SPARK AND CANNON

Telephone:

Adelaide	(08) 8212 3699
Hobart	(03) 6224 2499
Melbourne	(03) 9670 6989
Perth	(08) 9325 4577
Sydney	(02) 9211 4077

TRANSCRIPT OF PROCEEDINGS

PRODUCTIVITY COMMISSION

INQUIRY INTO ENERGY EFFICIENCY

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

TRANSCRIPT OF PROCEEDINGS

AT MELBOURNE ON THURSDAY, 25 NOVEMBER 2004, AT 9.05 AM

Continued from 24/11/04

DR BYRON: Good morning, ladies and gentlemen. Welcome to the continuation of the public hearings of the Productivity Commission's inquiry into energy efficiency. I'm Neil Byron and my fellow commissioner is Mike Woods. We've already met with a wide range of organisations and individuals with an interest in this inquiry. We held hearings in Sydney and Brisbane last week and Canberra on Monday of this week and we'll be having some video-links this afternoon. We're working towards a draft report for public comment in early April 2005 and we will then undertake further public consultation with interested parties to get feedback, after they've had time to read that report.

We always like to conduct our hearings in an informal manner but we are taking a full transcript for the record. At the end of the day's proceedings, I will provide an opportunity for anyone who wishes to do so to make a presentation. I'd now like to welcome the representatives of the Electricity Supply Association of Australia. Gentlemen, could you each introduce yourselves for the transcript and then summarise the submission - we've receive the written version already, thank you - and then we'd like to discuss it with you for half an hour or so after that. Thank you.

MR PAGE: Thank you, Commissioner Byron. Brad Page, chief executive officer of - I hate to correct you already - the Energy Supply Association of Australia. We changed our name some 10 months ago.

MR WENTRUP: I'm Killian Wentrup, environment policy analyst with the ESAA.

MR PAGE: Thank you for the opportunity to present to the commission. May I note that at this stage the material that you have with you is draft in form. In short order, we would hope to make that a final which you can release more publicly but time has been a little against us. Nonetheless, I think the key messages that we have in our draft will survive through to the final form.

Can I wish the commission well in its examination of energy efficiency, as it's a topic that's received enormous attention for probably the last 10 years in the electricity industry. No matter where you look across the world, in our view, it seems a very difficult topic to actually get real traction on and make headway, so I think the work of the commission will be timely and informative.

Perhaps I might start by indicating that the Energy Supply Association, contrary to what might seem to be the normal expectation, is actually very supportive of energy efficiency initiatives. Our industry faces very significant challenges over the next 15 years, with projected growth in the use of electricity somewhere in the order of 50 per cent, driven not just by baseload requirements for industry but especially by the increasing penetration of airconditioning in residential

circumstances. Any improvements in energy efficiency have the potential to contribute strongly to avoiding what might otherwise be a relatively inefficient investment in network and generation augmentation, where those assets may be in play and only fully utilised for extremely short periods of the year.

Our draft submission provides some examples of recent experiences, and I might just observe these. We have provided an example in Sydney on a very hot summer day, where we've compared effects between a very hot summer day and a mild summer day. Typically, a hot summer day leads to a 57 per cent increase in electricity demand for domestic and small commercial consumers. The top 15 per cent of peak demand occurs for just 24 hours in any one year and three-quarters of this is simply to meet domestic airconditioning needs. We think that that's reflective of a real need to examine energy efficiency and energy use issues.

If I may spend a little bit of time on what the impediments are, in our view, to taking some of this forward, we observe that with the bulk of the peak demand, which is very expensive time - and the wholesale market as well in summer - we can see prices move well into the thousands of dollars per megawatt hour as demand and supply converge. We would have to observe that state governments, who control prices in a retail sense, in all states continue to impose maximum prices and uniform tariff arrangements despite the ability for most consumers, but not all, to choose their retailer and to freely enter into particular contractual arrangements.

The effect of this is that anybody who has an airconditioner pays exactly the same unit rate for their electricity, regardless of the time of day or the circumstance that confronts the market, as their neighbour, who may not have any airconditioning. Again in our paper, we note that this results in a cross-subsidy from those without airconditioning to those with it. In New South Wales, in the example I cited before, that cross-subsidy amounts to somewhere between 1 and a half and 2 cents per kilowatt hour each year. If we get that into some perspective, generally speaking, residential electricity tariffs are somewhere between 14 and 16 cents per kilowatt hour. So, in percentage terms, that's a very significant cross-subsidy that's occurring between those with airconditioning and those without.

DR BYRON: For the average household use of kilowatt hours per year - I'm just trying to find out what the annual equivalent of that subsidy might be. Are we talking hundreds of dollars?

MR PAGE: Could we take that on notice, if you don't mind, commissioner, and actually give you a fulsome answer.

DR BYRON: Elaborating on the draft?

MR PAGE: Certainly. We're more than happy to do that.

DR BYRON: Sorry, I didn't mean to interrupt.

MR PAGE: No, not at all. We're happy to take questions on the way through. I guess our real bottom line message is that there are no price signals in the market to encourage energy efficient behaviour; whether it's thinking about the temperature you might set your airconditioner at on a hot day, whether, in fact, you even start using it until it's significantly hotter, or whether you shift some of your load to other times of the day when the tariff might be lower, consistent with the demand in the networks and on generation. Without fundamental price signals, we think that it's very difficult to make significant headway in energy efficiency and demand-side management approaches.

The second observation we make is that the stock of appliances, whether they are industrial applications or residential applications, is also an impediment to rapid achievement of energy efficiency improvements. If we were to look at energy-intensive industries, one of the observations we'd make to you is that the capital stock is long-lived, is very expensive and is, generally speaking, not particularly well suited to energy efficiency improvements incrementally. It tends to be a very lumpy investment, in that you get the best technology when you next completely renew significant aspects of the plant. So it's not a particularly responsive sector.

In residential applications, we note also that many of the appliances people use will be long-lived that are significant drawers of electricity. Refrigeration and airconditioning are obvious. Hot water is another obvious candidate. Again, these appliances have life spans of 10 years plus in many instances. The other interesting development in Australia - and, in fact, one of our member companies in New South Wales has been campaigning on this a little in recent times - is that when people buy new refrigerators they tend to keep the old one, put it in the garage and run it as the beer fridge. First of all, it will be less efficient than the new fridge. Second of all, it's now gone into a garage that often has a poorer thermal performance than the house and the fridge works harder. We actually haven't stepped forward in our efficiency perspective. The new fridge is more efficient, but the total use has gone up nonetheless, so there are issues surrounding actual genuine replacement and retirement.

The final area in which we'd make some observations is that there seems to us to be a lot of opportunity for improvement in the thermal performance of buildings generally. Again, we go to this topic because of the impact of airconditioning and the differential incentives that you might see between purchasing and installing

airconditioning as opposed to ensuring that in the first place the building is sympathetic to passive solar design, is effectively insulated - really improved its own thermal performance - and then if airconditioning is used it is not used in such a manner that it is an enormous drawer and inefficient.

We'd say that there are a range of impediments to achieving energy efficient improvements, and they really begin with effective price segments. Perhaps, commissioners, at that point I might stop talking and allow some time for you to ask questions of us.

DR BYRON: Thank you very much.

PROF WOODS: Thank you. Even though what we have before us is just a draft, it really has focused very clearly on some significant issues, so we are grateful for that and look forward to your final, particularly picking up not only the issue that the presiding commissioner has already raised but others that may come up. A couple of things: perhaps if I start with a big question and then we can work our way down into some smaller detail.

A question of what is achievable on energy efficiency: we get lots of figures and lots of targets and people say, "Well, if all of these things happened you would be able to cut your rate of usage" - putting aside conservation and just looking at efficiency - "by so much", but what you start to identify here - and others have, as well, to be fair to them - are some of the impediments that no matter what incentives or regulatory requirements or pricing signals you put in there will be lags in updating performance, and it would be interesting to start putting some numbers around those.

For instance, you talk about the delay between something come onto the market that is more efficient and when business or households in the ordinary course of their behaviour get around to replacing what they already have, and there is a cost also in writing off capital that currently has value. We debated that in structural adjustment in other areas where we had all that debate and resolved that that's the case.

In the case of big industry, if you're talking about a brown coal power plant, you've got a very long life before it does something more efficient. Sure you can change some emission structures and do various bits and pieces. In the case of other industry, it's not until you've got your next six or 10-year refit and they import some new whiz-bang bit of machinery from Germany that's more efficient than what they're currently using - whether they're a jam factory or a glass factory or whatever they are. But even in the households, changing your airconditioner is not something you do often, and your point about the fridge is desperately true: so many fridges get retired to the garage and keep chugging away and make excellent bar fridges.

The house itself: you're talking 40 years before quite often there's any significant alteration. I don't know that you are well placed to do it, but we should start to try and sketch out some of these numbers because there is no point looking at regulation or pricing or things - they might change some of it at the margin, but there is a whole lot of lock-in that will take time to progress and that needs to be factored in. Do you have any further comment on that?

MR PAGE: Commissioner Woods, I was going to thank you for those observations. We would agree with them. Now being serious about it: I think that, like you, we have read a very wide range of claims, many of which we think are difficult to justify, that would suggest, for example, that if you were to actively pursue energy efficiency and demand-side measures and you were examining what are some of the options for reducing greenhouse gas emissions, there are groups that would suggest you could dramatically reduce greenhouse gas emissions, and 50 per cent of that reduction in the space of five years could come from energy efficiency.

Frankly, for the reasons which you have just outlined - which we happen to agree with - we don't believe that that's possible. But the question as to what is possible is not something that we have committed resources to, for a range of reasons not the least of which is we think it's a pretty big task and, in the limited resources we have, we've really got to examine where we might most place them.

PROF WOODS: Yes, where you add value.

MR PAGE: We're not sure we add that much value in the energy efficiency arena, but perhaps this inquiry is better placed to pursue some of those things. But we would agree with you: there is a crying need for a balanced understanding of what is achievable and what are the real rates at which you change the deployment of appliances and machines that use electricity.

PROF WOODS: You identify one of your key concerns, this question of summer peaking that's now happening. Two questions on that: one is that you quote some figures in your draft, which no doubt will reappear in your final submission, that peak demands are growing 200, 250 megawatts, 2.4 per cent a year, faster than the average demand growth of 1.9 per cent, and then you make the obvious point that to pick up your peak loads you're using your gas turbines to cut in, but you then say, "These plants usually only run for a few hours per year." How is it economic to invest in those and operate those if it is in fact so constrained in the period? I did my quick sums and I wouldn't put my money in them, but somebody is and they must have done their sums.

MR PAGE: Yes, certainly.

PROF WOODS: I understand the price they are getting for that peak period, but nonetheless it just didn't add up as a business proposition.

MR PAGE: Let me assure you that I don't think companies like AGL or Origin Energy invest in these things without it making economic sense.

PROF WOODS: Precisely, but the "few hours" is what I stumbled over. If you could tease that out in your final, but any comment you may make at the moment - - -

MR PAGE: Certainly. We can probably be more specific. Can I make a couple of observations. The growth at 200 to 250 megawatts per annum applies to Victoria only. That's not a national figure.

PROF WOODS: Yes, you do say that.

MR PAGE: That makes it still more significant. It might be best if I tease most of this out orally and we add some other material into our final.

PROF WOODS: Yes.

MR PAGE: As I'm sure the commission appreciates, electricity retailers are always seeking to hedge their financial position and, for the record, prices in the national electricity market can spike to as high as $10,000 per megawatt hour, at which point they reach a regulated cap. On average, pool prices are running in the high 20s to low 30s in Victoria, so there is a big spread in risk exposure here. Generally speaking, the retailers enter into what are known as "contracts for difference" with generators to actually hedge their position in the wholesale market.

However, in times of very high demand, it may be that retailers are not able to fully cover their exposure to the spot market and there are good reasons for that: generators often don't wish to commit on a bilateral contract basis all of their capacity and that's largely, for their part, a risk-management procedure as well, because if one of their generating units has a failure for some reason they are suddenly well out of the money because they can't physically deliver and they, in turn, are exposed to whatever the spot market is doing.

Some of the response to that circumstance by retailers has in fact been to invest themselves in peaking plant. As a general observation - and it is a very general observation - the investments have often been in second-hand, open-cycle gas turbines, so it's the least capital cost. They then offer the retailer two advantages: first of all, at times of very high demand, they will be bid into the market and

dispatched and receive directly the very high price, so they have essentially bought themselves a physical hedge as opposed to a financial hedge.

The second aspect to it is that, to the extent that this is in addition to their existing hedge cover with somebody who is fundamentally a generator in the market, they may well earn revenues beyond what their retail load is as well, so there is an element of, at limited times, being able to behave as both a retailer and a generator. When we say "a few hours a year" perhaps we need to come back to you with better quantification, but I wouldn't want you to think, for example, that it's about two or three hours a years. The number we have seen from a private study - and therefore we've not been prepared to put it in here as we can't footnote it, but it's essentially that a number of these generators only come into play when the price rises above $75 a megawatt hour for a sustained period.

PROF WOODS: That would be interesting because that puts into perspective the sort of price they're cutting in at and then you can work out what part of the market spread is over and above that price cap.

MR PAGE: Certainly.

PROF WOODS: But that's lower than the impression I got from that figure and it does have the calculation - - -

MR PAGE: We'll endeavour in our final submission to be more specific for the commission in that area.

PROF WOODS: Yes. Focusing on the peak again you mention in several areas exposing customers - or "being made aware of", you use as one phrase, the real cost of their energy use. A bit later on you talk about time-of-use tariffs and appropriate financial incentives. "ESSE believes that interval metering can provide a function for unlocking demand response opportunities." We had some interesting evidence of a part of that solution - not the actual pay-the-bill part, but the information component from Moreland yesterday, where they were saying when they plugged smart meters into people's appliances and it showed what their actual usage was, the first reaction was, "Gee, I hadn't realised how much electricity we used."

