PRESENTATION TO SENATE INQUIRY INTO GLOBAL WARMING

SUSTAINABLE ENERGY INDUSTRY ASSOCIATION (AUSTRALIA) and AUSTRALIAN AND NEW ZEALAND SOLAR ENERGY SOCIETY

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The Sustainable Energy Industry Association (Australia) was formed in 1999 by Australia's major sustainable energy organisations, who recognised the need for a peak council to support the development of the sustainable energy industry, and to liaise with Government. SEIA's mission is to promote the Australian research, manufacture and application of sustainable energy and to encourage the uptake of renewable energy and energy efficiency products in both Australian and international markets.

The Australian and New Zealand Solar Energy Society has promoted the development and use of solar energy (including its indirect forms such as wind and biomass) for many years. It is a founding member of SEIA

Summary: Key Points

- Australia must ratify the Kyoto Protocol as a matter of urgency to re-establish credibility
- Australia must cut greenhouse gas emissions from fossil fuel use - by much more than proposed at Kyoto. Yet we are unlikely to meet our Kyoto obligation unless we accelerate our efforts
- Today's investments in buildings, equipment and infrastructure determine future levels of emissions - but we're making the wrong investments
- Sustainable energy is a strategically critical element of greenhouse response
- Sustainable energy can create jobs in both urban and regional areas
- Funding for sustainable energy RD&D and commercialisation must be increased
- Sustainable energy products and services are a potentially important export opportunity
- Establishment of energy markets has increased greenhouse gas emissions. Serious remedial and compensating action is urgently needed
- We need to dispel the *Big Myth* that cost of greenhouse response is too high: many response measures are (or could become) cost-effective, and the cost of failure to limit global warming must also be considered
- Comparisons of the costs of greenhouse response options often undervalue and over-price energy efficiency and renewables, leading to inappropriate policy priorities
- Governments, business and the community must be made accountable for their greenhouse performance, and all policies that impact on greenhouse gas emissions must be harmonised

- Australians need a positive vision of a successful low greenhouse impact Australia
- Policymakers need to re-evaluate the significance of the role of end-use consumers in responding to global warming: they are much more important than is often realised
- Australia must set a price for carbon emissions by introducing an effective Emissions Trading Scheme as quickly as possible. If this is too difficult, an interim carbon levy is needed. We cannot afford to allow uncertainty to block effective action.
- Concerns about carbon leakage to countries that do not yet have to meet emission targets are ill-founded

Australia must ratify the Kyoto Protocol as a matter of urgency

This is a symbolic issue. The Australian and international community needs a clear statement. Australia needs to re-establish international credibility, after having pushed the negotiation process to the limit to gain its Kyoto Target of 108% of 1990 emissions with inclusion of land use change.

Australia must cut greenhouse gas emissions from fossil fuel use - by much more than proposed at Kyoto. Yet we are unlikely to meet our Kyoto obligation

Atmospheric concentration of the major greenhouse gas, carbon dioxide, is already 20% higher than at any time in the past 400,000 years, and is growing rapidly. The Earth's ecosystems are already operating in CO_2 concentrations beyond known experience over the past 400,000 years. It is unlikely that, even with our best efforts, concentrations of greenhouse gases can be held within double or triple pre-industrial concentrations.

Humanity is already committed to a global experiment in which we have no back-up systems, and to allow greenhouse gas emissions to grow is to move further beyond known experience.

It is also confirmed that the documented increase in greenhouse gas concentrations is resulting in global warming. It is also clear that:

- The Earth's response to warming has a lag - so even if we drastically reduced global greenhouse gas emissions immediately, we are 'locked-in' to further warming for decades into the future
- Global warming is not a benign increase in average temperatures: it involves giving weather systems access to far greater quantities of energy, leading to increasingly serious and frequent extreme events. These events have increasingly serious implications for both humans and natural ecosystems
- The rate at which warming is occurring is faster than plant and animal communities may be able to respond, especially when they are in small areas separated by developed areas.

If the Earth's atmospheric concentrations of greenhouse gases are to be held below dangerous levels, as is the intent of international agreements, we must act aggressively and rapidly to reduce emissions far below those proposed in the Kyoto Protocol. And we must assist developing countries to reduce their emissions, too. The implication of this situation is that Australia's greenhouse response strategy should look well beyond 2010.

However, data available to date suggest that Australia has probably already exceeded its Kyoto target. And factors beyond the areas targeted by the National greenhouse Strategy are driving ongoing emissions growth.

