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TRANSCRIPT OF PROCEEDINGS

PRODUCTIVITY COMMISSION

INQUIRY INTO ENERGY EFFICIENCY

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

TRANSCRIPT OF PROCEEDINGS

AT BRISBANE ON WEDNESDAY, 17 NOVEMBER 2004, AT 9 AM

Continued from 16/11/04 in Sydney

DR BYRON: Welcome, ladies and gentlemen. Welcome to the public hearings of the Productivity Commission's inquiry into energy efficiency. My name is Dr Neil Byron and I've been appointed presiding commissioner for this inquiry. My fellow commissioner is Prof Mike Woods. This inquiry began with a reference from the Australian government on 31 August this year and covers the potential economic and environmental benefits offered by measures to enhance energy efficiency.

We've already talked to a range of organisations and individuals with an interest in the issues. Submissions have been coming in to the inquiry following the release of our issues paper in September. Hearings like these are part of the commission's open and transparent process for collecting evidence. They provide an opportunity for any interested parties to come forward and present to the commission any evidence they have that's relevant to our terms of reference and to put that evidence on the public record.

We conducted two days of public hearings in Sydney on Monday and Tuesday this week. Next week we'll be holding more hearings in Canberra, on Monday, and then Melbourne on the 24th and 25th, with video-links to Adelaide and Perth. We're working towards completing a draft report for public comment by early April next year. We will undertake further public consultation with interested parties after they've had time to read and digest that report.

We always like to conduct our hearings in a reasonably informal manner, but I remind all participants that we are taking a full transcript for the record, so comments from the floor are not really helpful. But at the end of the day's proceedings, we always provide an opportunity for anybody in the audience who wants to come forward to make a brief presentation on the record. Participants are no longer required to take an oath but they are required, under the Productivity Commission Act, to be truthful in their remarks. Participants are perfectly welcome to comment on issues raised in written or oral presentations of other participants.

The transcript will be made available to participants for verification and then, after checking, will be available from the commission's web site as soon as possible after the hearings. Copies are also available using the order forms available here today.

I'd now like to welcome the Honourable John Mickel, Queensland Minister for Energy, and staff of his department to come to the hearings. Thank you very much for taking the time out of your schedule to come here, and we look forward to hearing your contribution towards helping us deal with our terms of reference. Thank you.

MR MICKEL: Thank you, Dr Neil Byron and Mike Woods. I would like to welcome members of the Productivity Commission to Brisbane. I also wish to thank

you for giving Queenslanders and Queensland industry an opportunity to present their views at these public hearings.

Queensland is a major player in the national energy industry. In fact, as a result of our economic and population growth, we have overtaken Victoria as the second-largest consuming state in the national electricity market. Between the last two summers, peak demand for electricity in South-East Queensland jumped 13.2 per cent. That growth is partly due to the increased use of airconditioning, which I will address shortly. Our statewide annual growth in energy consumption is forecast to average 3.1 per cent over the next 10 years. The rest of the national market will average 2 per cent over the same period.

Queensland is planning for the future. We have attracted more investment dollars into the energy sector than any other state. Queensland accounts for $4.7 billion of the $6.3 billion invested in generation across the entire market. Of this, approximately 40 per cent is the private sector investment. $1.3 billion has been invested in transmission. That's almost a third of the total invested across the market. In the distribution sector, ENERGEX is investing a record $421 million in capital works this financial year, and Ergon Energy is investing $700 million in capital works, operations and maintenance. Ergon Energy and ENERGEX are focusing on customer service delivery, staff recruitment, vegetation management and summer storm preparedness in line with the recommendations of an independent review of the electricity distribution and service delivery otherwise known as the Sommerville report.

Queensland's gas market is also growing rapidly; approximately 4.3 per cent every year compared with 3.8 per cent nationally. We're also responding to the growing demand for electricity by exploring ways of reducing peak demand; for example, by encouraging the use of more energy efficient appliances and improved housing design and working with ENERGEX and Ergon Energy on the issue of demand management. In Queensland we have a very effective program called WaterWise. It's probably time we changed our habits and became energy wise as well.

Energy efficiency and demand management are issues we are having to face up to as a result of population growth and the high take-up rate of appliances such as airconditioners. They are issues which need to be addressed by the state and federal governments working together. Our latest figures show that in 2001, just over 28 per cent of Queensland households had airconditioning. By May 2004 that figure had climbed to 36.3 per cent and by May of next year, 56 per cent of Queensland households are expected to have airconditioning.

The Environment Protection Agency's sustainable industries division undertook a study with the CSIRO, ENERGEX and the Brisbane City Council into

the potential impact of airconditioning. It estimated the installation of each airconditioner - probably a four-megawatt airconditioner - potentially cost the system around $13,000. That's the sort of money that needs to be spent to provide the sort of infrastructure that is needed to supply the power for those airconditioners. That is why energy efficiency is an issue we cannot ignore. At a national level, the Queensland Department of Energy chairs the Ministerial Council on Energy Efficiency working group, which provides advice on energy efficiency policy and program delivery for all Australian governments.

A positive step has already been taken with the recent decision by all energy ministers through the council to approve the development of a national framework for energy efficiency. Through development of the framework, governments recognise that energy efficiency practices can provide substantial benefits for very low cost. It's estimated that the framework will save the Australian economy up to $750 million a year in energy costs and has the potential to create up to 1000 jobs. Householders will be encouraged to measure their energy efficiency against the community benchmark, by comparing their power bills with the average household.

New national efficiency ratings will be introduced for houses, apartments and renovations to encourage people to change their behaviour. Energy efficiency courses will be introduced in schools and energy performance standards will be introduced for commercial builders. I encourage the Productivity Commission to work closely with officers involved in developing and implementing the national framework for energy efficiency during their inquiry. Queensland is driving the national framework for energy efficiency process and believes that it is an important national step to realising the benefits of energy efficiency.

Another important national energy efficiency program is the National Appliance and Equipment Energy Efficiency Program, which sets mandatory minimum energy performance standards and labelling for some electrical appliances. This program has been very successful so far, with the latest review finding that it reduces greenhouse gas emissions by 134 million tonnes between 2003 and 2018. That's the equivalent of taking 31 million cars off the road. Over the same period, governments, businesses and households are expected to save a total of more than $4 billion on their power bills by buying appliances which are more energy efficient. However, we must continue to expand this program, making existing standards more stringent and bringing more products into the program. To this end, the ministerial council recently agreed to broaden the program to include mandatory minimum energy performance standards and labelling for gas products.

While the national programs that I've touched on are strongly supported, I also believe there is a role for state governments to implement programs that meet local needs. The Queensland government already has a number of energy efficiency programs. The Queensland government has been promoting energy efficient solar

hot-water heaters for residents since 1995, and was the first government in Australia to introduce a solar hot-water rebate scheme. We've also implemented a government energy management strategy, through which all Queensland government departments have set targets to cut power bills for government-owned and leased buildings. I'm pleased to report that this strategy is progressing well, and we are expected to reach our first savings target well ahead of schedule.

In line with our Smart State Strategy, the Environmental Protection Agency is also encouraging research into and development of innovative, renewable energy sources through the Queensland Sustainable Energy Innovation Fund. The agency is also working with business to improve energy efficiency through its $6 million ecoBiz program. There are many other programs relating to the commercial and industrial sector, the transport sector, the building sector and the residential sector. Gayle Leaver from the Department of Energy will discuss these programs in more detail.

I would also like to quickly mention the Queensland government's new energy policy, which will provide a road map for the future. It will promote energy efficiency across all sectors: residential, commercial and industrial. It will aim to change our habits when it comes to energy use. But once again, I would like to thank the Productivity Commission for bringing these public hearings to Queensland, and allowing us the opportunity to speak today on behalf of the Queensland government.

DR BYRON: Thank you very much, minister.

MR MICKEL: Pleasure.

DR BYRON: That has been very helpful to get the proceedings under way today. You've raised a lot of issues that I think will come up over and over again during the day. I understand you have to rush off, but thank you.

DR BYRON: Gayle, could you just introduce yourself for the transcript?

MS LEAVER: I am Gayle Leaver, the manager of the sustainable infrastructure area in the Queensland Department of Energy.

DR BYRON: I gather you've got some notes.

MS LEAVER: Yes.

DR BYRON: If you would just like to talk us through that, and there may be a couple of points that come out of that that we would like to elaborate on a bit further.

MS LEAVER: That's fine. I wanted to start off with some basic information, and go from there.

DR BYRON: That would be terrific.

MS LEAVER: The basic stuff is what is energy efficiency and, to my mind, energy efficiency is simply about using energy wisely. By using less electricity, everyone can save on their power bills, and this is particularly important for families and business. The main factor is, savings can be achieved very easily without significant changes to lifestyles or business practices. Stand-by modes and inefficient appliances needlessly consume significant amounts of power. For example, stand-by power in the average Queensland home can cost from about $80 to $100 per year, so energy efficient homes that reduce stand-by power usage can save money for other things.

Energy efficiency is very much a key component of sustainable development, and this has been recognised as part of the National Framework for Energy Efficiency. The greater adoption of energy efficiency practices can provide substantial benefits for very low costs. Australia's energy efficiency performance in recent times has been comparatively poor. In November 2002 the Ministerial Council on Energy endorsed the development of the National Framework for Energy Efficiency to define future directions for energy efficiency policy and programs in Australia. There are clear economic, social and environmental benefits associated with improving energy efficiency across the economy, but these are not being realised.

There are a number of market barriers which are limiting the realisation of energy efficiency improvements. Inaccurate evaluation of investments often results when investors explicitly or implicitly apply significant risk premium to energy efficiency investments, to account for the uncertainty created by changes to existing practices. Substantial information gaps exist in relation to many technical and financial aspects of energy efficiency improvement, and there can be considerable

transaction costs associated with overcoming these.

The barriers to entry for new entrants - particularly relating to the high costs of obtaining information on energy use - can be significant. Split incentives are a significant barrier for energy efficiency improvements, where the benefits accrue to a number of different parties, and only one party meets the costs of the energy efficient activity.

Analysis undertaken for the NFEE - the National Framework for Energy Efficiency - has shown that significant energy savings could be achieved through investment in cost-effective energy efficiency measures across all sectors of the economy, and that implementing a program to capture this potential would provide net economic, social and environmental benefits. Stage 1 of the NFEE has been agreed by the Ministerial Council on Energy for implementation within three years. Stage 2 will be considered followed the completion of the Productivity Commission's inquiry.

NFEE has identified that the stage 1 measures have the potential to save around 45 to 57 petajoules of energy by 2015, or one-quarter of the identified cost-effective savings potential across the Australian economy. These energy savings are worth up to $750 million per year, and the expected GDP benefits could be as much as $400 million per year. Up to 1000 jobs could be created. The stage 1 measures consist of nine integrated and interlinked energy efficiency policy packages. The energy performance of the residential building stock will be improved over time through nationally consistent minimum energy efficient design standards for new homes, units, apartments and major renovations, and mandatory disclosure of the energy performance of homes, units and apartments at the time of sale or lease. Similarly, the energy performance of the commercial building stock will be improved over the same time.

The awareness of senior management about energy efficiency will be raised, and the skill base to identify energy efficiency business opportunities will be improved through requiring large energy consumers to undertake mandatory energy assessments, and report on the energy efficiency opportunities that these identify; and nationally coordinated training and accreditation for energy auditors and energy performance contractors. Governments will develop nationally consistent standards for measuring and reporting on government energy efficiency programs; introduce public annual reporting by all jurisdictions on energy use and progress towards achieving the targets set for government agencies; establish minimum energy performance standards for government buildings; and develop best practice models for government departments to implement energy efficiency programs.

The National Appliance and Equipment Energy Efficiency Program will be broadened in scope to include mandatory minimum energy performance standards

and labelling for gas products, and expanded through the introduction of new or more stringent minimum energy performance standards for residential, commercial and industrial products. The capacity of relevant professions and trades to implement energy efficient solutions will be improved through a nationally coordinated effort to integrate energy efficiency concepts into the courses for the key trades and professions.

The capacity of industry to deliver energy efficient solutions and reduce energy efficiency investment risks will be developed through a nationally coordinated program to generate highly visible examples of energy efficient equipment or processes in key industrial sectors, and new or refurbished commercial buildings; link industry and government to key centres for leading-edge energy efficiency research and development; and establish nationally coordinated energy efficiency best practice networks.

The awareness of householders and small business will be raised, and energy saving actions motivated by requiring energy retailers to provide benchmark data on energy bills; developing a nationally coordinated network to facilitate easy and timely access to high-quality and relevant information; producing targeted promotional campaigns for specific energy efficiency issues; and integrating energy efficiency concepts into the school curriculum.

The type and availability of finance products for energy efficiency will be increased by working with the finance sector to raise awareness of the opportunities for and benefits of energy efficiency investments, and providing tools for the valuation and risk assessments of proposals.

This program of initiatives under NFEE is strongly supported by the Queensland government. Significant progress is being made in implementing these initiatives. A couple of issues on the issues paper: the issues paper raises many questions about energy efficiency, and I certainly do not propose to answer all of them. However, we do have a few comments.

I am somewhat concerned about some of the definitions in the paper. I believe the proposed definition of "energy efficiency" is too strict. An inquiry that only looks at energy efficiency and ignores energy conservation will miss an important and closely related set of opportunities. The Productivity Commission should give some consideration to energy conservation activities, particularly those which have very little impact on the outcome delivered, such as a consumer setting their airconditioner a few degrees higher to reduce energy used but still maintaining a relatively cool home.

The Productivity Commission’s definition of "cost-effectiveness" is also some somewhat narrow. It does not take account of positive externalities or the split

incentives associated with many demand-side responses to energy service provision. By using the current definition, the Productivity Commission will be ignoring a broader set of energy efficiency improvements which could be justified on a net societal benefits examination.

It is noted that this inquiry isn't an inquiry into climate change policies. However, both the economic and environmental potential of energy efficiency improvements should be examined or at least recognised. The environmental benefits associated with energy efficiency include greenhouse gas emission reductions, reduced water consumption from generation and other activities, embodied energy savings, reduction of other air pollutants and reduced land footprint from energy and transport infrastructures.

It is also important to consider the interdependencies between material and energy efficiencies, such as energy and water savings, which can occur concurrently from efficient shower roses. There are many policies which can result in cost-effective energy efficiency improvements. It is important to note that all of these policies can be effected provided they are implemented correctly. The correct mix of initiatives is also important.

I will simply highlight a few of the options and basically comment on those. Pricing and market reforms: a higher price does not necessarily mean less energy usage. Customers' response to price is difficult to determine, given the relative inner elasticity of energy markets. On the issue of competitive markets, the priority for the Queensland government has been to ensure competitively priced power to customers throughout the state.

To ensure pricing equity between rural and regional customers and those in the south-east corner, the Queensland government maintains a uniform tariff policy. This policy provides that customers of the same class pay the same price for their electricity supply, regardless of their geographical location. Energy market reforms have led to cost-reflective pricing for contestable electricity customers. The majority of benefits from energy efficiency occur in altering the electricity usage behaviour of these large customers.

The Queensland government is currently reviewing the cost and benefit of extending retail competition to Queensland's remaining small business and domestic customers, approximately 1.7 million. A key consideration is whether or not small consumers have the capability of responding to price changes and, if they can, what type of metering technology would deliver the most efficient, cost-effective outcome. There has been a recent and noticeable increase in the willingness of jurisdictional regulators to accept demand-side management initiatives within regulatory price-setting processes.

The Queensland government supports this recognition of demand-side management and the role played in networks' capital expenditure deferral. The Queensland government is also participating in the interjurisdictional investigation of demand-side measures and the barriers that currently inhibit a greater uptake of innovative and effective demand-side participation. Minimum standards for energy efficiency and labelling of appliances is an area of energy efficiency policy where Australia currently performs solidly.