A bit later on the reaction was, "Mm. The novelty's wearing off. I now know that I don't need to keep running back and looking at the meter. I've got used to all of that." The third is that when they were offered to be able to keep the stuff for $200, "No, thank you. I don't want to spend the $200 to know that." The fourth behavioural response ultimately was, "Well, it really wouldn't change my usage anyway."

It was the information component without the bill component, so maybe if you also slapped the tariff on it might make them, but I just worry about whether that pattern might happen anyway: the first would be the, "Gee whiz. I had no idea," followed by the, "Mm. This is all becoming a bit tedious and I'm really not going to run back to the meter to see what's happening, " followed by, "Well, it doesn't cost a lot anyway. I'll just switch it on."

MR PAGE: It's a very complex area, I think, commissioner. Human behaviour is a fascinating subject and that's not the first time I've heard that experience; in fact I've heard it first-hand from somebody who has actually participated in a trial of that nature and that was precisely their response.

PROF WOODS: That's what worried me. It struck me as very true.

MR PAGE: Can I perhaps have a swing at a few issues though, which I think are not really drawn out from that anecdote. One of the genuine impediments we have in this country to increasing energy efficiency is almost bizarre in one sense, but the cost and the price of electricity in this country, even though people may well feel they pay a lot for it, is on an international comparison basis exceptionally competitive.

Independent surveys by either the International Energy Agency or a firm called NUS Consulting show that, for industrial and residential purposes, we are somewhere between the cheapest or the third cheapest in the OECD for electricity, on average. That then also says that Australians therefore are enjoying energy in the form of electricity that's frankly affordable and, because the price is so low and we know that the elasticities of demand - at least in the short run - are essentially inelastic, you do have a natural impediment sitting there. So, on the one hand, we think it's really very good that we have got a clear competitive advantage in the cost of energy, but as soon as you look at how to use it more efficiently that initial price question is not there.

What we then say is the price issue is further diluted when you don't get any reflectivity to the time of use. I would want to stress that our submission is just a little different to the anecdote that you have used.

When we talk about interval meters, we're not talking about meters necessarily where people can go and look at it and say, "Goodness gracious, that's what it is costing me right now." What we're talking about is the technology; that rather than the accumulation analog based meter that's in most houses, you can actually have a digital piece of equipment that records and stores usage on half-hour time blocks. That then enables an accurate translation and the offering of tariffs that are sculpted according to the time of use and, indeed, could well be sculpted according to any

number of factors, including season.

DR BYRON: That is the sort of smart meters that Victoria is now mandated the rollout of.

MR PAGE: That's right, correct. Mind you, that rollout is something like a 10 to 15-year exercise. So we don't, again, get these things in place quickly. They are of themselves not an overly expensive technology, but if you were to do it nationally there are literally millions of them to be installed, so there is actually a rollout issue there.

I think our other observation about this is that the level of interest and the elasticity of demand is actually different as between individuals according to their economic circumstance, and so we well envisage that there is a situation where people who are in better socioeconomic circumstances may well run their airconditioner all year round simply because they don't particularly mind what the price is - they'll pay it. That simply brings us to an equity issue which says that is fine if they want to do it, but they shouldn't be causing then substantial and very expensive investment in generation and networks that is then cross-subsidised by those who are in lower socioeconomic groups who don't have access to the amenity of airconditioning, but start paying the costs that are caused by others.

So there's a user-pays element that I think comes through here strongly. So there are actually two issues that we see in this: one is if you don't have those price signals, frankly you've got no chance of changing behaviour anyway, but acknowledge some people won't regardless, because they regard it as affordable and that is their preference in allocation of their resources. But the other angle to this which is significant, in our view, is that there are people out there paying for the privilege and luxury that others enjoy.

DR BYRON: Is it necessary to have as much detail as these sort of digital meters might record to be able to structure tariffs? I mean, don't we already know enough about urban residential usage patterns to be able to bring in a two or three price - I'm thinking of the way Telstra and Optus say, "Well, if you phone after 8.00 it's half-price, or on weekends it's less," or something like that? I wouldn't expect that we would ever have 48 different prices for 48 different half-hour blocks in the day; nobody could cope with that level of detail and complexity.

MR PAGE: Quite so.

DR BYRON: But to have a peak and an off-peak, or a weekend rate or something that was fairly simple, or summer or winter rates, or whatever - and this seems to apply to everything from, as I say, phones to airlines to petrol.

MR PAGE: Yes.

DR BYRON: Surely it's not inconceivable that we could have more than a standard uniform year-round rate for electricity.

MR PAGE: Commissioner Byron, I agree entirely. I think there are two issues here, though. On a standard analog accumulation meter you get no recording whatsoever of time of day or which day of the week, or any other data, so you have nothing. The best you could do, if you had that, is to go down a route that's called load profiling, which in fact in several states is used already for settling wholesale market, where individual customers have moved to different contracts. I wouldn't actually - and our association - does not promote that in a retail sense. It works broadly in the wholesale market, but it carries with it a range of dangers for consumers and for suppliers if you try to apply an imputed load - set of load characteristics, usage characteristics on a residence.

So that causes us to say really you can only do this accurately and be certain of usage patterns by moving to the digital technology. The fact that it accumulates on a half-hourly basis is simply a feature of the technology and is a different question to the way that retailers, if they were able to access that technology, could then package their services, their structure, their prices and offer these sorts of contracts, if you like, into the market. Some retailers might wish to start at afternoon peak from, say, 2.30 pm to 6.30 pm; others may see that their businesses is better suited by talking to their consumers in terms of 2 pm to 7 pm. The opportunity to distinguish half-hours in different blocks is just afforded by that technology and it's no more or no less expensive to do it half-hourly than on any other basis.

DR BYRON: Just for the record, I guess, when we're talking about peak-load pricing and increasing block tariffs, I'm assuming that this is all going to be revenue neutral in the sense that there would be discounts for those who don't make excessive demands on the system, as well as penalties for those who do. But that reminds me that the - - -

PROF WOODS: Did that get a yes from you?

MR PAGE: That gets a yes. Yes, that is a reasonable expectation.

DR BYRON: The structure, the mix or the ratio between fixed and variable charges on an electricity or gas bill tends to disadvantage relatively small users and advantage relatively large users, if you've got fairly significant sort of connection charges. Presumably that's also the basis of why there were, in the past, discounts to large volume users. I'm just wondering if the structure of pricing and the fixed to

variable proportions in some way masks the incentive for people to actually reduce their consumption through energy efficiency measures.

MR PAGE: That's an interesting - - -

DR BYRON: And would it become a problem if you have all these fixed costs of supplying all these houses and small businesses and, through whatever measures, their actual consumption started to become very low - I mean, if everybody put photovoltaic cells on their roof, for example, but you've still got the network costs of having them all connected to a grid, but they weren't actually buying much on a monthly basis? Is that conceivable?

MR PAGE: Gee, how long do I have, commissioner? I wonder if we can just work through a couple of things. In terms of fixed versus variable costs in billing at the retail end, I think the first thing to observe is that most of the network fixed costs actually get translated into a per unit cost, so they are bundled along with your energy cost. Now, you will see - particularly at residential levels - that there will also be a fixed component that's in there per month and, according to the particular state you're in or the particular contract you've signed, that could well represent a range of different costs that that retailer faces, from as simple as the straight accounting costs of running your bill and so on, and ensuring that you - in inverted commas - have supply, through to, at other ends, the fixed costs of running the line; a line rental, if you like, component that is just fixed, which would be similar to what we're used to with some telecommunications type of things.

I think it's also fair to say that very large users see on a per unit basis that those fixed costs fall because the fixed costs and the more units you've got dividing into them, they fall per unit. So I think that partly explains the issue, because energy efficiency therefore, if we were to go back to our time of use question, I think it's probably reasonable to expect that retailers - if they were able to structure their tariffs in that way - would actually have a per unit price on afternoons in the peak of the summer that would not only represent the additional cost of the generation and therefore the energy itself but would also be seeking to add to that the additional use of the network and the capital cost that has gone with strengthening the network for those times.

DR BYRON: We've been told that in New Zealand they have congestion charges on the network for those sort of peak times.

MR PAGE: Yes, they do. They practise a form of nodal pricing which we don't. It's a contentious issue, I have to say to you, because there is in a fairly complex way a form of congestion costing turns up in Australia but it largely manifests itself in increasing wholesale energy prices as congestion occurs on the networks. The other

thing, as I best understand it, though, like most markets around the world - sorry, like the few markets around the world that use nodal pricing - it's very much a wholesale market question. It would only be very large users that were exposed to the effects of that congestion pricing. By and large it becomes another financial risk factor that the retailers have to hedge.

DR BYRON: On demand-side management, do you think it's useful for us to differentiate between load shifting through time and space, peak clipping - we just reduce the peak - and I guess more general energy efficiency measures that actually reduce overall energy consumption across the whole 24-hour spectrum? Do they have different consequences? Load shifting, for example, I would imagine doesn't actually do anything much for greenhouse emissions; you're just using the same amount of energy at a different time of day. Just to elaborate on the demand-side management thing, are there impediments facing network operators in making advances on demand-side management?

MR PAGE: I might deal with the first part of the question, if I can. Our draft submission - and I can assure you our final submission is encouraging you to take the wider view and include demand-side management rather than treat it separately from energy efficiency. Whilst we accept and understand completely that they are fundamentally two different concepts, we actually think that they are so closely related that they should be - - -

DR BYRON: Yes, I hope - - -

MR PAGE: - - - picked up. Now, my reason for saying that to you is that you do actually have to contemplate what the objectives are that you're trying to achieve in pursuing any of these initiatives, because of themselves they have no inherent value. In fact, if I was to be extreme about it, my members - if they were in nothing but profit-maximisation mode - would say, "It's not in our interests to see any of these demand-side initiatives or energy efficiency because the more we can sell the better off we are" - not perfectly true, but as a general observation.

If the objective here is actually to continue or to encourage as efficient a set of investment as is possible, and therefore continue to ensure the competitiveness and the competitive advantage of this industry for the Australian economy, then we'd say to you demand-side management is a very important aspect to take into account. We say that because, for example, even load shifting eases congestion on networks at critical times of the day. The greenhouse issue might well be of interest for other reasons, but fundamentally load shifting is just as valuable in managing or avoiding inefficient investment as is general energy efficiency: you know, less input for the same output.

DR BYRON: Yes.

MR PAGE: So that's why we encourage you to consider these demand-side issues, as well as the ability to chop some of the tops off the peaks and the like. When you come to greenhouse, I think we would generally accept that some of the demand-side management initiatives don't do a great deal for greenhouse and, in certain circumstances, could actually worsen it. It's perverse perhaps, but at times of peak demand you've probably got more gas-fired generation running than you have - - -

DR BYRON: The change in the mix of sources, yes.

MR PAGE: That's right, so the marginal unit of production in terms of its greenhouse gas emission at times of peaks, where not only have you got running for sure gas, you've got a hydro running as well. Actual emission per unit is probably lower than in the off-peak period where essentially you've resorted to your cheapest fuel source, which will undoubtedly be coal.

PROF WOODS: So if you evened out all your peaks and troughs and just had ongoing baseload you'd virtually have 100 per cent coal, apart from the hydro cutting in and out and things - - -

MR PAGE: Not perfectly true.

PROF WOODS: No, but - - -

MR PAGE: I mean, it depends on your access to competitively priced resource and so if you - - -

PROF WOODS: The proportion of coal would increase as a component.

MR PAGE: I think that's probably true. In Tasmania you're going to see essentially hydro or some gas-fired generation, and in South Australia you're going to see gas-fired generation because there's no access to competitive coal. In the other states, all other things being equal, yes, I think your observation is right.

PROF WOODS: Can I just go back a bit to this peak load question. Given that interval metering (1) is only just rolling out and is not going to be available to the network operators for some time anyway, at least five years, if not longer, before you can actually then start to do some profiling of your energy tariffs and, (2) given that a number of customers aren't going to respond differently once they get that information and those bills anyway and, (3) given that airconditioning continues to be a growing component of household expenditure, what are you actually going to do for the next five to 10 years, because there's not a lot that's going to the situation, or

is there? Is there some sort of surprise that's waiting around the corner that will affect this or are you just going to have to make those investments and cope with the consequences?

MR PAGE: The very short and honest answer is, unless a surprise turns up that we're not aware of, a very substantial amount of that $30 billion worth of investment that we anticipate coming into the industry over the next 15 years will be in direct response to that growing demand that you've just described. The industry has a responsibility, quite literally has a responsibility in most licence conditions, to supply energy. We've seen recent examples where interruptions to supply have significant political and community effects. The industry takes that very seriously and, in the absence of any clear pattern of reduction in demand, we'll be forced to continue to invest to supply that demand.

PROF WOODS: Now, if contestability of household clients - is the reverse possible; ie, nobody is bidding to connect that mansion that's got this whacking great airconditioner and supply to? Is it the local geographic distributor who ultimately is the fall-back legally or morally, or what's the contractual situation?

MR PAGE: It's slightly different state to state but as a general observation that I think holds true, there are what are regarded as natural distributor and retailers in particular in geographic areas. As a general rule, distributors as part of their licence condition have an obligation to connect any new business, residence, et cetera. You fill out your form; the line must be connected. Who you then choose to purchase your energy from in those states where you have freedom of choice is up to you, but again there are native retailers in each region, and they're fairly well known as well.

PROF WOODS: It's just that I could imagine some trepidation of having to connect some of these, because you know what they're going to do to your load.