A more pro-active national greenhouse strategy must be developed as a matter of urgency. This should include development of scenarios and strategies that extend to 2030.

Today's investments in buildings, equipment and infrastructure determine future levels of emissions - but we're making the wrong investments

Any investment made today will impact on Australia's greenhouse emissions inventory in the post-Kyoto period, whether it is a new refrigerator, office building, car or power station. Investments that increase or maintain emissions instead of facilitating reductions will become a burden to the Australian economy, and potentially create financial difficulties for the businesses and households that make those investments.

Proposed investments in additional coal-fired power stations, shale oil developments and expanded road infrastructure, as well as increasing market share of fuel-guzzling four wheel drive vehicles, etc underpin continuing emissions growth. The reality is that Australian business and households are investing in infrastructure that will generate more, rather than less greenhouse gas. Even obvious subsidies for energy waste, such as the lower import duties on four wheel drive vehicles than on passenger vehicles, are being left in place while action to reduce emissions proceeds at a snail's pace.

To put the task into perspective, if Australia's underlying rate of growth in emissions is 10 million tonnes of CO_2 per year, we need to be investing between $1,000 million and $5,000 million annually in emission reduction actions to simply neutralise that growth. This investment is *not* a cost to the economy, but a cost-effective investment. The rationale for this calculation is as follows:

> *Emission of 10 Mt CO_2 from energy use involves spending around $1,000 million to buy fossil fuel energy. To avoid that energy use by investing in measures with a one year payback (that is, an extremely attractive 100% per annum internal rate of return) would thus involve investing $1,000 million in emission reduction actions. If, on average, measures offered a five year payback (ie a 20% per annum internal rate of return, still much higher than most investments offer), we would need to invest $5,000 million. These investments would be recovered through savings on energy costs.*

It is obvious that we are not investing in emission reduction at anything like the levels required to neutralise the growth effects. This must change.

In developing an effective long term strategy, it will also be important to balance investment in measures that deliver short term marginal reductions in emissions, such as upgrading power stations, with investments that deliver larger savings that are sustainable. A serious danger facing Australia is that some investments may look sensible if achieving the Kyoto Target is the only goal, but they could lock us into higher emissions beyond 2010 than other investments that may not look so attractive in the short term. In particular, any investments in fossil fuel systems must be evaluated within a framework that considers the possibility of aggressive emission reduction action beyond 2010.

A database of investments and their lifecycle greenhouse emission impacts (both positive and negative) should be established, so that appropriate investment priorities can be set.

It is a matter of urgency that businesses and individuals who make investment decisions should be fully informed about the implications of their decisions, and should receive financial signals that encourage them to make decisions that contribute to long term emission reductions and, to the greatest extent possible, are cost-effective on a lifecycle societal basis.

This Inquiry should recommend that a methodology be developed for comparison of response options that considers both short and long-term costs and benefits. Any future investment in fossil fuel consumption must demonstrate its compatibility with achievement of large emission reductions post 2010.

It should be noted that each week's delay in achieving the economically optimal rate of adoption of sustainable energy is costing the Australian economy millions of dollars, as well as undermining our potential to meet the Kyoto Target and ongoing emission reduction aims.

Sustainable energy is a strategically critical element of greenhouse response

Energy efficiency improvement and, in an increasing range of markets, renewable energy are the major planks of any cost-effective greenhouse response. To achieve the Kyoto target, strong emphasis on implementation of energy efficiency measures will be essential in the short term, while the renewable energy industry must be expanded so that, in the longer term, renewable energy systems can progressively replace fossil fuels. So the rapid development of a vibrant Australian sustainable energy industry is strategically critical.

Recent developments such as the 2% renewables target, GST package and the DISR *Action Agenda for Renewable Energy* are creating impetus for the development of the renewable energy industry. However, it will be important to ensure that these initiatives achieve their full potential, and that the momentum is maintained and expanded. This means:

- *For the 2% renewables target:*
    - *Action should be taken to ensure that strategically important technologies gain sufficient market share to support their development*
    - *It should be made clear that any penalty payments made will be invested in purchase of additional renewable energy, not transferred to consolidated revenue*
    - *Consideration should be given to upgrading the target to 10% of electricity generation by 2010, following on the example of the United Kingdom, and reflecting the need to balance recent high growth in emissions*
- *For the GST package:*
    - *Consideration should be given to managing the phase-out (or ongoing funding) of initiatives planned for the next four year period: rapid changes can seriously undermine the viability of businesses*
    - *The proposed restructuring of the Diesel Fuel Rebate should give due consideration to the capital costs associated with transfer to other energy solutions*
- *For the DISR Action Agenda:*
    - *Sufficient funding and resources should be allocated for the rapid implementation of recommendations*

Further action to support development of renewable energy is needed. This is discussed later in this submission.

