendations said that that should become standardised across the country.

Already in New South Wales, we've had the premier suggest that he wants a mandatory fit-out of properties before they're sold, so in other words, he wants you to obtain a BASIX certificate which says that you have done these things to make it energy efficient, and/or to install the energy efficient tapware, et cetera, sort of thing. What level that is at, we haven't yet heard, but they're asking for more than just disclosure. They're asking for evidence and proof that the building has been adjusted to perform better before point of sale. Really, I suppose we're saying that in the context of a national market, the renovation contribution to the economy is really quite large. I think it runs at around 23, 24, 25 billion dollars a year. It's a huge amount of renovation work. We're just not quite sure what the implications of this are.

Does it mean people spend less on bathrooms and kitchen renovations because they have to, by regulation, do their energy efficient stuff or water stuff? Or does it just mean that they spend more, in which case we say, "Yes, bring it on," but we just don't quite know the influences and the impact of that type of regulation on a really thriving renovation economy, as something that we all benefit from, because it's injecting quite a few funds into the national and state economies. I just think it needs to be investigated a little bit further before we could come out and support it on the basis of that investigation.

PROF WOODS: We would certainly be keen on any evidence that looks at information disclosure versus mandatory action and the relative costs.

MR GERSBACH: Yes. On the surface it doesn't seem a bad thing. We're not saying that we're opposed. All we're just saying is that it might not be such a bad idea, but we just need some - I mean, it has been operating in the ACT for four years at least. As I say, I don't think it was being enforced for quite some time, but we would love to see some evidence as to - - -

DR BYRON: It is a bit surprising to see it extended to a national scale when there's no evidence that it has actually done anything at all - good, bad or indifferent in the ACT.

MR GERSBACH: Exactly, but NFEE did some great homework in their stakeholder consultations, so maybe there is some evidence out there. It just hasn't come to us. One would think that if it relates to the housing industry, it should find its way to us, et cetera.

DR BYRON: There seem to be an awful lot of properties sold in the ACT with a zero out of five rating.

MR GERSBACH: Exactly. What does it mean to the purchaser's choice? Are they saying, "Okay, well, look, we'll buy it." Does it reduce the price of the house? I doubt it. They're probably buying on location, proximity to schools and shopping centres and work.

PROF WOODS: Location, location and location.

MR GERSBACH: So, yes, whether it actually means anything in the transaction process, or whether it encourages that new buyer to go out and invest in being more comfortable within their dwelling, we don't know, or whether it's just a good-sounding policy and nothing more than that.

DR BYRON: I'm not implying that I'm opposed to it, it's just that it would be interesting to see some evidence that it actually does something.

MR GERSBACH: No, nor are we. Yes, certainly it would put some information in front of the consumer's nose to say, "Do you know what you're buying?" Let the buyer beware. It may not be but I haven't seen one of those transactions. When was the last time I bought a house? A little while ago, but you get your zoning certificate; you get your legal - there's a whole wad of information that gets handed over. You get, "Here, are you happy with this?" And you sort of go through it all, and if there's nothing wrong with the house, you sign on the line. If there's something wrong with it structurally, et cetera, then you begin to ask questions. I don't know whether you would ask questions or whether you would sort of say, "Okay, I know that and I'll deal with that in 12 months' time, once I've got over this little spike in payments that I need to make," or whether it's just forgotten after the transaction occurs.

DR BYRON: I think we had probably better wind it up there, but that has been extremely helpful. Thank you very much for coming.

MR GERSBACH: Thank you very much.

DR BYRON: Thank you for your submission.

MR GERSBACH: Would you like that breakdown of the greenhouse gases? I can send that through as a separate one-pager.

DR BYRON: We can pick it up from the Greenhouse Office. If you've got to go through and - - -

PROF WOODS: We'll take the benefit of your work.

MR GERSBACH: Yes, I would be happy for you to verify that is correct, and I'll leave that with you. That's the GreenSmart magazine.

PROF WOODS: That will be interesting, thank you. I appreciate that.

MR GERSBACH: Thank you very much.

DR BYRON: Thank you.

DR BYRON: We can now continue with the hearings. Melanie, if you would just like to introduce yourself for the transcript and then summarise the main points and we can then have a discussion for about a half an hour or so after that.

MS HUTTON: Okay. My name is Melanie Hutton. I am a climate change campaigner for World Wide Fund for Nature Australia. I am here representing both that organisation and CANA which stands for Climate Action Network Australia. On behalf of both of those organisations I would like to speak to the submission that was sent through last Wednesday. The key points in this document are that we bring to this inquiry a fundamental requirement that the issue of climate change, greenhouse gas emissions and an emission reduction target and framework for that reduction is embedded in the actual recommendations that come out of this. We have gone to some degree of detail in the submission about why one needs to consider greenhouse gas emissions as an overriding feature for anything to do with energy efficiency.

I think the impacts of climate change happening both here and overseas are pretty clear, so I won't go into that in any detail. However, I would like to touch on issues of cost of climate change and that that needs to be accounted into any pricing for energy; currently that isn't there and that does bring us a skewing of both the forms of electricity that are available to us, but also an unfairness of pricing to deliver energy efficiency and demand management strategies. At the moment, under the status quo, it's very difficult for us as environmental and social change agents to be able to push the alternatives to the current energy supply that we have.

DR BYRON: Melanie, sorry to interrupt after inviting you - - -

MS HUTTON: No, that's okay.

DR BYRON: Would it be worthwhile for me to reiterate that this is not an inquiry into greenhouse per se? I personally have been involved in greenhouse issues since the 80s, but this is not really a greenhouse inquiry. It's an inquiry into energy efficiency measures which would have both environmental and economic pay-offs. I don't think we can actually go into all the climate change science and the case for greenhouse, but the point that you were just making when I rudely interrupted you about the fact that current electricity prices don't reflect greenhouse costs is one that's very obvious and we are already onto that one.

MS HUTTON: Okay, and that's fine. I'm certainly not coming here to speak to the converted about climate change, but just that that is an overarching aspect of our submission and that's what our recommendations further in it are coming from, I suppose. First of all, we definitely support the nine energy efficiency policy measures which were included in the national framework on energy efficiency and I

think probably the only point that we would want to raise is that it's not clear what kind of engagement is going to happen when it's rolled out with both community and environmental groups, so there was a need to get some clarity on stakeholder involvement.

Also we have in the submission tried to differentiate the difference between demand management, energy conservation and energy efficiency, and we felt that there was - I mean, it might just be subtle linguistics but, both from an educative perspective and also from a policy-writing perspective, we think that that's really important.

DR BYRON: So do we and we would like you to elaborate on that one later.

MS HUTTON: All right. Then into the document we just touched on a few of the different sectors that we felt currently needed additional support in order to help deliver the measures that were outlined in the issues paper, such as the accredited training being required for tradespeople so they can actually go in and deliver the energy efficiency services. Also levies and taxes have been mentioned for encouraging a shift away from - again we come back to the fossil fuel generation but, as I say, we can't separate the supply side of energy from the use of energy, in our submission.

The other factor in the report that's worth mentioning would be the whole shifting in the peak demand for energy which, in the past, we have pretty much seen in winter and we're now seeing that quite substantially shift across into summer with the use of airconditioners, and I would think probably others have touched on that in great length. We also feel that that is a very significant and growing problem and that now is the time to actually put in place technological solutions that could reduce that peak and therefore reduce additional costs for network expansion, upgrading and, I think, too, a bit of sort of educative growth - education work - as well, around that.

The only other thing I would touch on is that backing up a lot of the details in the submission is the work that came out of the Clean Energy Future Group report, which quite clearly indicated that there are the technological tools available to deliver probably about a 20 per cent energy reduction out to 20:40 through putting in place energy efficiency and demand management strategies. We see it as a really successful first step to addressing energy demand.

DR BYRON: Thanks. This inquiry's terms of reference specifically focus on energy efficiency measures which are cost-effective to individuals. The way we are interpreting that is that it is just a subset of a much larger range of measures that may well have social and environmental pay-offs and be worth doing, but not necessarily

immediately cost-effective or profitable for the particular decision-maker.

MS HUTTON: Yes.

DR BYRON: Out of the whole universe of possible conservation or energy efficiency measures we are asked initially just to focus on that subset of things which appear to be immediately worthwhile and we are wondering, why aren't they already happening? They offer substantial immediate savings and environmental pay-offs. Why isn't it happening? Do you have any particular insights on that which you can share with us? I mean, the general point that you make in the submission that the users of electricity today generally don't have to - they don't even know and they certainly don't have to pay what the true cost of that electricity is. They are shielded from all that and so they are making consumption decisions or decisions to buy great big airconditioners or whatever without knowing the true cost of the electricity.

MS HUTTON: Yes.

DR BYRON: Is that one of the problems or is it the fact that people don't know or care or think very much about energy efficiency?

PROF WOODS: Or that energy is cheap and therefore it really doesn't make all that much difference to their bottom line?

MS HUTTON: If we were talking about water we actually wouldn't be having this conversation because it's a visible tangible resource that people can identify with and can understand if it is taken away from them just what kind of impact that is going to have. When we are talking about electricity I think for so many people and certainly from overseas experience, for most people they flick on a switch but there is absolutely no understanding of what happens from that wall switch back to where it comes from and until people can get a sense of their role in that supply chain line and therefore the choices that they can make - I think that is why it is so incredibly difficult to get behavioural change and place and that's why we feel that leaving it to voluntary market choices is not going to work. It has to come through in some form of mandatory policy changes to actually shake people and actually get them to wake up to - that they have choices, both financially and also a lifestyle choice as well.

DR BYRON: I guess the standard economist's response would be in countries like Western Europe and Japan where energy prices are four or five times what we pay not only for electricity but also petrol prices and so on, people there tend to be much more energy conscious and look for energy efficient technology solutions and, even between their own ears, they're thinking energy efficiency and are much more conscious of it than we are, and so that suggests, at least to an economist, that one of the things here is that electricity, like water, is so cheap that people don't think about

it very much - it doesn't get onto the radar - and that's not to say that prices should go up fivefold to be similar to what they are in Europe and Japan, but it seems to me that it is very hard to get people to make decisions as if energy was valuable and scarce and getting scarcer, when in fact when they pay the bills they see that it's really pretty cheap.

MS HUTTON: Exactly, and I think when I say that there is a need for a technological solution that's where you have those time-of-day meters, which I think probably, if it was part of a mandatory national plan around energy efficiency, is the most simple and effective way to start to get behavioural change.

DR BYRON: We talked a bit about this when we were in Adelaide a few months ago and people say, "If you get one of those 40-degree days in February when everybody wants to have their great big aircon and set it to 15 degrees," or something, even if they found out that it was going to cost them $50 instead of $2 they would probably still turn the damn thing on. Well, maybe if it was $50 they would go to the mall or the supermarket or the swimming pool or something instead.

MS HUTTON: Yes.

DR BYRON: So the empirical question is, even if electricity prices included a full sort of carbon cost of all the damage that it's doing, would people's behaviour necessarily change that much?