MR PAGE: I'd have to say to you I think that the trepidation comes more from the network owners than it does from the retailers, but they don't have a discretion as to whether they connect or not, so that still further drives my earlier answer to you; that short of something coming along to ameliorate that rate of growth, our members will continue to apply the capital investments as best they can to meet those new demands.

DR BYRON: Coming back to demand-side management, and possibly tying it into that point, what IPART is doing now in New South Wales with taking into account demand-side management factors in terms of the price setting, how well is that working? Is it likely to help? Is that a model for what other states might do?

MR PAGE: I'd have to be honest with you, commissioner, and say I haven't

examined closely the impacts of that IPART decision. I think some of the individual companies in New South Wales, if they're making submissions and appearing before you, could be useful to you. And the other group that I think probably has something to add here is the Energy Networks Association which deals in detail - and I should mention I didn't answer an earlier question of yours about impediments to network based efficiency measures, and again I think the Energy Networks Association is a better body to address that, because I think it's a very detailed issue.

DR BYRON: We've had a suggestion in one of the other submissions that we've received about the traditional electricity and gas supply companies sort of reinventing themselves as energy services providers. Well, you know what that means. Any reactions to that?

MR PAGE: I think one of the positives that's come out of market reforms in both electricity and gas and in the states that have taken the plunge and allowed a choice of retailer for customers is that most of the larger energy companies have become at least dual fuel. It then does enable them to not be trying to promote one energy source over another but instead to move into a space they never occupied previously; they can sit down with an individual consumer and establish what their real needs are and what the most usually cost-effective solutions are, and that moves you from thinking in terms of buying electrons and molecules into thinking about buying the source of my lighting, heating, ventilation, et cetera.

I think that's an industry that can grow still more strongly if you keep moving back the barriers to effective and competitive pricing, and the UK, in our view, provides some interesting early signs of what's possible when you actually remove all price controls. In the UK there are no price controls on the retailers. All of the price controls were removed several years ago by the Office of Gas and Electricity Market Regulation. They did that because there was vibrant competition in place.

There are now some instances turning up of brokers entering the market, where they will look at individual energy requirements and broker the market for the best deal that they can find for individual consumers. That's the sort of energy service you don't readily see in Australia at the smaller consumer end. There are consultants certainly working at the larger end where there are big gains to be made, but simply the margins are not there, and the price controls remove the opportunity for that sort of innovation. So it's left to the retailers and, to the extent that their dual fuel offerings can help them along the way, they do it, but I guess we'd just observe that there is still more innovation potential there if we unlock it.

DR BYRON: Yes. The final question is one that is a sort of final question to everybody. We're asked to look at the National Energy Efficiency Target idea. I'm wondering if you have any ideas on that and whether it would be a good idea and

how it might work, or any problems with it.

PROF WOODS: Your coverage of it in this draft is fairly thin and - - -

MR PAGE: It's brief.

PROF WOODS: Thin as well.

DR BYRON: Or maybe you'd like to elaborate on that in your actual submission.

MR PAGE: Commissioners, I'm sure we'll add a little more attention to it. I think I've got the incentive. But, nonetheless, can I very quickly say to you that there is experience already in the electricity industry with targets of one sort or another, and the Mandatory Renewable Energy Target is one that springs to mind. But I think in this area there are risks in trying to introduce a target and trying to introduce a tradable certificate type mechanism that goes with that, if you don't also allow the costs that are associated with the operation of such a scheme to be passed through, and inevitably these sorts of target based schemes have their burden falling completely on retailers, and retailers in this country are facing - and the Energy Retailers Association I'm sure would be delighted to spend some time with you on this, but they are increasingly - the point at which governments that have an objective to change some sort of behaviour or recognise an externality always put the burden on the retailer.

Now, without the ability to really pass through all of the costs associated with that - and see our earlier comments about government controlled maximum prices - retailers are simply seeing that they're having to internalise increasingly the costs of those sorts of measures. We really honestly believe that you can unlock a lot more of this by getting rid of the whole bunch of impediments first and then asking the question about whether a target is required with some form of tradable certificate arrangement around it or not. We just think going there without enabling the full suite of measures that allows you to respond to it is not a particularly smart place to go.

PROF WOODS: If you could sketch out what you would see as the ideal pathway, either you or the Energy Retailers Association - I mean, you do talk to each other - - -

MR PAGE: We do.

PROF WOODS: That would be really helpful, to say, "Sure there's some target stuff here but we really think that the total package should look more like this," and interestingly you mentioned MRET and it reminded me that I didn't notice any reference to that here, and just looking back through it, that's true. But are you or

energy retailers - somebody to do a comparative analysis of MRET and Queensland's 13 per cent gas target and the New South Wales scheme, to just objectively say, "Here are the schemes, here are the respective consequences from industry's perspective," so that we can start to understand the relative merits of the various approaches.

MR PAGE: I have to say that in all cases those schemes have as their liability points specifically the retailers, and I do think that the Energy Retailers Association is the appropriate place for that analysis to come from.

PROF WOODS: That would be helpful. We might pursue them on that.

DR BYRON: Well, in view of the time, I think we're going to have to leave it there. Are there any final comments, anything else you'd like to add?

MR PAGE: Not at this stage.

DR BYRON: Thank you very much for the time and effort you've put into the submission and for coming today.

MR PAGE: And thank you.

DR BYRON: And we look forward to your final.

MR PAGE: Thanks very much.

DR BYRON: Mr Parker, when you're settled down and comfortable there, if you could introduce yourself and your organisation for the record. I'd like to thank you very much for the written submission and for coming today. If you would like to highlight the main points of the submission which we've read carefully, then we can talk about it.

MR PARKER: My name is Alan Parker. I'm partly retired, or maybe partly working. I don't represent any particular organisation, but I've been working in this area for about 20 years, I suppose. I started off as a founding member of the Bicycle Federation of Australia, Bicycle Victoria; for 10 years I was secretary of the Town and Country Planning Association, particularly concerned with transport issues. So basically what the submission is about is looking at the energy efficiency of the existing transport system.

I would like to start by drawing your attention to the figure on page 5, which is figure 2. This data on this graph that runs to 2041 shows something that's been completely ignored in the past, apart from the two CSIRO scientists Poldy and Foran. It's going to hit Australia rather badly, and the world in general rather badly, within 10 years, because what has actually been happening is the world is not running out of oil; it's not going to run out of oil. It is going to run out of the low-cost conventional oil - that is, the sweet oil that's been coming out of the ground - that you get in any oilfield in the first 50 per cent of extracting what is in there, and then after that as it goes over a peak known as a Hubbert curve what you start to get is sour oil; claggy stuff. The more you get to the point of getting what you can get out of there, you have to start putting additives in and what comes out is dirtier; there are higher refining costs.

In the longer term, if you look at Australia as an example of what's typical for the rest of the world, what you will find is that we'll be getting most of our oil in 10 years' time beyond the continental shelf in deep water, so that the cost of extracting that oil and investing in the infrastructure to get it out is going to be a lot more. What Foran and Poldy have done is they've looked at the business of the energy and the oil extracted and then the energy cost to extract the oil. They are looking at what Fleay called "energy profit ratio" or energy return on energy invested. Figure 2 shows that today, if you look at the fuel chain efficiency - in other words, the amount of energy you can get out of oil after you've subtracted the energy cost to extract the oil - you're looking at a fuel chain efficiency of 71 per cent.

If you go back to page 4, and the figure on page 4, you can see that I've defined fuel efficiency from the oilwell to the road wheels. This was a concept developed by Wald in the Scientific American in May this year, and that graph is a black and white variation of the one that Wald presented in the Scientific American in May. The important thing to realise is, if we're looking at energy efficiency, you've got to look

at total energy efficiency. I mean, if you look at coal and domestic appliances, you start off with the energy efficiency of getting it out of the ground and then you've got to put it into the power station, and it's just the same with motor vehicles. But the system does not analyse energy in that way.

Figure 1 shows on page 4 that if you look at the total efficiency of motor vehicles of the conventional variety, or the possible new fuel cell vehicles, you'll find that they're all much of a muchness. The white bar is the total efficiency. The reason that the fuel cell vehicles, which are based on hydrogen, are not that much better - and in this particular case are actually worse than conventional diesel or petrol engines or petrol-electric hybrids - is very simple: all the proposals that you've got from the major car manufacturers to produce hydrogen-powered vehicles will make their hydrogen from gas or coal. You don't save anything. There's another figure in that paper showing you the greenhouse intensity of making hydrogen from that.

There is another option in the longer term, and if one has a look at page 12, for instance, there's a figure on there in which I have taken Wald's figures for 2004 - and I'm only looking at the total efficiency now - and I'm looking at 2024 and taking into account, let us say, the higher energy costs of getting oil out of the ground. If you look at that, you'll find that the only type of vehicle that's got really high efficiency is a hydrogen-powered vehicle, but it's hydrogen generated from surplus wind power that you get with the wind farms.

The previous speaker I noted referred to hydro supplementing the peak load in Tasmania. They're also putting in 500 megawatts of wind power as well, and they'll use the wind power as the way I suggest you should use it for transport. They're actually going to use the wind power to boost at the time of peak load, but they're also going to be pumping water back up into the dams, because water shortages in Tasmania are such that in some years you won't be able to rely on the hydro. The thing about wind turbines is you only calculate that you can use about 15 per cent of the energy that it actually generates. The other 85 per cent: what are you going to do with it? It doesn't matter how energy inefficient it might be, looking at the process of electrolysis and producing hydrogen from electrolysis, with wind power you can actually do that.

The whole technology there is under development. I believe the EU has thrown about 1 and a half billion dollars at it to try and look at the whole problem. But I would suggest to you in the longer term, as far as trucks and railways and stuff like this, Australia has incredible wind energy potential just lying there, but the only thing we can use it for at the moment is use about 15 per cent of it and push it into the grid at some time, hopefully, as they can do it in Tasmania, because it's on a particular part of the coast where you've got an average wind speed of about 20 metres per second, which is extraordinarily high. You get hardly any calm days at

all in that area, so you can rely on your wind in that particular location in the north-eastern part in particular of Tasmania.

Wind power developments are such that three and a half megawatt wind turbines in farms, you can imagine it in various parts of Australia - in the bush, way beyond the coastal areas; some of the inland areas and that kind of thing - and you can imagine the production of a large amount of hydrogen from all these installations, with the technology that's already in the pipeline. Electrolysis is proven.

DR BYRON: That would be a very decentralised way of generating transport fuel.

MR PARKER: Yes. The other problem you've got with hydrogen is either liquefying it where you waste an awful lot of energy - and I refer to the key papers in there that show just how wasteful that is - or compression. I'm arguing in this paper for a more limited role for it, and that role would be - and I say from 2004 down to 2024 was all the B-doubles, all the B-triples, all your interstate freight, right, will be passing through rural areas, be passing through the bush where these wind farms are located, and that's where you do the refuelling. So you can store efficiently at low pressure out in the bush and use wind for that.

That's the optimistic side of it. Australia has a special opportunity for doing this because of all the countries on this planet I don't think there are more than two or three that have got more wind energy resources per capita than any other country.

DR BYRON: I seem to recall hearing about hydrogen through solar processes, but I notice you haven't looked at that. Is there any potential for that area as well as wind?

MR PARKER: Yes, I think so. But, you see, it's not proven. At the moment you can buy wind farms, collections of two megawatt, two and a half, and there are three and a half megawatt ones offshore. They're currently available. If you look at the costs of generating hydrogen, including the carbon analysis that I'm talking about - how much it costs you to build the infrastructure as well - you'll find that that's by far the most efficient. I would think in 25, 30 years' time, solar electric has got a lot of potential. I do refer to it in this paper with regard to a vehicle that you can't buy in this country because of asinine regulations that have been introduced, and they've been introduced by people who should know better in the main road authorities and made law, whereby you cannot buy in Australia the most efficient computer chip controlled electric bicycles.

Given the high costs of solar electric at the moment, try and use solar electric to power battery-powered cars: forget about it. It costs the earth. You'd need to

cover the whole roof of a house. But the Japanese have power-assisted bicycles of between 200 and 250 watts legally classified as a bike. You can just buy them off the shelf. About 100,000 elderly Japanese - mostly women - buy them every year. The next step in that technology - and the Japanese are right into it, because companies like Honda have built blocks of flats and in the bottom of these flats you've got a kind of stable of electric bikes, and they use photovoltaics on the roofs for charging the electric bikes.

The electric bikes are not fully powered. They're only designed to take 50 per cent of the effort out of a trip at particular times; like, when you're an older person, it's getting going, when you get started; going up a hill, or when you get a heavy headwind and then you get this 50 per cent power boost. For that kind of requirement, you'd say you only need two square metres of photovoltaic cells that stick on the top of a garage or on the side of a wall and with the rechargeable batteries you'd have a very efficient use of solar electricity.

If you have a look on page 9, I've gone back to the conventional way of looking at vehicle efficiency. If you look at figure 3, what I've done there is to show vehicles at 100 per cent occupancy and, for the public transport vehicles, 25 per cent occupancy and driver-only cars on the two bar charts. If you look right up at the top, "Solar electric bicycle, zero megajoules per passenger kilometre". That's vehicle efficiency not total efficiency, because you've obviously got to make the electric bicycle, but the electric bicycle only weighs 25 kilograms compared with 1200 kilograms for a large car. There, you've got a wonderful example of energy efficiency.

PROF WOODS: I was interested that with a three-litre four-wheel drive, let alone a four and a half litre four-wheel drive, there are more megajoules per passenger than a 727. It's an interesting figure.