The National Appliance and Equipment Energy Efficiency Program applies energy efficiency standards to a range of products under the minimum energy performance standards, MEPS, and provides energy efficiency information to customers through the energy rating labelling scheme - the star rating scheme. However, more products could be covered by the program and the minimum energy performance standards must be continually revised to ensure that they meet world's best practice, ensuring poor-performing products are not dumped in Australia.

Further, the labelling scheme should be extended to ensure energy efficiency information and star ratings are provided in all advertising material, thereby providing customers with this information at every stage of the purchase decision-making process. Lack of information has been identified as a key area of market failure in relation to energy efficiency. Overcoming information failure can be difficult, particularly in trying to educate all players in the market. This is a key area where state government has a role in identifying market segments where information deficiencies exist and developing targeted information provision programs.

Other mechanisms that encourage behavioural change, such as partnerships with sectoral associations, can also be effective. A balanced mix of cost-effective policy responses should be adopted across all sectors - government, commercial, industrial and residential - to reduce policy risk and maximise outcomes. While improved energy efficiency by householders is important, the most significant energy savings can be made in the industrial and commercial sectors, simply because they use more energy.

Most of the large and energy-intensive businesses have already done a lot of work in this area, but could do more. Medium and small businesses where energy costs are a less significant proportion of their operating costs have often not considered energy efficiency improvements. These businesses provide an obvious area where significant benefits can be achieved. Governments are also significant users. Programs to improve the energy efficiency of government buildings are important, both in the energy they save and in providing leadership to the community and an example of the benefits that can be achieved through greater attention to energy efficiency.

Programs encouraging energy efficiency by households are important, not just because household consumers can save money, but also because they generate community acceptance and approval of energy efficiency concepts and goals. If the concept of energy efficiency can gain large support from the community, the delivery of programs in other sectors is likely to be viewed more favourably and our goal of energy efficiency as a business-as-usual practice will be that much closer to reality.

The Queensland government has a number of programs which aim to improve energy efficiencies. I will highlight some of the main ones. The Queensland government has been an advocate of implementing energy performance standards for residential buildings, adopting the energy efficiency provisions in the Australian Building Code. The Queensland government is currently working with the Commonwealth to refine and improve a new building simulation software tool to better assess the benefits of cross-ventilation in houses, particularly houses in Queensland.

The Smart Housing initiative delivered by the Queensland government aims to help Queenslanders to plan and build homes that are more sustainable over time. The Queensland government is currently giving consideration to a range of new initiatives that promote more sustainable housing over the longer term. The Queensland government has a community and business focus energy efficiency call centre, currently called the Energy Advisory Service, which provides fee advice on energy efficiency and renewable energy and distributes information brochures and fact sheets.

The Queensland government has contributed to and administered rebates to install renewable energy systems, including solar hot-water systems, domestic grid-connected photovoltaic power systems, working properties in western and northern Queensland, household and commercial properties in off-grid areas and photovoltaic power systems on community-use buildings. Power for a sustainable future is a Queensland-government-provided schools program of materials which provide opportunities for upper primary and lower secondary students to explore ideas and issues relating to sustainable energy.

The Government Energy Management Strategy, or GEMS, was introduced by the Queensland government in November 2003 and requires all Queensland government departments to set targets to cut power bills for government-owned and leased buildings and facilities. The Queensland government also provides funds through the Queensland Sustainable Energy Innovation Funds, which promote innovation in energy efficiency and renewable energy technologies and practices.

Through the ecoBiz Program and its precursors, the Greenhouse Industry Partnerships Program and the Cleaner Production Partnership Program, the Queensland government provides support for companies making eco-efficiency

assessments of their premises and to implement these outcomes. As you can see, there's already a lot being done by the Queensland government. Further energy efficiency will be a key component of the new Queensland energy policy which is due for release next year.

Energy efficiency in the transport sector: first of all, I would like to congratulate the Productivity Commission for including an examination of energy efficiency in the transport sector. This sector is often forgotten when energy efficiency is considered. However, transport in Australia, and particularly road transport, is almost entirely reliant on petrol or diesel fuel. Increasing transport activity is resulting in increased energy use and thus increasing the use of these fossil fuels and the associated economic and environmental costs.

A cohesive overall strategy which identifies the strategic direction to be taken to maximise energy efficiency for transport in Australia is needed. Such a strategy could give clear guidance in preferred transport modes and guide infrastructure investment in order to ensure optimal efficiency. In urban planning, most of the opportunities for increased public transport patronage and walking and cycling modal share come about from increases in densities and better integration of land use and transport, which make travel distances shorter.

Passenger motor vehicles have the scope to improve their energy efficiency through technological improvements. In the longer term, the introduction of fuel cells and electric vehicles has the potential to offer significant gains. However, while new technologies have potential, they are generally not sufficiently advanced at present. Still, by replacing older vehicles with newer ones which meet higher emission standards, improvements in environmental performance and fuel efficiency can be achieved. The Queensland government is actively encouraging newer buses, which have reduced emissions and minimise resource consumption, into the urban bus fleet.

The federal government has failed to provide special funds to assist with major public transport initiatives that could fund trials of new environmentally friendly passenger motor vehicles. A lack of public knowledge of energy efficiency issues is also a significant difficulty in the transport sector. Most people choose not to use light, energy efficient, small vehicles for perceptions of safety and some convenience reasons. Customers are not sufficiently informed about energy efficiency differences and this is an area where more work could be done by all jurisdictions. The Commonwealth government's recently released Green Vehicle Guide is acknowledged, and Queensland Transport does promote this guide.

However, investigation of the extension of the fuel efficiency labelling scheme should be carried out. A revised labelling scheme could include an estimate of weekly operating costs based on average travelled distance, fuel efficiency, petrol,

registration, insurance and maintenance costs for the first five years. This would better focus the message to the hip pocket for consumers. The Queensland government aims to reduce any barriers and impediments which prevent energy efficiency improvements with the assistance and cooperation of all stakeholders. To date, alternative fuels have not been able to greatly improve fuel efficiency, but they can reduce some of the problems of relying on fossil fuels. In the longer term, hydrogen fuel cell vehicles could offer the greatest opportunities to improve energy efficiency.

The introduction of fuel efficiency regulations can also have a significant impact on the energy efficiency of the transport sector. Pricing mechanisms such as sales tax on new vehicles, registration and fuel excise could also improve fuel efficiency significantly. There is scope for improvements from shifts in the mode of urban passenger travel, which can have a major impact on fuel use. Voluntary travel behaviour change initiatives, such as TravelSmart, are based on a targeted and personalised marketing approach that empowers people to change their travel behaviour. Another new Queensland government initiative is TransLink, which provides one single public transport network covering South-East Queensland. The Queensland government is also encouraging land use patterns which reduce the need to travel and encourage travel to be more sustainable, such as walking, cycling and public transport.

In closing I would like to highlight the important of energy efficiency. Householders, businesses, industry and governments need to be more vigilant in the way we use energy. Improved energy efficiency will provide a wide range of benefits: to our hip pockets, the environment and the energy networks. The Queensland government has a long history of implementing energy efficiency programs and we intend to develop additional programs which will address the challenges Queensland is currently facing to be more energy efficient. We also intend to work hard to develop national programs and national responses through NFEE and in our role as chair of the Ministerial Council of Energy Efficiency working group. The benefits that can be achieved from energy efficiency are great.

DR BYRON: Thank you very much. You've covered a very wide range of issues there, which I think illustrates very nicely how pervasive energy and energy efficiency issues are through the entire society and economy - everything from residential housing to buildings and transport and manufacturing industries and so on. So thank you very much for all that.

Just to start off I should respond to the issues you've raised with regard to the terms of reference. We take no credit. The terms of reference were given to us by the federal treasurer. The definition of energy efficiency that's in there is not our definition but one that was given to us with the terms of reference; likewise the phrase "measures that are cost-effective for individual consumers", et cetera. I

understand that that narrows the scope of the inquiry. I completely agree with you that there are probably hundreds, perhaps thousands, of other measures that would be worthwhile from a comprehensive social and environmental perspective but are not immediately cost-effective for the particular individual decision-maker.

My interpretation of why that limitation was imposed on us was that we should look first at that subset: the ones which appear to be goers immediately. The central question in our inquiry, I think, is, "Given that they look like they're such obviously good sense, and things that should be done immediately because they cost so little relative to benefits" - and some of them apparently don't cost at all. There's negative cost.

MS LEAVER: No, that's certainly correct.

DR BYRON: So the real focus for us is on the barriers and impediments. Why on earth are these measures that are so apparently, so obviously, a good thing - why aren't they happening already? If we can understand that, then it will help us, when we broaden, to look at the other measures which are worth doing from a social point of view but may not be commercially viable for the individual business or household. But we're trying to understand that first subset. I wish I could take credit for including the transport issues in the terms of reference, but that, too, was just in the terms of reference when we got them. It makes the terms of reference far more comprehensive, but it also means that I think we've got half a dozen different inquiries on this. We could spend a whole year just looking at transport issues - - -

MS LEAVER: That's right. The transport sector in itself, yes.

DR BYRON: - - - and how that relates to the things that you mentioned: intelligent transit systems, land use planning, intermodal issues of improving urban passenger rail, the long-distance freight haulage tasks and all those sorts of things. We could spend an awful lot of time just discussing improving energy efficiency in transport, without having to worry about manufacturing industries and builders and residences and appliances, and the way the state and national electricity grids and gas grids are managed. I mean, we could spend a year on that, too.

MS LEAVER: Absolutely right. I suppose the only comment is that what often has happened historically is some of these eco-villages, where the more energy efficient homes are, are put in perhaps remoter areas where public transport is yet to hit, so in effect they end up driving to work every day, so half the gains are lost.

DR BYRON: It undoes some of the good work, yes. Could I come back to one of your early remarks, that Australia's improvements in energy efficiency have been substantially lower than the improvements in the rest of the OECD?

MS LEAVER: Yes.

DR BYRON: Can you elaborate a little bit more on why you think that's happening? Why haven't we kept up with other countries in improvements in energy efficiency?

MS LEAVER: I think primarily that the general public isn't necessarily aware of the benefits of energy efficiency. I think to some extent the benefits of energy efficiency have been sold primarily as an environmental benefit, and not necessarily that it actually can save them money. I think to some extent apathy has ruled: someone else can worry about the environment. I also think some of the countries where energy efficiency has had significant inroads are countries that are facing certain crises like problems with fuel supply, problems with increased population growth, so they've had a lot more drivers to do something. I think that's really only become apparent in Australia in the last couple of years, to be honest.

PROF WOODS: Is cost of fuel a relative driver in Australia versus other countries?

MS LEAVER: Probably not. I would think that the energy prices are not significantly high enough - well, are not high enough necessarily to sort of make people want to manage their energy. I think the other argument is that it really doesn't matter how high the electricity price is, people can make savings if they are more energy efficient, but I think the initial driver - in some European countries electricity prices are quite high, and there's an automatic driver to just manage your wage bill, I suppose.

PROF WOODS: That we don't have here.

MS LEAVER: No.

DR BYRON: We were told yesterday by participants in the Sydney hearings that the average cost for a household for all its power, electricity and gas is - I think they said - $2.55 per week, and that's about what a lot of people pay for a cup of coffee or something. If you say, "Well, by taking all these measures, your household could become 10 per cent more energy efficient and you're going to save 25 cents a week," I suspect that that doesn't really grab people's attention and make them sort of rush out and do it.

MS LEAVER: No, I think you're right. I think, though, there have been some significant changes in recent years. The component of what would have been a household, say, 20 years ago and today is a bit different. I mean, every teenage child has got their own TV and their own DVD and their own video-recorder - - -

DR BYRON: With stand-by modes.

MS LEAVER: - - - and it really cuts into the energy bill, and it does place quite a deal of pressure on the networks, particularly the distribution networks.

DR BYRON: The barriers that you talk about in terms of the poor information flows, the excessively pessimistic risk assessments and the split incentives - those sorts of things seem to have been coming up consistently.

MS LEAVER: Yes.

DR BYRON: When I first started writing about energy efficiency in the 70s, after the first oil shock in 73, 74, we were talking then about the problems of split incentives, perceptions of high risk and so on.

MS LEAVER: And I don't think it has really improved, to be honest, which is a shame.

DR BYRON: But you talk later about the governments having a balanced mix of cost-effective policy measures, and it seems to me that on virtually any issue at all - not just this one - governments can provide information, they can regulate in the sense of making some things compulsory - - -

MS LEAVER: Yes, and adding certain practices, yes.

DR BYRON: - - - or you can use price signals and incentives and taxes and penalties and subsidies and those sorts of things, to try and direct people the way you want them to go by using prices. So it seems to me, on energy efficiency we've been doing information measures and persuasive and educational sorts of things. We've been doing some with regulation and saying, "Well, okay, these appliances, for example, are just not up to standard. They're not - - -"

MS LEAVER: "They cannot be bought."

DR BYRON: Yes. "They can't be sold in Australia." So we've got those sorts of things, but I think understandably all governments are fairly reluctant to see huge increases in electricity prices or gas prices or petrol prices, because - - -

MS LEAVER: That's certainly correct, and I suppose the obvious question is when will a price increase affect behaviour, because there have certainly been increases in the price of petrol, and all it does is that Thursday night, in Brisbane, when the petrol is cheapest, there's an enormous line-up at the petrol station. I don't know that anyone has stopped using their car.

PROF WOODS: So do you have a view on what sort of price increase would be necessary to bring it to a consciousness that people start to - - -

MS LEAVER: No, I don't, to be honest. I don't think there has really been a lot of work done in Australia or even in the States to sort of get a feel of when it would impact.

PROF WOODS: Is the danger that the price might get so high that you're actually starting to affect overall economic performance before you're starting to affect people's specific behaviour?

MS LEAVER: I suppose that's my own personal concern, that there are so many unknowns. The reality is, if people value certain electrical appliances over other things, they may continue to use that and that could impact on other lifestyle issues.

DR BYRON: A number of people have said to us that there are welfare issues with the increase in use of airconditioners, that there are a lot of elderly or sick people who need airconditioning when you get those stinking hot summer days, and you don't want to make airconditioning unaffordable or unavailable to those sorts of people.

MS LEAVER: Absolutely, yes.

DR BYRON: But quite apart from the level of price, a few people have suggested to us that when you're filling up your car, you know exactly how much petrol you're paying for because you're paying on the spot. With electricity or gas, you get a bill three months later and you don't actually know why it's higher this time than it was last year.

MS LEAVER: Last time, yes.

DR BYRON: Or what was it that happened two and a half months ago that suddenly - - -

MS LEAVER: There's a dramatic increase.

DR BYRON: Also there's a disconnect between when you make the decision to have the aircon on day and night and when you pay the bill a couple of months later, and people may not actually see that.

MS LEAVER: That's certainly a valid comment, yes, I would think.

DR BYRON: So it's not just the price, but it's the way we charge for it - the whole system.

MS LEAVER: Yes, it's the connection. I mean, I'm fairly certain that if people get a significant price in their electricity bill, they generally do inquire, and at this moment in time there would be quite a few that will be because of airconditioning use.

PROF WOODS: Could I pick up on that particular issue. The minister identified the cost of infrastructure of coping with a new airconditioner, and he quoted a fairly large size airconditioner, but nonetheless, that $13,000 in infrastructure costs to support the marginal increase necessary to cope with such a thing, how does one ever recover that sort of investment cost through charging?

MS LEAVER: First of all, I can't comment on the $13,000. That figure didn't come from my area, so I don't know what analysis came to get that figure. It does seem somewhat high. I think the harsh reality is, when you're getting a significant amount of airconditioning growth, that's putting pressure on the networks that is actually increasing the costs of either maintaining or upgrading networks. I don't think you do recoup your money. Now, some members of the public would argue that's our role. Energy is a right, and consequently any energy clients - - -

PROF WOODS: Somebody somewhere has to pay for it, and it's either the energy user or the general taxpayer, if it continues to be government owned.