MS HUTTON: If we were only talking about this in isolation the answer would probably be no for the majority of people who have discretionary income that can absorb that, they wouldn't change; but I think if we take it as part of a bigger package - for example, with some of the energy efficiency building codes that are coming into place - then I think we are beginning to talk about being able to shift behaviour. On its own I don't think it would work very effectively, but I think coupled with energy efficient buildings, coupled with an information program, coupled with - I don't know - whatever else you wanted to do, all kinds of rating schemes, then I think it would make a big difference.

PROF WOODS: And also you would have to take into account, if you were driving prices to that extent, what that is doing to the rest of the economy anyway, and whether that in itself is a desirable outcome.

MS HUTTON: Yes.

PROF WOODS: It may do something about energy efficiency, but it may also do something about employment or growth.

MS HUTTON: Yes. I think that there is a significant area untapped for especially regional job growth around energy efficiency roll-outs, which is one of the recommendations about having the upskilling and training of tradespeople to help roll this out.

PROF WOODS: I noticed on that one and what I was curious about - it's later on in your submission - voluntary training scheme for registered tradespeople.

MS HUTTON: Yes.

PROF WOODS: The obvious question. Who ensures that it's the right training and who sponsors the cost of the training?

MS HUTTON: My initial take on that would be as we have got with the Green Power scheme, which was overseen by what was SEDA but now DEUS, is that there is probably a role there at a government level to have an accreditating scheme, and there is that auditing process, but not necessarily the overall training and management of the scheme.

DR BYRON: Like certifying the certifiers.

MS HUTTON: Yes, creating more jobs.

DR BYRON: Branch stewardship council.

MS HUTTON: Yes.

DR BYRON: Can I come back to the point that you made earlier about the distinctions between energy conservation, energy efficiency and demand management, because when we spoke to people who are concerned with things like the national electricity grid they were interested in demand management as a way of shaving the top off the peaks and that meant deferring future capital expenditure and building more. But they made the point: "This has got nothing to do with greenhouse. We're not doing this because it's going to reduce greenhouse emissions. We're doing this because it actually saves us having to build more power station, transmission lines or substations or whatever else."

Somebody gave us the example of an off-peak electric hot-water system, which actually helps with demand management in that sense but it doesn't do anything at all positive. In fact it's negative for greenhouse because you are using electricity to keep that body of water warmer for longer during the off-peak hours, so you end up using more electricity, it's just that you are using cheap electricity to do it. So they were very clear in trying to emphasise to us that not everything that's demand management

is going to give you an environmental pay-off.

MS HUTTON: Two responses to that. First of all, there is a definite benefit to shaving off the peaks in order to give us time to look at our distribution networks and hold back on how we are going to finance the upgrades of them, or the expansion. Within that time, though, the environmental call, or even the economic imperative, should be that we look at alternative energy sources to the current centralised mainly coal-fired power stations. Therefore, by shaving off the peak and giving us a window of time to actually look at our long-term energy supply options, that will then determine whether or not we stick with the current networks or do we actually look at it being distributed, do we look at actually changing it so we can bring in more wind power or buy less?

DR BYRON: But you are in agreement, I think, in the sense of saying, "Well, demand management means that we defer building more systems."

MS HUTTON: Absolutely.

DR BYRON: You are taking that one step further in saying, "And by the time we do build a new system it will be a different type of system."

MS HUTTON: Exactly.

DR BYRON: It might be distributed or it might be some complex gas cycle rather than dirty brown coal.

MS HUTTON: Yes, you are completely right. An even greater economic benefit for shaving off the peaks is that we actually give ourselves an opportunity to wisely invest in the best long-term energy asset for Australia that will not only meet us long term technologically, but also environmentally with its greenhouse gas emissions. The other point too, that you raise with the solar hot water: a lot of the recommendations that are in the Clean Energy Future report - and I don't think it's specified in our submission here but it has always been an assumption - that the mandatory solar hot-water systems that go in are gas boosted rather than actually electricity boosted; therefore, you do away with the greater environmental cost of using coal-fired electricity rather than gas.

PROF WOODS: Mind you, if you were trying to maintain supply of electricity and you were relying in part on wind generators you'd still have to have an awful lot of spinning reserve happening in the background for when the wind fluctuates, and you've still got to meet your demand.

MS HUTTON: True.

PROF WOODS: You can't guarantee that the wind will blow.

MS HUTTON: But then one also can't guarantee that a coal-fired power station isn't going to have maintenance or have a blackout and therefore we need backup. I don't feel like the issue of backup to any form of electricity generation system is really the issue; it's really that we develop a robust and varied electricity generation structure.

PROF WOODS: Can I ask you? You mentioned "barriers perpetuated by lack of expertise in existence for self-sustaining energy efficiency industry within Australia". Then you say "a taxation system which provides a disincentive to energy efficiency". This is in Challenges to Energy Efficiency. I wasn't quite sure what you were getting at where you talk about "a taxation system which provides a disincentive to energy efficiency". I racked my brains to try and work through that one but it - - -

MS HUTTON: Can I ask you which - - -

PROF WOODS: Yes, it's on - you don't have page numbers.

MS HUTTON: The unnumbered pages?

PROF WOODS: Unnumbered page 3, yes.

MS HUTTON: Under Challenges to Energy Efficiency.

PROF WOODS: The Challenges to Energy Efficiency, first paragraph, line 4. If you want to come back to me later with a note or something, that's fine.

MS HUTTON: Okay. "A taxation system which provides a disincentive to energy efficiency". I will have to get back to you on that one.

PROF WOODS: That's fine. That was just wandering around in my head. Yes, presiding commissioner, you educate me, please.

DR BYRON: One possible thing that they may have been alluding to is the way fringe benefits tax treats leasing of vehicles.

PROF WOODS: They might have, yes.

DR BYRON: Just from previous discussions with interested parties.

PROF WOODS: Okay, thanks.

MS HUTTON: I'll get back to you.

PROF WOODS: Just a supplementary note.

DR BYRON: You've made comments and submissions supporting the cost-reflective pricing and also location-reflective pricing and the issue about the way the real cost of distributing electricity across the state is often hidden because of this so-called postage stamp pricing, where the price is the same no matter how far the electricity is transported. Do you think it's feasible to introduce location based pricing in a way that would actually tend to encourage distributed generation?

MS HUTTON: All things being equal - and it's difficult to speak on this without thinking of a whole range of other economic instruments and policy requirements to sort of support it - I firmly believe that we need to move our energy generation system away from monolithic great big structures that provide the bulk of a state's energy needs in one space and distribute that out, as much in order to give us that security of supply but also from an economic perspective of jobs as well in the rural sector, which is definitely what we'd get with biomass generation, and also from the wind perspective, the advantages for that to be on some of the low-return or marginal farming land that we have as well. I think from a jobs perspective and an energy security perspective, yes, I think it is worth - - -

DR BYRON: Would you envisage that we'd still have a sort of a network, a bit like the Internet I suppose, or a neural network, of this density in the connection but with hundreds of relatively small nodes rather than having a couple of huge power stations located in the Hunter Valley or the La Trobe Valley and then radial spokes just going out from there to the rest of the states? The related question is that over the last hundred years, I guess, we've moved towards centralised government provision of things like electricity and water and so on, with this highly centralised mode.

Now we are talking about going back to decentralised distributed, much more self-sufficient, and the question is, that's almost reversing the trend that had prevailed for the previous hundred years. I'd just like your thoughts on why we need to reverse that. Why was it that for most of the 20th century we have been going towards these large centralised facilities and then distributing across Australia and now we have suddenly realised that's the wrong strategy, we need to go the opposite way?

MS HUTTON: What we've developed was right at the time but because of the climate change issue, which I do believe needs to be tabled, and also for security of supply both domestically for the users and then also for us as a country, economically, to be able to generate our own power, the move away to decentralised energy creation is not only desirable, it's also achievable. Again, from the Clean

Energy Future report, there are no technological barriers for Australia to develop biomass wind solar to meet the needs of the rural communities. So there may be places in Australia, such as South Australia-Lower Victoria, where the resource such as gas is there; let's use it. Let's put in 1000-megawatt gas-fired plant; not a problem. But there are places, such as in Northern Queensland, where it makes far more sense to be putting in a distributed network which captures PV, or in WA you put in wind power.

I think if we are looking at a long-term strategy of how our networks and energy supplies look, it will be a mixture of both. I think the difference would be that I would hope to see, with the pick-up of energy efficiency and demand management policies, a significant reduction in our overall growth of energy demand and then also a corresponding reduction because of the change in supply side of our greenhouse gas emissions.

DR BYRON: Can I change the subject considerably? Most of this inquiry has been about the efficiency of use of energy once it's delivered to the final end user, whether that's a household or a factory or whatever.

MS HUTTON: Yes.

DR BYRON: There are also issues in terms of how that electricity is generated. I've been dying to find somebody I could ask on this. What do you think of the hot dry rocks proposal or the one-kilometre high - - -

MS HUTTON: Air thing.

DR BYRON: - - - tower-tunnel thing? Does your organisation have any view of these as potentially zero emissions of technologies and hypothetically, if something like that was going to generate large amounts of electricity through a centralised chimney or hot dry rocks at Innamincka - - -

PROF WOODS: Innamincka is a very nice place.

DR BYRON: Yes, well, any thoughts?

MS HUTTON: Yes. I come back to this Clean Energy Future report. We only look at currently available commercially viable sources of energy. The hot rocks and the column of hot air pushing through - what?

PROF WOODS: Thermal tower.

MS HUTTON: Thank you very much - thermal tower. They are great in theory,

they are great as a pilot, but as to how economically viable they are, in relation to the current forms of energy-creating technologies we have, they are not even in the ballpark. They are like geosequestration probably at the moment. So they are fun to look at and they are fun to talk about, but because of the short time frame that we have - which is probably no more than five to eight years to really look at how we are going to significantly reduce our demand on energy, how we are significantly going to change our supply sources - we can't afford to really dabble in what are essentially still pilot trials that are not commercially viable. So I would still be staying with the coal for your high-energy-intensive industries; gas biomass; wind solar, and hydro.

PROF WOODS: That's an interesting trade-off, the imperatives of timing versus the exploration of new sources.

DR BYRON: I was going to, but didn't, interrupt before when you were talking about the intermittent nature of wind. I've been reading a lot of very interesting papers about the complementarity or symbiotic relationship between wind and hydro: that even if the wind is blowing at 3 o'clock in the morning, you use that to recharge your hydrological batteries.

PROF WOODS: Yes, you pump the water back up.

DR BYRON: You pump the water back up. In fact, I think Denmark and Norway do this and in places like British Columbia in Canada: the wind power is actually used to recharge your hydro-electric dams and it really doesn't matter what time of the day or night that is. Then during the day, when you've got peak demands, the water comes down the hydro-electric.

MS HUTTON: That's a very good bit of synergy there. I like it.

DR BYRON: In fact, there's even a proposal that has been put to us that the Basslink connecting Tasmania to the national grid - Tasmania basically becomes a battery that can feed electricity into the grid during the day when the prices are high, and at night you take the electricity back to Tasmania and use it to pump the water back up the hill so you can do the same thing again tomorrow.