MR PARKER: Yes. But what I've added to that is the solar electric bicycle, the ethanol-powered bicycle, the petrol-powered bicycle and the mains electric bicycle. If you take ethanol as a fuel, it's ridiculous to think of it as powering motor cars in cities except as a blend, as happens in some American cities, which reduces your air pollution. That's a logical use for it. One of the problems with the petrol-powered bicycles is the cyclists don't like them because they smell, if you're on an ordinary bike on a shared footway following along. But, you see, with an ethanol-powered bicycle, you don't get that problem. The smell is almost non-existent. With ethanol, it doesn't matter if it costs two or three times as much as petrol. If you've only got a little petrol tank with half a litre in it and you're only using half a litre every two or three days, you've got a wonderfully efficient vehicle.

The Chinese, in particular, are getting into this. This year the Chinese will be

making a simpler type of electric bicycle than the Japanese one. It hasn't got the computer chip control, where you switch it on like a car and everything is automatic. You can't use the power assist to wind it up to 50 K, so you've solved the safety problem with young blokes doing it. The Chinese are going in for fully-powered electric bicycles and they will be producing 4 and a half million this year. How many transport engineers in this country would even have a clue about what an electric bicycle is?

This is one of the problems that we've got, which is why we've got this ridiculous legislation that says it can only be classified as a bicycle because it's 200 watts, whereas in Japan you're looking at 200 to 250 watts. By proper research, they've determined that that's the level for the 50 per cent power assist. For people who are partially disabled, they're investigating a 70 per cent or 80 per cent power assist. This is under way at the moment by the Japanese government.

PROF WOODS: Just while you're on pages 9 and 10 there, I notice that you talk about the mass production of petrol-electric hybrids - Toyota and Honda - but you've got some interesting phrasing - "Persuade Toyota and Honda to make these vehicles in Australia." Why do we need to actually make them here? Isn't it important that they be available here? I can't understand why we'd actually want to - - -

MR PARKER: Let me put it this way: when the Labor Party in this state, for instance, came into government it made all the usual noises about sustainability and ecologically sustainable development and now they've even set up a state department. But what's the first thing they did? They gave away $200 million to build a four-wheel drive factory. It may interest you to know that in the last inquiry into the car industry that I attended, when it was the Industry Commission, I produced information from - because at that time the vice-president of America, Al Gore, had done a deal with the US car industries in which they were supposed to produce a three-litre per 100 kilometres family car by the year 2003, which they've got no intention of doing, of course. But they signed this agreement with Al Gore to say that they would do it. Of course, it never came about.

What happened was I'd produced all this information and said - this is 10 years ago, or thereabouts - Australia needs an energy efficient national car. What the commissioner - I'm afraid I've forgotten what his name is - said to me was, "Look, we were looking at the future of the car industry and the issues you raised of safety and the environment - and, in particular, what Al Gore is trying to achieve with reducing greenhouse gas emissions - and we realised that it was that complicated and that difficult we couldn't handle it. So I'm afraid we went back to the minister and said, 'We're going to need more time; this is a really big issue and we should be looking at it,' and the minister said, 'Well, forget about it; just continue and you'll just have to ignore that.'"

The reason I'm raising that is the question of a national energy efficient car is vitally important. It's not a coincidence that the Japanese have actually, first of all, developed the most energy efficient rail system in the world. It goes back to 1973-74 with the first oil crisis, which closed down about a third of their factories for up to six weeks. The Japanese national security agenda was determined by - remember MITI, the all-embracing bureaucracy in which different government departments don't go off on different tangents, like they do in Australia? They had a common policy and they introduced a national energy security policy, and that's referenced in my paper.

PROF WOODS: I don't want to head off on tangents but I just thought, from your perspective, you would want consumers to be having access to the most efficiently produced vehicles, irrespective of where that production is.

MR PARKER: Initially, but there are two sets of recommendations. I'm talking about up to 2010, or thereabouts, and from 2010 to about 2020. What I'm saying is that by 2010 we should be persuading them. The interesting thing is I quoted what Arnold Schwarzenegger - - -

PROF WOODS: Yes, I noticed that.

MR PARKER: - - - tried to do as governor of California. The first thing he said to the Japanese was, "We've established all of this energy efficiency legislation. We've got a ready-made market of 26 million people" - or whatever it is that they've got in California - "and we want you to build a factory to produce it here." What I'm saying is I think that, if you're going to look at energy efficiency in the long term, blunders like building a four-wheel drive factory - no more. It shouldn't really be on. It can't be, by anybody's definition of ecologically sustainable energy development.

The other major argument that I'm putting forward here is - and I'd like to say why I've looked at it, because in Australia I notice that most of the government agencies concerned with assessing the future of cheap oil depletion - and, as I said earlier on, we're talking about cheap oil. We're not talking about the really expensive stuff from tar sands and the like.

PROF WOODS: Shale.

MR PARKER: What I found is that Treasury, for instance, has got a paper out and they're talking about the next four or five years. The world growth in oil consumption is going to be 5 per cent per year. There's an inquiry going on at the moment looking at the 1984 Fuel Emergency Act, and they're saying, "No, it's 1.5 per cent per year." What's referenced in there is SSSWG. Some other

government committee has got the University of Melbourne and somebody else to come up with another assessment, which is 6 per cent per year. Well, 5 per cent per year, as determined by Treasury, is doubling the demand for world oil in 10 years. If you go down to 1.5 per cent, it will take 30-odd years to double it. What kind of a government have we got here? It's totally unrealistic.

I put a load of references in here about the oil problem. On the front cover, you'll find there's a little graph. You can see right at the top I've put that greater energy efficiency is the main kind of point at issue and transport mode shift. Let's consider what Japan has done as part of its national energy security policy; a transport mode shift. There are 5 and a half million people every work day in Japan who park a bicycle at a railway station. They do that for two reasons. It's too difficult to use the buses often and the fact is that you've got suburban sprawl; not at the densities we've got but you've certainly got it in the Japanese cities. They use this as their mode of access to getting to railways.

If you look at cities like Osaka, that's about 15 million, but the 4 and a half million bit of it anyway - if you look at the increase in car use for commuting, for urban congestion, you'll find that it's stayed relatively stable. Bicycle use for direct trips to work is in the order of 15 per cent; public transport trips are in the order of 70 per cent and this all goes back to a rational policy introduced by MITI in response to the first oil shock.

We have no such policy and, what's more, we have a fantasy dream world situation, with various government agencies who talk about, "You know, current consumption of oil is so-and-so." Then they look at the total reserves of oil and they say, "At current rates of consumption, it will last 40 years." But all the estimates are between 1 and a half per cent growth rate and 5 per cent growth rate. If the 5 per cent growth rate is real - because it's certainly real in India and it's certainly real in China - you're looking at a near catastrophe by about 2008. What happens to this economy if you have to increase the price of oil to retail at $2.50 a litre?

DR BYRON: I'd assume that there would be fairly substantial changes, but I've observed, having lived in Europe and the UK and Japan and seeing what prices they pay for fuel today - admittedly, people make fewer car trips and they drive smaller cars and they make greater use of public transport than they do here, but their economy still works even at prices in excess of $A4.50 per litre for petrol.

MR PARKER: But what happens when you get to the stage beyond that, where there's so little oil - like happened during World War II in Australia; you have to ration it for essential purposes. I provided facts and figures in this paper that show quite clearly by about 2008-2009, looking at, say, a 3 per cent growth rate in world oil demand over a longer period - the 5 per cent is no doubt true for the next three or

four years. I think Treasury has been quite good in that analysis. But you're going to come to a point where you're going to say, "That black gold - and it is black gold - is too useful as a resource to waste it."

Nobody asks the question. When you know it's going to cost a lot lot more to get the stuff from the bottom of the ocean or from tar funds or from shale, nobody asks the question, "What is the function of oil to a society?" or to the world even, in which it's going to run out. It's predictably going to run out, the cheap oil, and you're going to get to a point where you have to ration it. You have to say, "We've only got so much left and, if we're going to survive, what do we use it for?"

The Japanese have already asked that question. It's no coincidence that they are the country in the world that's producing the petrol-electric hybrids and it's no coincidence that they've got two or three designs that go beyond that, that will increase the efficiency of the petrol part of the petrol-electric by another 50 per cent. It's no coincidence that you're looking at Cheney, the vice-president of the USA - I mean, it should be self-evident: they've already invaded two countries, they're looking at the moment for a pretext to invade a third, Iran.

I might add, my interest in this whole problem goes back to when I was working in Iran in 1958, and even then the brighter students were talking with the lecturers and people like myself - I was running a civil engineering laboratory - and even then they were saying, "What are we going to do when the oil runs out in 30, 40 years, and you've got the Shah of Iran and he's giving it all away to the Americans?" All over the Middle East, that's what the young students are saying.

I refer to a graph here by Bakhtiari, an Iranian who comes from the town where I was staying for 18 months, and I was saying to him, "What are the young graduates saying in Iran today and in the rest of the Middle East?" and he said, "Well, that's simple. Everybody's saying, 'Well, what have we got in terms of natural resources? All we've got is oil and we're going to lose it.'" This is what stands behind what's going on in the world at the moment. I've addressed all of these questions, and what I'm basically saying is that, unless you've got a Japanese-style energy security policy that looks in real terms at the future, you're never going to be able to do what's necessary to introduce energy efficiency; it just will not happen, period.

DR BYRON: I've just got an eye on the clock there.

PROF WOODS: I've covered my points as we went through.

DR BYRON: Well, your discussion this morning has been as wide-ranging and comprehensive as the submission. You've covered everything in there from cost of accessible and cheap oil through to the tax policy, urban policy and the social

implications of urban sprawl and so on. I don't know that I've got any other questions at the moment.

MR PARKER: Well, there's one other point that I should make - - -

DR BYRON: Final comment, yes.

MR PARKER: - - - and I've got an actual paper on this. I've done a lot of studies of the journey to work, in papers that I've given, and if you have a look at page 20, figure 8 - - -

PROF WOODS: I was attracted by the headline of that one. I put a ring around that at the time - "Most long single occupant car commutes originate in the outer suburbs " - which makes the bicycle substitution just a little tricky, but you can certainly ride to your local railway station.

MR PARKER: Well, if you look at figure 8, what you can see are the trends from 1976 to 2001. What I've shown on a previous graph is the car fleet - you get more and more four-wheel drives in. So we were getting increased vehicle fuel efficiency - not total efficiency but fuel efficiency - from about 1976 right the way through to about 1994. Then when the four-wheel drives get in, the overall fuel efficiency starts to slightly increase. If you look at these trends for transport, on the right-hand side I've got a different scale of course, and I break out, and you can see it's all pretty well downhill apart from the percentage of people who worked at home, which has gone up from 1986 to 2001.

Now, what I did after that was, I said, "Well, what's happening - the difference between the inner and outer suburbs, and if you look at figure 9 on page 21, what I've done - and this also applies to every other capital city - was take the 16 regions of Melbourne, break all the data down and then do it by household density per square kilometre. The reason I did it, and you get these curves this way, is the journey to work - the transport people have had a habit of saying, "Oh, but that's only 12 or 13 per cent of all trips," that's what they say, but in actual fact these trips are much much longer, and as the cities get bigger they get even longer. So what you're looking at, according to VicRoad's study last year, that 12 to 13 per cent of trips becomes 32 per cent of all kilometres.

Then when you start to look at the driving conditions in the peak hour for the trip to work, they're nearly all journeys that start on a cold engine and it's stop-start driving conditions, and what you're looking at is 40 per cent of the air pollution and probably 40 per cent of your congestion costs. If you want to see how all of those costs and the percentage of driver-alone cars, they're all on figure 9; it shows you the curve.

From the point of view of Melbourne, if you look at the six outer urban regions, what I've plotted there is per cent of all commutes by car, taxi, truck, et cetera; per cent of drive-alone car commutes; per cent of car fleet in households with three or more families. If you look at the latest transportation plan for Melbourne - and it's just the same with all the other cities - where's that extra million people going to go in the next 30 years? Melbourne 2030: they yak on about it; they're going to put another million people into Melbourne. Where are they going to go? They're going to go into these six outer urban regions on this side of the graph, and you can see - any hope of increasing the energy efficiency of your entire transport system by getting a better balanced transport system - I mean, it's not just a matter of having more energy efficient cars; we've got to get more people onto public transport; we've got to get more people walking; we've got to get more people cycling.

If in a city like Osaka you can get 15 per cent of trips riding a bike to work and then another 15 to 20 per cent of bike-rail trips and then people who walk to the stations, and then you start to say, "What is the overall energy efficiency of the Japanese car fleet?" it starts to look really good when you look at fully loaded trains and you start to consider the trends that are built in there.

DR BYRON: Yes. I guess this graph explains - or answers, in some ways - one of the things in our terms of reference under the transport heading is looking at land use planning, and this is exactly why I think that's in there - because of the implications of having urban sprawl, in terms of the efficiency of the transport task in getting people to and from work and so on.

MR PARKER: Yes.

PROF WOODS: And that was very helpful.

MR PARKER: When the economy starts to really fall apart, how are these people going to survive in these areas? A lot of them have got three cars, public transport is almost non-existent. To deal with a problem like that - that is, say, 10 to 15 years away - one has to start planning now. You can't change a society fast, it just can't be done; it's a slow slow process and there's got to be a long-term vision of when the end of the age of oil comes to an end, and what one is going to do about it, and what the role of energy efficiency is - in relationship to this, if you like, worst- case scenario - it could be sold at. But I don't think it's a worst-case scenario and neither does Foran and Poldy who did the research work at CSIRO.

Poldy is in Europe at the moment talking to the people from ASPO - that's the Association for the Study of Peak Oil - and they've had three international

conferences now on oil depletion, and it's pretty obvious what the situation is there. I've explained in the paper about what state oil companies have done and what individual oil companies have done. I mean, if you want to jack your share prices up, what do you do? You jack up your reserves.