MS LEAVER: Yes.

PROF WOODS: There's no magic.

MS LEAVER: No. You're right, yes.

PROF WOODS: So, yes, I won't hold anyone to that figure, but nonetheless there is an infrastructure incremental cost associated with it.

MS LEAVER: Absolutely, yes.

PROF WOODS: The other point that I therefore wanted to raise is: for those who don't have airconditioners, is there is a danger that if tariffs are going up generally to cope with the additional infrastructure costs, whatever they might be, to cope with these additional loads - are those without airconditioners going to in effect be cross-subsidising those who are churning through the power on the airconditioning?

MS LEAVER: I suppose the easy answer is the government maintains a fairly close watch on electricity tariffs, so there have been no significant increases, but you are right. There would be a number of people, I suppose, who don't have airconditioners who would probably argue that they're paying for people to use

airconditioners. I suppose the reality is that in parts of Queensland there are an awful lot of people who have airconditioners, and I think the better message is to make certain that people are using airconditioners correctly. I think that that is actually not the case and I think that's an area information awareness really needs to focus on.

PROF WOODS: The ads on TV - - -

MS LEAVER: Yes, they're using the airconditioner - - -

PROF WOODS: - - - for 23 degrees rather than 21 degrees, et cetera.

MS LEAVER: And closing your windows, closing your curtains, basic things, but it's surprising when you drive around and you see the airconditioner on - in fact you hear the airconditioner on with some of the old ones - and they have got their windows open and doors open, so they don't really help.

PROF WOODS: That's true.

DR BYRON: You're right. There are a great many measures that people can take that are really not much more than commonsense in terms of reducing their energy consumption, their greenhouse emissions and their own power bills. It sort of boggles the mind as to why these sorts of behaviours continue.

MS LEAVER: Yes. I mean, just speaking to people - I have heard in recent months that people get up, put their airconditioner on, go out and do their shopping and whatever, and then they come home to a cool home, so the airconditioner has been running for several hours with no-one in the home. To my mind that's a bit of a waste.

DR BYRON: I guess they can afford it.

PROF WOODS: Yes, absolutely.

MS LEAVER: Yes, that's probably it. And I think you are right: there is that disconnect between when they get the bill and when they have actually used the power.

PROF WOODS: There are some interesting trade-offs - for instance, between information and regulation - and I guess appliances is a good example of that. You can do your labelling and that provides information, but you can also do your minimum energy performance standards and that does your regulation.

MS LEAVER: Yes.

PROF WOODS: Are both necessary? Is one more effective than the other? Are we underutilising one and relying too much on another? All these are trade-offs.

MS LEAVER: Yes, you are right. Certainly there has been a MEPS recently introduced for airconditioning and there is going to be another round of MEPS for airconditioning - I think it is around 2006 - so there will be substantial improvements in the quality of airconditioners that are coming into Australia over the next couple of years, but I also firmly believe with the labelling that people don't really look at the label enough - the star label - as part of their purchase decision. They look at a whole range of other things: colour, size, what other freebie you get with your purchase.

PROF WOODS: Price.

MS LEAVER: Your price. And then they look at the label. I suppose what I would like them to do is look at all of that and then factor the label in as a key component, because your operating costs will be a lot lower with a higher-star appliance.

DR BYRON: Some of the marketing and psychology people say that with labels on appliances, it's the third or fourth thing that they look at. It's not one of the first tier - - -

MS LEAVER: I've heard that it is about the fifth thing, yes.

DR BYRON: To me, a simple case is in motor vehicles, where, if somebody is going out to buy a sports car or a V8 or a four-wheel drive or something, the fuel efficiency of the vehicle was sort of number 57 on the list of things that they are interested in.

MS LEAVER: Yes. Make certain it comes in blue.

DR BYRON: In other words, they may be more concerned about the steering wheel cover or the exhaust note than they are about its fuel efficiency, and I suspect that there may be examples like that when people want to go and buy a plasma screen TV or - - -

MS LEAVER: Yes.

DR BYRON: The point is that even if we provide information to people and even if they understand that information, they may simply have other priorities, other attributes that they are more interested in.

MS LEAVER: Yes. I think the first driver is mandatory energy performance

standards for appliances.

PROF WOODS: So you take out the bottom-rung performers.

MS LEAVER: Take out the poor performers.

PROF WOODS: And just allow choice between some that are - - -

MS LEAVER: Yes, so you gradually review and make it more stringent, so you actually have only your high energy efficient appliances, but I still think the star labelling is an important part. I am not convinced that necessarily people are even looking at that in the first place and I think some sort of information program could help.

PROF WOODS: Perhaps if the star featured how many dollars a year you would save or how much each one would cost on an average performance.

MS LEAVER: The same thing applies with - they have got a water label. There are not a lot of those on appliances, but people need to be aware.

PROF WOODS: Dishwashers and shower heads.

MS LEAVER: Yes.

DR BYRON: Some of the people today, I think, will be talking about building codes and housing design and those sorts of things.

MS LEAVER: Yes.

DR BYRON: If you think of the old classic Queenslander, it was beautifully designed for the environment, and yet we have had people, for whatever reason, going into neo-geo type buildings that don't have eaves that are going to cost a fortune for airconditioning because they don't have the natural design features.

MS LEAVER: You are right. Certainly one of the key components in the future for all governments - and the Queensland government is looking at that - is better housing and building design, and we're looking very closely at that because a better design can really save significantly on energy costs. It may not necessarily negate the need for airconditioning, but it may minimise the need when you need to use it.

DR BYRON: I guess what I was leading to there is that there are a lot of people who have basically gone backwards in the sense of choosing houses that are energy efficient because other things - whether it was prestige or status or because they thought that brick was better than timber, or whatever, people have been choosing

houses with energy efficiency, or what it's going to cost to actually live in this place at a reasonable standard, not foremost on their minds.

MS LEAVER: Absolutely, and I think a key component that is looking to come out of NFEE is the mandatory disclosure provisions for homes and buildings, and the main driver of that is that eventually when you are buying a home you will get information about how this building or house performs energywise, and that will be part of your information package when buying a home. It will be also for rental, as well, which is a key issue for people renting.

DR BYRON: The next question will be, how much difference does it actually make? Some real estate people say, "Location, location, location," and if it's close to the school or whatever, but - - -

MS LEAVER: Yes.

DR BYRON: I think Canberra has had this system for about five years, of mandatory disclosure.

MS LEAVER: Canberra has had it. I didn't think it was as long as that, but they have had it.

DR BYRON: It might be only four.

MS LEAVER: Yes.

DR BYRON: But I haven't actually seen an evaluation of how much impact that has had on people's decisions about whether or not to purchase.

MS LEAVER: I don't know if there has been, but I mean if it has had it for a couple of years, the key component is to get that concept of evaluation. My understanding is that the idea of mandatory disclosure is certainly being considered around the world, but I think one of the issues we need to consider is, the Queenslander is a great home and had some real benefits, but the reality is that with an ever-increasing population wanting to go in a very small part of Queensland, Queenslanders, and the land that often goes with Queenslanders, may not be viable in the future.

PROF WOODS: There are other costs, aren't there?

MS LEAVER: Yes.

PROF WOODS: I mean, if you were spreading out your suburban population - - -

MS LEAVER: You've got transport costs.

PROF WOODS: - - - then your transport costs go up and your net energy consumption of living might not change. You might have a better house, but higher transport energy.

MS LEAVER: Yes. And we have certainly got high rate of young couples that choose to live in units because of their lifestyle. I think the test for us is really not just better housing designs for homes, but better housing designs for communities of apartments - - -

PROF WOODS: Balconies and overhangs and louvres.

MS LEAVER: All of that, yes.

PROF WOODS: Cross-ventilation, and all sorts of good options.

MS LEAVER: Yes.

DR BYRON: You raised the problem of split incentives and I have been asking a few people a hypothetical: you have got people who are renting a house, a flat or whatever, and it's very expensive to heat or cool and so they go to the landlord and say, "Can we have insulation in the roof or double glazing on the windows?" and the landlord says, "Well, if I spend a couple of thousand dollars on that I would have to put the rent up by $10 a week," and the people look and say, "Well, that would save us $30 a week on the fuel bills," so they come to a deal, the work gets done and everybody is happy. Apparently it never happens like that.

MS LEAVER: No. I think that's a fairly rare case, that one. That would be the ideal. I think you would probably find more often than not that the landlord says, "This is an investment opportunity for me. I'm not spending any more than I absolutely have to. I want to maximise my profit. I don't care about your energy bill."

DR BYRON: Or, "This house is $10 a week more expensive to rent than the one adjoining it, but that's because it has these features that are going to save you $30 a week," but the tenant may still choose the cheaper one with the higher electricity bills because they are only looking at the sort of headline figure.

MS LEAVER: Yes, and I think that will be the test for mandatory disclosure: what we are actually disclosing, so that people understand that it's not just renting the rooms, it's actually renting the energy performance of that home. I would think for a renter that that would be a key component, because they have got a limited salary and they want to minimise their rental costs.

DR BYRON: Sure.

PROF WOODS: I'm conscious of the time and that we have others scheduled to appear soon, but can I just pick up on the business side. We have dealt with households a fair bit this morning, but we're getting evidence from businesses that sort of have a profile of a single site, small management team - usually owner-manager - so they don't have the economy of scale across multiple sites; they don't have large management structures where they can devote somebody to be the energy efficiency manager or whatever.

MS LEAVER: Yes.

PROF WOODS: They have a lot of competing pressures and there are some mandatory things they must do, like occ health and safety and other things.

MS LEAVER: Yes.

PROF WOODS: What surprises me is that a number of them, because of all these pressures, do actually find time to also look at energy efficiency and find time to do something constructive about it, but I can understand why in many cases there are gains to be had but, "Hang on. That's down here," and it may save half of 1 per cent of their operating costs compared to, "I don't want to get fined for doing something to my employees through occ health and safety," or, "I want to maximise my profits."

MS LEAVER: Yes.

PROF WOODS: What was coming out of your message and the minister's message was that there are a number of programs that have happened, have transmuted into other programs that are happening and might then re-evolve into other programs that might happen.

MS LEAVER: Yes.

PROF WOODS: Is there a high level of consciousness in the Queensland government - for businesses especially, but I think it probably applies to households - to keep the programs really simple, really practical and really achievable, and not to keep changing their names, labels, terms and conditions? Information has a cost. They don't have time. They're tired by the time they go home at night. They don't want to wade through another 40 pages of, "How do I get another $10 saving somewhere?"

MS LEAVER: I think that's absolutely right and I think that has probably happened in all the states where they like to change the names of their programs

every couple of years.

PROF WOODS: Let alone an employer who has got sites in several states and they are all - - -

MS LEAVER: And they're all - yes.

PROF WOODS: It's desperately too hard.

MS LEAVER: I certainly do believe that that's something which probably all the states have now recognised: that they need to make the information that is going to these commercial businesses very simple, in a way that they can put data in and get some information out. EcoBiz has recently designed a very simple software toolkit and it has been tested.

PROF WOODS: A little cost calculator.

MS LEAVER: Yes, a little cost calculator. They put energy figures in. They also put water and waste figures in, so they get a feel for what they're actually using. The ecoBiz people will sit down with them and go through a number of programs that they can do to improve their costs, and they trial a few and help them out, and it may be helping out financially as well, and they review it at a certain time to see if there have been improvements.

PROF WOODS: I am just not convinced yet that, although there is sort of recognition of it, it is actually translating yet across the gamut of programs. The more we travel around the states and see the variations on themes and look at some of the documentation, which is sort of fairly complex - - -

MS LEAVER: Yes, and I suppose my view is that a lot of the time it's coming back to a basic problem of information: that commercial businesses don't know where to come to sort of say, "Look, I want to do something cheap, but I want to get some results and improve my energy or my water costs," and it takes some time to come to us. At the moment we are actually going the other way and going out to some key commercial businesses, but we are obviously not going to cover all of them.

PROF WOODS: No. If you are a metal manufacturer at Longreach and you are flat out just surviving, how are you going to know?

MS LEAVER: That's right, yes, and I think that would be a problem being experienced by everyone and I suppose that's something that we really need to seriously address. There are no easy answers there at the moment.

DR BYRON: We could probably go on all day, but I think we had better give you a rest and give somebody else a turn. Can I thank you very much for the submission and for coming today. It has been extremely valuable.

MS LEAVER: Thank you.

PROF WOODS: Can I just clarify: what you read into the transcript, is that the submission?

MS LEAVER: It's key components of the submission, yes.

PROF WOODS: And the submission itself, has that formally been lodged yet?

MS LEAVER: I believe it was lodged last night.

DR BYRON: We look forward to seeing it in full when we get back to the office.

PROF WOODS: Yes. Thank you very much.

DR BYRON: Thank you.

DR BYRON: Thanks for coming, Mr Schneider. If you could just introduce yourself and your organisation for the transcript and then we can look at the presentation.

MR SCHNEIDER: Yes. Good morning, ladies and gentlemen. My name is Manfred Schneider. I am the technical service manager of Steam Link, and we try to assist industry to improve steam energy efficiency. I thank the commission for inviting me and giving me the opportunity to present our case.

It was very interesting to hear government philosophy about energy efficiency, but it looked to me as though it was more focused on domestic issues. As Prof Wood mentioned, businesses are normally overlooked. We are not in the business of using energy, we are in the business of assisting industry to gain more out of energy, so we are actually something in between. We officially don't exist. We asked the Queensland government for assistance but, since we don't supply renewable energy, we don't exist. Even if we can prove through our services that certain industries can save up to 10 or 15 per cent energy, we don't get recognition, we don't get support and our clients don't get recognition either. I tried to address the issue with different officials but, obviously, we are not big enough and powerful enough to really put our point across.

I will now go ahead with my little presentation. It's my own energy philosophy. You have domesticated energy; that is, electricity and gas. We're not paying enough for it, but we still pay for it and, therefore, we know it exists. To a certain degree, we take care of it, because it is controlled, measured, costed and, to a certain degree, even regulated, if sometimes not - as we found out recently in Queensland - properly, but that's another issue.

Here, I'm talking more about free-range secondary energy; that is, steam and even compressed air. Steam Link, as our name says, only focuses on steam, so I'll stick with steam. Steam is normally generated in a boiler on a production site; I have to say seldom measured, because we have been in the business for six years and we have achieved a little bit - not much, but we have achieved certain things - and people realise now that it's energy and have started taking an interest.

As was mentioned before, small industries are struggling to achieve energy efficiency. I agree that that is right, because of the cost factor. What I come across is that multinational companies don't care about energy efficiency because they're driven by costs; profit, not production costs. We live in Australia. I had a discussion last week with a research doctor from CSIRO, and he mentioned that the actual energy costs in Australia are too low for big industry to really worry about energy efficiency.

The controls are outdated for steam distribution systems. You have a steam

boiler, then you have your process application and machinery. They're maintained, and normally the process machinery is upgraded every five years with the latest from all over the world, costing millions of dollars. But the steam distribution system is neglected. What I came across, again, is that multinational companies are willing to spend millions of dollars to have X unit output and if they get Y unit output it means 25 per cent less and they're happy. I don't really understand it, but that's how it is. They don't want to spend a very small amount to get the steam system upgraded, because it's a cost nobody can explain. Steam is no longer a well-known energy, so therefore management sees it just as a cost, et cetera, but this is another issue.