Progress on energy efficiency improvement has been slow. Energy efficiency programs and businesses have suffered greatly during the restructuring of the energy sector (see below).

It has taken almost a decade to introduce modest Minimum Energy Performance Standards for some equipment. It still seems that it will be several years before basic energy performance standards for buildings are introduced. And, as noted below, we simply cannot rely on the energy markets to drive rational investment in sustainable energy solutions.

Since energy efficiency improvement is a critically important element of a successful short-term greenhouse emission reduction strategy, a much more effective action program is urgently needed. Key elements of such a program will be the introduction of effective incentive programs targeting key market intermediaries, including equipment manufacturers, distributors, retailers and installers, as well as intensive programs targeting consumers.

Sustainable energy can create jobs in both urban and regional areas

Investment in sustainable energy is fundamentally different from investment in conventional centralised energy systems for reasons including:

- A large proportion of the employment created is in light manufacturing and services. Creation of a job in these sectors requires modest capital investment relative to each job in conventional energy supply.
- There is scope to locate sustainable energy employment in regional areas because:
    - Harvesting renewable energy resources is relatively labour-intensive, and involves activity located at fuelwood and other biomass resources, at fringe-of-grid locations or remote energy grids (where wind energy etc are most cost effective). In some cases, harvesting of biomass during the growth phase of plantations can enhance their economic viability by creating a revenue stream early in the life of the projects
    - Installation of on-site renewables and energy efficiency measures involves significant labour input at the sites of energy use. Since these options are most cost-effective in high supply cost locations, many of which are in rural areas, employment would be created in those regions
    - Installation of renewable energy-based cogeneration systems and high energy efficiency technologies would allow regionally based industry to reduce its total energy costs and insulate itself from the risk of increased energy prices driven by the competitive energy markets.
    - Development of renewable transport fuel solutions in rural areas will help insulate them from varying world oil prices, and will also give them more secure access to fuel. This will help to maintain rural employment
    - Renewable energy and high efficiency systems can assist with rural development and rehabilitation programs. For example, solar pumping systems could play a valuable role in dealing with salinity in the Murray-Darling basin.

Funding for sustainable energy RD&D and commercialisation must be increased

In 1996-97, Government funding for renewables R&D was only $7.6 million. While some additional funds are becoming available under 'Safeguarding the Future' programs, a more substantial, long term funding program is needed to underpin the ongoing development of sustainable energy, including both renewables and energy efficiency. There is a need to build Australia's RD&D capability, which has been adversely affected by lack of stability of funding. The DISR *Action Agenda for Renewable Energy* has developed some useful recommendations, which could be expanded to include energy efficiency.

As with many other sectors, commercialisation is a weak point in development of sustainable energy. Additional assistance and support for stable market growth will be important factors underpinning commercialisation.

Sustainable energy products and services are a potentially important export opportunity

The emerging global market for sustainable energy products and services is potentially enormous. Sustainable energy solutions will play important roles in both developing and developed countries. Australia has strategic advantage in a number of areas of sustainable energy. And, at this early stage in the industry's development, there is still time to capture a share of other small but rapidly growing markets. But this will require focused effort. Again, the DISR *Action Agenda* has identified a number of useful strategies for renewables: these must be expanded to include energy efficiency, and sufficient resources must be allocated to achieve success.

Establishment of energy markets has increased greenhouse gas emissions. Serious remedial and compensating action is urgently needed

The early years of development of energy markets have seen:

- Unsustainably low energy prices, which have distorted investment decisions which will impact on energy use for many years - after prices rise again

- Cutbacks in government programs in the mistaken belief that the market could be made to operate effectively within a short period: it has now been almost a decade, and market failures are being 'locked in' by decisions being made now
- Continued cross-subsidies of energy prices
- Averaging effects in market frameworks: this occurs on a geographical basis, and undermines the economics of sustainable energy in markets where it should be most cost-effective
- A likely decision to use 'profiling' (at least in Victoria) to allocate costs to small consumers when they become contestable. Profiling involves using a representative load profile to estimate the cost of energy supply to a customer class, instead of using individual metering. This means small consumers - responsible for up to half of all electricity consumed - *will not* receive price signals that reflect their actions, but will be charged prices based on the average for their customer class. If some households use enormous amounts of airconditioning energy on hot days, the cost of supplying this load will be spread over all households. *So the electricity market may simply not work for small consumers: government must step in to provide appropriate signals and run compensating programs*
- Failure of regulators to ensure that market participants, including transmission and distribution system operators, give due consideration to cost-effective energy efficiency programs. For example, in NSW there are requirements for development of demand management plans, but no penalties for failure to implement them!
- Failure of many State and Commonwealth government agencies to set an example by effectively pursuing cost-effective energy efficiency measures.