DR BYRON: As Shell - okay. Thank you very much, Mr Parker. That's been extremely informative and thank you for all the effort you've put in to assembling all this information for us.

PROF WOODS: A very thorough document. Thank you.

DR BYRON: Thanks very much for coming.

MR PARKER: Right. Thanks.

DR BYRON: We'll now adjourn until 11.30. Thank you very much.

DR BYRON: If you would just like to introduce yourself, Geoff, for the transcript.

MR WHITFORD: Yes, my name is Geoff Whitford. I'm the group technology manager for Rheem Australia. I would like to thank the commission today for the time to make this presentation.

DR BYRON: Please proceed.

MR WHITFORD: The company manufactures all types of water heaters, and the purpose of today's presentation is to explain some of the minute finer points of Rheem's submission. The subjects covered today will look obviously, first of all, at the company profile, the market, the product, product efficiencies and then we make six recommendations on ways to serve and improve our energy efficiencies. The company profile: Rheem Australia is a joint venture now between Rheem US and Paloma. It just so happens that Paloma owns Rheem US, so finally all roads go back to Paloma. We report to Rheem US and it is more of a convenience on the basis of communication. We tend to make very similar products in Australia as compared to the US, excepting of course that they have different markets, we have different markets and there are different market pressures and so forth.

Rheem Australia operates three plants in Australia. There is the Rydalmere plant, where we manufacture domestic and commercial water heaters - gas, electric and solar. We own the Solahart plant in Perth and they obviously make solar water heaters, and there is some cross-badging between Rheem and Solahart. This is mainly at the plant. We also operate and distribute under not only the Rheem brand but also the Vulcan brand. We also have a plant in Melbourne, which manufactures gas products and pool heaters under Raypak, which is also part of Rheem US but has now been incorporated into the one company within Australia. So there is one reporting function of all those plants, as well as the New Zealand plant, Rheem New Zealand, and there is a small joint venture plant up in China as well that reports into the Rydalmere operations where it's all consolidated.

One of the things that we're very keen on is energy conservation and making sure, since we do have a dominant position in the marketplace, that we act responsibly. We have aggressively worked on the development and manufacture of energy efficient products for a fair while now to the point, in 1999, we were awarded the Galaxy Award for both the company and also for products, and we were delighted to achieve that award. The market: approximately three-quarters of the market is a grudge purchase. That's the breakdown. All of a sudden you either haven't got hot water or, alternatively, the tank leaks and you really need to be back in operation that night. We run breakdown services and so forth, and try to help people get back into hot water as fast as we can.

The other market obviously is the new home market. Some of it, I suppose, is a considered market. Certainly it's a considered market by the builder where, if it looks like a water heater, that's what he wants if it's the right price. But other markets, other than new housing, it's also the top of the range, top of the product line. So it is a considered market, whether it be considered for the bottom of the range or the top of the range. The next point I would like to make is - and these are super-rough figures, but it gives you an understanding - that they are rented properties and the decision-maker is interested in capital and not so much energy conservation.

Once again what he wants is, obviously, if it looks like a water heater at the right price that's what he's interested in. He has reduced his capital and, the running costs and the bills associated with that, well, that's up to the tenant. Water heaters consume around about 40 per cent of energy. That obviously does vary quite an amount, depending on whether you have teenage children or whether you've got low-flow shower heads - all those sorts of things. But it does consume a fair amount of energy for the average household, be it gas or electric.

PROF WOODS: Not necessarily equipment in price. I mean, if you've got off-peak pricing for instance, your bill may not reflect your energy usage.

MR WHITFORD: That's true, yes.

PROF WOODS: So there are different incentives; that you are driven by your bill, not by your quantum.

MR WHITFORD: Yes.

PROF WOODS: Then, if you've got off-peak, you are more profligate with hot water than you might otherwise be.

MR WHITFORD: Yes, it does vary. But probably the point I was just making is that it does consume - - -

PROF WOODS: It's a big block.

MR WHITFORD: It is a big block, yes. So we've got some areas there where we can help the community reduce energy. Types of products: gas, electric, solar and heat-pump water heaters. Most products for in Australia we manufacture storage and we import instantaneous gas water heaters from our parent company Paloma in Japan. The energy restrictions, or the energy regulations, for electric storage water heaters relate to MEPS - minimum energy performance standards - and there are mandatory requirements which are enshrined in legislation and so forth. There is

also a regular update of reviewing standards by the Australian Greenhouse Office, and that works very well.

On the gas side, the product has to be AGA certified, otherwise it cannot be connected and, within the standard to operate gas water heaters there are certain specific criteria for energy efficiency and stand-by losses. Those stand-by losses are under review. In fact, the heat-up efficiency is going to be increased next year, but as the AGA starts to become divorced from that area the Australian Greenhouse Office is picking it up, and this is going to be worked under the gauge of organisations similar to NAEEEP, so it will all come back under the one regulatory framework, and of course everything is up for grabs there with star ratings, efficiencies and so forth.

On the solar, whilst there is not mandatory standards as such for performance, there is a pseudo-mandatory standard. That is that the product, first of all, has to comply to AS2712, and that is a performance standard. That relates to durability of the product on performance. Once you gain that you obviously then get the product rated, and there's another standard, 4234, and that determines how much percentage solar saving you get. What happens is that manufacturers then apply to Aurora to get a rating, using that information, and you get a renewable credit rating. As it works out, the ratings now, one credit is equivalent to around about $36 on the open market and the more ratings you get obviously there is a greater incentive and a greater rebate back on the solar. Product efficiencies: in an electric water heater the element, because it is encased totally in water, it's about 100 per cent. There is around about 10 per cent heat loss.

PROF WOODS: That's still a cheap loss.

MR WHITFORD: That's right, yes. These vary once again, depending on insulation and the draw of flow, but as a super-rough it gives one an understanding. Of course, when you look at energy that's related to the watt-hour meter, not at the generator.

PROF WOODS: Yes.

MR WHITFORD: On gas we have a star rating. Currently the standard has a minimum of 70 per cent total efficiency, and product such as ours goes up to near 90 per cent - some of the top-of-the-range product. The stand-by losses on gas are slightly higher. They can range in the order of 20 to 30 per cent. That is due to the fact that there is an external heat exchanger. You get heat in, but obviously when the burner is on the heat wants to try and get out. There are ways in which to overcome that and, whether that be storage or whether that be instantaneous, the way the methods of tests work out there is a certain percentage lost. That is for storage. For

instantaneous there is a complicated formula which relates to the amount of energy taken to heat up a heat exchanger in an instantaneous gas water heater. So there are efficiencies and losses. Now, those two are worked together in a complicated formula that works out the star rating compared to a minimum based label.

Solar: there are various ways of expressing solar. On this demonstration here we have put one unit of energy into a solar and you will get around about three units of energy out over the total year. So you could say, for example, that solar is around about 75 per cent efficiency or solar gain. Heat pumps: you could claim 300 per cent efficiency or a COP of 3, but it uses very little energy as such. In summertime, for solar, it would be a very poor solar system where you would continually have to bring on the element or the heat pump. In wintertime, obviously with three weeks of rain, they need boost-up. The product is always designed so that you assume you're going to get three weeks of rain, so the golden rule is, "Thou shalt not run out of hot water," and then of course we work on how we can save energy from there. So that's a combination of those two factors to make the design of the water heater.

On the recommendations: 1, establish a national building regulation to actively encourage installation of solar and heat pumps in new buildings and major renovations. This is the first recommendation. So far we have now got regulations within Victoria for new houses to be either a solar system or a water tank - for new houses. For New South Wales there is a new system called Basics and there are four major factors there. One is obviously energy, and that relates to how much energy is going to be used by the various appliances. Both have advantages and disadvantages.

Obviously those systems need to be extended further to other states. I know that Queensland is talking seriously to New South Wales and a few others, but there are advantages and disadvantages in both systems, excepting to say of course that obviously state governments are starting to realise that the water is precious and so is the energy. On recommendation 2, we provide financial incentive assistance to reduce capital costs of solar and heat-pump water heaters.

PROF WOODS: Sorry, just on recommendation 1 again, those systems do affect behaviour. I mean, deliberately. That's why you have things like Basics, because they are trying to affect behaviour, but the design of the regulation can affect behaviour in ways that you may not want. I mean, you make the point here in your submission that the points that are given to solar or heat pumps will affect the degree of take-up of those.

MR WHITFORD: Yes.

PROF WOODS: So it's not just that you have a regulation that promotes. The devil is in the detail of how you design your relative weightings as to what outcome you are going to get.

MR WHITFORD: Yes, and whilst there is one mandatory field in there, which we are hopeful that the New South Wales government will use, and that is called postcode, I can see there that the weighting should be different between, say, city and country. In some outlying areas where you have got long distribution lines the weighting should be different again, because if water heaters are going to cause massive increases in transformers and distribution grid, obviously there's a value to the community there that needs to be considered. Peak demand, shoulder peaks, as well as ordinary energy: I think it's a great system, but I think it's the infancy stage that needs to develop further and I don't think solar water heaters, a heat pump, at this stage have been weighted their true value to the community.

DR BYRON: In terms of the network costs?

MR WHITFORD: Yes, to the network costs and - - -

DR BYRON: Savings and - - -

MR WHITFORD: Yes, there is energy, but there is also network costs. All the factors considered for sure.

PROF WOODS: We had an interesting example, and it's not in your field, yesterday where the timber industry was saying that if you give high weighting to thermal mass but think that concrete slabs are much more important in generating thermal mass than the timber flooring, then you skew the whole behaviour of the building industry to start putting slabs, even where it may be less appropriate, because they're chasing the points.

MR WHITFORD: Yes.

PROF WOODS: What you're pointing out here in your area is some of those subtleties as well; that if you don't take into account things like long distribution lines, then you may not be giving the right weighting number of points to each area.

MR WHITFORD: Yes. I mean, the community has paid for the infrastructure and obviously we need to use that wisely.

PROF WOODS: Yes. That's very helpful.

MR WHITFORD: Because it does use a lot of energy and sometimes, if it's not

used wisely, it will use it at the wrong time.

PROF WOODS: Yes, if you haven't converted them to off-peak and they're boosting at the same time of the airconditioning load, yes. Okay.

MR WHITFORD: One of the points on financial incentives is it need not be funded by a government. For example, the REC system is not really funded by the government, it's managed by the government, and the capital costs of solar and heat pumps is significantly higher and that obviously deters from a purchase, as we talked about with grudge purchasing. But there are factors in there that need to be considered and need to be organised specifically by the government along the way.

DR BYRON: I was just wondering to what extent recommendation 1 and recommendation 2 are two different ways of trying to achieve the same thing; that if the financial incentive was right, perhaps you wouldn't have to regulate it as well.

MR WHITFORD: True.

PROF WOODS: Do you need to do both?

MR WHITFORD: I think so. In some areas you probably may need to do both, but one of the things I was talking to Mike earlier about was going back, when I first joined Rheem, there was a forum for manufacturers and the distribution generation networking and retailing to get together to try to get all the stakeholders in the one room and work out which are the best solutions for the community. With the break-up of the energy markets now into separate segments there's not that forum, or there's not that strong linkage, and I know that Rheem has often proposed various ideas either to conserve energy or promote various products, and it's pretty hard to try to break through nowadays. So that may be well worth looking at for getting stakeholders together.

PROF WOODS: On this recommendation, just a little further, I guess what worries me is if we increase the rebate by $1000 I would not be in any way surprised if suddenly the price went up by say at least $500 - ie, why wouldn't the manufacturer want to capture - or manufacturer/wholesaler/retailer, that whole chain of supply - why wouldn't they want to capture some of that price? That's one thing. I know you're all very honourable and do it only for civic duty - - -

MR WHITFORD: Yes, I can appreciate your point there.

PROF WOODS: And the second one is: where then is the imperative on efficiency? If you make them sufficiently cheap for the consumer, how do we know that you're driving your workforce and your capital hard enough and your innovation,

to produce the cheapest possible product? If you're getting them out the door because of recommendation 2 - there is a rebate; and because of recommendation 1 - because you've got a guaranteed market, how do we know that you're fighting hard in an industry where - I mean, there's Rheem - ie, Rheem Solahart, dee-dum, dee-dum - and there are a few other suppliers but they don't have that jingle that sits in your head and annoys you constantly. But, you know, there's not a lot of competition - well, apparent competition. There may be competition, but to the average consumer, how do we know that you're driving that price down as low as possible?

MR WHITFORD: That's a valid point. One of the things we have noticed, for example, with solar and heat pumps, is that Europe have now identified, "Hey, there is Australia," and there is a lot of activity going on for approvals of European and Israeli product coming into Australia, also from China, and so they can identify that here could be a market for solar and so obviously with the import tariffs we have in Australia we - - -

PROF WOODS: Do they cop the 5 per cent general tariff or - - -

MR WHITFORD: I think it may be. I'm not too sure.

PROF WOODS: It wouldn't be more than that.

MR WHITFORD: It's not more than that, anyway. When you consider for example the market in Israeli, it's quite substantial for solar water heating.

PROF WOODS: Mind you, you are protected by a long distribution chain that they have to get. There's a fairly natural hedge there for you.

MR WHITFORD: Yes, that's an advantage we do have. I can appreciate that that is a point which needs to be considered along the way, and obviously the devil is in the detail. There would need to be some sort of additional guarantees along the way, or review points, to make sure that we're spending people's money wisely - just as we're doing now.

Continuing on with recommendation 2, we can see that there are some clear advantages in the new buildings and existing buildings. We can see that there could be variations to the REC scheme to promote high-efficiency products and maybe even to the point of providing funds by subsidising low efficiency for high efficiency. These are various ideas that we could think of. What we're obviously trying to work towards is promoting high efficiency and there are various ideas that we could work with government on.