MS HUTTON: I like the idea and, without deviating too far from the issue of energy efficiency, we need to as a nation come to grips with the issue of climate change driving some of our decisions that may not be as desirable as, say, threatened species or some loss of biodiversity for the sake of producing greenhouse-free energy sources. But that's probably outside the scope of this - - -

PROF WOODS: The odd mutton-bird in the propeller.

MS HUTTON: Yes.

DR BYRON: Yes. Back to energy efficiency. I guess - well, it is within the terms of reference if we think of efficiency in terms of generation as well as in terms of consumption, and we are dealing on both sides. Yes. Can I ask: you've got an interesting phrasing on the next page under the heading The Need for a Comprehensive National Framework on Energy Efficiency; ie, NFEE. Your wording of the second dot point there "urges the ministerial council to engage the jurisdictions to prioritise the roll-out of this first stage". Is that code for some concern on your part that although all ministers may have signed up, not a lot may actually happen? I'm trying to interpret your wording.

MS HUTTON: Yes. No, that was not a subtle reference to any concern. It was us wanting to highlight that this mustn't be allowed to slip and there must be the commitment of resources, finance, will, to actually deliver what has been signed off by the minister, and that presumably economically it is viable for them to sign it off, therefore it should be delivered.

PROF WOODS: But for you to have made that point would only be in the context of you being uncertain that it would not just automatically happen?

MS HUTTON: We're talking politics.

DR BYRON: Diplomatic answer. Can I come back again to the accredited training and the GreenPlumbers. I'm thinking about what is needed to get this up. Is it something which would get up by itself, even without governments doing anything if in fact there's a demand for it?

MS HUTTON: No.

DR BYRON: Thanks. Keep elaborating.

MS HUTTON: Emphatically no. We're certainly not seeing it from an energy retailer perspective, which is probably the largest body that could probably get the most out of energy efficiency measures and training their people and going out and delivering it. If we're not seeing it happening there, we're certainly not seeing the demand for skilled staff being requested down to our training institutions, our TAFEs. So from our perspective - did you ask do we need to have something more mandatory calling for it?

DR BYRON: Yes. How do we make it happen?

MS HUTTON: How do we make it happen.

DR BYRON: Given that you're convinced that it's not going to happen by itself.

MS HUTTON: My only comment in response would be that a suggested way forward would be to look at this GreenPlumbers scheme, which has been noted in here as an ideal model that could be expanded, and if you would like more information on it, I'm more than happy to put in a supplementary - - -

PROF WOODS: Yes, I think we'd be interested, because consumer information, skill throughout the industry, these are things that are promoted as being needed, but to actually put them into effect, we're not getting a lot of evidence brought forward to us. If you could elaborate on that, that would be helpful.

MS HUTTON: Okay. Sorry, I can't fill you in on any more details.

DR BYRON: That's all right. One of the things that has come up in our demand management conversations is the idea that electricity retailers can, either through telemetry or through some ripple down powerlines or something, have the ability to switch off, or that users might sign up for interruptible contract.

MS HUTTON: Yes.

DR BYRON: Can you elaborate a bit more on how you think that might happen. Is it that people would sign up - even households with big airconditioners or whatever - to a contract that said, "We agree that you have the right to turn us off so many days a year in exchange for a reduction in our bill of X cents a unit," or something? We've heard about some factories that have either a system where they can be switched off or they get phoned up and say, "We will pay you X thousand dollars if you agree to shut down your factory for half an hour." Often they agree, because it's a better deal than keeping the factory going for half an hour.

MS HUTTON: Exactly. I'm not an economist, but I think that they're either in the wrong business if they can close their business down for some length of time and get paid more for giving up a very small component of their cost structure, than if they kept their production line or whatever operating. I would question the pricing schemes or tariffs that go with that interruptible contract that happens between the high-energy-use industries and the retailers that are trying to get some energy back when there is a peak demand.

One of the issues might be to look at some of the contractual subsidies that happen at the moment with some of our very high-energy-intensive industries, and therefore what additional costs for the use of energy which is given to these private

companies would actually be offset or maybe balanced out against the subsidies which they are getting in the first place for the energy they use.

DR BYRON: I'm trying to think of a hypothetical example where I'm a retailer and I've got 20,000 households and half a dozen big factories. Now, I may have different prices because I thought some years ago that it was a lot easier to supply half a dozen factories - you know, run a pipe straight to the front door - than to supply 20,000 households, but even if we assume that they're all paying the same price per kilowatt hour, if I see a peak load coming and I'm trying to prevent blacking out 20,000 households, it might be much easier for me to talk to one or two of those large companies and do a deal with them, than to either ring around 20,000 households or cut all their power by 2 per cent.

MS HUTTON: All things being equal, yes, I agree with you.

DR BYRON: You don't have to assume that the factories are getting their electricity at a ridiculously low, heavily subsidised price; that even if they were paying the same price, it still might be easier and lower transactions costs to make a deal with one company there.

MS HUTTON: Agreed. Yes.

DR BYRON: I'm not trying to defend the - I'm thinking out loud.

PROF WOODS: I'm done.

DR BYRON: I don't think I've got any more questions either. Is there anything else you wanted to say, Melanie, by way of summing up?

MS HUTTON: No. I'll get back to you on the two points, the GreenPlumbers and the tax.

PROF WOODS: Thank you very much.

DR BYRON: Thank you for coming.

MS HUTTON: Thank you.

DR BYRON: I think we can now adjourn for an afternoon tea break.

DR BYRON: Let's resume the hearings. Charles, if you could just introduce yourself and your affiliation for the transcript and then summarise the main points of your submission and we can discuss them, please.

MR BRITTON: Okay. My name is Charles Britton. I am the policy officer with the Australian Consumers Association and the role we take today is to try and represent the interests of small retail users of energy, I guess focusing particularly on electricity. That's something we have thought about the most, I think, but some of the concerns overlap. I want to turn my mind first to the notion that consumers are somehow energy profligate. I think there is this feeling abroad that people are wasting energy. In a sense, that gives rise to the notion of an efficiency review and, while you can always conjure with greater efficiency, I think it's important to just stop and think about whether in fact people are profligate with energy.

We have certainly made the point in the notes I gave you that consumers in Australia live an energy-intensive lifestyle. I drew attention in there to some work by ABARE that indicates that while we are using more energy than we did some years ago, we are not using anywhere near as much as if we'd stayed on a linear trajectory. I was also interested in some commentary that wasn't in that from Ross Gittins in the Sydney Morning Herald, and I can give you the reference. The point he was making was about the impact of the oil pricing and commentating on the fact that oil prices haven't had the same sort of effect this time round in the sense that it did in the 70s, and he made the point that the energy intensity of world output measured in barrels of oil consumed per billion dollars of real GDP has declined by almost half. It's from my position a straw in the wind, but I think it is interesting to think about; in a sense, challenging what you might call the black armband view of the present, in terms of what is going on in energy use, certainly economy-wide.

I think that moves on to the next point: that energy is essential to consumers. It's not a discretionary thing. There is work been done, and I can again give you the reference. This was presented at a utilities conference. I thought it was quite interesting. You may well be in touch with that, but Marie Langmore from the Department of Human Services in Victoria presented work she had done on electricity price structures and household behaviour, which was quite interesting. I certainly am neither qualified nor capable of going through it all.

But the key point: she looked at demand elasticity, price elasticities of electricity, and came up with the notion that in fact in the short run, demand is inelastic and in the long run there is greater variability but it's generally inelastic. So in other words, it's essential and people don't respond terribly well to price signals, which is I think one of the key points of our concern: the potential for people to go into the easy solution, which is to say, "Well, we'll put up the price and people will stop using it." I think that is a really important thing we ought to correct, if you like.

I talked a little bit in the notes about this notion of peaks and efficiency and I think there is some interesting thinking to be done there about efficiency and peaks, particularly in what you might you call naturally peaking systems and how far you go in trying to push down peaks when it is an entirely natural phenomenon of the way that the system or the process worked. I talked a little bit about price signalling. There is some confusion, I think, in some of the commentary about price signalling and that is: what are we price signalling about? Are we price signalling that we need to invest for the relevant infrastructure to meet the demand? Or are we price signalling that we want people to reduce their demand so we don't have to build the infrastructure so that we save money that way? Or are we signalling that they should conserve energy and reduce their demand in order to meet environmental outcomes?

Those are three things, each of which can be conceived as a goal, but I do notice, in participating in debates about this, people hop from one to the other, sometimes in a rather unsynchronised sort of way. So I urge anybody in the area to be careful of exactly what it is that we are trying to address with whatever interventions are being conjured with. In the demand elasticity study I talked about, it was interesting in terms of the inelasticity. One of the things that was then conjured with was the notion of bringing the billing closer to the usage.

This is where we venture into the vexed question of the interval metering debate and the question as to whether we get more up close and personal with consumers about their electricity habits so that they might be more minded to change them. I think the key point is that electricity shopping isn't fun. It's just not an interesting thing to do. It's sort of a bit like shopping for a fixed-line telephone service. People say, "Why couldn't it be like mobile phones?" Well, shopping for a mobile phone seems to be fun and youngsters are right into it and we have a thriving market in mobile phones, but we don't in fixed line. In part, that's competition and it's also partly because people aren't terribly interested and can't be bothered. It's just not an interesting thing to do.

I think this is one of the things in back of the problems of retail contestability. You have to actually deliver a large price drop in retail contestability to get people's interest because there is no X factor; it's purely dollars. Equally, if you're going to catch their attention to stop using it, you're going to have put up, equally, a big price jump to catch their attention, which goes back to the price signalling. Not only is it inelastic but you also have to have significant changes to catch their attention. It's not something people are naturally interested in. People have been naturally interested in airconditioning, and that's the other vexed question in this area.

I guess we have taken the position here that to some extent we are in a transitional phase of people moving to airconditioning. Our view is, "Well, why

shouldn't they, really?" A lot of the concern about airconditioning is about peaking. A lot of the environmental concern is about base load. Greenhouse gases are not caused by people turning on airconditioners on three days a year. Now, this is where we go back to, "What are we price signalling about?" If it's about environment then airconditioners, particularly domestic airconditioners, are hardly relevant for the amount of greenhouse gases they produce. They do produce peaks, yes, but they are called "needle peaks" for a reason: because they are very small. Equally, a dimension of fuel poverty in Australia is the inability of people to cool their homes in trying heat.

I think I've talked in the notes again about anecdotal, I guess, evidence, but evidence suggesting that in fact people do die when it's too hot and that airconditioning assists in ameliorating that. It goes back almost to what I was talking about: the profligacy argument. Are people being profligate when they aircondition themselves in 40-degree heat? Our answer would be no, they are acting entirely reasonably.

Just to conclude, I'd like to introduce the phrase "the long-term interests of end users". It's a phrase that the Productivity Commission actually has commentated negatively on in telecommunications, but I think I'd like to mention it in this context as well, since why have we got this energy system? Why do we produce energy? Why do we want to be efficient about it?

Well, in our view it's to meet the long-term interests of the end users of that system. It's broad, it accommodates all sorts of change, but ultimately that's why we have it there: to meet people's needs. People want risk management, they want reliability, they want continuity and they want price stability from electricity. I think from there the only excitement gets fairly negative. That is probably just an overview of the sorts of comments and attitudes we are taking. I'm happy to discuss it further, whichever way you want to take it.