As was shown by the Allen Report to DISR, electricity market reform has led to an increase above Business As Usual of 8 million tonnes of CO2 per annum by 1998. Even if the market were made to work, this blowout would not be eliminated until after the Kyoto Protocol period. Ongoing investment in expansion of power generation, transmission lines and distribution systems is increasing the amount of 'sunk' capital driving future increased electricity consumption.

We cannot afford to wait until energy markets are 'working properly', although market reform should continue as rapidly as possible. Clear price signals that reflect environmental costs must be incorporated into market frameworks, and compensating and complementary programs that balance existing market distortions and failures must be introduced.

We need to dispel the *Big Myth* that cost of greenhouse response is too high

Most studies of the cost of greenhouse response have considered only the economic impacts of response actions - and have grossly overstated these costs, as shown below. These studies have failed to consider the economic (and other) benefits of greenhouse response. This approach is outrageously biased. For example, no one would invest in airbags for a car if they considered only the costs, and placed no value on their value in saving lives in car crashes. At a less dramatic level, few people would spend money buying a refrigerator if they placed no value on its food storage capability. The Australian Bureau of Statistics (ABS 1998) has estimated that an unusually good farm season in 1995-96 contributed 1.3% of Australia's GDP growth. If global warming adversely affects farm output through more frequent droughts, floods, migration of pests etc, this factor alone could outweigh estimates of the cost of greenhouse response to the Australian economy.

The reluctance of scientists to predict the specifics of the impacts of global warming, combined with the enthusiasm of economists to model the supposed economic impacts of raising energy prices (used as a surrogate for the cost of greenhouse response actions) has led to a serious distortion of Australian greenhouse policy. Further, as shown later in this submission, the costs of greenhouse response estimated by most economic modellers, and interpreted by analysts of their studies, are unrealistically high.

A balanced analysis of the cost of greenhouse response must consider all the costs, benefits and risks associated with response scenarios. This Inquiry should commission such a study, with a view to developing standard comparative methodologies for government and business to apply to their

decisionmaking. Where there are uncertainties in the costs of climate impacts, a range of values should be considered, rather than setting these costs to zero, as is common practice.

Comparisons of the costs of greenhouse response options often undervalue and over-price energy efficiency and renewables

There are many reasons why studies of greenhouse response overstate the costs of energy efficiency and renewable energy. This leads to development of inappropriate policies.

When the cost of response actions is quoted in $/tonne of CO_2 avoided or removed from the atmosphere, the absolute costs of sustainable energy measures, rather than their cost relative to 'Business As Usual' investments are often used. This leads to distorted comparisons. For example, if the cost of purchasing credits to offset emissions is $20/tonne of CO_2 stored, this is an absolute cost that must be paid by the emitter in addition to the cost of purchasing the fossil fuels being used for productive activity. But many energy efficiency and some renewable energy measures offer annual internal rates of return of 30 to 50% or better. Relative to a typical rate of return from most business investments, say 15%, investment in these measures has a *negative* cost - the investor is financially better off than if (s)he had not invested in the energy efficiency measure. This situation occurs because analysts fail to deduct the cost of the energy that would have been bought if the energy efficiency measure had not been adopted.

For investments in renewables and energy efficiency, unfair and inappropriate comparisons are often made between the cost of renewable energy or energy efficiency measure applied at the point of use and the cost of fossil fuel energy at the point of extraction or generation. For example, it is common to compare the cost of electricity generated from renewable sources with the cost of coal-fired power at the power station, typically 3-4 cents/kWh. Yet the average small electricity consumer pays 10 cents/kilowatt-hour - a cost that includes delivery of the electricity to their home or business. And the cost of electricity supply to country electricity consumers can exceed 30 cents/kWh. So renewable energy may also deliver negative cost emission reductions in some markets, while its potential to do so will be enhanced as economies of scale are captured.

The value of co-benefits of sustainable energy options, including reduced pollution; increased employment; reduced dependence on centralised systems; reduced consumption of water, detergent, etc; and so on are often ignored. For example, financial savings for reduced detergent use in a water and energy efficient washing machine are much larger than savings from reductions in water and energy use.