DR BYRON: One of the ideas that has been put to us in the past is that somebody

is buying a spec built house and the hot-water system is already in there and, as you say, it's almost certainly the cheapest one the builder could get.

MR WHITFORD: Yes.

DR BYRON: So even if the owner says, "I would have been happy to pay $700," or, "I would have been happy to pay 3 and a half thousand for a solar system, but since this cheap and nasty thing is in there, and it's going to last for between 10 and 14 years" - you know, locked in - would a simple change like saying, you put a cardboard replica in the space where the hot-water system goes and the builder says, "The purchase price of this house includes X hundred dollars worth of hot-water system. I'll put in the cheapest one, if you want it, or if you want to put that X hundred dollars towards the top of the range, I'll put that one in for you."

MR WHITFORD: Yes.

DR BYRON: And so rather than excluding the home buyer from having any say in what they get stuck with, just put in a cardboard one and fit it after the consumer has had their say. Would that work?

MR WHITFORD: It would. One of the things is that I've asked that question amongst our sales force and what tends to happen is the new people look at the building, "Okay, do you want pink tiles? Do you want red tiles? Do you want glass? Do you want a rangehood?" "Do you want - - - "

DR BYRON: Is there allowance for - - -

MR WHITFORD: "I'll have it extra, and I'll have that flash rangehood," and then of course, "I'll have a dishwasher," that's extra, and so forth. Then finally, right at the end, "Do you want a water heater? Do you want a different water heater?" By that time they've run out of money. But one of the things that may be worth - and I know that it's taken - there is specific higher, top of the range markets for houses as well as bottom of the range. Some of the top of the range do in fact have solar water heaters on them, specifically up in Queensland and some parts of New South Wales, and now obviously there will be parts of Victoria as well, so it is happening now.

One of the things that I was interested in, a scheme proposed a few months ago, was that when you sell a house maybe that is at the point of saying, "Hey, now you need to upgrade your energy efficient appliances," and so you can penetrate faster into the marketplace. You may have a water heater that's 10 years old, that's on its last legs, and people know that and they want to move out - well, move out before that water heater goes bung and, at that point of exchange, maybe there's a review point there. And councils can do this: you need to get a clearance from

council that a new water heater or a more efficient water heater goes in. Councils at the present moment now in New South Wales, you would fight pretty hard to get an electric water heater put into a new house. It would have to be a solar or would have to be a - - -

DR BYRON: I've mentioned a few times in other hearings the personal anecdote of trying to sell my house in Canberra with the solar hot-water system on the roof, and trying to tell prospective buyers, "This is going to save you X hundred dollars a year," and no, even if you spent 2 or 3 thousand dollars on it, you don't get an extra penny back when you come to sell the property, even though in my view it was an extremely valuable cost-effective feature.

MR WHITFORD: Yes.

DR BYRON: So there are those sorts of impediments about whether people will actually appreciate - I imagine now if you tried to sell a house and say, "Oh, and by the way, we've just replaced the hot-water system with a top of the range model," you might not even get a yawn out of it.

MR WHITFORD: Yes.

DR BYRON: Whereas if you replace the benchtop with marble, then you'd get an extra thousand dollars.

MR WHITFORD: That's true. That's a really valid point. One of the proposals by one of the councils was at the point of signing off that the house is as per regulation, that maybe they need to make sure that house is insulated; maybe they need to make sure that house has got a good, efficient water heater, or a solar water heater. I think those are appropriate points that may be worth looking at for the existing markets and new housing markets. As we said, the Basics program we don't think gives enough weighting to solar. We certainly congratulate the Victorian government on the approach they've take down here with solar gas. Along the way somewhere I believe that the market or the energy block that water heaters use needs to be shifted away from the airconditioning load, otherwise as a community we will suffer a lot.

DR BYRON: I probably should have admitted that in my house here in Melbourne I have Solahart with a Rheem gas booster. But I guess I'm in the financial position where I can afford to do that, but I imagine that a lot of other people who don't have the resources even with a subsidy - it would still be sort of rich bastards like me who can do it, rather than people in other circumstances.

MR WHITFORD: Yes.

DR BYRON: And so if it's taxpayer funded, then there's a certain regressive element in that - - -

MR WHITFORD: That's true.

DR BYRON: - - - in that some of us can afford to put in very nice and cost-effective, money-saving measures, but the people who really need to save money can't afford - - -

PROF WOODS: Capital constrained at the front end.

MR WHITFORD: That's right, yes. I'm sure that if you get all the stakeholders together there are areas that we could work with people on those sorts of ideas. It just looks to us as if we've got to shift the water heater load out of the way of the airconditioning load, either remove it in summer or shift it so it doesn't - because the cost to the community is exorbitant.

PROF WOODS: That's what off-peak does in effect.

DR BYRON: I think we might have interrupted the flow, but we were at recommendation 3, I think.

MR WHITFORD: Yes. The last point I think is probably to provide funds or incentives to purchase high efficiency. That could be that you add in additional cost for lower efficiencies and subsidise - a bit of cross-subsidy there.

PROF WOODS: Are there significant variations in the efficiency of solar hot water, say, electric boosted, or solar hot water gas boosted, or are you talking about efficiencies between solar versus just straight electric, or straight gas? I'm not quite sure, where you're talking about higher efficiencies, what use - - -

MR WHITFORD: There are variations in high-efficiency solar systems, as compared to low efficiency.

PROF WOODS: Significant? I mean, are we talking quite a wide band?

MR WHITFORD: Yes. You could be, yes.

DR BYRON: Reflective surface.

MR WHITFORD: Yes, a reflective surface, well insulated, well-insulated tanks, and - - -

DR BYRON: Ones that don't burst when it's a heavy frost.

MR WHITFORD: Yes.

DR BYRON: For Canberra.

MR WHITFORD: Yes. So those type of efficiencies, the top of the range product as compared to the lower range - for example, in some areas of the Arabian Gulf anything that looks like a solar water heater is probably good enough, but when you bring that down here, it would be a dog of a water heater. But that's a very low efficiency, so you can imagine that what we are always striving for is the optimising of designs - - -

DR BYRON: Between cost and effectiveness.

MR WHITFORD: - - - and performance. That's also the same with gas. There is ultra high efficiency and - - -

DR BYRON: Then we get on to it in - - -

MR WHITFORD: - - - our standard product, yes.

DR BYRON: - - - number 5.

MR WHITFORD: Yes. Number 3, the harmonisation of the various ratings for solar water heaters and heat pumps: there is an expanding rating performance. What has grown up - and this thing has probably grown arms and legs along the way, and that is for rating solar water heaters. Tests are done on the solar collector and those tests, together with the heat loss test of the tank, are plugged into a Transis computer modelling program developed by the New South Wales Uni, and this program now has been adopted as an Australian standard. So it works out the total solar gain, using the Australian standard, of how much solar gain you'll get.

There are a number of variations that come out here. There are four zones within the standard we need to work through in the various areas of the country. There is another requirement down in Victoria, a slight nuance, a variation. There are also nuances and variations in New South Wales, so we've combined a whole - there's about now six variations we could have. On top of that, just looking at the simulations, there's 35 inputs per simulation, so that's a manufacturer's problem.

It tends to relate to me that the same sort of thing has happened for example with cars. There used to be a country and a city track for rating cars, and now they've dropped out the country, I think it is, or the city, but what people are now

starting to relate to is the relative weighting between one to the other and how much it's going to save or cost them, and so there's improvements we need to work on as an industry in that area, and we need some help from the government in that area.

Also, when you look at these technical ratings, there needs to be some further government involvement in trying to help bring out a national rating, so it's easy to compare solar water heaters against solar water heaters to the average Joe Blow in the street, and maybe solar as compared to gas, so there's some help and support the industry needs in those areas to help promote more energy efficient products.

PROF WOODS: But whose responsibility is that? You talk about here harmonising, and we totally endorse that you produce one simple, clear but accurate set of ratings. But whose responsibility in this area?

MR WHITFORD: I suppose there is a responsibility. I'm a member of the standards committee in this area, so I've got a responsibility to make sure I push that barrow, and I know there haven't been big barriers put up at all. The committee is receptive to those sorts of ideas, so it would be a case of getting Canberra and Victoria and a few of the government departments to agree upon say one rating, and then trying to work through the areas of how best to promote it. Obviously with technical people working on standards, you need probably marketing people. With technical people you'd finish up with a five-legged camel to the average consumer. So there's that area that needs some work on it to promote the industry.

PROF WOODS: But there are no barriers to it?

MR WHITFORD: No, it's just coordination and resources. I suppose there's a barrier to it at the present moment. There's legislation in Canberra that needs to be changed.

PROF WOODS: You mean Canberra as in the national level when you're talking Canberra, or are you talking about the ACT?

MR WHITFORD: The national level. So there's more areas that we as a company can do. For example, in frustration, for our solar gas we've got what we term as a nine-star rating. Now, on the gas product, the reading only goes up to six but we know with solar gas you get a lot more, and when you work back the other way, which is normally maximum five, we get up to about nine. So that's obviously a promotion that we've done internally for our products, but those sorts of systems and schemes need to be thought through a lot more on a commercial and a national basis to cut the confusion out, to make sure that people understand and make value judgment choices correctly.

PROF WOODS: Are other manufacturers also putting their own bids into the community in terms of their efficiency and effectiveness?

MR WHITFORD: Yes, that's so.

PROF WOODS: I mean, is it a competitive industry in terms of within the domestic manufacture? What would be your rough market share in each of these, without divulging commercial-in-confidence?

MR WHITFORD: Solahart and Rheem would obviously have a lion's share of the solar market, but there is fierce competition within. There's probably about another half a dozen to a dozen competitors, and those competitors are growing more and more as we see more imports starting to come in, and so I think the world has recognised Australia has a problem, and the national government has started at the REC system, which has been really good and really supportive. Now the rest of the world has recognised that and are now starting to move in on us. We don't have a problem competing with the rest of the world but we'll just need to organise ourselves and get additional support, because the industry is still quite young.

PROF WOODS: Yes. Okay.

MR WHITFORD: Recommendation 4, and this is what we've been talking about: the widespread ignorance and misconception about purchasing and costs and benefits of solar water heaters and heat pumps. Obviously we need to get the majority of the stakeholders in there and start talking about these issues for solar, for energy efficiency, for comparisons one to the other, and how best we can simplify - maybe it's not absolutely technically pure, but the relativity between one product to another, relative to where both products are going to operate - still a valid, reasonable comparison.

All the ratings that we have for example on appliances right now are not totally theoretically all correct - say for fridges, washing machines - but it's a reasonable valid comparison between one to the other, and so we need support and help in those areas. Being a reasonably young industry, the industry hasn't got as many resources as it should have to promote these sorts of things at this stage for solar.

Recommendation 5: the gas products at the present moment are regulated by the AGA, and that system is going to be finally taken over by the government, and there's good work being done by GAMMA, as well as AGO and industry to start to move that in a forward direction now; resources being applied to those areas to check tests and do all sort of nice things and make sure all the testing is accurate for energy conservation efficiency. So that system is being done. Regular reviews are going to take place, the same as the electric industry. It will be the same for the gas industry,

and that's all good stuff.

Currently you need a certain percentage efficiency and performance to at least be able to market the product. Nowadays most appliances are being produced with three, four or five stars, whereas you can manufacture and sell at one star, but market pressures have forced the community to move up to a minimum of round about three stars. Rheem is happy to work with the government and work towards moving the benchmark up further, and we see that as a need, and once that - - -

PROF WOODS: When you say "the government", who in the government?

MR WHITFORD: It will probably be the Australian Greenhouse Office, but the greenhouse office is the vehicle that is coordinating it with the MCE, and so they're just a coordinating vehicle as such, and so that work is starting to be done - starting to review those issues. I think Rheem has suggested that we're happy to keep raising the benchmark up. We see that as part of our community responsibility. Beyond five star - - -

PROF WOODS: Presumably it will get rid of some competitors who are still wandering round the ones and two.

MR WHITFORD: There's not that many actually.

PROF WOODS: Aren't there? Okay.

MR WHITFORD: Yes, there's not that many. It's surprising how market forces have taken that on and I think it's - yes, not in the domestic. Maybe there are rats and mice lower in the market. That stuff's really shrapnel. The main bulk of the water heater markets is round about the three plus.

DR BYRON: Yes, I was wondering about what effect the MEPS have had on the range of heaters that are available in the marketplace. Are there sort of cheap and cheerful ones that used to be available that people might have bought but now can't?

MR WHITFORD: Yes. I can remember 20 years ago when Gas and Fuel first brought out the concept of four star, say 20 per cent of gas. There's very few manufacturers really who were interested in taking that up initially until they could understand that the market pressures were starting to be applied, and we've all pushed that way where at least - well, all the major manufacturers have got a five star and also three stars.

DR BYRON: Yes, but are there the cheap products - I don't know, instantaneous or something - - -

MR WHITFORD: Yes, there are a couple of those - - -

DR BYRON: - - - that used to be available to consumers who wanted a cheap and cheerful product and now they're simply not available because of the MEPS?

MR WHITFORD: Yes, there are some but there's still one or two cheap and cheerful charlies from Europe that are still less than three stars, and I think they certainly understand it's on the agenda to raise the star rating for imported product from Europe. Certainly in the gas industry because you've got two variables - you've got thermal efficiency and you've got stand-by losses - you can do something with that, especially when you were operating at about 70, 75 per cent efficiency, whereas electric water heaters, you've really only got one variable. That's just more and more insulation and you're only really talking about 5 to 10 per cent of the energy, so that's why we decided electric will have MEPS and, for gas, let market forces continue to play. The gas industry has been very good in that area, it really has, yes.