DR BYRON: Thank you very much. I was just thinking while you were talking: you are probably the only representative that we will meet in the course of two weeks of hearings representing individual private energy users, so that puts a fair burden on you. I was particularly interested in your comments about demand management because, as a lot of the people involved in the national electricity grid and so on say, demand management may well be a desirable thing from their point of view because it defers major future capital expenditures, but they have also said to us, "Don't think it's going to do anything for the greenhouse. It won't. It's an entirely different argument." The idea is that there are things that we will do for environmental reasons that won't necessarily help the grid work better and there are things that we will do to make the grid work better that won't necessarily help deliver environmental outcomes. I thought that was a good point.

You are basically arguing against variable price signalling. The first observation is that we now have wholesale markets in the eastern states where the price of electricity varies basically every half-hour unit, yet users, including residential users, just see one - at most two - usually just one price every time of day, every day of the year, when in fact there is an enormous amount of activity going on behind the scenes in the wholesale market. One of the retailers we spoke to said, "Basically, all we do is provide a hedge to the final consumer on this volatile wholesale market." I guess the question is: should final users be insulated from knowing what is happening in the wholesale market?

MR BRITTON: Well, certainly the argument from our point of view is that what people expect from their retailers is risk management. Certainly, consumers I don't think were terribly well consulted in the setting up of that market. They weren't involved in constructing a risky, downright dangerous market for some of the participants. It wasn't constructed with end users in mind. It was constructed, as far as I know, for reasons of economic efficiency at the wholesale level and trying to breed some sort of national market. But to go, "Because it's there we have to expose people to it," I think doesn't really work for me as an argument, particularly when consumers didn't ask for it and don't want it.

So at a headline level, as a point of principle you can't argue, "Just before it's there, they should be exposed to it." Notwithstanding that, to the extent that it is there and that it's become the state, if you like, well then, certainly we would argue against exposing people to that without any intermediation. Obviously, that's where the retailer adds the value.

PROF WOODS: I think Neil is talking about exposing to the information, not to the market.

MR BRITTON: Yes, that's an interesting distinction, and I think to the extent you can get them to pay attention to the information, there is no harm in that. I guess that classic economics would say they are not going to look at the information until they're exposed to the pricing because otherwise they are not going to pay any attention. I don't think that is exactly true. I think we can bring more information to people and they will participate, but I think that's marginal, and I'm very concerned that that's one step towards bringing the pricing to people. I think we have to think quite carefully about what we do with pricing because where the information goes, the prices won't be far behind, in my view. So we can't sort of put off the consideration of how we manage exposing that pricing into the marketplace for small consumers.

DR BYRON: What about if retailers were to offer a new set of contracts for

interruptible power supplies for no more than X days per year, for no more than X hours at a time, "and in exchange for signing up to this we'll give you your electricity for the rest of the year at X per cent discount"?

MR BRITTON: Certainly that may be a more useful way of going about it. I do think we have to think about what the capital implications of that are, in a sense. I think we talked about that possibly being - or even with interval metering - three-phase power seems to be a reasonable cut-off. In this area we have big users and small users and I think there are good arguments for small users being relatively well shielded from the variability of the market. They are not particularly attractive customers in the first place. They are not the sort of people that electricity companies would be falling over themselves to do good deals for and so they need risk management and products that suit them.

DR BYRON: I accept your point about consumers have got better things to do with their time than sit and watch the electricity meter go round. I certainly have. But I am trying to think of other examples: the fact that Telstra offer special deals for phone calls after 7 pm at night or Optus mobile is free after 8 o'clock at night or something. One or two simple rules that allow them to vary peak and off-peak: most ordinary civilians can understand these ideas and behave accordingly; even, you know, buying your petrol on Wednesdays every second week when it's 10 cents cheaper a litre than on weekends and public holidays. So the idea of having at least a couple of different prices where the supplier is encouraging people to use off-peak isn't entirely novel, is it?

MR BRITTON: No, not at all. As I was leading to, I think that's the path we need to explore as part of the risk management, in a sense, of the retailer crafting products which work for the marketplace and not necessarily stepping into the world of the unvarnished interval meter, I guess you might say. There is a world between those and we would certainly support the notion of offerings that give people capacity. But you do, coming up from the bottom of the market, have issues about people having capacity to choose appropriately with contracts. I mean, the telecommunications market is actually rife with confusion and misunderstandings and unfair contracting.

PROF WOODS: Deliberate obscurity.

MR BRITTON: Well, there are large elements of that. There are certainly some people who can take advantage of those markets and can micro-gain, I suppose you might say, but there are large numbers of people that can't. I think that price elasticity argument comes to roost as well, in the sense that a lot of people just won't be bothered with that terribly much and I think that's where, being realistic about it, if you are going to go down that track you have to understand that they are going to be big - you are going to have make reasonably big changes to affect people's

behaviour. You look at the retail contestability and I think it's something like 2 per cent of Victoria realistically has changed suppliers, if you don't count the ones that have gone from a standard contract or a price-controlled contract to a three-year contract, and because you are looking at price variations of 2 and 3 per cent, it's just not going to get people's attention. It goes back to what I was saying about what it is you are trying to get at. We certainly support the notion of non-price based interventions to the degree that when you do things we need to step back and look at not just information about usage but information about better installation of airconditioners, better insulation of houses, better the housing stock, and look at the macro-environment people are in, rather than just the usage patterns on any particular day.

PROF WOODS: Consumer sovereignty: does that counter the various proposals for minimum energy performance standards for various appliances and things that are being mooted? Where do you stand on that issue? You were talking about other forms of intervention, but do consumers have a right to be able to choose a less efficient product, particularly if the capital cost is a bit less, so they can actually acquire it even though they may pay more later because of its higher running costs?

MR BRITTON: It's an interesting question. I suppose, being reasonable, you wouldn't want to have, if you like, unconscionably inefficient devices in the marketplace. It really is, I think, an attractive idea but very difficult to run without getting into the sort of micro-management of every - - -

PROF WOODS: Fridge, toaster and dishwasher.

MR BRITTON: - - - fan. We are certainly strong on the notion of adhering to international standards. It's one of the things that drives the affordability of a lot of equipment, Australia being such a small market.

PROF WOODS: Like digital TV or something.

MR BRITTON: Yes, digital TV would be a classic, and I've got to say some of these big tellies are really running up lots of power, but the capacity for people to buy from the international market and not to impose unique standards from within Australia I think will be one of the angles we consider that sort of proposition for.

DR BYRON: But looking through past issues of Choice, I'm surprised. I had assumed that typically Choice would include ratings comments on the energy efficiency of appliances that had been looked at, and I was surprised at how often they are not. If we are consistently being told that consumers are not necessarily well informed about the running costs of devices that they buy, I automatically assume Choice is one of the few places you can go to where you will immediately

see that, if you want to know how much this gismo is going to cost to run, and so I was actually a bit surprised, because I thought it was there.

PROF WOODS: Is that because they don't see it as a high issue amongst consumers?

MR BRITTON: I haven't done a content analysis of Choice. I do know, ever since working there, there is a theme running through the testing that is done about energy efficiency, but the point is it's one thing amongst many. Certainly we have looked at and tested machines against their energy star rating and we have certainly also been campaigning about the standby energy and the ratings and the standards for that, and I think, going back to the previous question, people should have clear expectations about how these things are going to perform in terms of things like standby and that's a cost there that people have just got no awareness of.

So I think there is a theme running through that it's an important part of it but it's not the only thing consumers consider, and they are certainly going to look at short-run cost and want a long-run payback. An example is fluorescent globes where you put a fluorescent globe in and pay $7 or $8 for it and you go through another supermarket in another couple days - just my personal experience - and see incandescent globes there for 30 cents each or three for $1.50 or something, and you really have to think about what the payback on those things is.

DR BYRON: Yes. Even if a plasma screen TV has got a high star rating, it might simply mean that it's fairly economical to run compared to other plasma screen TVs, but it doesn't tell you that it has the same energy consumption as a small factory.

MR BRITTON: I guess that's why my hesitancy in responding to what you were asking before because, yes, there is the question of where do you go with that sort of logic? If you say, "We're going to have standards where you have to buy an energy efficient one of those," do you then move to saying, "Well, you can't have one of those because it's not energy efficient"? As background to the airconditioning debate, I have to say there is pretty staggering hypocrisy comes to light in that, where you have got people sitting in comfortably airconditioned offices opining about the tragedy of all these domestic people having airconditioners in their homes. I think that's really something that you need to think about as to, yes, we do have a certain lifestyle in this country; yes, we do have to try and achieve that in a sustainable way; but we do have to be careful about how we let different agendas drive the choices that people make.

PROF WOODS: Do I need to declare a conflict of interest in that I am a subscriber to Choice? I put it on the record.

DR BYRON: I don't think that's a conflict of interest. It's a sign of good sense.

PROF WOODS: But the other thing is, I think you made a very sound point that it is one of many considerations. A lot of participants in this inquiry look at the world through the energy efficiency lens and can't understand why people aren't motivated to that end in itself, somewhat single-mindedly, but here is you representing a whole plethora of end users and making the point that energy efficiency is but one of many things that they take into account in their daily decision-making.

MR BRITTON: Absolutely. I think that's part of the reason that we support a least-cost approach to some of the other more macro energy problems that confront us. I think it's also useful to look at the household expenditure ratios and look at how much people really do spend on energy and why that's not that important to them. It's not to say that it's unimportant to them but it goes back to the point we were discussing - it's one amongst others - and that's part of why it's not fun shopping.

DR BYRON: But particularly with energy prices relatively low in Australia, as they are now, you can understand to a certain extent why people don't get excited about the possibility of saving a couple of cents a week. Even in the case of transport, if we were serious about fuel efficiency you would probably expect to see a lot fewer big V8s or four-wheel drives and we would all be getting around on bicycles - driving from here to Kununurra on your bicycle. It's been done. The point is that given energy costs as they are - and somebody this morning made the point about the proportion of the fixed as opposed to variable costs on your quarterly or monthly electricity bill - a lot of the charges are standing charges to be connected to the grid. When I look at my own electricity, gas and water bills, less than a third of the bottom line is the actual consumption charge. So if I was 10 per cent more efficient I don't even take 10 per cent off the bill, I take less than 3 per cent off the bill.

MR BRITTON: A couple of points come in there at once. One of the points was fixed-cost environment. In many respects that - however accurately - reflects the nature of the industry, because what you've got is a very high-capital, actually quite low-operating cost industry, and so in that sense the standing charge approach is entirely rational. It's really, in other circumstances, the sort of industry that lends itself to an all-you-can-eat sort of model, which is again the telcos. It's interesting to watch the telcos going the other way, where you are getting high standing charges comparatively, $79 for your mobile phone and you get $500 worth of mobile phone costs, because they built the network and they want you to use it. In many respects energy is more like that than it is the high variable cost sort of environment where if somebody uses it you'd expect them to pay more for it.