Control systems are outdated. The systems are generally neglected and poorly maintained. Nevertheless, steam is still industry's preferred effective, reliable energy medium, because it has proven itself over the years. It was part of the Industrial Revolution. We use steam to generate electricity. Energy efficiency, as I just realised, is focused very strongly on electricity. That's fair enough, but the funny thing is we use steam to generate electricity. We use all the technology to control electricity. We develop computer programs and everything to control electricity and, to a certain degree, gas - domesticated energy - while steam, the foundation of the Industrial Revolution, gets treated like a stepsister in one of the fairy tales. It is absolutely neglected.

Here, we have a small presentation of who we are. Steam Link is a dedicated team of professionals actively assisting the various steam-dependent industries with all facets of the effective use of steam energy. I've been involved since 1998, and we now have people coming to us. We have people from big, small and indifferent companies ringing us up to assist them with their production processes and with their problems with steam systems. I sometimes find it frustrating when you go to these places and the people look at you and don't even want to listen. When you buy yourself a car - it doesn't matter how new or old - you will maintain it, because you want it to last and to run and to perform as it's supposed to perform, regardless of the cost efficiency or whatever. You need it, you depend on it.

With steam-operated production plants, it doesn't exist. It just does not exist. I go to these managers and accountants and they all have the big cars, not the small cars, and I ask them, "How often do you service it?" "By the book." "This plant, how often do you service it?" "Since 1953, never." This is very disturbing. Even if it sounds like I'm grovelling along here just to make ourselves look good and important, I think we are, because we are focused on a very specific area of steam energy.

Because steam is no longer in our everyday lives, I'd like to remind you that you need steam for sterilising. If you go into hospital to have an operation and the steriliser doesn't work, I would recommend you don't have the operation. You won't die from your illness, you'll die because of what's on the scalpel. We all like our

drinks; beer and wine. You need steam to produce them. Dairies need steam to make your milk and cheese. We use steam for humidification, we use steam for making car tyres, we use steam to make glass, we use steam and we use steam. Because it's no longer in the public eye, steam no longer exists.

To a certain degree, there is also a problem with the education system. When you have engineers coming from university, they have no steam experience and then they are in charge of steam plants. This is also very frustrating. But anyway, as I said, I'm not a public speaker, so I just try to put our case across. I don't want to go on further.

So what we do - we do it since 1998 - is bothering industry and government to give us a go and, as I said, we're getting busier and busier. Obviously we're doing the right thing, and we're doing a lot of referral work. People know me or know Steam Link for a long time and we're still here, so therefore we obviously do the right thing.

The outcome should be that efficient steam systems deliver effective steam energy. I know it's a very bewildered picture, but I learnt a lesson. The lesson is, if you don't market, with abstract pictures, figures or presentations nobody will take notice. So even if it looks like issues of pipes and other issues here, this is what we face every day. That's how it looks: steam systems producing millions of dollars' worth of goods and when you look at it , nobody has a clue what's going on. It's the same thing. You go to a plant, you have a look, you have no clue, no idea. The people themselves say, "This is 15 years old. The people who put it in are no longer there, so don't ask us. You find out."

So we want to go further, on to actually what we want to do, because we want to talk about the efficiency. The common shortcoming in steam systems is basically incorrect installation of pipes, incorrect pipe sizing, uninsulated pipes, and steam is a two-medium energy source where you always have water and gas in the pipes, so you have to drain the condensate and ultimately the steam leaks. Sometimes you see it, sometimes you don't, where you lose steam to atmosphere. I have even government agencies put stainless steel trusses around it because they can't afford to fix it, but they can afford to put 50 metres of stainless steel cover around to cover the condensate dripping from the pipes.

As was mentioned before, health and safety is another issue, because I think it does no longer exist, health and safety. There is no health and safety inspector. I have never seen one. I go to places where they put new systems in. I'm not in the water business, but just a couple of months ago I went to a place where they asked me to put a steam system in and heat water. They built a 30,000-litre water tank and to keep it hot they keep it at 30 degrees. I asked a friend of mine, who's an engineer in the hospital, "Why are you keeping your water at 67 degrees?" He said, "Because

it's the standard. If you store hot water, it has to be above 65 degrees because of Legionella and, and, and. The minimum is 65 degrees, so I want mine at 67 to cover myself." And there's a 30,000-litre tank at this production plant stored between 35 and 45 degrees. Brand-new installation, consultant approved it, everything.

When I came across and we had a meeting with this consultant about this new system, I did ask him, "What is the requirement for hot-water storage?" After humming and hahing he said, "60-plus degrees." I said, "Well, what's this here?" "Don't talk about it." The client said, "Don't talk about it." So health and safety obviously is not an issue. It was a brand-new installation. Somebody should go there and check it.

The main issue here with steam basically is poor housekeeping, because we're not looking after the steam. It's like in your house: you leave your lights on, it costs you. It's the same thing with steam systems. If it's not done properly, we're wasting it. I'll just put some figures here because it's always interesting to show how much it costs. If you have a medium production plant, 10 metres of unlagged pipe is easily done somewhere - damaged insulation, if you have insulation - you will lose five kilowatts of energy. If you have a little steam leak somewhere, a two-millimetre hole, you will lose 15 kilowatts of energy. If you just add it up for just normal production time - it's not even specific - this one plant is wasting 37,500 kilowatts a year.

The funny issue here is that under normal circumstances I would say 99 per cent of any steam-using plants will waste this amount of steam, because you cannot keep it up - maybe 95 per cent. That's 5 per cent that do it, they have the money, whatever. But a very high percentage, that's what they're wasting - minimum. I don't know how many steam plants we have in Australia, but you have to multiply this by the steam plants. Then you have to ask yourself, "This is just the actual waste we're putting into the atmosphere where we do nothing with it. May we create health and safety issues? Yes."

And it adds up, because we're not only wasting the 37,500 kilowatts we just blow into the air and do nothing with, we also have the cost of energy to generate this wasted steam. If you have a coal-fired boiler, we don't use any gas or electricity or whatever, just coal-fired - coal is cheap, so it doesn't really matter. I have one client here, they put two brand-new coal boilers in. I said, "I heard you had problems with the condensate." "Ah, it doesn't really matter. It's irrelevant." Coal costs nothing, therefore who cares? I'm not negative, I'm not cynical, I just want to bring it as it is. So it costs to generate the wasted steam. We have then excessive greenhouse gases, with all the sulfur, NOx, and all the other nasties, being produced for nothing.

We have a problem with excessive condensate build-up, so internal problems

with all the possibility of delivering dry, saturated steam to our production process, because if we have a hole somewhere we may even experience pressure losses, again, loss of temperature and vent, and as I say, then multiply all these costs by the number of steam plants in Australia.

Why I'm bringing it up here: I had a meeting last week with people from renewable energy companies, and I had to say that if Australia looks after the steam systems, we don't need renewable energy, because we could reduce our energy use by X percentage, but we have to give initiative to the industry. We have to actually not give initiative for renewable energy. That way we can put not coal-fired boilers in but we put solar-powered boilers in, so they are fantastic, only to lose what we gain here with very capital-intensive investments; we lose on easy-fix formulas. I don't get it. I'm really sort of sometimes very frustrated.

I have another handicap - I call it a handicap. I take ownership when I see a problem. I go and get agitated. I go and have arguments with management and with engineers and with owners of plants because I cannot understand why they don't obviously see what I see. Obviously they see it because of the money. They have a different view. Even if I get agitated and it speaks against me, at the same time it actually gives me the reputation that I am what I am, and I'm not just here to sell anybody anything. I'm here to really address the issue.

Now, here we have laundries, food processing and, as I mentioned before hospitals, and all the other people who use steam in the production process. The further thing is, you have then internal plant problems - you know, mechanical types, where you have water hammer. You have then health and safety issues. We have pipes burst and gasketing material fails, increased maintenance and maintenance costs. Cost, cost, cost. It all gives then the steam systems the bad name that they're expensive to run; but nobody maintains them.

If you maintain them, obviously the first address people go to is the boiler service people, because they maintain and manufacture and service boilers. I've come to the conclusion that that's fantastic, but it's like if you would take your Mercedes to the dentist because the dentist has a Mercedes too so he knows what to do to fix it or service it, because he has a drill or something. I don't know why they don't understand that a steam system is different to a steam boiler.

Actually, there is nothing in Australia that actually focuses on steam systems, because the only other way industry can go is to the manufacturer of the steam control equipment. What I experience there is, they see every customer who knocks on the door and says, "Can you help me?" - they see them as a sucker - sorry about my expression here - because I've been across to other people, where they showed me a quote to put a steam system and upgrade it, where they put equipment in. I could not imagine where to put it. But the point is, they had a customer here who

had no clue what do, so he went there and they said, "That's what you need."

DR BYRON: Mr Schneider, if I could draw your attention to the time. If you could take us through your submission, please.

MR SCHNEIDER: Okay, sorry. So we have then the production losses. We all suffer because, through production losses, the product prices will go up. There is inconsistent product quality, so we have a very high percentage in some areas where people have to discharge product, or you get seconds, whatever, and then we have another unscheduled production stop and other costs. We should maintain dry saturated steam to deliver effective energy, and not wet steam where you have, as you can see, differences in temperature and performance.

Just to see the steam tables, the difference is also what people don't understand with steam, because if steam is under pressure you will have a different flow rate through a certain type of pipe, so you have less velocities, and again it's a health and safety issue more than anything else.

This is something I just wanted to see: the environmental impact. The environmental impact is that we see rainforest destroyed and rivers dirty, but the issue here with steam plants - the environmental impact - is if we don't maintain and we don't keep energy under control, this can happen. The boiler can explode and can destroy things. It is an environmental impact. Maybe it's not the right picture, but it may draw attention to the same issue.

What we set out here as our little exercise to present to you is to create synergy. We're in favour of renewable energy sources. We're in favour of reducing greenhouse gases. We're in favour of assisting industry to get it right. But we also have to make sure that we address this problem as it is. Renewable energy source is important but we also - especially with steam systems - have to maintain and bring our steam systems up to date, to maintain efficiency of our steam systems, to have sustainable processed energy, where we can put it on for future generations to live on.

I just found this on the Net: that 65 per cent of all fuel burned by US industry is consumed to generate steam. I just put this on here. It's not that it will apply to us, because America has cold weather up north and they're using a lot of steam for heating purposes of buildings and whatever, but I just wanted to show that other countries have the same problem. What the US government did - and this is what I put underneath - the US Department of Energy has a web site where they actually advise industry and give them assistance to get it right. This is just one of their web sites. One of the issues they talk about is best practices. They have an absolutely incredible web site to help everybody with every steam problem, whatever you want. It's free of charge. You can load it down. You can do what you want. So what we're

trying to do here, those other countries do on an even broader scale. To finish my presentation, what Steam Link is all about is improving steam energy efficiency and to keep Australian industry going green, clean - steam for the future. Thank you very much.

DR BYRON: Thank you. It was very interesting. I can't help thinking that you must be a very popular guy when you go to one of these factories, that you must be able to save them a lot of money, and I'm surprised they don't welcome you with open arms.

MR SCHNEIDER: I had this meeting last week with CSIRO and this gentleman was from Ireland, and he said, "If you give this presentation in Ireland, you won't leave. You will be wrapped up and taken away to these customers, because they need you." But the cost of energy in Australia - sorry, people are not interested. If I go to a multinational company and talk about energy efficiency, greenhouse gases, it's just like you talk to a brick wall.

DR BYRON: Why don't you tell them, "I can save you money"?

MR SCHNEIDER: No. It's not big enough. If you talk production - real production - where you say, "I can increase your productivity by 10 per cent," then they listen. Only when they have a problem, really a problem, where their steam system, because of all this neglect, is stopping to perform, then I'm their hero. I do it now for six years. Believe me.

PROF WOODS: But a 10 per cent saving on the steam component of their total operating costs is not enough to attract their attention?

MR SCHNEIDER: No, not 10 per cent of - sometimes steam is a very important part of the production process, like in - - -

PROF WOODS: Food production.

MR SCHNEIDER: Food production. With food production, live steam is also used, and if you can get the steam system right, it means you consistent temperature and humidity, and this production process runs for 16 hours, never stops. If you have a problem in your steam supply and the production process stops three hours day because of whatever, that costs money, and we're talking then 10 per cent of production. I've been to a paper factory where they aimed to increase their hourly output by five metres. I went to this production plant and told them what I would recommend after I went through the plant and had a look at their drawings. So they followed my advice, and they saved one metre. It increased it one metre. It didn't cost them anything. They just listened to what I had to say, they did it, and they gained one metre.

DR BYRON: I think in view of the time we probably have to wrap it up there, but I would like to thank you very much. That has been fascinating. I don't think anybody has spoken to us about steam before, so it's very good information for us, and thank you for taking the trouble to come.

MR SCHNEIDER: I thank you for the opportunity to bore you with my presentation. Thank you very much.

PROF WOODS: Thank you. Very helpful.

DR BYRON: I think we'll take a break now and resume at 11.00. Thank you.

DR BYRON: We resume the hearing now with representatives of Friends of the Earth. If you could just introduce yourselves for the transcript. We've both read the submission. Thanks very much for sending that in. Would you like to summarise that for maybe 10 or 15 minutes and then we can talk about it for a while.

MS LONG: Thank you. I'm Stephanie Long and I'm the climate justice campaigner for the Friends of the Earth Australia.

MR KEILAR: My name is Nathan Keilar and I'm also with Friends of the Earth, assisting Steph Long with her work.

MS LONG: Our submission is broken into two sections. Nathan authored the second section of the submission and I authored the first half, so we'll just do a few minutes on each.

DR BYRON: Yes, please.

MS LONG: Apart from being quite pleased to be able to contribute to an inquiry on energy efficiency, we were a bit concerned about the exclusion of climate change as an issue within this inquiry. Obviously, energy is a key issue for climate change and it's a key concern of ours, as an environment and social justice organisation. We're a bit disappointed that climate change has been excluded and, because of that, chose to include a fair bit of information about climate change in our submission.

Within the parameters of establishing economic and environmental benefits of energy efficiency, it is clear to us that we need to have a good understanding of the economic cost of climate change. Unless we have that level of analysis about what climate change is actually costing us, we can't have a really rational, reasonable and realistic understanding about the benefits of energy efficiency as a form of mitigation, or partial mitigation, of those economic costs.

In the first section of our submission, we chose to look at what the reinsurance and insurance industry has documented about the rising costs of natural disasters, as some indication of what climate change costs are, but also bearing in mind that for many people insurance is a bit of luxury, particularly for those in the developing world. These figures are an indication but they're not at all a complete economic story about climate change. Governments also share a level of burden about the economic costs of climate change when they respond to natural disasters.

We looked at, in particular, the hailstorms in Sydney in 1999, which attracted around $1.5 billion of expenses according to the insurance industry, and then also the bushfires in Canberra in 2003, which is one of the more recent natural disasters that have occurred in Australia. There have been indications from scientists that we're going to be able to link rising temperatures to incidents of drought - the drying out of

landscapes - which then exacerbate our bushfires, particularly in bushfire season, which we're about to enter back into, coming back into summer.

In addition to the section that I prepared for our submission, I've also got copies of two reports that I'd like to leave with you today. One is from the Climate Group, which is a UK based nonprofit organisation, and they've done a really fantastic analysis of corporations' economic savings by taking into account both energy efficiency and energy consumption mitigation strategies. The other is a paper from the Tyndall Centre, also in the UK, which looks at modelling economic costs of technological change. Most of the models that we have about energy projections are based on a history of what our energy use has been rather than having a clear assessment about what technological changes are possible and will be potentially available in the coming years. I think it's really vital that we have a look at modelling in a different way and use that to compare against figures that are produced by the International Energy Agency, for example. I'll leave those with you.

DR BYRON: Thank you very much.

MS LONG: I'll just pass over to Nathan.