In economic modelling studies, it is often assumed that energy efficiency improvement beyond a minimal level is costly. This is based on the assumptions that the economy is already almost as efficient as it is economic for it to be, and that 'rebound effects' will mean that energy savings are negated by increased consumption funded by the financial savings from the energy saving measure. Both these arguments are fallacious but are deeply entrenched.

Numerous studies have identified billions of dollars of potential savings from adoption of cost-effective energy efficiency measures. Further, some of these studies have noted that these cost-effective measures are not being adopted at optimal rates. For example, a BIE study of energy efficient motors found they would be cost-effective in 80% of situations, but market share was only 2%. Both SEDA and Energy Efficiency Victoria have found that their Energy Smart Business partners typically implement only a small proportion of the cost-effective savings opportunities identified. This failure to adopt cost-effective energy efficiency measures is a cost to Australia's economy, which is not considered in most studies.

The logic behind the impact of a 'rebound' effect is that, where an energy consumer achieves a cost-effective saving, the financial benefits will be either:

- Eroded by increased activity or comfort (which the consumer can now afford to pay for), or
- Spent on other activities that involve use of energy, either directly, or in sectors of the economy supplying inputs to those activities

There is some truth in these propositions. However, they reflect a selective assessment of the situation. For example, other possible consequences are:

- That consumer's demand for a particular service may have reached saturation, or energy may be a minor criterion in determining the level of activity, in which case direct energy consumption would not rise
- Energy is a small component of the overall economy, so if financial savings are spent on activities of average energy intensity, only 5-10% of the expenditure would flow to increased energy use - a modest rebound effect
- Financial savings may be invested in buying additional energy saving equipment or services, thus accelerating energy savings. In many cases, new equipment is more energy efficient, so savings will be achieved without conscious choice
- Consumer demand for energy efficient products and services will increase competition among suppliers to deliver more energy efficiency

Governments, business and the community must be made accountable for their greenhouse performance, and all policies that impact on greenhouse gas emissions must be harmonised

While State and Commonwealth governments have signed the National Greenhouse Response Strategy in 1992 and the National Greenhouse Strategy in 1998, the reality is that these strategies have not influenced other aspects of government policy, such as industry development, regional development, transport, energy reform, etc. The result has been that decisions made in support of other policies and strategies have led to increases in greenhouse gas emissions far greater than the savings achieved through the limited implementation of greenhouse strategies. Clearly this cannot be allowed to continue.

It is essential that policies be harmonised to ensure emission targets are achieved. This will require development of 'whole of government' policies, strategies and action. Since the Commonwealth Government is ultimately responsible for Australia's compliance with its international global warming obligations, it should establish mechanisms for ongoing benchmarking of the performance of State Governments, business and households against performance criteria. These might include minimum rates of reduction in net emissions per $ of GDP (which may be set at differing levels for different States and types of businesses, and could allow for trading between parties), and emissions per capita for the residential sector.

The Commonwealth Government should develop and publish a series of intervention options that could be progressively introduced where a party failed to meet its target. While early implementation of emissions trading will help large emitters to focus on emission reduction, additional strategies such as the above will be needed to influence small emitters.

The Inquiry should develop and propose procedures to reward State Governments for implementation of effective 'whole of government' greenhouse response strategies. It should specify target rates of reduction in emission intensity for States, business sectors and community emissions, so that each sector has a meaningful focus for its action. If these targets are not met (after allowance for trading between parties), a range of previously published intervention actions should be pursued

Australians need a positive vision of a successful low greenhouse impact Australia

Studies that have highlighted the costs of greenhouse response, along with alarmist statements by some sectors of industry have created a pessimistic atmosphere in Australia with regard to greenhouse response. As demonstrated below, this attitude is not justified. We need an active campaign to show Australian business and households that they can be greenhouse winners. Many Australian businesses in a wide range

of sectors have already achieved impressive reductions in greenhouse gas emissions: these can be models for others. In other cases, new developments in technologies could be showcased to empower customers to purchase them. But this kind of action cannot be funded with a few hundred thousand dollars over a few months. Millions of dollars are needed over a period of years to re-educate Australians to convert the perception of threat into opportunity.

As an initial step, several independent research groups should be funded to develop case studies and detailed scenarios of an Australia that exploits the benefits from greenhouse response. Funding should also be allocated for these groups to actively promote the visions they develop, and for consultation with the community.

The Inquiry should recommend that the Government actively promote (via television and other media) case studies of successful greenhouse response by businesses and individuals.