PROF WOODS: But only in one sense. Isn't the purpose of the telco to in fact

maximise demand, whereas what we are trying to achieve in electricity is to have some demand management? Telco wants you (a) to sign on in the first place because that will give a whacking great fixed cost, but then they will also employ various techniques to on-sell you other things as part of your bundle of goods.

MR BRITTON: They would always like to have more money from you, there's no doubt about that.

PROF WOODS: Yes.

MR BRITTON: And I certainly wouldn't - and I don't - fall into the trap of equating the two, but I think it's important to recognise that there are pretty sound reasons in many respects for having high standing charges and that's one of the dilemmas of demand management. It goes back to, "What are your demand managing for?" because ultimately it's going to cost a certain amount to run that system. If you incent people through prices to actually conserve or you will save money by conserving electricity, you end up at some point in the conundrum where you are going to have to pay for the infrastructure anyway and so prices will have to rise to cover the fact of the reduced usage and you actually start to see that sort of thing flow through fairly quickly.

So there is a logical problem in the demand management in terms of running the network, in terms of delivering benefit to consumers in pricing. It can only go so far, and that's one of the perils of demand management as a solution. It goes back to: what are you demand managing for? If it's a solution to your base load, then it runs out of legs at some point, and the peril is that if you put all your eggs in the demand management basket and haven't billed infrastructure, you are going to have involuntary demand management next because the lights are going to go out.

Consumers do value continuity and reliability - I would be very hesitant to say "above price", but certainly it's a major consideration and people are prepared to pay, if you like, above the absolutely rational amount in order to get that continuity and reliability. So I think that's a really important thing to bear in mind, and that's one of the things I think gets overlooked when you get the corporatisation/privatisation style of thinking; not that we're opposed to either per se, but you have to recognise, I think, that private capital is less sensitive to the non-price aspects of people's concerns, but the political public sort of sector is going to be more responsive to people's demand for stability and reliability. That's our analysis anyway. It obviously could be debated.

The other important point with pricing in electricity is to look at the household expenditure and if you start increasing the price of electricity and increasing other energy prices to the point where they really do matter, it's got to come from

somewhere. As economists you would be well aware that money doesn't magically appear from anywhere.

PROF WOODS: No.

MR BRITTON: And it's going to be taken away from other aspects of people's lives and also other aspects of the economy.

PROF WOODS: That we are particularly conscious of, that if you want to pursue demand management through pricing you have to be aware of the overall economic consequences of that, not only in terms of consumer response but in terms of cost to industry, the whole flow through the economy. At some point you might grind the economy to a halt and end up being more energy efficient, but is that the net outcome you want to achieve? So I take your point there.

I thought you, in your written material, did overplay the consumer response a little. You were making the obvious point that metering doesn't equal billing and that people don't want to sit and watch their meter spinning, but then you talk about analyses from behavioural economics perspective shows that consumers generally detest consequences of variable-use billing and the like. Detesting the consequences though is a different thing to how they will respond to the consequences. They might detest the consequences but they might respond in the appropriate manner, so you might actually achieve what you want to achieve. I just got a slightly sort of Messianic sort of tone appearing through here. I don't know whether that was deliberate or whether that was just the way the various phrases were strung together.

MR BRITTON: It's not entirely a submission as opposed to notes, perhaps.

PROF WOODS: Okay. I understood your point.

MR BRITTON: There's a sensitivity, I think, in electricity particularly, and energy, where there is a political sensitivity as well, and one of the aspects is people may change something but it may well be the government rather than their electricity behaviour. There is sensitivity that people will react, I think, quite vigorously to the sorts of pricing increases that would be required to get their attention. Once you've got their attention, part of detesting it will be - they will do a variety of things and there will be political consequences. We are seeing it now with New South Wales trains. People are intolerant of basic infrastructure failing to perform. I think you're seeing that in Queensland. There has been enormous pressure there because of basic intolerance of the fact that it's not working. Pricing will just be salt in the wound for something that makes people feel - - -

PROF WOODS: "It doesn't work but we'll up the price as well."

DR BYRON: Yes. It may be harder fixing it though.

PROF WOODS: Yes, indeed it may.

MR BRITTON: I think that comes again back to what are you are pricing for. Are you pricing to fix it, or are you pricing to discourage people from using it at peaks, or are you pricing to discourage people from using at base? Again, you've got to be careful about hopping between them.

DR BYRON: Yes. Quite right. But the other part, the sensitivity about electricity and water prices particularly, is the sort of income distribution in the fact that these are regarded as essentials and so on, and therefore governments in all jurisdictions of all political persuasions always are very reluctant to see electricity prices or water prices go up. I was wondering to the extent to which that's simply a function of - we're accustomed to think of these as being government owned utilities. Food is also an essential and, you know, we don't tell Coles and Woolies that, "You've got to reissue prices to a price for pensioners because otherwise they couldn't afford to eat," but that seems to be the argument that comes through for electricity bills. You know, you can't increase the price of electricity because some poor people may not be able to afford to consume as much.

Maybe the answer is to increase their incomes or their welfare payments or pensions or whatever so that they can afford to buy the amount of electricity at that price that they need. We don't subsidise everything else they do, but these one or two areas which are government-run businesses, we seem to choose certain people who warrant special treatment and therefore - - -

PROF WOODS: Maybe that's why they're government-run businesses.

MR BRITTON: Yes. Well, I guess you come down to the problem that poor people can be inefficient and perhaps it's inefficient to have them, but I think that's a cultural challenge that we sort of rise to in a variety of ways.

DR BYRON: We won't respond to that.

PROF WOODS: No.

DR BYRON: No. I don't think we need to go there.

PROF WOODS: Can I just go back to an earlier discussion about minimum standards versus labelling and the like. I mean, from your organisation's perspective are there sort of certain products or product ranges where labelling is sufficient in

itself, or are there other ranges of products where you think it would be acceptable and reasonable to actually only allow onto the market those that perform at a minimum threshold level of energy efficiencies?

MR BRITTON: Our bottom line is product safety so we're not utterly laissez-faire. So product safety is an obvious area and I guess gives you a starting point so you can - - -

PROF WOODS: But you're saying international product safety, by the way, not Australian peculiarity in product safety?

MR BRITTON: Even in safety, there's a sense that's our bottom line, rather than international standardisation, so safety is most important. What's absolutely critical is that we have a standards regime that defines what's safe and what's unsafe, and then we have a compliance regime which tests and ensures that what is labelled to be safe is safe and that unsafe products aren't sold unlabelled. From there the best practice would be to have international standards that did that. If they don't, then we'd be happy to have Australian safety standards and that's important, but from there the next point really is essentially international standards to get the affordability of the Australian market in the context of the world.

Really from that point on is the transparency, if you like, of the setting of the labels. In other words, the rating schemes and the fact that they actually related to what people do, and that they don't add to cost in any non-transparent way. We're not unhappy with the notion of rating schemes to give people information on which to make decisions, but equally it's important that that be both consistent and not anticompetitive so that people can make genuine decisions based on them. We'd be certainly concerned about anything that set a floor.

If there was an overwhelming imperative - and we're talking energy efficiency - and people felt there was a need for a floor akin to the safety standard thing, then we'd want to see a great deal of consumer involvement in setting those and monitoring how they were set, because I guess a little bit shy of a long history of industry being quite happy to set minimum standards that perhaps suit their own interests, rather than those of consumers. So we'd certainly want to see anything that looks at mandating standards being carefully examined from the long-term interests of end user sort of test, rather than perhaps a more global test of energy efficiency and abstract - - -

DR BYRON: This inquiry is a multi-headed beast. We've talked so far today about sort of demand management and the metering and so on that relate to the management of an electricity grid in particular. We've talked a bit about appliances that go inside houses. Our terms of reference here today also cover things like

transport. I won't bother you with manufacturing and so on. Of course, we've spent a lot of the time today discussing with other people about the design, construction and operation of residential housing, and how that relates. Does the ACA have any particular position on things like basic five-star energy efficient housing or housing design planning controls that relate to the efficiency of sort of space heating and so on of houses, rather than just the efficiency of appliances that are located inside houses?

MR BRITTON: We'd certainly be in favour of schemes which give people information. You've got the interaction between those sorts of things and affordability, so what's really important is that in building higher and higher standards of accommodation we don't force people of lesser means into more and more substandard environments, and then penalise them through pricing structures - the things they have no control over. I mean, certainly in the retail space one of the big concerns is people that are in rental properties; you've got that disjunction between the person that owns the property and the incentives that are there for them, and the capacity of the renter who pays the ongoing costs of the energy bills to do anything about it, or otherwise contribute to their landlord's pocket by putting insulation in the roof and it then becomes his property or whatever.

I think resolving some of those things are very important, but what you end up doing is being careful, I guess, in public policy terms of not gold-plating it for the best possible reasons and then creating an affordability barrier. The classic example has been in boarding houses - the accreditation of boarding houses and the improvement of standards in boarding houses - and the squeezing out of people that use them as essentially refuge housing. You've got wonderful boarding houses here, but you've still got that floating population that can't afford to live where they used to live. It's a different arena, a different topic, but you've got that sort of - for the best intentions ending up actually creating a perverse outcome or disadvantaging a significant group of people.

DR BYRON: That landlord-tenant thing has come up a number of times. One would think that in principle a tenant can go to a landlord and say, "My electricity bills are too high. Would you consider double-glazing and insulation in the roof?" The landlord comes back and says, "Well, if I did that it'll cost me X thousand dollars and I'd need to put the rent up by 15 bucks a week," and the tenant says, "It's going to save me 30 bucks a week so, yes. Thanks." You know, a mutually beneficial deal is made. But what people are telling us is that it almost never happens like that.

MR BRITTON: Certainly. Oddly enough and most perversely of all, it seems to happen least when your landlord is actually the state, which is, I think, a sad irony of the whole thing. That's part of the problems of demand management, because you can construct a spreadsheet model that says all these things should happen, but out

there in the real world are asymmetrical bargaining relationships. This thing being in the context of other pressures - time, information seeking and costing in the family budget, et cetera - where you don't necessarily get those outcomes. So you end up in a position where you don't actually get the price improvements in people's lives and you don't build the infrastructure that you need to actually meet the demand that's there. One of the other things we have to do is get real about the sort of society we live in and the energy demands that are in fact there, and be very careful not to make excessive demands on demand management.

DR BYRON: Yes. I think that somebody else said to us the important thing is not to get the maximum level of demand management or energy efficiency, but to get the right level. What you're saying is that the right level is not to push it all the way to the point where there are only a few electrons coming down the pipe because everything else is being demand managed out of existence. That would be an extreme point to go towards.

MR BRITTON: Taking your point about how you argue it, because it's such a long-run, large investment industry, getting the policy settings wrong can have very large consequences, as California learned to its detriment. I can't necessarily join any particular dots in that direction, but it is an important point to recognise, that the jeopardy of getting it wrong can be really quite severe and take a long time to rectify. It's a bit like trains.

DR BYRON: I think I've just about run out of questions, Mike.

PROF WOODS: Yes. I'm fine. Anything that we haven't discussed that you want to tell us about?

MR BRITTON: I think I covered most of the main points at the beginning and at least get back to most of the points that dropped in conversation.