MR KEILAR: My section 2 mainly focuses on end-user energy efficiency, because that's where Friends of the Earth sees major potential for improvement, specifically with regard to mitigating greenhouse gas emissions because of the electricity supply industry in Australia. There are three major points that I wanted to touch on to start off with, depending on how much time I have.

Levies and taxes: Friends of the Earth recognises that Australia's economy is moving towards a service based economy but are concerned that, while services have been booming, heavy energy-intensive industry practices have also been booming, which has been counteracting the transition towards a low-energy-intensive economy. We've referred to a couple of different examples, primarily the aluminium smelting industry, which uses 15 per cent of Australia's electricity and contributes only 0.15 per cent of the GDP. It receives a hell of a lot of subsidies as well. We propose that those subsidies would be better directed to a demand management fund that focuses on improving information and various other aspects which are talked about in that section.

Another concern is the retail sector. Given the recent restructuring, the retail sector has ended up as a profit-maximising agent in selling as much energy as possible. This is of concern because there are obviously other ways to make money. If you were to look at providing services, rather than simply selling energy, there's potentially room for a lot more economic activity.

Opportunities need to be created for retailers to move towards the energy

service spectrum. This could be done by a number of different things. We suggest, under the licensing of industrial facilities section, that a national register could possibly be created, keeping track of energy efficiency improvements that have been implemented or that could potentially be implemented, just to outline to investors where there is potential or where there has been successful exploration of energy efficiency strategies.

Industrial facilities are currently required to audit themselves, but we would also ask that they be required to implement whatever is cost-effective and possibly open up to investment for those that could be cost-effective if grouped with a larger number of projects. For example, this building might not be cost-effective to energy retrofit all the lighting, but if you were to pool maybe 15 of the buildings around the city then all of a sudden it becomes a lot more cost-effective. By analysing these different types and keeping them all on a register, we would hope that that would improve investment opportunities.

Education and the provision of the information has already been pretty heavily researched with NFEE, while most of the other aspects we've talked about are from sort of a top-down aspect. Tradespeople and retail training: currently, if you were to call up someone and ask for a hot-water heater, they probably won't be able to give you too much information about what the most energy efficient option is. It's quite complicated. There really need to be trained specialists to answer those questions if people are inclined to explore that, and currently there are not. We would like to see something similar to the GreenPlumbers scheme. That provides comprehensive training and gives people that connection with energy efficiency.

Mandatory standards are the two other major things which I consider very important. It's pretty much just removing the bad apples from society. It enables authorities to benefit from low-cost energy savings. It enables customers to spend less on electricity, whilst encouraging domestic manufacturers to improve their products and to become more competitive against the less efficient imported models which we currently see quite a fair bit of dumped in Australia.

Building standards and road infrastructure: we didn't talk about road infrastructure, but building standards and roads are considered two of the longest-lived investments in society, so a bad decision made there represents huge energy savings over the life - so we'd also like to see quite comprehensive policy and standards developed around making sure that good decisions are made now, because that represents a huge loss potentially in the future.

DR BYRON: I think that's a very good summary of your submission. Sorry, I don't mean to cut you off.

MR KEILAR: No, that's fine.

PROF WOODS: Part 1 we probably won't spend a lot of time on, but thank you for writing it.

MS LONG: You understand the reason for that, that this isn't an inquiry into climate change; but it's always useful to understand the context within which things are being undertaken.

DR BYRON: The commission did actually do a climate change inquiry in 91-92. We've been following it with great interest ever since but we haven't been asked to do another climate change inquiry.

PROF WOODS: But coming from Canberra, I understand the effect of bushfires very clearly. On to section 2, a couple of things. Maybe I'll start on the demand management fund. You talk about:

> This fund should leverage support for industry to implement energy efficient actions.

You then, a couple of pages later, describe the fund. What I don't understand is, and perhaps if you could tease it out for me a little further, just how do you calculate the quantum that would go into it? You talk about, "All perverse subsidies are directed into a fund," but that sounds a big vague still. If you could take me through it. Who then runs the fund? How is it invested to make sure that its real value is maintained? Who makes decisions on allocations from the fund? If you could just work me through those in a bit more detail than what's in here.

MR KEILAR: The demand management fund actually came from a report I was reading by the World Energy Council on energy efficiency.

PROF WOODS: You've referred to that there.

MR KEILAR: I've referred to that there, yes. So there are quite a few case studies in that if you're interested in having a look at that. They're quite comprehensive and they discuss all those things about - there are a few different options about how you can - - -

PROF WOODS: I was just wondering what your preferred model is. I understand about them applying in various areas, but where do you come from within that? Or is that something you want to come back to?

MR KEILAR: I came from a very broad background and I think the specifics need to be teased out further. I didn't look into specifically how it should be set up and what's required of it, but I do understand that there is a definite need for it. There are

some really good examples of where it's worked around the world. It's been probably a month or so since I've looked at that report, so I have trouble recalling any figures.

PROF WOODS: No, that's fine. I just wasn't sure if you had a particular functionality in mind; but I understand that.

MS LONG: I think ideally you'd match the criteria for attaining funds to the energy standards, so the kind of thing like the five-star building rating and so on. So if we have established a standard which industry needs to comply with, there needs to be some assistance for them to do that. I think there would be a level of matching with that and probably ideally it would be regulated by some form of government.

PROF WOODS: I guess you have to start questioning why taxpayer funds are being used to help business become more profitable in their own right. It's a dilemma I haven't yet got myself over. If these things are in their own best interests and they can save money and can generate additional profit, why is the taxpayer subsidising them to do it? Now, if there are externalities that, over and above that, are worth achieving - maybe I'm helping you with your answer - but because of information asymmetry or some other market failures, then maybe that's an argument that you'd probably put forward?

MS LONG: If we're taking the perverse subsidies away from industry, and perverse in the sense that they don't have environmental benefit and they rarely provide economic or social benefit, then that's actually a double social and environmental benefit in the long run, by removing those subsidies yet providing those funds to something that has much greater value. Possibly if you structured those kinds of funds so that the recipients of the financial benefit were actually the energy efficiency providers, rather than the corporations that were purchasing that kind of technology, then we're actually providing financial incentive for the energy efficiency industry in Australia to expand. So it's about shifting the economic and investment indicators that we have in Australia, so that we can get beyond the really energy-intensive scenario that we've established ourselves in for the past 200 years, and move towards a different kind of economic future. So I think, somewhere in there - - -

MR KEILAR: Currently investors have no incentive to explore energy efficiency as an investment opportunity. I just had a flashback then to something I was reading - and the demand management fund could potentially start off at the beginning by identifying an opportunity and then funding it, providing 100 per cent of the capital to make it work and clearly documenting and publicising any results, and then offer opportunity for investors to come in, say 10 per cent, 20 per cent, 30 per cent over a period, slowly. As more and more energy efficiency progress is made and projects are shown to work, hopefully that would leverage investors into seeing that there are

key opportunities to invest. Currently, that just isn't an option in Australia. So that's something we'd like to see.

PROF WOODS: One of our terms of reference requires that we look at a national energy efficiency target. It's been puzzling us what you do. One option is, everybody cut down by 5 per cent, and how does that unfairly affect those who have been working hard at getting their energy efficiency goals right compared to those who haven't done any work on it? You've come up with an interesting model there of just requiring people to undertake actions that have an eight-year payback or less. I thought there was an interesting concept developing there. Your choice of payback period and your adoption of that particular model: is there any further thinking behind that as to why you went that way?

MR KEILAR: Actually from a study I was reading that hasn't been released yet; but I think the NFEE inquiry identified a four-year payback period. Once this report had gone in and analysed that, it clearly wasn't enough. It wasn't even going to meet a reduction in consumption, which is what's required, what we consider is required.

PROF WOODS: So you just want to tighten it up a bit further than what's proposed?

MR KEILAR: Yes, looking to tighten it up. An eight-year average energy efficiency option should be implemented, so pulling things together, and if they prove cost-effective over eight years - while some may be slightly more and some may be slightly less, if it happens around eight years, that's when you should start to see a reduction in emissions and in consumption of energy.

DR BYRON: Just to elaborate on that one, when we've spoken to a couple of managers of major business and said, "Look, there's these opportunities that have been identified for your factories and they've got payback periods in two or three years. Why on earth aren't you doing them?", they say, "Well, because we've got something else over here we can do" - in quality or marketing or something else - "that's got a payback period of six months." They may actually know that there are energy efficiency opportunities available that are actually quite profitable, but they're busy doing other things that are even more profitable. So if someone outside comes along and says, "Not only do you have to do these things that are moderately profitable, but you have to go all the way up the energy efficiency scale and do these things that are only just sort of break-even" - - -

PROF WOODS: For their individual businesses, putting aside externalities.

DR BYRON: Yes - from the private commercial point of view. You're basically saying that you're going to override a manager's ability to manage their company. You'd say, "Stop doing that thing which is profitable. Go and do this thing which is

borderline." Now, I believe the Victorian EPA already has that capability, where they can require not only that the audits are being done but that opportunities found in the audit have to be, are required to - but I imagine that the people who own and run these companies may feel that control is being taken out of their hands.

MS LONG: And it is. In that form of scenario it is being taken out of their hands and it is a government intervention that is dictating the way that they run their business, but from Friends of the Earth's point of view it's really clear that the market alone does not provide a guaranteed social or environmental outcome. It can provide an economic outcome, and we actually require government intervention to ensure that there is a balance between environmental, social and economic growth and benefit in Australia, and actually we would perceive that it is the role of government to perform that function, and it's difficult because the inquiry is constrained and we're not really supposed to be talking about environmental externalities and climate change.

DR BYRON: We are supposed to be looking at the environmental benefits of pursuing these energy efficiency opportunities.

PROF WOODS: But only those that go through the suit of having cost-effectiveness for individual consumers and producers.

DR BYRON: At this stage.

PROF WOODS: But then we look at the broader context, as well.

MS LONG: Yes.

DR BYRON: I can readily understand that if experts went into a factory or into a commercial operation and could identify things that are worth doing that would save that business money in terms of energy, but you could probably have other experts who could go in, say, in terms of occupational health and safety, in terms of waste management, in terms of quality control, in terms of probably a dozen different things, and I guess one question in my mind is, "Why only energy efficiency?" Why should governments run programs to make businesses more profitable by improving their energy efficiency when we're not running similar programs to make them more profitable through any one of these other windows? What is so special about that window, and I guess the answer is, greenhouse. Sorry, I shouldn't have said - - -

PROF WOODS: Don't lead the witness!

MS LONG: I think one of the key problems in Australia is that energy is so cheap.

DR BYRON: Some people say that's a plus rather than a problem, but in terms of

energy efficiency it is a problem.

MS LONG: It's a problem, and the scenarios that are actually in this document are from companies outside of Australia where energy isn't so cheap and therefore it's economically profitable to really invest in energy efficiency and, again, it's a greenhouse issue. The externalities about climate change are not factored into the cost of coal, they're not factored into the cost of oil. It's kind of like a compounding scenario. It makes these questions really difficult to answer, knowing that businesses are in business to make a profit for their shareholders, to have a marketplace for people to have employment in all of those issues.

PROF WOODS: There are a few positive externalities of business, like providing jobs and providing goods and services for consumers.

MS LONG: Absolutely, yes.

PROF WOODS: There are a couple of benefits in the process.

MS LONG: That's right. I'm not denying that at all.

DR BYRON: Yes. I find it hard to imagine any politician from any persuasion in any jurisdiction going to the electorate and saying, "Our main policy promise for the next period is to increase electricity and petrol prices fivefold," or something like that. I can't imagine anybody would see that as a way of getting re-elected.

MS LONG: No.

DR BYRON: But, in a way, that may be the sort of change that's necessary to actually focus people's minds and to start them pursuing opportunities to become much more energy conscious and energy efficient and to explore some of these demand management techniques and so on. As you say, the Europeans and the Japanese have had very high electricity prices and petrol prices and have a very strong incentive to look at ways of being very energy efficient and, in Australia, with very low energy prices and a very benign climate, we don't have anything like the same pressure as the Japanese or the Swedes.

PROF WOODS: Can I do the household expenditure figure bit? While we are on prices and what it would take to focus attention, an instructive figure that we were presented with the other day is that fuel - power, gas - is 2.6 per cent of total household expenditure, so if you identify a savings of 10 per cent you are creating a saving of a quarter of 1 per cent of household expenditure, or less than a cup of coffee.

Similarly, alcohol they spend even more on than fuel and power, and there are

a few externalities there - 2.9 per cent - and tobacco, one and a half per cent, more than 50 per cent of what they spend on power and fuel, and there are a few externalities there. And, of course, of that 2.6 per cent, a lot of that is fixed charges, so that the variable charge component, the actual energy consumption charge, is even less than the 2.6 per cent. I couldn't work it out mentally the other day, but I'm having a go. What do you need to do to prices to suddenly attract their attention? The answer is, "An awful lot," I suspect.

MS LONG: Yes.

MR KEILAR: I would just like to say that while it is only a small percentage of price, that's just for direct energy consumption. If you look at the embodied energy which those people are choosing to consume - say processing that's required to make glass, make plastic, whatever - it would actually probably be quite significant, I think.

PROF WOODS: Absolutely, but that's not a charge that they're going to be sensitive to. I mean, they are going to be sensitive to their power bills, but the fact that they come in every quarter means that something happened a couple of months ago and there's not a direct connect anyway, but it seems to me that you need a balance of things. You need your regulation to cut out the poor-performing appliances and you need the information through your labellings and that. The pricing: just what role can that play? As Neil was talking about earlier, you've got your three components: your market pricing type components, your regulation-type components and your information-type components. Where does pricing fit from Friends of the Earth's point of view in that mix?

MR KEILAR: It provides part of a solution. It's a good start. It provides a good indicator. It can be the first signal to let people know that they are doing some type of activity and it's resulting in - airconditioners are the perfect example. People using their airconditioners in peak times are necessitating that everyone across society under that same tariff has to bear the cost of those people running their airconditioners, so by rearranging that pricing structure you can then inform people that they are responsible for that increase in expenditure. But pricing is by no means the only solution. Friends of the Earth sees it as a part. Any one of these things which we talk about are, by themselves, going to be useless - well, not useless, but have minimal effect compared to if they were part of a more strategic, well-founded policy.

PROF WOODS: Do you spend a lot of time chasing through the various government programs and nuances and how they work and what their effect is? Does that take up much of your time?

MS LONG: We try not to, because it can take up an awful lot of time. There's a lot

of evaluation of the different programs that get run and we would probably more look for the really innovative programs and check out how they are going, or look at the really poor-performing programs and try and figure out why they haven't worked. For example, the G-Gap program from the AGO was particularly unsuccessful. Why did that happen? What does that mean for how we develop programs in the future?

Just to return to your question about pricing, I think for individuals in a household, even for individuals within the commercial sector, to really understand climate change we have to get them to understand the link between climate change and energy and that understanding is quite poor because energy of itself is really a bit of a nebulous thing to think about. You can't hold it. You can't see it. It's not like water use. People really understand water use. They understand reducing their water use because it's of environmental benefit. There's not the same level of awareness about reducing their energy consumption.

PROF WOODS: I think they understand water use not because of the environmental benefit but because they can't turn it on to water their lawn.

MS LONG: Well, it could be that, as well - and their neighbour will report them for putting the sprinkler on.

DR BYRON: I understand that it's very hard to persuade people to take energy efficiency measures because of the climate change argument, especially when it's hard to get them to take measures even when you can show that it's going to save them money. Even when there are big pay-offs they won't do it.

MS LONG: Sure.

DR BYRON: You can't even persuade them to do things that are in their own self-interest. We have seen examples where the cost of greenhouse gas abatement is actually negative. It doesn't cost them anything and it actually pays them to do it and still it's very hard to get them to do that, so trying to persuade companies or households to do something that is sort of more abstract and long term and a bit more nebulous, like climate change, must be even harder than persuading them to do something that's already in their own self-interest.