Policymakers need to re-evaluate the significance of the role of end-use consumers in responding to global warming

Much of Australia's greenhouse response policy has focused on large emitters and, in particular, the electricity industry. Reasons for this include:

- They are obvious sources of emissions
- They are limited in number, and they are sensitive to the issue, so they are relatively easy to target
- The National Greenhouse Gas Inventory identifies them as major contributors
- Economic studies, such as the ABARE pre-Kyoto study, have focused emission reduction action on electricity supply. This seems to be because they have included limited scope for efficiency improvement in all sectors, so that the greatest scope for emission reduction identified has been through fuel switching in the electricity supply sector.
- Application of emissions trading to large emitters is expected to have a 'trickle down' effect by sending price signals to small emitters and end users of electricity

Figure 1a. Breakdown of Australian energy-related greenhouse gas emissions by sector, according to NGGI categories.

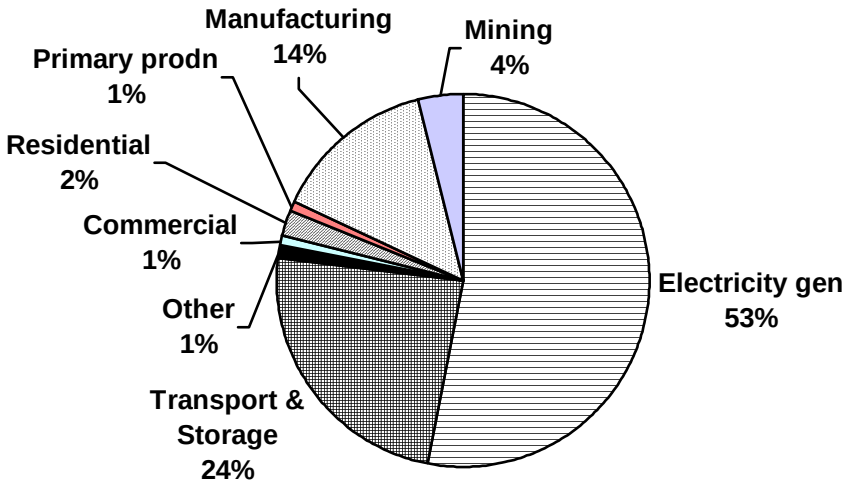
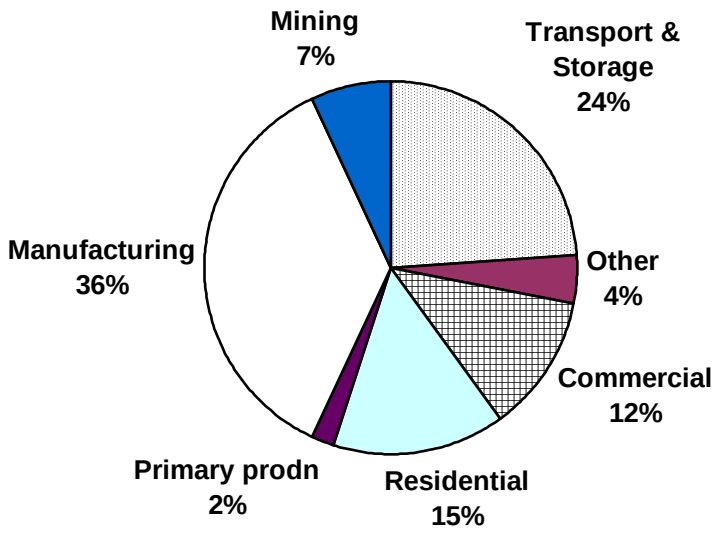


Figure 1a shows the breakdown of Australia's energy-related greenhouse gas emissions as presented in the NGGI. If this breakdown is used as a basis for policy development, it seems that the residential, industrial and commercial sectors are very minor contributors. But this is because most of their emissions result

from use of electricity, which is reported under *Electricity Production*. Figure 1b shows a breakdown of emissions with electricity-related emissions allocated to end-users.

This second breakdown gives a very different picture. It is now clear that decisions made by small emitters (cars, trucks and small users of oil, gas and solid fuels) and small residential, industrial and commercial electricity consumers are associated with over 60% of energy-related emissions. The choices they make with regard to energy consuming equipment, vehicles and buildings are very important. And the efforts made by manufacturers, importers, retailers and installers of equipment and buildings to reduce emissions are critically important.

Figure 1b. Australian energy-related greenhouse gas emissions with electricity emissions allocated to end-users.