DR BYRON: Good.

MR WHITFORD: I suppose looking beyond five stars, and all major manufacturers now make five-star products, that would require starting to get more and more significant capital, because we're starting to get up into the condensing areas. For example, Rheem make a product which is near 90 per cent thermal efficiency. Once you get into that area, you get condensation forming on the flue gases, and that's acid with a pH of about 3 to 5, but once again the technology is there. It's a matter of just working with it. It costs more and more to get more intricate designs and more elaborate heat exchangers and system, but by the same token, as the cost of energy goes up or as we perceive that it needs to go up, then of course that needs further investment. But once again Rheem is happy to work with government in that area.

DR BYRON: What we've been told a few times is that the combination of MEPS and labelling is the combination of carrot and stick and that you're truncating the bottom end of the distribution, saying these products aren't good enough for sale in Australia. At the same time you're trying to encourage and stretch the top end of the distribution.

MR WHITFORD: Yes. It does work. I work with a lot of people from AEMA, Australian Electrical Manufacturers, and whereas 30 years ago when I first joined the gas industry, in some cases when the product was round about 75, 78, because gas was so cheap, why would you need to? You just detuned a bit. Nowadays our marketing guys are saying, "Forget 70 per cent. We must have at least 80 per cent efficiency, and we really want 90 per cent. We've got one or two products

90 per cent. What about the rest of them?" So those are the sorts of pressures that are coming on the industry to try and improve the performance of product all the time. Environmental factors are a major issue now with product, not only for water heaters but for other types of appliances as well - major motives. I think I've covered all those points.

The last point, increase the market price for excessive consumption: this obviously is an area that's been talked about, whether people are allocated a certain amount of water and, above that, there are higher and higher charges. That could be the same for energy - people are allocated a certain amount of energy. If you want to go higher, that obviously would encourage more energy efficient product. Another option obviously would be to cross-subsidise the low-efficiency product with a high-efficiency product. Another option they've done in the UK is that they've just cut the line and said, "From now on we're going to have condensing product."

PROF WOODS: Explain that one to me.

MR WHITFORD: The UK are now bringing in a law - I think it's coming through mid-year next year - where their minimal thermal efficiency is about 84 per cent for new product coming through. There will obviously be areas where the condensation coming out of those products is such that it's just not practical to install them, and then there will be some dispensation, but they've started to work on the efficiencies, so they're doing some good work in the UK right now - that and also solar. Holland is doing good work in high efficiencies in solar, working through this issue of trying to save energy.

Obviously the second point there in regulation 6 is to work through and try and get some further momentum going for the high efficiencies. One of the problems we have as a company is how well will the high-efficiency products go? How much do we invest and where is the cut-off line? So obviously there is a commercial risk associated with driving higher and higher efficiencies if people don't want them or if they can't be sold or the capital cost - - -

PROF WOODS: Can't be recovered.

MR WHITFORD: Yes. I suppose the other area - the last point on recommendation 6, and this has come up a number of different times in various communities - is, what is the real, true cost of electricity, be it off-peak, be it peak demand? There are certainly areas there that maybe we need to explore further the true cost of electricity and that obviously would have an impact on our markets along the way.

PROF WOODS: Excellent.

MR WHITFORD: In general, thanks very much for your time. We certainly welcomed the opportunity to explain our case and how we would like to help and support the Australian community to improve our energy usage.

DR BYRON: Thanks a lot. I have just got one more question. It has come up a number of times - the problem of split incentives or the principal and the agent sort of problem - and you mentioned in your opening remarks about - what was it? - 30 or 40 per cent of houses are tenant occupied.

MR WHITFORD: Yes.

DR BYRON: I could imagine hypothetically if I owned a house that I was going to rent out I could decide to put in a solar hot-water system and gas booster and then when I put it on the market as a rental property say, "Now, this is going to cost $10 a week more than it might have otherwise, but it is going to save you $20 a week in electricity bills." The anecdotal evidence we're getting back is that when tenants are looking for a place they're not interested in paying an extra $10 a week in rent to save $20 a week in their electricity bill.

MR WHITFORD: Yes, that may be the case.

DR BYRON: Do you have any explanation for that?

MR WHITFORD: No, but I suspect it's probably the case, just purely from personal experiences.

DR BYRON: But the evidence is that investment properties usually have the cheapest you can get.

MR WHITFORD: That's right, yes.

DR BYRON: Even if it means that the tenants end up paying through the nose - - -

MR WHITFORD: That's right. It's not the owner's problem.

PROF WOODS: And even cases where owners in their own properties might be considering solar, you have a situation, if you own a rental property and the real estate agent rings up and says, "The tenants are without hot water," your instant response is, "Well, go to your local plumber and get them to replace what's there." You don't think, "This is an opportunity to upgrade - - -"

MR WHITFORD: To upgrade.

PROF WOODS: "- - - and won't my tenants be so grateful that I have spent three grand in putting in a solar, when I could have spent 1200 putting in a standard product."

MR WHITFORD: Yes. When you look at it, what incentive does the landlord have, or what incentive does the retailer have to reduce the volume or the amount of electricity being distributed.

PROF WOODS: Yes.

DR BYRON: Thank you very much for making the effort to come and tell us about all this.

PROF WOODS: That was excellent.

DR BYRON: You are obviously at the coalface end of MEPS and labelling and - - -

MR WHITFORD: Yes, it's working well. Sure, there are problems occasionally and you have hiccups and minor attention to detail but, in general terms, MEPS works well. But there's lots of stuff, like things we need to do to get the right forum to move ahead from the industry base to make sure we service the community properly. There is not the vehicle there to do that at the present moment.

PROF WOODS: You were commenting earlier that that was in part because the electricity chain is now fragmented between generators, transmitters, distributors and retailers; that in the old days when you wandered off to the local state monopoly you had a captured audience.

MR WHITFORD: That's right.

PROF WOODS: Now you have fragmentation and nobody there to deal with it. We had a parallel situation with unemployment. When it was the days of the old CES, if a big factory was about to go under they went there and the CES came in and worked through with the workforce. But in the days of all the Job Network providers, they all have individual incentives, but there isn't a forum, a body, to go along and say, "There's a problem coming up. Can we all work together to deal with it?"

MR WHITFORD: That's right.

DR BYRON: In this case, even if there was agreement on what the problem is and

what to do about it, it's not clear that there is a mechanism and who is going to do what.

MR WHITFORD: Yes. It comes back to, who is the customer? In some cases it's for energy conservation, sometimes there's varying process.

PROF WOODS: Different incentives.

MR WHITFORD: Different incentives, yes.

PROF WOODS: Fascinating.

DR BYRON: Thank you very much, Geoff.

MR WHITFORD: Okay.

PROF WOODS: Appreciate that.

DR BYRON: I think we can adjourn now until the next participant.

DR BYRON: Good afternoon. Thank you for making yourself available. I'm Neil Byron and I have the honour and glory of presiding over this inquiry.

PROF WOODS: I'm Mike Woods. I'm the other commissioner on the inquiry.

MR McDONALD: Right.

DR BYRON: Apart from Vince, the only other person in the room is Paul Belin and the Hansard reporter.

MR McDONALD: Not a problem.

DR BYRON: Would you like to talk us through the main points in your submission, which we've both read, and then we can maybe have a bit of question and answer on that, if you've got time.

MR McDONALD: Certainly. Yes. I suppose firstly I'd want to say that when I looked at this inquiry I thought, "By jingo, it's a very wide-ranging terms of reference."

DR BYRON: We had the same reaction.

MR McDONALD: I bet you did. I should point out for the record first that I'm a chief executive of the Building Products Innovation Council and our organisation is a representative body of all the building material suppliers. I'm not sure if you've had a chance to look at the web site, but if you did have or if one of the staff has, you'd see that nearly all materials that go into buildings are represented on our council.

We do have a fairly focused business plan in our organisation and one of the areas that we touch on is in fact linked closely with energy efficiency, probably because of the impact it has through the Building Code of Australia but also for some materials development perspectives and other issues.

I've touched on the links between the energy efficiency and the building code in our submission there. I did send you a revised front page. I actually live in Melbourne and work in Canberra, and sometimes our communication is not quite right, and I noticed yesterday that they sent through a transposition of a previous submission that mentions China. Forgive me if you've still got that one.

DR BYRON: Right.

PROF WOODS: Yes, I did see a reference to China.

DR BYRON: Yes, on the front page.

MR McDONALD: Yes. Well, I sent through a revised one yesterday - asked Barbara to. Obviously that was from our submission to the Department of Foreign Affairs and Trade about the China Free Trade Agreement.

DR BYRON: I was wondering why it was there.

MR McDONALD: Yes. It probably might make it clearer - if you try and work out what China has got to do with energy efficiency, God help you. So having said just generally, we are very very interested in the commission's inquiry in terms of its impact on energy efficiency, and the resultant flow-on into the area of sustainability. I'm sure everybody is aware that sustainability is the new buzz word in a variety of media areas, but our sector is and has been for many years very conscious of the sustainability issue.

The reason that we're so active in it is that it's an area that must be done in a complete full life cycle assessment type analysis or not at all, because if you half-do sustainability you're missing the picture and you get the wrong determination of the most appropriate building systems and materials. So we say you do the full life cycle or you don't do it at all.

Now, the full life cycle includes embodied energy and operating energy as some of the areas that go into sustainability outcomes, so therefore that's how it links through to the energy efficiency part of your inquiry from our view. Of course we are only talking about materials here - building materials. I can't comment on things like whitegoods and all those sorts of schemes; we have no staff, performance staff, things like that.

Moving quickly through our submission, I don't really think I need to harp on it, I'm more than happy to answer questions, but innovation is one of the key areas for coming up with building solutions that will lead to more efficient performance of the building, whether it be in cooling or heating or in perhaps lighting. There are some issues that we're working on with other organisations, such as Standards Australia at the moment, to look at more appropriate ways to call up amendments or new standards, such that the building fraternity can quickly move to an option of more appropriate and long-term sustainable building solutions.

In terms of your specific issues in your issues paper, I made a comment there about your energy efficiency gap, which is a term I hadn't heard before and it's quite an interesting concept, but when you look at affordability and things like that, we're very conscious of the need that the rate of change has to be at a pace that enables the public and in fact the materials developers to cope with it. There is a gap between

the best technology and probably the most frequently used technology, and there always will be; it's sort of dynamic as I've said, but it gets rather complex as to - well, you guys would be better placed than me to argue the economics of life cycles of materials - if you like, market life cycles and how you can make them more affordable yet still maintain your levels of R and D to further develop.

The scope of cost-effective energy efficiency improvements: yes, well, we've got a few ideas there that the commission might or might not believe are viable in terms of encouraging further improvement. Market values: I suppose there's this common term called "greenwash" which you probably have heard about, where people are promoting environmental and energy outcomes over and above those really achievable - merely marketing, really. That doesn't help in communicating the best message to consumers, and the best message is often that if you've got a shorter-term agenda or a short-term building, then you don't need to have perhaps the most energy efficient and expensive system to get the most sustainable outcome. So there are all sorts of issues there about resource allocation and that, that I guess flow from that.

Behavioural norms is another area that I just touched on. One of the things I don't have the statistics on but maybe some other people do, is how much of energy efficient solutions or sustainable solutions or for that matter building regulations, once put in place and once a building is built to a particular outcome, how often does that stay in place as a system or a product? I think there are a lot of alterations after the event that probably can have an impact on your overall outcomes. I wouldn't, however, say that, when you look at the actual energy efficiency in domestic or residential accommodation, we're not going to have a massive impact on the energy use anyway, which I'm sure others have provided you with stats on actual household energy consumption. In terms of commercial, it may be a little different, as I think I've mentioned somewhere else in the document.

National uniformity is a core issue for us. There are far too many - in fact, I think there are now 15 different energy measurement systems in place around Australia, and for a builder of an enormous size, yes, they could probably handle it because they could put two people on it full-time. For the majority of the smaller owner-builder or builders that just build domestic houses, I'd argue they've probably got no hope of keeping up with the appropriate energy efficiency requirements.

PROF WOODS: To some extent, Tony, presumably though the smaller ones only operate in one state; therefore you'd cut that 15 down considerably.

MR McDONALD: That would be a fair call and I had thought about that myself, but sometimes you get the small to medium size one. I think it is the skills transfer - you know, we've got skill shortages around Australia in building and construction.

You need to have a mobile workforce, so it would be good if they all knew the same rules, wouldn't it?

PROF WOODS: Yes, you're quite right.

MR McDONALD: But you're dead right, for the smaller guy, he should only have to know, if he's in New South Wales, "Well, what's the basic you can require me to do?" International comparisons: the ABCB did some work on that previously. I made a bit of a comment about transmission losses and cost-reflective pricing, which is pretty self-explanatory I think. You mightn't agree with it, but I think it's self-explanatory. I don't know if there's anything else that I'd want to go on about at the moment.

PROF WOODS: We've got the full submission, although we'll get the revised version very quickly.

MR McDONALD: Yes.

PROF WOODS: But that's quite helpful, because you've gone through at least the highlights and we've got the full document here.

MR McDONALD: Yes. Well, I don't see there's any sense in wasting your time going right through it all question by question, so I'd prefer to actually discuss it with you and see how your thoughts are evolving and see if there's anything you need clarification on.

DR BYRON: One of the things that occurred to me is that we're frequently told that consumers don't know about potential energy efficiency gains and therefore governments must mandate some things, forbid other things, run information programs, offer financial incentives, et cetera. But I would have thought that your member companies must advertise. I mean, if they've got a new product, an innovative product that offers solutions, superior performance, aren't they doing everything they can to inform potential customers?