DR BYRON: If there's anything else you think of at any time, you can always put in a half-page note or something.

PROF WOODS: You made the point that what you'd provided us were notes for the purpose of the presentation. Is that being turned into a formal submission that we can publish?

MR BRITTON: Yes. Time allowing, I will.

PROF WOODS: I can't see what's wrong with you sort of topping and tailing that, and just submitting it. It doesn't have to be glossy and glorious.

MR BRITTON: I wouldn't mind revisiting it and in the context of what you said, thinking more about the variable pricing - there are a couple of things in that which are perhaps a little bit provocative and that's one of them, I think. The other is talking about peaking as a form of mental arithmetic - behavioural economics and the aversion to peaking - so there are two themes that might be worthy of elaborating, but whether time allows.

PROF WOODS: All right, but if you could in a fairly timely manner, that would be helpful to us, just to have it on the record.

MR BRITTON: Yes. Certainly what I will do at the very least is confirm whatever we can do as a submission, so for your purposes you can take it on board.

PROF WOODS: Thank you.

DR BYRON: Thank you very much for coming.

MR BRITTON: Thank you.

PROF WOODS: A brief adjournment.

DR BYRON: A brief adjournment, yes.

DR BYRON: We can continue with the public hearings for the Productivity Commission's inquiry into energy efficiency. The gentlemen from the Centre for Energy and Environmental Markets: if you could each introduce yourselves for the transcript so that the transcribers can recognise the voices later, then if you want to talk to the submission for a while, then we can engage in some sort of conversation about that later. Thank you very much for coming.

DR MacGILL: My name is Dr Iain MacGill, and I'm the research coordinator engineering at the newly established Centre for Energy and Environmental Markets at the University of New South Wales.

MR OUTHRED: And I'm Hugh Outhred, joint director engineering, also for the Centre for Energy and Environmental Markets at the University of New South Wales.

DR MacGILL: Firstly we would like to thank you for the opportunity to come and speak with you. I would also like to apologise for not having materials for you prior to now. What we have just given you is a very rough outline of what we plan to write for our submission to your inquiry - and our apologies for not having that ready. There are also a couple of other documents there, including an outline of a recent presentation on energy efficiency made at the recent Business Council for Sustainable Energy Conference in Sydney, a paper we did last year on energy efficiency certificate trading, which looks at some of the issues of actually creating trading schemes in energy efficiency; for example, a national energy efficiency target or similar, and finally our submission to the NFEE process which we're also following.

Just to provide some context on where we're coming from with this submission that we hope to make, the Centre for Energy and Environmental Markets is an interdisciplinary research centre which has just been established. It joins researchers in the school of electrical engineering and telecommunications as well as the faculty of commerce and economics, Institute for Environmental Studies, Australian Graduate School of Management and the faculty of arts and faculty of science. What we're really trying to do with the centre is formalise a lot of work that we've been doing over the years in an interdisciplinary way on areas of energy markets and environmental markets, and so we now have a formal vehicle for pursuing these.

Our work in energy efficiency, which extends back - I guess much longer for some of us than others - in many ways is rooted in the work that we have been doing on energy markets more generally, and particularly electricity industry restructuring over the last decade or so. What we plan to focus on is the demand-side energy efficiency issues within the Australian stationary energy sector, but with a particular focus on the electricity industry, which is where we do a great deal of work. In our

submission we hope to, first, frame the Energy Efficiency Challenge, as sort of outlined in your issues paper, within what we see as the wider context of energy market design and the challenges of that, and then we'll attempt to address some of the key specific issues that you raise throughout the issues paper.

I guess the starting point for us is really the role of the stationary energy sector and the great value of using an energy services model for any analysis in thinking about the sector and how it works. Obviously it has a vital role to play - the stationary energy sector - for essential public goods and because of contribution to economic development and progress. It also represents a very major investment by society in terms of the capital and operating costs of all the equipment involved on both the supply side but certainly also the demand side, involved in delivering these services.

There are questions of the energy efficiency of this process from primary energy resources through to the delivery of end-use energy services. There is the economic efficiency of this process in terms perhaps of societal benefits delivered against the cost incurred to society in delivering those. Clearly of particular interest to this inquiry is the cost-effectiveness of this process for individuals as a measure of the private benefits they derive from chosen energy services against the costs of providing these; generally in terms of government policy objectives and revolving around the efficient provision of energy services to meet essential needs and permit ongoing societal welfare and progress; at least some level of accessibility for all members of society, given energy's role as an essential public good; security of supply - certainly on the agenda at the moment - and environmental sustainability.

Much of the work that our group has done has really focused on the particular characteristics certainly of the electricity industry, and the challenges that raises for energy markets that drive these. Certainly with electricity with the ultimate just-in-time flow industry, supply and demand must exactly balance at all times. There is no cost-effective storage of electricity itself; instantaneous transmission and distribution from all generators to all end-use equipment. For these and a range of other reasons, there are some real challenges for market design with this rather unusual commodity.

There is certainly a range of other potential market failures, as you identify in your issues paper: monopoly; the role of electricity as essential public good; incomplete markets, certainly on the demand side; significant externalities; information failures - again, as you note particularly on the demand side; the business cycle with these very capital-intensive, long-lived investments - certainly on the supply side, but also on the demand side in some areas certainly, such as buildings and things like that. For these reasons, in our work on energy markets, and particularly the electricity sector, we tend to try and explore them on the basis of

them as designer markets and the very important role that policy-makers have in designing a set of rules and structure for these markets actually to operate. We certainly seem to face challenges in aligning individual energy consumer motivations and behaviour with societal objectives for energy.

That sort of brings us to the clear point and the basis for our analysis on end-use energy efficiency largely through the view of the wider energy market context. What we hope to do, if we haven't done it yet, is focus on the key questions as outlined in your issues paper. I've just made some dot points on the sorts of areas that we do hope to go into in greater depth.

PROF WOODS: Can I just interrupt for a second?

DR MacGILL: Of course.

PROF WOODS: You followed the format of what we've identified as the key questions, but do you have a view on whether they are the key questions?

DR MacGILL: Hugh, do you want to - - -

MR OUTHRED: I think that's a very good question. I think probably - in terms of our presentation - it might be best if Iain just completed his list and then we come back to it.

PROF WOODS: Yes. I'll just flag it, but come back to it.

MR OUTHRED: But I think it's a very important question and we would like to talk to that

PROF WOODS: All right.

DR MacGILL: And that does come up in the fourth bullet point right there. In terms of this question of, "What are the environmental and economic costs and benefits of cost-effective energy efficiency improvements?", certainly the individual benefits appear to be potentially very large with both worldwide and Australian evidence that energy consumers are failing to implement even highly cost-effective efficiency options. You see, of course, a very wide range of those estimates from the IEA estimates through to some of the work with the NFEE. The associated environmental benefits are also large, particularly given our emissions-intensive energy supply sector.

The costs of undertaking energy efficiency certainly can't be neglected. It certainly seems that some of the work that is done in energy efficiency doesn't take

enough consideration of them. However, what we do argue in the "What can be done?" section towards the end, is that there do appear to be clear policy opportunities to reduce transaction costs and so on. But in light of your earlier question, certainly it seems there are far greater economic and environmental benefits if a wider societal view is taken on cost-effectiveness, particularly through avoiding supply-side infrastructure investment when there are demand-side options that are more cost-effective. Perhaps your use of "cost-effective" - as given in your terms of reference - limits in some ways the potential to explore what's really possible with energy efficiency.

DR BYRON: We didn't write the terms of reference, but I'll come back to that in a minute. Carry on.

DR MacGILL: Sure, yes. Also within your terms of reference, and as you clearly outline in your issues paper, there are limits in your brief to explore climate change policy issues, but certainly if you have a view that we have some pressing climate change policy objectives coming onto the radar, it does seem to support far greater efforts to be made in energy efficiency than those justified on an individual cost-effective or even societal cost-effectiveness criterion - just because of their low cost abatement.

In terms of barriers and impediments to adopting cost-effective energy efficiency improvement, we do plan to focus mostly on the significant barriers that we feel lie in the present electricity market design and what you might almost term dysfunctional retail sector for certainly the electricity industry here at the moment. There's a whole range of issues. Obviously it's incomplete: time, location and energy security, price signals to end users. We also argue the lack of a trusted and impartial energy service facilitation institutional capacity that help energy consumers optimise delivery of their desired energy services.

Our view is that information failures are significant, but in our view certainly not the most important barrier. Certainly for many energy users their stationary energy costs are less than 5 per cent of expenditure. That creates potentially a fairly poor motivation for them to really explore all of their energy efficiency options, given more pressing decisions and desires. Even when motivated, many energy consumers are poorly equipped to take action through poor understanding, but also important structural issues - split incentives - and again, we would argue, a missing sort of energy service facilitation capability to help these people.

Present market arrangements with open-ended obligations to supply; very pressing and highly political security of supply concerns; a commodity that's largely valued by its absence rather than its presence; a well-established and encumbered supply-side industry which has electricity as its core business - it certainly does seem

to mean that we see far more emphasis on supply-side rather than demand-side options for investment in the stationary energy sector. I think there's a good case to be made - as I'm sure do many people presenting before you - that there are very cost-effective demand-side options and a range of institutional factors that are holding them back.

Then, very quickly: would government intervention to address these barriers and impediments produce net benefits and what form should that intervention take? We will certainly argue there's a very clear role for government policy intervention in key areas of energy market and energy efficiency market design, in order to improve market operation. Our view is that net benefits are likely to be very large, given the great potential for cost-effective energy efficiency improvements. There certainly are widely available and mature energy efficiency technologies for deployment and the low risks associated with those; a good understanding of energy efficiency potential from worldwide experience and what we would see as good policy options that have low risk and low cost, with high reward. We'll certainly be arguing on the importance of a coherent energy efficiency policy framework that does require that it sit within a coherent and comprehensive energy market policy framework.

There seem to be very good opportunities for regulation as a low-cost and proven effective approach to correct some what would seem to be energy efficiency market failures. In terms of financial incentives and the role they can play, it can certainly be a valuable one, but given that many energy users are already ignoring cost-effective energy options, we need to assess them in that light and also in the potential application of schemes such as energy efficiency certificate trading. We've done some work on that over the last couple of years and have been exploring its implementation in schemes such as the New South Wales benchmark scheme. I guess our work seems to highlight some of the design challenges for those types of markets.

DR BYRON: Great. Okay. There are lots of interesting things there we can talk about, but coming back first to the terms of reference and the key phrase that is in the terms of reference about the measures that are cost-effective from an individual point of view, our interpretation of that is that there may be a whole universe of measures that would be worth doing from a social, economy-wide point of view, if you took into account all the environmental features, but we're asked first to look just at the subset of that, which are the measures which are immediately cost-effective today, and to understand what the barriers and impediments are to the more widespread adoption of those measures. We can get those as the first cab off the rank and then we can think of, "What would you need to do to adopt that broader set of measures which are worthwhile from a society-wide point of view, taking into account the environmental effects even if they're not immediately cost-effective for the decision-maker?"