MS LONG: I definitely think that's true. It makes the job pretty hard.

MR KEILAR: I think just because it's hard it shouldn't be something that's overlooked. I think it's a crucial aspect towards change, towards a longer term of reference of thinking, and there's the potential to encourage that, I think, and to bring that out in all different aspects of society.

MS LONG: But for it to make sense to people it needs to be matched with a really

clear education information campaign, so that they understand why this is happening and why it's necessary.

DR BYRON: That's why I liked where you were going before with trying to get all the policy measures working together as a cohesive package, because I suspect at the moment we have been largely running with education information types of measures and regulatory sorts of measures, but the price signal that businesses and households have been getting is actually contradictory to that.

MS LONG: Yes.

DR BYRON: You can't get people to make decisions as if energy was really scarce and getting scarcer, when in fact the price they see on the bill is that it's cheap and getting cheaper. I guess the same applies to water. When you are trying to get people to conserve and treat it like a scarce valuable resource, the price they pay is still ridiculously cheap, so that means that we haven't been using the price signals to reinforce the regulation signals and the education signals and, as you were saying, we need to have them all coherent and reinforcing each other.

PROF WOODS: I would have to say you have dealt with that quite well in your submission. I was interested to see what you would say today but, in all honesty, you have said things like pricing alone has its limits and must be within the context of that. It's well articulated. We do understand your arguments.

MS LONG: I just wanted to draw the point: in Queensland I think there is huge potential for energy efficiency and it's greatly needed, because what has partially been found by the Sommerville report is that the dramatic increase in peak demand has been a contributing factor to the breakdown and the problems that we have had with the distribution system in Queensland. It has not been something that has gained a lot of public or political profile within the fall-out of that report and those kind of costs in Queensland are ultimately burdened by the government, which then needs to take responsibility for the way in which Ergon and ENERGEX are managing their capital infrastructure, so that cost is being burdened by somebody else.

So it is about putting all of the costs of the energy generation and distribution system together and having a comprehensive understanding about what that means for price and therefore what the price should be, so it's not only just about the fact that the regulation and the pricing and the education aspects have been contradicting each other, but even the pricing aspect alone has been a bit rag-tag and that needs a lot of shaping up, I think.

PROF WOODS: Certainly the increase in the domestic energy consumption has been quite rapid and you could understand that five years ago you wouldn't have

predicted the demand loads that are on now, especially as those demand loads are in the hottest part of the day when the system is under its greatest stress anyway, so you can understand some of those confluences.

DR BYRON: We were told in South Australia that those people who don't have airconditioning to their house are paying an extra $70 or $100 a year to pay for the network improvement costs so that those who do have the airconditioners can deal with the spike, so there seems to be an equity issue there, too: that everybody who doesn't have one is having to pay the infrastructure costs because each of these new ones puts a demand on the transmission and the substation systems.

MS LONG: And it's probably people from lower-income households that can't afford an airconditioner in the first place that might be burdened with that extra cost, as well.

DR BYRON: Exactly, but the people who are making decisions to buy one of these big things don't necessarily see - they're not exposed to - the cost that that imposes on the system and on everybody else in the system, and that seems to be a problem with the way we price these things, the way we charge for those energy services.

MR KEILAR: Definitely. If you look at your power bill there's probably an ad for an airconditioner at the bottom of it. What does it say about your history of consumption of energy? Nothing. It gives you a number which is an abstract representation of how many electrons passed through some point. So it's quite hard for people. There's no connection. Pretty much the only face people have with their own personal energy consumptions is their power bill and there is nothing there to relate - - -

PROF WOODS: There's not even a temporal connection.

MR KEILAR: Yes. There's no attempt, and that's a deliberate thing, I would say. If you look at your telephone bill, you can work out how many calls you have made. Even something like that would be more effective than the current system.

DR BYRON: Can I just ask one last question, as we are going to have to wrap up soon, about the large energy users, the large energy-intensive industries. There are a couple of comments you made in the submission about that. One is that they get their electricity too cheap, and the other is supporting the idea of mandatory audits or opportunity assessments. Some people have said to us that the big energy users like aluminium refineries, because energy is such an important part of their total cost structure they know exactly to the fourth decimal place how much they're using and they're comparing technologies all around the rest of the world, desperately looking for some way to shave the fourth decimal place down a bit because it is so important, when in fact it might be the newsagency or the corner delicatessen or somebody who

has no idea what his energy bill is and might be able to make a much greater percentagewise reduction than the people at the top end who are already focused on it. Any reaction?

MS LONG: I think that that would be a clear ad for us to re-use and recycle materials rather than continually producing more materials that we might not necessarily use, and re-use is definitely an energy factor that we haven't addressed in our submission. There's a whole bunch of environmental and social and economic benefits for re-use, which is possibly what Harry might speak about.

DR BYRON: A good lead-in to the next speaker, I think.

MS LONG: Yes.

DR BYRON: Any concluding comments that either of you would like to make?

PROF WOODS: No? It was well written and comprehensive. Thank you.

MR KEILAR: Thanks for having us.

DR BYRON: Thanks very much for taking the trouble to come.

MR JOHNSON: Dr Neil Byron and Commissioner Woods, I'd like to thank the Productivity Commission for giving me the opportunity to participate in this inquiry and thank you for making the venue public-transport-accessible.

The terms of reference state that improvements in energy use have the potential to lower Australia's greenhouse signature; also, that improvements in energy use help cut water usage and, since the provision of water is the world's second greatest challenge after climate change, improvements in energy efficiency are vital.

Lester Brown, in Plan B: Rescuing a Planet Under Stress and a Civilisation in Trouble, explores what he terms the enormous potential for raising energy productivity. We've been through quite a few of these sorts of household mandated steps that could be taken. I think we've looked at a lot of those; they are pretty well covered. Even something as simple as when you have your solar heater put on the house, if you stick it above the kitchen, which is where you use small quantities of hot water frequently, that comes down to your sort of insulation, piping. That's just a simple little thing. As I think you mentioned, Commissioner Woods, we need to look at education which is simple, practical and achievable. I think that is one thing that is missing; the public haven't grasped this.

On that aspect of education, it's trying to get the public to realise that what we are talking about is more important than the latest football score, or even what the Aussie dollar is doing. Perhaps we've got to look at people, like human icons, like some of our sporting heroes. Like, if we are trying to save a particular tree we don't say, "That tree is important for a flatworm or a mosquito that lives there." We choose an Aussie icon like a koala or a sugar glider.

Maybe if we could get one of our sporting heroes, like Ian Thorpe, to say, "Look, I am promoting legal performance-enhancing substances, such as the air I breathe, the water I drink, the soil that grows my food" - you know, if it came from someone like that, the average person might say, "Hey, if Thorpie thinks this is important, it is important." We are not using that sort of thing enough to sell the education side of things.

I think I mentioned the water-saving devices that lead to energy efficiency. If you've got a lesser demand for water, say you have your rainwater tank, you've got the water savings in transporting and storage; the water, the energy embodied in the transport and storage of water. So little things like that are the things we should be looking at.

PROF WOODS: Just on that point, you might want to go into our web site because we had evidence from somebody at an earlier inquiry, who was looking at the costs of energy used by Sydney Water, and gave us some material on that. So if you want to follow that through, feel free.

MR JOHNSON: Yes. That's the other thing. On the water point, if you take a bottle like this, for example, it's the water used in the manufacturing process but it's also the water that's embodied in the electricity that's used. Now, that bottle, for example, if you buried it in the ground, would last a million years. Today, in Australia, we virtually use them only once, when, seriously, we should be using something - as Stephanie said - again and again for its original manufactured purpose. When it breaks you then recycle it, but to see the re-using as the second step. I think Prof Ian Lowe suggested a 1 per cent cut in consumption is equivalent to 25 per cent recycling rate.

We've really got to get this paradigm shift, where we see the reduced number 1 as the best option, where you reduce your consumption or waste. Number 2 option is that you use something again and again for its original manufactured purpose. The third option is that you recycle something. If you can't reduce and re-use, you recycle something; it's easy to recycle if there's a recycling place fairly close to where you are going to do the recycling.

It's the embodied energy and water that's locked into re-usable that you incur every time you have a single-use throwaway disposable, and that embodied energy and the water involved in the manufacturing process locked into your plastic lunchbox, as against the seven billion plastic bags we use in Australia. In Queensland, lighting I think represents 13 per cent of the household electricity bill. So perhaps we've really got to revisit, in the smart state, daylight saving.

The new housing stock needs to be built to suit the tropical climate, rather than continuing with the ongoing provision of housing stock more suited to regions with harsher winters. It's a false economy to try and keep down the price of budget housing by building housing stock with minimum-height walls and minimum-width eaves, so you then end up using more airconditioning. Brown suggests that there are huge energy efficiency gains to be realised when we embrace solar voltaics. That's growing at 30.9 per cent per year, so solar voltaics is growing pretty well.

PROF WOODS: From a very low base.

MR JOHNSON: Yes, it's a low base but it is starting to happen. I think when you look at the way the world is going at the moment, with threats that climate change - although we are not meant to mention - - -

PROF WOODS: No - - -

MR JOHNSON: - - - the threat that climate change faces - I think we've got to look at doing something differently.

PROF WOODS: It's an important contextual component of our inquiry.

MR JOHNSON: Yes. Similarly, if we could get into wind energy, that has an annual growth rate of 30.7 per cent. Transport again has been mentioned as the area where massive gains in energy efficiency can be made if the optimum mode of transport is chosen. I like to see it this way. What's the best way of transporting people or goods between two points with the least adverse impact on people and non-voting species living between the two points?

The federal government suggests 100 bicycles can be produced from the material used to manufacture one car. Cycling uses a third of the energy of walking, a quarter of the energy of public transport, a fiftieth of the energy of the average car. The federal government suggests savings of about $130 million a year from those who already benefit from cycling, through health benefits. I think this question needs to be looked at: what percentage of federal transport funding is spent on roads, rail, public transport and cycle use?

Queensland has the highest level of childhood and adult obesity in Australia, with our country being close to that of the USA, but we drive around the corner in a machine that ways a tonne, runs on a non-renewable resource, to buy a packet of chips. How energy efficient is that, when even wars have been fought over that valuable resource?

An unhealthy battery-reared child is driven to and from school each day on more congested roads. 38 per cent of household greenhouse gas emission is generated by transport. So that's something we've got to really look at. How can we achieve some of these changes? Perhaps we've got to look at tax changes. The congestion tax of $8 a day that applied to traffic entering Central London put in place in 2003 reduced traffic congestion by 24 per cent virtually overnight. The taxes could be used to improve public transport.

An environmental tax could possibly replace payroll tax, which itself seems to be a disincentive to employment. We could restructure the tax system as Brown suggests by lowering income taxes and raising taxes on environmentally destructive activities such as fossil fuel burning, to incorporate the ecological costs. Edward Carr, in his article, suggests in the Economist, "If you want to protect the environment, stop subsidising its destruction, and at the same time bring in enormous energy efficiency measures."

With trying to get people onto bicycles, I think we've got to perhaps look at a few more of the carrot incentives rather than the big stick approach, so that you provide more end-of-trip facilities, safe bike routes to school, more cycle lanes, or perhaps increase the width of the shared footpaths that are now used by cycles.

The other thing that needs to be considered is, we all enjoy the benefits of having a car. It gives us independent transport mobility, but with an ageing population, one of the hardest things to face is when we reach a stage when we can no longer drive our car, through failing sight or medication. We are an ageing population. How can we still get that independent transport mobility? Perhaps we've got to sort of give promotion to adult tricycles.

PROF WOODS: Yes, I noticed that. I was trying to envisage my mother getting out of her car and going onto a trike, but I didn't quite get there.

MR JOHNSON: It's not a thing we think about, and yet I've had people come to work and they're in tears because this is their last trip in a car, and they've enjoyed driving a car from the age of 16. They're in their 80s.

PROF WOODS: It's a very real loss of independence.

MR JOHNSON: But, I mean, an adult tricycle - if you sell the car, you've got no rego, no insurance, no petrol - you can afford a pretty nice adult tricycle. You could have your photovoltaic cover on the sort of shopping basket on the front and the back, with a little battery-operated motor, just to give you a little bit more distance. Most older people don't want to whiz up to the coast. They want the local circuit - the shops, the pool - just the local circuit. They've got all the time, and if they can still retain that independence, I think that's something that could have great environmental and social benefits.

We're still sort of rusted onto the car cult at the moment, but until that tax shift takes place, to bring in the fuel cell car, perhaps the next best one - the more energy efficient choice of a car - would be something like a Toyota Prius or a Honda Insight - the hybrid petrol-electric motors. They cut fossil fuel use by 50 per cent, so that's a bit of a way to go.

The other area that I think we've really got to look at is waste minimisation. I should have explained, I run a centre at a school for children with moderate to severe intellectual and physical disabilities. They're in an area of Aspley in Brisbane. As Barry Jones said in Sleepers, Wake! "Your job opportunity will depend on your postcode." Now, Aspley is an area where there's a very strong work ethic, so although these kids may be unable to read, write and count to 10 or speak, their expectation when they leave school is that they will go to work like their parents do. So we tried in 83 to start providing some sort of work for these students. It was very simple work, just crushing aluminium cans, to teach them basic work habits.

This sort of situation has grown like Topsy, but we have a 24-hour-a-day, 365-days-a-year centre, where the public drive in, drop off their recyclables and drive out. The students during school time, and past students, sort the materials and

try and add value to them by pulling out as many re-usable, refillable containers as possible. Three mornings a week, a group of retirees volunteer from 4.30 am to cut up large pieces of cardboard, which the kids can't use, with a Stanley knife. Now, these guys aren't greenies. They get the social contact they've had through their working lives, and they still want to be useful citizens. An important thing is, because the centre is open the whole time, the public see what these kids with disabilities can do, not what they can't do, and what the retirees can do.

Waste minimisation means minimising the waste of materials, but more important are the people who want to be useful, contributing members of society. We've got this ageing population. We've got people with disabilities, and by enabling them to contribute to society, not only do you get health and mental hygiene benefits, you're enabling them to earn their keep, whether it be on a disability pension or an aged pension. This is the sort of thing we should perhaps be looking at. A simple one would be, a lot of older people walk along twice a day. We should be looking at more older people - groups of older citizens - walking a group of children to their local school.

PROF WOODS: That's now becoming quite common in a lot of - - -

MR JOHNSON: I think in Europe it happens a lot.

PROF WOODS: In Australia.

MR JOHNSON: That's something that gives local people - - -

PROF WOODS: Our local primary school has the school bus that wanders along, with somebody in the front and the back.

MR JOHNSON: Yes. Giving kids that grandparently figure, in fragmented families - I think that's an important part. It gives them a sense of place that could be used more. If we're minimising waste in our cities, I think we've got to perhaps look at the volume based charges - the Seattle system. Someone was saying before about when you're doing the right thing, you're actually subsidising other people who are burning their airconditioners, if you don't have one. So if you're someone who takes your recyclables to your local community recycling facility, composts your organic material, buys re-usables as against disposable, you could have a 60-litre collection of garbage as against the 240-litre collection of garbage.

Now, if you're doing the right thing, you're actually subsidising those who are doing the wrong thing, and that's a great way of cutting down material, because if you're a waste manager, the more stuff you can con people to dump in a big hole in the ground, the better they like it, the more they handle. If there's plenty of aluminium there, at $1000 a tonne, very simple to recycle. When we get short of

landfill space, we will pay them to dig it up again. They will call it resource recovery rather than double handling.