As noted above, the imminent decision to use 'profiling' to develop the tariff structures for small electricity consumers in Victoria means that the electricity market will not be able to provide financial feedback to individual households regarding the cost of their actions. The market will have failed for the consumers of up to half of all electricity.

The Australian Government should place high priority on implementation of effective programs and incentives that target end-users of energy and key market intermediaries. SEIA's proposal for a Reverse Carbon tax approach (attached) is a practical option.

Australia must set a price for carbon emissions by introducing an effective Emissions Trading Scheme as quickly as possible. If this is too difficult, an interim carbon levy is needed.

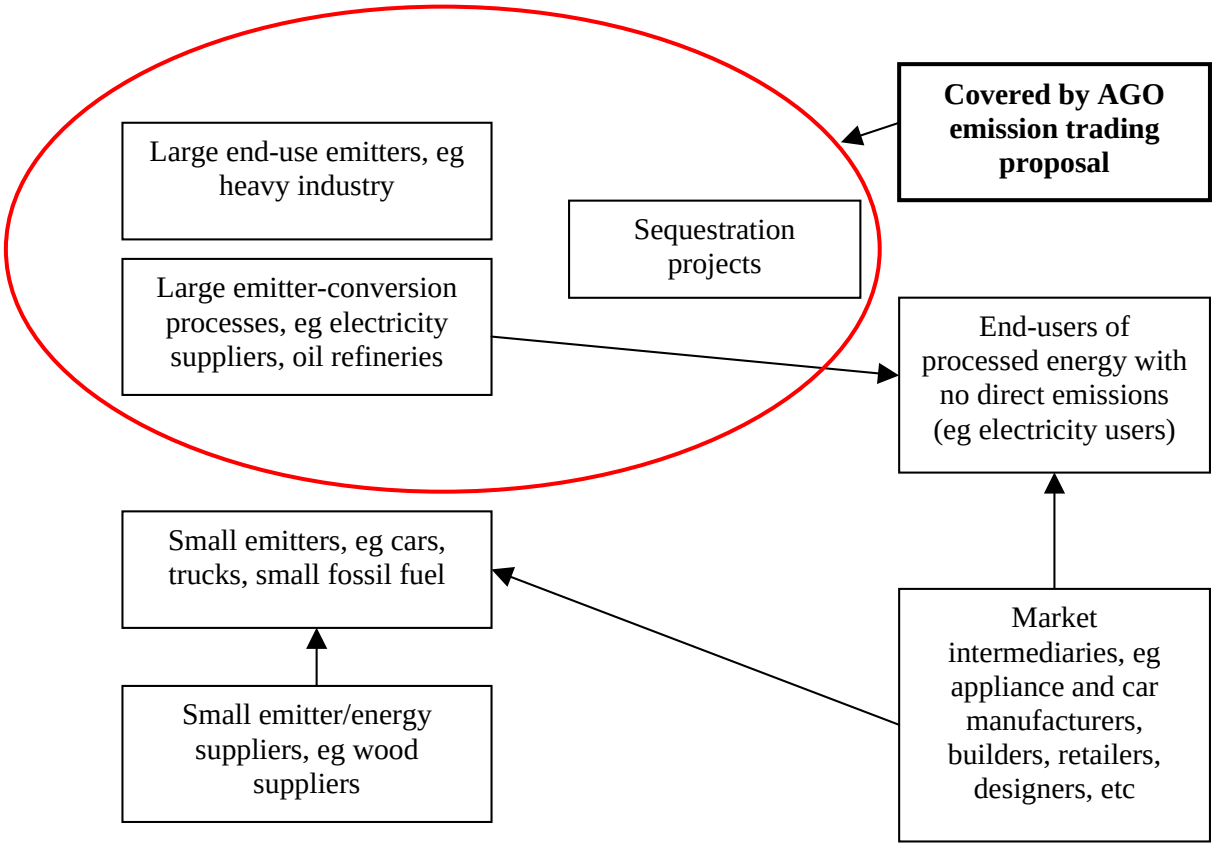
It is a matter of urgency that emissions trading - or at least some scheme that sets a minimum price for carbon, such as a carbon levy - be introduced as quickly as possible. Until uncertainty is reduced, many organisations will not actively pursue greenhouse response measures - even when they are cost-effective.

In supporting emissions trading, however, SEIA is not suggesting that a scheme that focuses on large emitters and offers 'grandfathering', as proposed by the Australian Greenhouse Office, will be sufficient. As explained below, SEIA sees serious limitations to the proposed schemes. These limitations are, to a great extent, an outcome of a failure to recognise the significance of the roles of small energy users and market intermediaries.