So it's not that we're dismissing all the ones that are, if you like, in the second tier but we're trying to understand the first ones first. That conundrum is, as you say, if there are things that could be done immediately today, and even with today's relatively low energy prices in Australia that are low risk, high reward, low cost to implement, why on earth aren't they already happening? I accept that what you're saying is right - that there are all these measures that could be adopted - and it just intrigues me, especially when other people are telling us that the economy is becoming much more competitive; it's internationally exposed; companies are trying to squeeze every ounce of fat out of it to make their supply chains as efficient as they possibly can and they're looking to save every last dollar they can.

To think that there are all these hundred-dollar bills that you are going to pick up off the ground and nobody is bothering to bend over, there's a paradox there. Somebody said to us a few weeks ago in Adelaide that, yes, there are heaps of hundred-dollar bills on the ground but some of them are stuck down and you have to work hard to scrape them off before you can pick them up. I don't want to get into too much generalisation, but it's generally engineers who can see all these huge cost savings, all the hundred-dollar bills on the ground, and it's the economists who say, "Well, they can't be there because if they were there somebody would have picked them up."

The conversation is not going anywhere, which I think is one of the reasons why we have been asked to come and look at this whole issue as to what exactly are the barriers and impediments. I accept that just about any business or any household could do things to increase their energy efficiency and for some reason people aren't bothered. Is it just because energy prices are so cheap that it doesn't get onto the radar of households, companies and boards? Is it because in fact there are costs in bending over and picking up hundred-dollar bills? You have got to recognise them; you have got to have the right tool; you have got to have the time and you have to be willing to bend over. I mean, I don't know; it just seems such a contradiction.

MR OUTHRED: Perhaps I can start responding to that and then Iain might like to pick it up. Yes, electricity has this kind of characteristic and I'm sure it extends to other industries as well but if we just stick with electrical energy, one way to illustrate this problem I think is just to look at our national electricity market and notice the difference between the normal prices in that market - I'm not sure whether you're familiar with it but typically around $25, $30 per megawatt hour - and the price ceiling, which is set at $10,000 per megawatt hour. In fact, a lot of people argue it should be higher.

If you think about it, the price cap is really there partly as a surrogate for the value of the services they deliver; in other words, a rationing price. It illustrates what

is a fairly general situation for electricity: the actual cost of minute-by-minute provision, under normal circumstances, is very much less than the value. You can translate that directly into a managerial response, whether it's in your household or in a factory or a school or a university or whatever, and that is that incremental cost of delivery is not something that anyone focuses on because it's the small issue.

So for example here, with this hearing, we're taking for granted the fact that electricity will be available. In fact, if it wasn't, I guess the hearings would have to stop until we found another supplier to turn the tape-recorder back on, and yet nobody has bothered to even think about making that provision, taking that precaution. In other words, our culture now around electricity is that we can take it for granted that it will be there.

Another example of that is the laptop computer there which has a built-in battery. It probably adds a few hundred dollars compared to the cost of the desktop computer and yet having that backup battery in there would eliminate many of the computer crashes and the costs associated with them, and yet we find people don't bother making that investment. It's relatively rare to find an uninterruptible power supply associated with a computer. So there's a whole set of decisions around electricity that really don't look rational if you start to go into the details but they're largely, I think, driven by the culture that we now have around electricity which is that it's very much regarded as an essential good and it will be provided and that we don't have to worry about that very much. We basically get on with consuming, doing all the other things we do, taking for granted that it will be there.

I think that culture gets in the way of answering this question about, "Well, how could we manage or why should we even think about managing with less of the stuff that has always been available?"

PROF WOODS: I understand that in relation to backup, because there's a history of reasonable or sufficient reliability - a little less at the moment - but that doesn't explain behaviour in relation to seeking out efficiencies in production costs, because any operations manager reporting to the board on profitability will be seeking opportunities. There is your phrasing coming out of the IEA - and we have read similar sorts of things - the highly cost-effective efficiency options, and we've had presentations, and you have payback periods of less than two years, et cetera. But we don't get very convincing answers on why this is so and what are the impediments to achieving those efficiencies.

MR OUTHRED: Because it's largely cultural and therefore, in fact, difficult to explain.

PROF WOODS: The profitability is not cultural. Profitability drives its own

motivation, doesn't it?

MR OUTHRED: No, but remember what I was saying about the small size of these costs. The fact that they don't typically get on the management radar screen - we certainly see this, for example, in our own university, which has struggled with this issue of energy efficiency for as long as I have been there. It's not that the opportunities aren't immediately visible. It's just that, in terms of management time, they never really reach, if you like, a critical mass. They never become sufficiently important for the decisions that need to be made - and some of the decisions unfortunately have to be - in the way organisations are structured they have to be made fairly well up the tree before these things happen. So there's a lot of stickiness about the whole process and unfortunately that's just the way it is.

You will find many papers written about, "Do you find it easily packaged?" "No." "Does it fit nicely within a particular discipline like economics?" "No." It more sits, if you like, in sociology than it does in economics, which is one of the reasons why it appears to economists as a frustration rather than something that sits well within an economic framework.

DR BYRON: When we have asked the managers of major businesses about do they know about energy efficiency measures that would substantially improve the efficiency of operation of their plant and what the profitability of payback fees are and why are they doing it, they say, "Yes, we know about them. We know that the payback is dah dah dah, but if there are things that we have to do, like OH and S and food safety and so on - - -"

MR OUTHRED: Which are higher priority.

DR BYRON: Yes, which is part of the licence to operate - they're not optional - and then the question is, "Do we put $100,000 worth of management time into sales and marketing or quality control or waste management or blah blah blah, or energy efficiency?" "Yes, we know there are low-hanging fruit in energy efficiency but there's even lower-hanging fruit over there somewhere." So it's not necessarily that they're ignorant; it's just that they have got their eye on something else.

MR OUTHRED: It always gets crowded out because there is some other problem that comes up which is more important. It doesn't always get crowded out. Of course, some organisations make those decisions, but not enough to pick up any of the opportunities that seem to be there, so in that sense, if one accepts that that situation exists, then one of the tasks of policy is just to make it easier for those decisions to be made, which is one of the reasons why policy such as appliance standards, minimum standards and likewise for buildings have proved so effective worldwide in the sense that what they do is either facilitate these issues getting

through to the point where the decisions need to be made, or just reducing the decision space by taking away the low-efficiency options.

It is always uncomfortable from, if you like, a theoretical perspective to have to resort to those kinds of interventions but in practice we're dealing with issues where things like economic theory are less effective than they are in many other walks of life and it's just an example of the fact that theory - it doesn't matter what area it is, whether it's engineering or physics or maths or economics or sociology or whatever - that theory always has some limitations compared to the practical situation and this appears to be one of them where the concept of a market needs help, if you like, or it needs a supporting framework around it to produce the kinds of outcomes that we believe should be there.

DR BYRON: I guess the thing that has frightened some of the people that we have talked to is that if the government comes along and says, "We're going to require you to do an energy efficiency assessment and then we're going to require you to do whatever that opportunity assessment says because we think this is good for you, the company might itself have identified other things that are even better for the company."

MR OUTHRED: That's right.

DR BYRON: So you're now getting bureaucrats micro-managing private companies and saying, "Well, we know that forcing you to do this energy efficiency measure is going to be better for you than what you think you should be doing to run the company." It makes a few people a little bit uncomfortable I guess.

MR OUTHRED: Yes, and I think the emphasis should be of course on minimising interventions and targeting them in areas that are most appropriate. So one is typically wanting to avoid getting into that situation, but there are some kinds of decisions that lie outside it or, alternatively, if they're getting close to that nature, can be targeted in a somewhat different way. So just to try and illustrate that, if one sets aside the question of the company operations directly and turns more to the infrastructure in which they take place, like buildings, or standardised appliances and equipment like induction motors and things like that, then I think there is little damage done to the company's autonomy by working in those areas.

So there are some types of interventions which clearly avoid going too far into the company's core business. When, though, you're talking about other areas where you're getting close to that - and of course one example would be electricity-intensive industry; another would be general industries, things like small business, like bakeries, for example, where they might have quite energy-intensive work on site - I think the federal government program that was in place was actually quite an

effective intervention in that place, where what they were doing was inviting the market leaders of the industry to participate in a voluntary program, working with them to identify things that could be done in the company's context; in other words, not imposing but working directly, people spending time with the executives of the company, identifying opportunities that were beneficial as far as the company was concerned, and using that to establish effectively a new best practice in the industry, and then leaving the competing companies essentially to play catch-up.

Basically they've got to look at what's happened there, and then it becomes a competitive advantage. It seems to me that was a very effective way for governments to work with industry, so it's a matter of being innovative in terms of policy, and for looking at ways in which policies can work that don't look like Big Brother coming in to tell the company what to do.

DR BYRON: But if governments want to encourage or demonstrate to companies, big or small, to increase their profitability, I just wonder about why we have to use the energy efficiency lens to do that. If the government paid for consultants to come in and look at capital efficiency or labour efficiency or chemical use or waste management or OH and S or whatever, rather than giving a 7 per cent boost to that particular company, they might give it a 12 per cent boost or something.

We don't seem to do most of those other things, but energy efficiency is somehow more special than anything else. I suspect that no matter what angle you came from, if you sent in a really good consultant to any business, you could find things that would help. In that sense, energy efficiency is not unique, but it seems to be unique in that it's the one thing where governments have said, "We've got to go out here and show these companies how they could become much more profitable through improving their energy efficiency."

MR OUTHRED: Yes. Well, first of all, it's probably not the one thing, but I would agreed with you it's not obvious why you would want to single out energy efficiency for special consideration, but I think that ties back to the drivers as governments see it. Partly that's governments themselves, partly it's responding to political constituencies, but if we look at what's happening in Australia at the moment and the concerns that governments appear to have about the money that's being invested in the supply-side infrastructure and the associated concerns about, on the one hand, societal expectations for delivery of this product as an essential good, on the other hand the mounting range of problems that governments see in meeting those objectives, then I think that's as far as you might have to look to see why governments are seeing this as an issue.

DR BYRON: Demand management is a very efficient way, a very low-cost way, of deferring major big capital expenditures or even repair bills on the grids.

MR OUTHRED: Yes, I think it goes beyond the bills themselves, though the bills are an important part of it, but even issues like obtaining siting approvals is becoming a bigger and bigger issue, so there are a whole lot of problems that governments see and bureaucrats see, because of their areas of work, that are not impacting on individual companies.

But I'd also make this point: that of course if you see that as a driver for say the kind of policy or the inquiry that you are now running, the energy efficiency enhancements in themselves won't stop this juggernaut, if that's the way the governments see it. It won't stop that juggernaut because we will just get other end users picking up whatever slack there is in supply, so that we will find for example that it won't defer the new power station very much.

So I think it would be wrong to suggest that this was a panacea for that problem if governments see it as a problem, but it can be part of a rational broader framework. In other words - and this is I think another important way of looking at energy efficiency- if governments were trying to move away from some of the cross-subsidies that exist in energy pricing, and looking for ways to allow the costs to flow through in pricing, then improvements in energy efficiency is a way to allow them to do that. It's a way to sweeten the pill.