PROF WOODS: Our local council has two bins, and separate collections of recyclables. Again, isn't that one that's happening quite - - -

MR JOHNSON: It has started to happen, but do we have to put that bin out each week, or do we put it out when it's full? If you put it to the next-door neighbour's one, the truck comes along and stops once rather than twice. I mean, they're only little bits, but over a city - as I say, these are only very simple, practical things. We've put together what we call 365 hints that don't cost the earth. World Environment Day - that's one day a year, but if you clean your teeth once a year, that's not very effective. We've tried to put together 365 little hints that don't cost the earth.

The federal government put together a couple of booklets here, Global Warming: Cool It! Now, that's very readable, very presentable stuff. You don't usually get much stuff from the federal government like this. This is really worthwhile, and those sorts of practical household hints could be put together in a sort of handy-looking thing for kids or adults. The same sort of thing about biodiversity. They're both very readable booklets. They're not too technically difficult, and they're the sorts of resources that I think would be very valuable. I will leave those with you.

PROF WOODS: Thank you.

MR JOHNSON: The other one to look at when you're looking at energy efficiency is the differentiation - as in Germany - between sales packaging in the cardboard box that's around a packet of toothpaste - that's the transport packaging; that's the cardboard box around the packet of toothpaste - and around the tube, which is called sales packaging. In Germany the manufacturer of the transport packaging is responsible for collecting the cardboard box from the shop and recycling it. Colgate-Palmolive toothpaste is sold in Germany just in a plastic tube, so the manufacturer can sell a cheaper product, which is good for the consumer, the manufacturer of Colgate-Palmolive in Germany can pack more toothpaste tubes into a box, so they cut down on their transport costs and the shop owner can fit more toothpaste tubes on the shop shelves. That's one of the sort of very simple things that could be could be looked at, that give energy efficiency benefits all around.

The other thing is the energy requirements of different forms of packaging. One example that stands out in transport terms as a gross inefficiency would be the waxed milk carton. It's a high-quality paperboard, fully imported from Europe, manufactured into a single-use, so-called recyclable milk carton, recycled in only one place in Australia. In energy consumed in transport of this high-quality paper from

the other side of the world, maybe up to Broome and then back to Shoalhaven, it's hardly sustainable.

I think the other thing that we should look at is one of the greatest energy efficiency measures that could be brought back into Australian cities now that they're getting larger and there is a greater density of people in the cities, which would be a return to refillable glass bottles and jars. What we'd need to look at would be a standardisation in the shape and size with the most commonly used jars - say 100 gram, 250, 500 - as well as a standardisation in the shape of beer bottles for beers brewed in the city, as well as soft drinks and milk. These commonly used containers used in our capital cities would be mandated as refillable under compulsory deposit legislation for containers designed to last. As I say, a glass bottle lasts for a million years in perfect condition. In Finland 98 per cent of soft drink bottles are refillable. Some figures for a lot of European countries are pretty respectable.

PROF WOODS: I understand the term "refillable", but I also understand the term "refilled".

MR JOHNSON: Yes.

PROF WOODS: I'm just wondering if there's a difference between the 98 per cent of containers that are produced or used that are refillable versus how many are actually refilled.

MR JOHNSON: As I say, I'm not sure of the figures on that one, but this is something where a bit of research needs to be done. You will see from the figures I've got, they go back quite a few years, because I've talked to a few people, but very few people seem interested in the difference, the manufacturing costs of single-use as against re-usables. I have tried to get help and I get very little interest in that. The environmental groups are so busy saving this and saving that, they've got the big problems like global warming, climate change, those sort of things. Obviously they don't have the resources to do that, but I think some more up-to-date figures should be looked at in this area.

As I say, the primary sourcing of these bottles could be carried out in centres like Kingfisher Centre, with the labour-intensive workforce of young people with disabilities and retirees; those who want to contribute to society, who are still wanting to be seen as useful, contributing members. Some people don't want to contribute to society, but most people do - given work that is valuable - and that's an area that could be looked at. I think one of the speakers before said that the public take-up of more energy efficiency measures should lead to a greater public acceptance for the need of general greater efficiency measures.

I've got a five-minute video, courtesy of Channel 10, that I'll leave with you. Perhaps you might like to look at that because it is a rather unique facility. Again, all over Australia we have huge numbers of ageing people and people with disabilities who would like to contribute to society in a meaningful way, earning their keep as it were, and we're not tapping into that. We're not minimising the waste of people who want to be useful.

PROF WOODS: Yes, it's an excellent idea.

MR JOHNSON: One other small example is bush revegetation. It's an important area. Our students don't have the skills to stick a tree in the ground but they can prick out a thousand individual seedlings and pot them up for bush regeneration projects. There are similar numbers of older ladies who would perhaps enjoy that sort of work, having the social contact and still being useful people, working in a facility out in the community, still contributing.

I think Friends of the Earth have mentioned this: at the moment we have a sort of Mickey Mouse economics, where we have a huge economic focus, we tag on a little social, we tag on environmental, but you've really got to see a truly viable economy as almost a subset, where you have a truly viable economy but you have to have a social cohesion and you have to be able to breathe the air, drink the water and have the soil to grow your food. We've got to have that transition so that we have a future.

Our kids are only 20 per cent of the world's population but they're 100 per cent of the world's future. It's got to be looking more than three years ahead. There is a great book, Do-It-Yourself Earth Repair, put out by the Commission of the Future. I think that's something that needs to be brought back to life again, so that we do have a long-term commission saying, "Well, what sort of future do we want 15 years ahead?", not just three years ahead. I think that produced a lot of worthwhile material and perhaps that needs to be looked at. Thank you.

DR BYRON: Thank you very much, Harry. There's lots of very good food for thought in that.

PROF WOODS: I found the submission quite comprehensive and you've taken us through it in some detail, so I don't have anything further to raise.

DR BYRON: No. It was very practical, as somebody said earlier.

PROF WOODS: Yes.

DR BYRON: When you were talking about the idea of using a sporting icon, I couldn't help thinking of a former captain of the Australian cricket team who is on

TV all the time flogging big industrial size airconditioners to go into McMansions. So maybe that's the reverse example of what you're after.

MR JOHNSON: Reverse garbage.

DR BYRON: Yes.

MR JOHNSON: If they can sell important things like socks and T-shirts and real estate, surely - - -

DR BYRON: Yes, selling a future, a habitable planet.

MR JOHNSON: One thing about the economic side of things that was mentioned, if you take the insurance industry, I think in Florida, for example, from 1970 to 1992 the people of Florida paid out $10.5 billion in insurance premiums. Cyclone Andrew in 1992: the payout from that one cyclone was $16.5 billion. The insurance people are pretty big in this world and I would think it would be in their interests to make sure that we don't get too many sea level rises, because some of these mansions around the canal developments are going to become bottom-of-the-harbour schemes. I think the insurance industry should have a vested interest in improving energy efficiency which would cut the rate of climate change.

DR BYRON: I think you will find that many of the world's biggest insurance and reinsurance companies are already very active in promoting measures to deal with climate change.

MR JOHNSON: Yes, but we don't hear much about it.

DR BYRON: They're working very hard behind the scenes because they're very concerned, obviously. I think now, with an eye to the time, we're going to have to keep moving.

MR JOHNSON: Sure.

DR BYRON: But thank you very much for going to the trouble.

MR JOHNSON: I'll leave it with you.

DR BYRON: Yes, please. Do you want that video back?

MR JOHNSON: If it's possible.

DR BYRON: Yes, sure. We will look at it and we'll get it back to you within a couple of weeks.

MR JOHNSON: Yes.

DR BYRON: If we've got any questions on the video or anything else, we'll get back to you.

MR JOHNSON: Sure. Thank you very much.

DR BYRON: Thank you.

DR BYRON: Jeff, when you're settled and comfortable and everything is installed, if you could introduce yourself and your company for the transcript, and then take us through the presentation, and then we can talk about it.

MR THONG: Great. Thank you very much for your time.

DR BYRON: Thank you.

MR THONG: I work for a company called Lincolne Scott. We're headquartered in Brisbane, and we're consulting engineers to the building industry. As part of my role, I've worked in Brisbane, Singapore and Brunei, predominantly in services, design and supervision. In 1998 I went back to Singapore for five years and fairly specialised in energy efficiency, performing audits throughout South-East Asia, giving advice to government departments in Singapore, and for a short time chaired the Industry Committee for Energy Efficiency in Singapore which was a group of service providers - like I was - as well as equipment suppliers, like Honeywell, Johnson, Train Airconditioning, who had an active interest in energy efficiency and selling their services.

I've just recently returned to Brisbane and looked for this kind of opportunity to share some of the experiences I've had in terms of selling energy efficiency to buyers who can range from operators, to engineers, to building owners, to larger corporations in a general form. That's pretty much my presentation today. So just a quick agenda. I'll run through what I think energy efficiency does, just to set the platform for a start. Where does it apply from our perspective? I'll run through the parties involved in the purchase of energy efficiency within our limited scope, the barriers that I've encountered personally in trying to market those services, incentives that I think could work for this type of work and, to conclude, I'd like to present specific targets in sort of hot-spot areas that should be applicable across the board in specific cities.

What does it do? Basically, energy efficiency reduces operating costs and reduces maximum demand; reduces energy consumption and reduces demands on energy infrastructure without compromising acceptable conditions to occupants, as opposed to energy conservation which is otherwise. My scribbled chart in terms of energy on the Y-axis and time on the A-axis, a normal day load profile of a facility that we experience has that type of profile. In the morning it's low; as it gets towards lunchtime it's very high; and peters off towards the end as the ambient temperature comes down and load becomes less. So it being midnight and this being working hours, with an efficient system you'll obviously experience reduced maximum demand and the area under the curve gives you reduced kilowatt-hour consumption.

So where does it apply? Almost everywhere: manufacturing; regional facilities as opposed to urban facilities; commercial buildings in the cities, CBDs;

transport and energy production from the power stations. We recognise that the most needed area in terms of infrastructure is probably in the high-density areas where there are large volumes of energy consumers. So the parties involved in buying energy efficiency or accepting proposals: the buyer being a facility's operator or building owner, an external seller who would be a service provider like us or an equipment manufacturer, and an internal seller who's possibly an engineer within the facility, an operations manager within the facility. That internal seller sells to the buyer. These two are of the same organisation typically. They're the three parties identified.

Who is the actual buyer? It is actually the person signing the cheque. We often get access to not the person signing the cheque; we often get access to the engineer or the operations manager, and they will be the internal seller who will then sell it to the financial controller and/or the owner, specifically the buyer, the person paying for the service.

PROF WOODS: And the buyer has got a whole lot of competing people wanting that cheque.

MR THONG: Doing the same thing, yes. What do they need? A service or product of value. What makes us buy is perceived value, perceived versus actual. Actual value can be seen in many different ways, but perceived value is probably more important in a lot of ways, I find. You can do the best job in the world for somebody, but if they don't perceive that as valuable it's not worth much and they're not willing to buy that service. What makes people keep buying is perceived performance, so similar sort of lines towards that.

PROF WOODS: If it's seen to deliver.

MR THONG: That's right, yes. Barriers for buyers: we will always provide a proposal and then evaluate the risk involved in that purchase offer and assess the benefits. They may or may not go with it or ask for another proposal. They'll say, "Yes," and we'll proceed or they'll say, "No," and we go to the next customer. I put here again "perceived risk and perceived benefit" as part of what they see as being the best way to communicate the value of our services. That applies not only to our services but to energy efficiency in general.

There's a risk involved with the unknown of a lot of energy efficiency products that are out in the market, and the benefits are varied, depending on who you speak to. They could be interpreted differently in terms of how much they benefit a facility in qualitative and quantitative terms. They're all risks that go into the assessment process. I'm opening myself up to comment, but they're the two main barriers that I see. As part of assessing the benefits, we'll often be asked, "What are the incentives for us to buy energy efficiency or energy efficiency products?" They can be grants,

which I think are a short-term remedy to particular items, but what they do is they create a volume of purchasing in the market that can reduce costs initially. There are rating schemes for corporate citizens, and they're mainly voluntary sort of schemes like Green Star, ABGR and the Greenhouse Challenge.

What are the market drivers that we see? Market drivers are things that customers need. We see existing buildings as targets. We see new buildings as targets, and developers that are building new buildings or refurbishing existing buildings - I'll go back one page - they often look over the market drivers and incentives that are there and, unless they're large corporates that have the facilities to go into the rating schemes since they're voluntary, they tend not to buy it, as the costs are excessive. The risk that they evaluate is high versus the benefits that they foresee. There are two distinct types of facilities, whether they're existing or new, in terms of buildings. I'm targeting buildings specifically, because that's our business. There are a lot of other areas, like manufacturing and mines in regional Queensland, obviously, but my best understanding is with building facilities.

As a target, I think specifically if we could address certain CBD areas - this is Brisbane - it should apply also to other cities in Australia. High-energy density areas and the energy supplies available there: if the infrastructure is there and the consumption is high, the impact of energy efficiency is less. If the infrastructure is there, but the consumption is almost exceeding that infrastructure that's available, the impact from energy efficiency processes is much greater because of the impact, in turn, on the infrastructure that's available.

What do we look at? We look at hotels, which are 24-hour operations; large commercial buildings that have large consumption, the peak being at lunchtime or between 11 and 2 o'clock in the day; the areas where, if maximum demand could be reduced through energy efficiency, the gains and the benefits not only to the building owner in terms of the running costs but also to the infrastructure that's around can be substantial if it's pooled together. An individual building within the CBD doing their best to reduce maximum demand is like a needle in a haystack perhaps, but a combined effort generally among the community would see a great benefit to those areas which cause hot spots within the CBD.

I'd really like to identify those as the market sector that stands to gain the most, where there are high-density areas of energy consumption with the energy infrastructure potentially at its limits. I think that is what drives the demand for that sector of energy user. My question may be do these persons, as a group, know that they have the most to gain from this? There is plenty of press about these issues, and I'm not privileged to how that is accepted within a corporate group within those particular hot spots. Do they work together as a group to benefit generally from the gains that energy efficiency can give?

Just with a quick conclusion, already well progressed - and there are any number of fliers and web sites and educational processes out there, from schools to corporate entities, of case studies, which is a method of reducing the perceived risk of a buyer. Can we establish the most favourable targets in view of infrastructure benefit and buyer benefit and their particular situation? That would go for existing facilities, new facilities, new buildings, as well as their location; where they're at physically and what infrastructure is available to them.

When I was in Singapore, we looked at incentives for buyers of energy efficiency and we worked closely with the building and construction authority over there. The immediate question that always came up was, "Can we get grants or handouts from the government to purchase this equipment?" The major equipment, obviously, in a building is airconditioning. The answer was invariably, no, they didn't want to travel that path because they felt that it wasn't a sustainable process. It served a purpose for what was potentially a short period of time, and they had tried it before. Once they had to remove the grant or the handout or the cash incentives that they had, the market didn't buy it any more. So they felt it wasn't sustainable.

What we'd be looking for is a market-driven incentive for developers or existing facilities' owners, and that gets back to what benefit they can see as a group if they're in that particular hot spot within an area that has infrastructure limitations as well as high-energy use within those areas. Obviously, those high-energy users have the greatest potential to reduce their maximum demand, as well as their own consumption.

Areas of high-intensity energy demand need efficiency as part of the jurisdiction vision for the current and the future. Brisbane City in South-East Queensland has a vision statement for development throughout the area. I haven't read the document, but if it has a visionary statement in there about energy efficiency and what benefits there are for it and what the government feels is necessary for people to gain from energy efficiency and energy efficient technology, I think that goes a long way to setting a platform for people to follow and sort of drives a direction from government. That vision isn't easily projected from service providers like us. That vision is best to come from the relevant jurisdiction.