MR McDONALD: Yes, they are. This is an interesting point, and you've probably got a submission - I think you have - from the Glass and Glazing Association, who are members of ours as well, and they promote continually the energy efficiency benefits of double-glazing. Well, yes, they're right, but by jingo it's expensive, and that's the whole point: when our guys go to supply product into, say, a major builder or project home builder, there's a lot of price point considerations. So there is product available and product being developed that is probably more efficient but, as I said earlier, there are some returns that need to be gained out of that initial research and development that are a bit more difficult in some markets than in others.

DR BYRON: That leads into my follow-up question: a more general one, I guess, about what drives companies to innovate in new products. Presumably they think that if they come up with something that does a superior job than existing products, they can either get a price advantage or they'll get extra market shares simply through quality differentiation.

MR McDONALD: That would be the market driver, the bottom line driver, the financial driver, but I think there's also regulatory drivers, that people are going to have to come up to meet the alleged standards that these new systems and government rules and regulations are putting in place.

DR BYRON: Yes. I've got a follow-up on that one, because on page 3 you're talking about the building code and you've got a statement in there that says sometimes the new solution doesn't comply with the BCA. But I thought the building code was performance based, and I was led to believe that any new material or technique is okay provided it delivers the required outcomes. Is that not so?

MR McDONALD: I think that is so. I'm not an expert on the building code, but the thing is, if the building code calls up Australian standards - which I think is where I'm coming from - - -

DR BYRON: Yes.

MR McDONALD: - - - then the problem is that there's a lag time between the ability to incorporate that new product into the building and have it determined as satisfying the performance requirement, compared to the time it takes to amend the standard and have it subsequently called up in the building code. The problem is that the insurance industry won't cover the builders unless they build in accordance with the building code, but the standards have been amended to say that you've got to use the latest available materials that meet the Australian standards. So there's a dichotomy between what the building code wants and what the insurers want because of the de-linking, if you like, between standards and the building code call-up. Now, it's not a big issue by the way - I think it only affects a small area of the population - but it's a complex one to try and fix.

DR BYRON: I can imagine it would be - - -

MR McDONALD: If you are right that - my understanding as well is that the Building Code of Australia sets a minimum standard, deemed the "satisfy" provision, but performance based solutions that are over and above that, yes, go for your life.

DR BYRON: I can imagine it would be very frustrating if you think you've got a

superior product but just the time delays of getting it recognised so that it gets approvals.

PROF WOODS: It was exactly on that point, but you've helped answer it by saying that this is only a small issue, because I was wondering if, in fact, that's starting to explain some of the gap. There are all sorts of reasons why there's a gap between what's the frontier of efficiency and what's actually happening in practice - - -

MR McDONALD: Yes.

PROF WOODS: - - - and one of them could be process delays in getting "frontier" accepted as appropriate practice. But I think you've qualified that by saying that in this case it's not the code that's the problem, it's what the insurance industry will accept, and that it's not a big issue anyway.

MR McDONALD: That's my understanding of it, yes. Put it this way: to say it was a big issue - I haven't got any data to support it.

PROF WOODS: Sure.

DR BYRON: When you were talking about insurance, I thought - just reading the submission - you were saying that the insurance companies weren't happy with the product but you said in your comment just then that the insurance companies won't insure the builder. I was confused about what the insurance applied to, but you've sorted that out, thanks.

MR McDONALD: Sorry, I should have been more - - -

DR BYRON: No, that's good.

MR McDONALD: I hope the insurance industry is actually making a submission, but I guess they won't.

DR BYRON: Not yet.

PROF WOODS: We haven't got one from them, but it might be an area of inquiry. Anyway, we'll reflect on that to see if it warrants - - -

MR McDONALD: Yes. Well, I'm not being critical of the insurance industry.

PROF WOODS: No.

MR McDONALD: They've got their own concerns, and they're all private companies anyway.

PROF WOODS: Sure. You raised an interesting point about sometimes having competing and, in fact, conflicting objectives. Where that came up was the cost-reflective pricing for distribution and transmission and then saying, "But if you do that how does that fit in with policies such as regional development?" I think that's quite a useful point and it seems to be coming up time and again in this inquiry - that you can have policy drivers pushing one set of agendas but at the same time they're then cutting across desirable outcomes in certain other areas - and that was just a neat illustration of that.

MR McDONALD: Yes, you're right, because that's the same issue with affordability and stuff like that; obvious things that you could do to save energy. Well, a lot of the population can't afford to do it, so what do you do?

PROF WOODS: We've come across that in a number of cases, where builders, suppliers, et cetera, recognise that particularly the borrowing-constrained first home owner is trying to get in at the ground floor, which may not be the most energy efficient outcome. That's your experience?

MR McDONALD: I don't have any experience in that, but I think that's a fair call. The other interesting point about that is that they get in at the ground floor to whatever they can afford, but then improvements or alterations aren't yet subject to the same sort of energy efficiency assessment as was the initial building. I think New South Wales is moving to look at some regulation of alterations and additions. I'm not sure.

DR BYRON: Can you give us a couple of examples of the types of innovative building material products that have come up in the last couple of years that would contribute to greater energy efficiency and how much difficulty they had getting into the marketplace and getting accepted.

MR McDONALD: I can't give you the latter, in terms of products. My understanding is that they're continually evolving performance characteristics - - -

DR BYRON: I'm sorry, that shuffling of paper is cutting out the voice.

MR McDONALD: Sorry. My understanding is that the issue is not such a revolution as an evolution of products, but there are new materials coming out, like phase change materials and things like that. I suppose you could call that a revelation. The general view that's been put to me is that they keep evolving the performance of their existing products or how they put them together. I think a lot of

the energy efficiency solutions are about how you put things together, as opposed to the material characteristics themselves, but often a mix of both. I'd have to go back to my office and have a look at what products - lightweight steel is a good example and there are also the I-beams that they now make out of recycled plywood. There are all sorts of structural components that are innovative in terms of their approach to performance, with different sorts of chemical compositions, if you like. If you need more specific information, I'd have to go and dig that out, I'm sorry.

DR BYRON: That's all right.

PROF WOODS: We'll come back to you if we need it.

DR BYRON: Just on the subject, you've reminded me that yesterday afternoon we had comments from - I think it was - the Victorian Timber Promotion Council, saying that some of the star rating systems have a very big bonus or weighting for thermal mass concrete slabs and so, even when there may actually be very good technical reasons for putting in a suspended timber subfloor, builders are now going to be pressured to put in slabs simply because of the way the star rating system works.

MR McDONALD: Yes, and they're exactly 100 per cent correct. If you try and build - you know down at Lorne there, you've got beautiful outlooks on sloping ground with south-facing windows. All of that is contrary to timber flooring, because you can't get the insulation requirements to get up to your star rating. What the industry is doing - and I've spoken to the commission about this - is trying to develop better insulation products such that you can still use timber floors and meet your star rating. That sort of thing is happening, but the timber guys are dead right.

DR BYRON: Okay. It's very nice to have sort of independent confirmation of that comment.

MR McDONALD: I think the building commission would even admit to that, or whatever you call it. SEAV isn't it; Sustainable Energy Authority of Victoria.

DR BYRON: I also appreciated your comments in the submission about the building code and harmonisation of that. Another part of this organisation has just been doing a review of building regulations and the building code and the variations that seem to be - in spite of the fact that the Commonwealth and all the states have agreed to have a national building code, there are continuous pressures, particularly from local government, to make special exemptions or to add additional rules and things. Does that create problems for your members?

MR McDONALD: Definitely. It creates two problems. One is, obviously, a

manufacturing efficiency problem if you've got to specify a product differently for a different region. But also in terms of certainty there are issues and also in terms of consumer information. There was an example - and I'm not in a position to be quoted on it, but I could confirm it if the commission wanted - that one of the local councils - - -

PROF WOODS: Do you realise that this is a public transcript you're just about to speak to?

MR McDONALD: Yes. I don't have to say who - and thanks for that reminder - but I understand one of the councils in New South Wales has actually put in an improvement to their planning process that led to the inability to use steel in construction of building. That sort of happening, believe it or not, has ramifications throughout the industry that are magnified more so than the specific instances of damage, if you like. Obviously, once it's pointed out to them they fix it up, but it sort of sends nervous shivers through the industry about the inability to ensure that you do have a very very rigid and soundly based national system.

If you guys can slip me a copy of the final report on the building regulations, I'd love it, but the thing in their draft report that the commission released was we need to define the difference between planning and building. We're more than happy to say, yes, the planning issues are local council issues, but the building issues - they're performance based requirements that are scientifically, if not engineeringly, determined.

PROF WOODS: Yes.

MR McDONALD: Why are they playing around with that? Well, they're not meaning to play around with it. It's just that by making certain planning decisions they impact on the building. Yes, we really are very strongly of a view that we should have national consistency in the building regulations, and the building regulations address energy efficiency, so we should have national consistency there as well.

PROF WOODS: And occupational health and safety: presumably, what's unsafe for one jurisdiction would be unsafe for the next.

MR McDONALD: I'd have to think that one through.

PROF WOODS: Can I come back to a phrase you just used in your previous answer, and that is "certainty for industry". We've been getting evidence on the plethora of different schemes, but there's also the question of the changing nature of those schemes within any one jurisdiction. Part of it is complexity in, you know, you

then have to go away and read your next 40-page manual to understand what the changes are. But you mentioned a very important point, and that's certainty. Is the point you're trying to make that businesses are unwilling to invest or commit or put in R and D if they're unsure of whether the rules today are still going to be the rules tomorrow?

MR McDONALD: They're not unwilling to, but they wouldn't put as much.

PROF WOODS: Okay, so it does affect the quantum of investment and R and D and the like.

MR McDONALD: Yes, and it probably affects your ability to get a return on your investment in your current product range, which would fuel your R and D allocation for the future.

PROF WOODS: So if you weren't certain that this set of rules was going to last for the lifetime of the manufacturing and stock build-up and cycle of the product, then it would raise issues about your R and D and your investment?

MR McDONALD: Yes, it would affect it. But I'd prefer to go the other way and say, in a positive sense, that if we had more certainty and consistency we would be in a position to revisit the R and D that the industry thrives on, quite frankly.

DR BYRON: I think the last question from me is that yesterday - and actually in a few of the other hearings as well - we had evidence that the actual energy performance of houses bears little correlation with the star ratings that are provided by computer simulations. Have you got any information at all on how well the building rating system works, in the sense of making sure that the housing stock that's built under it is more efficient in practice?

MR McDONALD: No, I don't. I mean, the CSIRO - and I'm sure you guys will be talking to Dr Peter Newton, Selwyn Tucker down there in Melbourne and people like that. My understanding is that most of the energy efficiency systems are based on the matters - grounding - and I'd be very surprised if that wasn't on a solid footing, but I have no evidence of what you've just said. There's plenty of anecdotal evidence that if you don't build something properly it's not going to rate. The other thing is that you get your five-star rating in certain things, but there are a few alterations to previous practice that you can do that give you very very significant points towards that rating. That might be, like, you include a solar hot-water system. That gives you pretty good points towards your five-star rating.

PROF WOODS: A few industry short cuts to meet the regulatory requirements.

MR McDONALD: The most affordable way to meet the consumer and regulatory requirements.

PROF WOODS: Very well said.

DR BYRON: It's just that we were given lots of examples of buildings that seemed to have excellent liveability characteristics and excellent specifications in terms of their energy and water consumption, et cetera, and the point was made that you wouldn't get permission to build any of these buildings now because they'd be zero star, even though they'd demonstrated themselves as fantastic buildings in practice.

MR McDONALD: That would be an unfortunate outcome, but I'm not aware of it. One of the things that I think we all have to remember in energy efficiency and sustainability and everything like that is that, when you're coming up with these rating schemes and all these systems, don't forget you've still got to be able to build the bloody thing. Buildability is the other thing to keep in the back of your mind when you're in the lab, if you like.

DR BYRON: I think the other point they were making is that the actual outcome depends very much on the attitudes and mind-set of the occupants of the building, too, so that the people who are using it can - it's not all just engineering. There is some software in there, too - you know, what is between people's ears.

MR McDONALD: That's very true, particularly I think in commercial building. There are some very innovative commercial - like Council House 2 is a pretty neat sort of system in Melbourne there and the AROC headquarters in the UK - and I've seen examples of how that works, too. There are some great things around, but you have got to wonder. The people who are doing these leading roles - and I am glad they are - are not driven by the same commercial returns as the general populace.

DR BYRON: Yes, that's certainly true.

PROF WOODS: A very good point.

DR BYRON: That sort of exhausts my questions. Was there anything else you wanted to say, Tony, by way of concluding?

MR McDONALD: Only that I am more than happy to provide the commission with further evidence. We realise we are a fairly small part of this inquiry, but it's an important and growing industry and I don't think we are going to be moving away from regulation affecting energy efficiency and the input into sustainability and we would just like to reinforce the need for a full life cycle assessment in that approach, a national consistent approach.

PROF WOODS: Thanks very much.

DR BYRON: That's a very good summary. Thanks, Tony. We'll catch you later.

MR McDONALD: Thanks very much.

PROF WOODS: Very good. That was helpful.

DR BYRON: There being no other business I declare the - - -

MR BELIN: Have you got your closing statement?

DR BYRON: Yes.

MR BELIN: You don't have to ask anybody else in the audience, but just so that it appears on the transcript that this is the end of the hearings.

DR BYRON: Yes.

PROF WOODS: Would you declare your name for the purpose of this record, please?

DR BYRON: That concludes the commission's round of hearings. Thank you very much, ladies and gentlemen.

AT 1.15 PM THE INQUIRY WAS ADJOURNED ACCORDINGLY

INDEX