For example, if you feel that you have to bring in things like emission taxes or other measures of that kind, then improvements in energy efficiency reduce the bill as perceived by the individual end user, while allowing that broader policy objective to be achieved. So I think you may well find that the reasons behind why the inquiry is set up have, if you like, a broader set of drivers than energy efficiency in its own right. But I would agree with you; if energy efficiency itself was the driver, one would have to ask why we're here, why we're doing this.

DR MacGILL: I just had a couple of comments on this issue of cost-effective for individuals, given ongoing reform in energy markets. It's seen to be a bit of a moving feast, and what does it mean to have cost-effective decision-making to an entirely inappropriate set of price signals? I think, number two, this issue of companies being told what to do and potentially being prevented from doing other more important or more profitable activities: clearly the issue there is an opportunity cost issue, whether it's capital or management time and so on. If you have a good facilitation industry that actually helps put energy efficiency in and reduces all of those opportunity costs, provides the capital, basically makes it hassle-free for management, then that's a real way to get over some of these problems.

I think the third one in terms of getting management's attention is clearly OHS. You can make good arguments for good OHS on strictly economic arguments for a

business, but we don't just leave it at that. We see the wider societal importance of OH and S.

PROF WOODS: That's an interesting one, though, because there are very sound economic reasons why if you've got a skilled worker and they become injured, you'll want to get them back into the workforce as quickly and efficiently as possible but, left to themselves, many companies don't actually understand that, and you have to impose a high degree of regulation to ensure that across the board that occurs, and even then it's not always a perfect - - -

DR MacGILL: Yes. OHS has some very interesting market failure rates next to it. And then I guess in terms of the energy efficiency best practice and the fact that perhaps you can invite consultants in to do a whole lot of things for a business, I think that's certainly true - - -

PROF WOODS: Invite as in somebody subsidises - - -

DR MacGILL: Sure, but in some ways - - -

PROF WOODS: Like the taxpayer pays the business to become more profitable.

DR MacGILL: Sure, whether it's the bakeries or the - but in some ways you don't assess it by itself. You assess it as part of a coherent policy framework, and there's very good work that shows that a powerful way to build a policy framework is you need frontier, and that's often subsidies or whatever to just push the boundary of what people's understanding is of what's possible; you need incentives sitting behind that to bring the early adopters and those who have their eyes open; and then you have the bottom line regulation to bring the laggards along. So the value of the frontier policy style approach, which clearly does cost us money, is not just assessed in itself. It enables and strengthens the other policy actions that you're taking.

PROF WOODS: You've got on your last page a number of dot points. The third-last one says that regulation is a low-cost - and I would have to question that, because as an unqualified statement I think I would disagree strongly - and proven effective approach, and when you think of the distortions that regulation introduces into behaviour, I'd have to question that strongly. To correct many energy efficient market failures: it's not passing my test as immediately and blindingly obvious. Do you want to therefore elaborate?

DR MacGILL: It's not something in the point form translation. Firstly, with that "regulation" word: to expand on that, let's look at minimum energy performance standards or minimum performance building standards. I think the experience is the Australian government says it itself, that perhaps one of its most successful energy

efficiency policy actions has been MEPS, and it's basically just a technical regulatory approach built with this sort of frontier and the moving, but - and certainly the worldwide experience seems to say, as well, that many of perhaps the failings of some of our energy users to fully consider their energy efficiency options, you can best correct those informational failures and transaction costs by just removing the really dumb choices from their sphere of decision-making.

PROF WOODS: I guess I'll look forward to a qualification on that.

DR BYRON: Whether that means regulation is low cost from the point of view of the government in the sense of low budgetary outlays and whether or not you take into account that the costs that are imposed on those who are regulated, is another point.

DR MacGILL: I think it again comes to that issue of when you make assessments of the costs and benefits of something like the MEPS program here in Australia, the benefits are - - -

MR OUTHRED: We'll qualify it back to some specific examples in context rather than making a general claim.

DR BYRON: But you reminded me of the energy performance contractors. We've spoken to a number of them, and it seems to me that that's an extremely low-cost way of dealing with information asymmetries, in that the contractors have a specialised knowledge, the business has a problem that needs to be solved. They come together, they make a mutually beneficial commercial transaction. Both sides win, and to me that's sort of a textbook example of where, yes, there's a problem; no, governments don't have to do anything, because these businesses are emerging to solve the information asymmetry.

That's their business. They have knowledge that other people need, and they sell that knowledge, and to the extent that they get in there and offer to install hardware or to provide business or share some of the risk or guarantee - "If you let us do this, you will save at least half a million dollars a year for the next five years" - there are ways where all these things work through to the benefit of the economy and the environment without a bureaucrat being involved at all.

MR OUTHRED: Yes. Certainly these companies are very important and they're making important contributions but at the moment they're working within a narrower range of activities than would probably be effective, and it is of course in the end just a question of how efficient you want to get; how many of these cost-effective opportunities do you really want to pick up. There's certainly I think scope for expanding the range of work that they're doing, but I agree with you; they're playing

a very important role.

DR BYRON: I understand how they're working with larger major national companies but certainly in Melbourne there are organisations that will even come and look at your individual house for $100 or something, and guarantee to knock a substantial amount off your annual utilities bill by doing that. I know a number of people who have signed up for that sort of treatment. Now, I can't imagine it's a high profit margin business for the advisers, but even just going around households, they think that they can find enough hundred-dollar bills lying around to make it a good-value proposition for the householder to pay the fee.

MR OUTHRED: Yes. I'm not sure that it's working very well in the residential sector but I think it is working reasonably well now in the large commercial and the industrial sector, but when you get down to the residential level, I think one of the issues that is - and it's partly a transition issue, but it is the element of trust, and that I think could do with some more effort being put into it to build that up.

DR BYRON: I gather that there are some very interesting issues about writing contracts, about who takes the risk and who makes decisions and those sorts of things, but I don't think it's inconceivable to work through something.

MR OUTHRED: I think it's very important to try and build that sector of the industry. I think that's certainly something that's worthy of attention in your inquiry.

DR MacGILL: With regard to the energy consulting industry as such, or any service industry as such, I think another point that does seem to emerge from the experience with it is that they often only get to really intervene or become a player at a certain point where a lot of the really important decision-making has already been done. So when you go to a residential house and look for things to do you'll find things but the really big things have kind of got away because the house is now built. I think that highlights some of the split incentive issues. Really, to get energy efficiency right requires a whole number of decision-makers to somehow coordinate it appropriately.

DR BYRON: And it's always much more expensive to retrofit than to get it right the first time. Yes, I appreciate that, but the other thing that I'd like to hear a little bit more about are the designer markets and your fairly forceful comments about the dysfunctional retail sector and the importance of getting the market design right. Can you elaborate on that?

DR MacGILL: I'll let Hugh tackle that one.

MR OUTHRED: First of all, the way that the electricity industry is set up, the

primary contractual arrangement is between the electricity retailer and the end user. That is underwritten by a social construct. It varies from country to country but it's often described as the obligation to serve: the expectation that you will be able to get electricity supply whenever you want it, whenever you want it. What that has led to is a situation where the end users don't feel any need to forward-contract in any sense, to build a relationship about their plans for the future or to discuss them with anyone on the supply side. The expectation is: "As long as I pay my current electricity quarterly bill then for the rest of my life I'll be able to go on consuming electricity."

So the relationship at that boundary is dysfunctional in the sense that there is no expectation that you have to plan for the future if you're an end user, and that's one of the problems that we have with this culture of end-use efficiency and why, at the point of the investment decisions - designing a new house, if you like, or considering what house to buy - we tend to not focus on electricity. We tend to not even think about what the electricity bills might be. It means that the retailers, in operating within that culture, are once again primarily focused on this is an opportunity to grow future demand, rather than to provide sound advice to end users.

So their relationship with end users is more, at the moment, structured towards "How can I encourage this end user to use more electricity?" than it is "How can I encourage this end user to best meet their future energy service requirements?" So for example - it's not so common in the last couple of years because governments have essentially tried to call a stop to this - but typically electricity retailers would be offering things like interest-free loans for airconditioners and other inducements of that kind. So the cultural relationship is dysfunctional in the sense that it is really just focused on increasing the flow of electricity rather than anything else. As I say, it's important to look at the cultural context in which these relationships are formed, as well as what you might be thinking about in terms of the economics.

DR BYRON: Well, as a number of people have said to us - almost everybody sat there today and said to us - that most consumers (a) don't know and (b) don't care what's behind the light switch.

MR OUTHRED: That's right.

DR BYRON: All they know is, when they flick the switch they want stuff on. They don't know or care where it has come from or all the steps in that supply chain that has got it to that point.

MR OUTHRED: Yes, or any of the implications. So that sort of forces governments to come back in in this Big Brother role because of the lack of informed decision-making that's occurring at the end user point and it's all part of this cultural

context that we've created. We've essentially created a situation where end users, if you like, have not been encouraged to grow up and think about these issues, rather than just treat is as something that governments will provide.

DR BYRON: At the risk of being just a little bit controversial and hypothetical, if governments were to say, "Well, let's impose a tax on the burning of fossil fuels of X dollars per tonne of CO_2," for example, and that applied to power stations or petrol pumps or everything else, and so when the householder or the manufacturer in the factory or whatever got their electricity bill the price included the environmental damage being done, they would then have presumably some incentive to pursue all the demand management and energy efficiency measures they could find, and it would pay them to go out and find consultants who could help them reduce their energy bill - things that don't seem to happen at the moment. Energy prices are relatively low.

MR OUTHRED: I couldn't agree more. That would make a big difference, but the present federal government has ruled out emission trading, for example, as an option, and this is one of the reasons why we get forced into this situation, if you like, of talking about energy efficiency improvements rather than dealing with this problem in a more coherent manner. So certainly, if you want to make a recommendation that the government implements emission trading, we'll be right behind you. We'll be interested - - -

DR BYRON: I think that's what would be called courageous.

MR OUTHRED: I suspect it might be.

DR MacGILL: Just on that issue, we did recently write a paper on national emissions trading for Australia and we did identify three areas where emissions trading alone is unlikely to be enough to drive the sort of behaviour that we might hope and expect, and energy efficiency was one of those, due to the somewhat limited nature of price response for some energy users. We could send you a copy of that paper, if you're interested.

PROF WOODS: Yes, thank you.

DR BYRON: I think in view of the time we are going to have to wrap it up there, but can I just thank you both very, very much for coming. It's been a most stimulating and interesting session. Any final comments you want to put on the record?

MR OUTHRED: We'll put our proposals into writing. We'll see if we can tidy up some of our wording and we'll look forward with interest to seeing your conclusions.

PROF WOODS: And similarly we would like your reaction when we do put out our draft. If we can get a considered response to it, that would be helpful.

MR OUTHRED: Yes. We will certainly try to do that within our time constraints.

DR MacGILL: Thank you so much.

DR BYRON: Thank you. I don't think there is anybody else in the audience who would like to come forward and put something on the transcript for the public record. That being the case, I'll adjourn the hearings and resume tomorrow morning at 9 o'clock. Thank you.

AT 5.26 PM THE INQUIRY WAS ADJOURNED UNTIL
TUESDAY, 16 NOVEMBER 2004

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