I've put in the last note, more as a last thought than anything else, that there are a lot of schemes available to facilities at the moment and they're often confusing, so if there's a new one that comes out, in terms of targets - national energy efficiency targets - I would hope that that's incorporated and administered under one of the existing schemes to prevent confusion in the market about another scheme coming onto the market, and another target that they will have to follow. Energy efficiency is a subset of environmental issues and gains, and equally I think any scheme or targets for energy efficiency should also be a subset of any environmental rating schemes that are out there.

DR BYRON: You don't have a particular scheme in mind, that you think this could come under?

MR THONG: For existing buildings, the one I'm familiar with is ABGR. A lot of the research that goes into a review of a building will identify energy efficiency measures in there under that scheme. For new buildings, Green Star might be one of them. They're the two I'm familiar with. There's any number of others.

DR BYRON: That's actually one of the points that has come up a number of times, that there may be a certain confusion in the marketplace when people look at ABGR and Green Star, BASIX, NatHERS, BERS and so on.

MR THONG: Absolutely.

DR BYRON: A number of people have said there seems to be a proliferation of similar but not identical, similar but sort of related, schemes within each state jurisdiction. For an organisation that operates across states, you've got to get your head around a dozen different schemes in each state, plus the Commonwealth schemes that are sort of an umbrella over that. It doesn't always help.

PROF WOODS: Is it your experience that there is considerable confusion and the plethora of schemes adds to that?

MR THONG: Totally, yes.

DR BYRON: There are many very interesting aspects in this, but particularly because you've got international experience, which I don't think any of our other submitters have had. The sorts of barriers and impediments that we're asked to look at in Australia, are they any different here than they are in Singapore, or is there a remarkable uniformity in that people seem to be reluctant to undertake measures that seem to make very good sense?

MR THONG: The bottom line is cash, dollars. You can make the best recommendation in the world; present, monitor and model facilities and processes that someone like us would think is a no-brainer; and the payback is within one or two years, which is generally accepted as three - return on bonds in the US is 20 years but for an energy efficiency project it's down around three. If we can recommend something that gets a payback in six months but the capital cost may range from $100,000 to $3 million, if that cash flow there isn't available to someone within the next five years, where it's budgeted, it won't happen.

Every organisation is different. Some people leading organisations have a personal agenda to promote this type of work, and some don't. A classic scenario is

building developers versus building operators, where a building developer will sell their property to an operator. The operating costs of the facility don't interest the developer - they do interest some but not all - but in general the operator is more concerned with the operating cost. But the infrastructure within the building, the energy-consuming devices, are sold to the operator or maintained by the operator, but they're put into the building by the developer.

DR BYRON: The famous split incentives problem.

MR THONG: If there can be a cheaper install for the developer that is better for him, which is not as energy efficient as a more expensive product, then eight times out of 10 they won't go for energy efficiency.

PROF WOODS: Why isn't the market working? Why aren't property owners demanding of property developers better operating facilities?

MR THONG: I think that's changing. I think it's heading in that direction, with ratings schemes as they stand, however many there are. I think that that is developing a situation where, like you say, even tenants within a building or occupants within a building are demanding that type of service delivery within the building that they move into. That is changing. I've only seen it over the last 18 months since I've been back, but certainly overseas it's less prevalent in that exposure. I think Australia has done a lot of great work in providing the education to occupants that they should be demanding this type of efficiency within their facility that they're occupying and paying for. So I think that's changing. The question as to why people aren't demanding it: like I said earlier, do they know they have the most to gain from it as a group? Perhaps they don't.

PROF WOODS: But do you get constantly surprised, and are you therefore changing the way in which you make presentations, that you can present, as you describe, a no-brainer, and a proposal will have payback under three years of great significance, and they still say, "Well, we're not going to allocate the capital to it," and is that causing you to rethink your strategies and behaviours to draw back their attention?

MR THONG: I'm limited to how much I can change my approach, because effectively in presenting a type of proposal like that, we have to present facts.

PROF WOODS: That's always helpful.

MR THONG: There is a plus/minus accuracy within those, and for someone to invest $3 million in a project, based on calculated numbers, et cetera, on a specific return, they will want that plus/minus very accurate. We ourselves, as service providers, don't want to mislead anybody, any of these buyers, and banks who are

financing this type of work also want to know that their bases are covered. So I'm limited in what I can change. I can only present facts.

PROF WOODS: That's an interesting one. It's not only the owners of the facility but the owners of the capital, ie the banks, or the intermediaries of the capital. Are they an active participant in being sceptical and very risk averse in energy efficiency projects or are they fairly passive?

MR THONG: It depends on the bank and it depends on their experience with similar projects. Banks in the States have fairly well-documented case studies of returns on investment for financed operations. Our committee had high-level meetings with Citibank and several banks in Singapore to help to finance energy efficiency projects. The language is different. As an engineer, I speak a certain language and certain terminology. As a bank, the financial terms - their interpretation of return and investment is totally different. So there's a - - -

PROF WOODS: Communication gap.

MR THONG: Totally, which is neither party's fault.

PROF WOODS: No, it's just the reality.

MR THONG: But that's how it ends up. Some banks actively go after this type of work, or finance proposals. A return on investment under three years, if you excuse the last sort of three years in Brisbane, is fairly good in terms of property so to speak, or shares; or even if you lay cash in a bank and get 5 per cent interest, your returns are never going to be anywhere near three years; same with bonds. The US government - I read their energy performance contracting guidelines about four years ago. They base an acceptable payback on similar returns to what you can get from bonds, which is 20 years or thereabouts. But that mind-set is different for different people. Different buyers have different ideas about what's acceptable and what's not.

DR BYRON: We've spoken to a number of people in the energy performance contracting business and a number of them have suggested there seems to be a problem in that you needed a certain amount of relationship or trust or mutual confidence and so on, that both the client needs to trust the consultant and the - maybe it's just a question of working out a very clever way of writing contracts so that the risk is managed between the two parties.

But when we ask major Australian businesses why they haven't taken up some of these opportunities that seem breathtakingly profitable, one of the answers we get is, "Well, yes, that's profitable, but if I've got $1 million to spend, maybe I should put it into the sales force or marketing or quality assurance or something like that; and

there may be other things that are even more profitable than the energy efficiency measures." So even when the energy efficiency measures look to us - or look to the engineers - to be terrific opportunities, there may be other things across the whole business spectrum - - -

MR THONG: Exactly. The operating costs of a facility are a small percentage of the operating costs of an organisation: manpower costs, cleaning, all sorts of things. We did a lot of hotels and hospitals in South-East Asia and if they had $1 million to spend, they'd spend it on carpeting the lobby or granite refits of the lifts, in front-of-house areas. But if we could invest that in a more efficient plant that sat out the back in the plant room, it wouldn't happen.

I don't know whether it's still available on the Internet, but an interesting case was the Hyatt in Singapore. It wasn't done by the company I was working for, but the driver for the project was within Hyatt and he was in the finance department, so he understood the benefits of what was happening. He actually drove the whole process. They've ended up with one of the most efficient hotels in - at least in South-East Asia. I know they won a couple of awards. But the great principle about how that worked was that the language barrier wasn't there any more, between the finance person and the buyer signing the cheque.

PROF WOODS: It was being done from inside.

MR THONG: The engineer who has an operating budget and needs to make that thing in the plant room work until it falls over, you know - - -

PROF WOODS: So don't you need a sales force of accountants? That's an interesting concept.

MR THONG: Yes, but I don't know that a lot of accountants would like to do that.

PROF WOODS: For a fee I'm sure an accountant would do most things.

MR THONG: Yes. Definitely there is a gap in communications and why businesses buy and why they don't. Some do, to their credit. Some very actively promote their own corporate vision for energy efficiency.

PROF WOODS: But you were saying that's the leadership thing, that that's coming down from the top?

MR THONG: Generally, yes. There's very much a corporate philosophy of that type of thing. It's top-driven; it's not bottom-driven.

DR BYRON: I met a couple of years ago with people from your company in

Melbourne when we were doing a different piece on the environmental performance of commercial buildings. They were telling me about a number of the audits they'd done for large commercial clients like department stores and banks and so on. Have you been involved in that sort of auditing work as well? Is it as difficult to convince a bank or Coles or Woolies about energy efficiency opportunities as it is to convince a glass-maker or a brewery or a manufacturer?

MR THONG: I wasn't involved in those audits with Lincolne Scott, but I was involved in that type of work overseas. It boils down to the organisation. Those particular organisations did want to do it. It was seen as beneficial to doing it for them, so that they could (a) save money and (b) project themselves as good environmental citizens; so there were obvious benefits. I mean, the start point was doing those audits. Audits don't save money, they just identify ways to do it, then someone has to actually go out and perform the recommendations, but it's no different, to answer your question for an organisation to buy into getting that information. It depends on the organisation.

DR BYRON: There's not the front cost in doing the metrics and getting the information to even sort of diagnose if there's a problem, the nature of the problem, potential pay-offs and redressing the problem and so on. So if you don't have the appropriate metering and so on in place, then presumably management can go on for months - well, years - without knowing exactly where the inefficiency is occurring or that it's occurring.

MR THONG: The Australian standard has gone a long way to identifying that type of thing by separating different levels of study. There are levels 1, 2 and 3, level 1 being the very minimal identification of certain things which could lead to identifying a specific area of a large consumer that needed a closer look. Obviously, within those different levels, there are different capital requirements or up-front costs, so to speak. Either way there is still an up-front cost. People have to physically go down there and do it. Some organisations do it complementarily, but often owners don't want to do that because they are obligated to those organisations. Yes, there is a cost involved.

DR BYRON: And it's going to have to be paid for somewhere along the line.

MR THONG: There are benefits that come out of it. Different facilities are different and that's why the target has to be very specific. A brand-new building that is one year old and been operating and been finetuned and been assessed by someone and commissioned properly - there's not much point going into that type of building. But if there's a 15-year-old building that has old equipment, has a capex within the next three years that they need to change their equipment, and operates 24 hours a day, the projected savings that you'll get from that type of facility will be much greater than the one-year-old building. So the target has to be fairly specific.

DR BYRON: I think we're going to have to leave it there, thanks.

MR THONG: Thank you.

DR BYRON: That has been extremely helpful, particularly your international insights there. Thank you very much for taking the effort to put this together for us.

MR THONG: Okay. Thanks.

DR BYRON: I said this morning, in my opening comments, that before we close we always ask if there's anybody else in the room who wants to come forward, or even somebody who has already spoken and feels the urge to come back and - - -

PROF WOODS: Make a rejoinder.

DR BYRON: Yes, or comment on something else. Would you like to come and just introduce yourself, once you are settled there in front of the mike?

MR LITTLE: My name is Phil Little. I have been in the building industry for some 50-odd years. Along the way I studied architecture and planning at the University of Queensland, for three-odd years. I've been very interested in sustainable development; I think that's a big factor in what we are talking about. Essentially, sustainable development addresses the needs of using resources in new ways.

We've just recently had a sustainable development fully approved by the Brisbane City Council and the EPA here in Brisbane. It is not yet built. It was a three-year exercise and I understand it was the first one in Australia that actually addressed all of the issues of energy use, water use, water conservation, water recycling, and how we are going to live in the future.

Essentially, one of the important things was to provide local employment on site, to cut down the amount of commuting and job trips, and develop a community opportunity for businesses to run literally on site, using new communication systems, again to cut down the need for commuting. Out of that three-year study, amazingly what we found was that the costs of development are roughly the same to develop off-grid as on-grid. An amazing factor of that is that most of our pollution comes from the services provided; for example, sewerage, water services and stormwater access.

Looking at the whole thing holistically, and looking at both embodied energy and the energy that's used to run a village or a community, it seems to me that we need to investigate the whole off-grid opportunities because that simply means that the major advantage is that there is no pollution fallout from that, whereas once we go on-grid with sewerage, water and power, everybody lives downstream so we've got pollution problems and whole new ways to look at water use and what have you. So the studies have been done and proved.

How they are going to be applied in the future is what I'm particularly interested in. Because of the complications of the matrix, water, water recycling, energy and power are all interwoven. Essentially, it seems to me that we need to look at how we can develop residential land off-grid. That's about all I've got to say.

DR BYRON: That's very interesting. What I was looking up was, we had a submission from Michael Mobbs, in Sydney.

MR LITTLE: Michael Mobbs. Yes, I know Michael.

DR BYRON: He gave us some very interesting figures: that the cost of a housing lot, of going into one of these new developments that were sort of off-grid, that didn't have the stormwater and the sewerage and all of that, you could do it for less than a third of the conventional way of doing it, was his estimate.

MR LITTLE: Was that just for water?

DR BYRON: No. That covered everything: water, sewerage, stormwater, energy, developers' contributions, the council and all these sorts of things. We had another presentation from a company that's installing basically little gas mini-generator things that will supply electricity, heating water - - -

MR LITTLE: From methane?

DR BYRON: No, I think they are running off natural gas.

MR LITTLE: A gas turbine, yes.

DR BYRON: They are micro-distributive things.

MR LITTLE: Microturbine.

DR BYRON: They are putting together a greenfields housing development where all the houses will be supplied by this thing. It's completely off the electricity grid and providing heating and cooling. Other people have talked to us in the water context. It does seem that there are lots of opportunities, when we start thinking about devising a new village or a new residential development differently from the way we've always done it in the past. We've always assumed that the stormwater and the sewerage and that stuff go in there first.

MR LITTLE: It seems to be we can't do it the same old way that we've always done it and expect things to change. We seem to also have a major conflict between industries' needs - about 75 per cent of energy - and domestic. That seems to be able to be looked at in two different ways. Industry, the way I see it, could be running off coal-powered systems and domestic could be running off off-grid systems. The major advantage, of course, is that we cut down the greenhouse factor but also the pollution factors of contaminated water going into streams, and all the rest of it, which is another big global factor that we've got to address. It's a very costly thing to

address. When you really look, at the end of the day - particularly in South-East Queensland, where we're now looking at major increases in population - if we develop all the infrastructure, shall we say, on an engineered 18th century technology basis, we're going to end up with the same amount of escalating pollution, relevant to the increase in population.

The final thing I'd say is that our development patterns basically develop in dormitory suburbs, so that essentially means we must increase the amount of transportation and commuting and roads. We'll end up like LA if we don't change.

DR BYRON: I think somebody else made that point today, that unless you have an efficient public transit system in place, you can design a fantastic little eco-community where the planning is done right, the individual houses are done right, the appliances within the houses are done right, but if it means that everybody is going to drive their Commodore into the city and back every day, then you're undoing a lot of that good work.

MR LITTLE: Again, it depends if we plan villages or we plan - - -

DR BYRON: Communities.

MR LITTLE: - - - what we call jobless dormitory suburbs - the planning and planning policies. Government really needs to have a look at that. Now, the fact is we proved that we can do it. We proved that it can be done economically. But it seems to me that the big end of town - for example, I'm just making a note now that the electrical retailers are profit driven, they must be profit driven because they've got a fiduciary duty to their shareholders to be profit driven. So it really looks like it's a matter of a government philosophical shift to say, "We need to make decisions in such a way that they can make their profits, but in such a way we achieve the greenhouse minimisation and water minimisation problem."

DR BYRON: And the government sets the boundaries within which they can then go and pursue their profits, but the government sets the parameters?

MR LITTLE: Yes, but the difficulty is, it is like putting Dracula in charge of the blood bank.

DR BYRON: Yes. Mike?

PROF WOODS: No, that's fine.

DR BYRON: Okay, thank you very much for those comments, Phil, and in fact it's good to have that on the record, too. Is there anybody else? If not, I'll declare the public hearings adjourned and we'll reconvene in Canberra on Monday morning.

PROF WOODS: Indeed we will.

DR BYRON: Thank you very much. That was terrific.

AT 12 NOON THE INQUIRY WAS ADJOURNED UNTIL
MONDAY, 22 NOVEMBER 2004

INDEX