The Major Weakness of Emissions Trading proposals: failure to incorporate end-use solutions

Figure 1 shows the range of parties involved in emission and sequestration of greenhouse gases. The parties directly involved in the Australian Greenhouse Office emission trading proposals are included within the shaded regions.

Figure 1. Emitters and sequesters of greenhouse gases, and coverage by AGO trading proposals



The proposal for limiting emissions trading to a small number of major emitters and sequestration options reflects the desire to limit the number of market participants to a manageable number, to reduce the complexity and cost of operating the market. Using this approach, it would be possible to charge energy processors (such as oil refineries and gas suppliers) the full cost of emission permits for the fuel they sell. In theory, end-users of electricity should see price signals passed on by the energy conversion sector, and small emitters would be charged for their emission permits as part of their fuel cost.

In SEIA's view, this approach has some critical weaknesses:

- It relies upon the energy conversion industries to pass on the cost of emission permits to small emitters and end-users of electricity in a transparent and full manner
- If demand side response is to be encouraged, it relies on these price signals to influence user behaviour
- It excludes market intermediaries such as appliance and vehicle manufacturers - a critically important group, from all price signals

Failure to pass on costs as an increase in marginal energy price
The assumption that the energy conversion sector will pass on price signals in full, and as an increase in marginal energy prices may hold for sales to large customers. But, for smaller customers, where there is intense interfuel competition, tariffs may not necessarily accurately reflect costs - for example ACTEW and the Tasmanian HEC have introduced tariffs with high fixed supply charges and low marginal prices.

So energy suppliers could incorporate the cost of emission permits into supply charges, or spread them over the initial block of consumption, so that they did not affect marginal energy prices.

There is a strong incentive for electricity generators *not* to pass on accurate price signals to customers, if that might lead to their using less electricity by adopting energy efficiency or switching to other fuels. Most businesses would prefer to maintain sales of their product (in this case, units of electricity) in preference to losing volume of sales. So electricity generators are likely to prefer to reduce the greenhouse intensity of the electricity they sell (for example, by co-firing with gas or renewable fuels) in preference to encouraging customers to use less electricity, even if the overall cost of end-use energy efficiency or fuel switching is cheaper.

Such an outcome would lead to an economically inefficient outcome, with greater emphasis on reducing the greenhouse intensity per unit of energy than on end-use efficiency and fuel switching at point of use.

Demand-side response to price signals
While energy is a large component of total input costs to large energy intensive industries, it is a small factor for most service and manufacturing businesses - often less than 2 or 3% of input costs. Thus the cost of emission permits (at $10/tonne of CO2) is likely to be less than 0.3% of business costs - it will be easily lost in the 'noise'. For households, average energy costs are just over 2% of disposable income. Again, the cost of emission permits will probably hardly be noticed, and may therefore have little impact on decisionmaking. For car drivers, the impact on fuel price is likely to be less than 3 cents per litre - with weekly price variations of 10 cents/litre, this will be difficult to identify.

A perverse outcome if price signals are passed on perfectly is that the percentage increase in gas costs may be comparable to the percentage increase in electricity costs, even though gas is only a quarter as greenhouse intensive. If permits cost $10/tonne of CO2, this would add around 1 cent/kWh to electricity prices - a 10% increase for a typical commercial or residential customer. It would add around 60 cents/GJ to gas prices - a 7.5% increase for an average commercial customer paying $8/GJ. This smaller than expected difference in impact on prices is because the actual cost of input energy is a much smaller proportion of the total electricity cost than it is for gas.

Exclusion of market intermediaries
Decisions made by designers, manufacturers, importers and retailers of appliances, equipment have large impact on lifecycle energy consumption of the products they sell. Relatively small price differences at the point of manufacture can have serious implications. For example, manufacturer opposition to upgrading the insulation of electric hot water tanks was based on estimates of less than $10 million in retooling costs, and a fear of loss of sales to competing gas products. This delayed introduction of a program that would save consumers hundreds of millions of dollars each year for several years.

The proposed approach to emission trading ignores the critically important role of market intermediaries in determining the level of emission intensity of equipment, and their influence on consumer choice.

Manufacturers are reluctant to incorporate features that increase the price of their products above those of competitors. Yet retooling to incorporate efficiency improvements often slightly increases costs in the short term. If some market intermediaries could gain access to a share of the financial benefits resulting from avoiding purchase of emission permits, they would be much more likely to design, manufacture and market lower greenhouse intensity products.

Some Solutions

SEIA has developed a proposal for a 'Reverse Carbon Tax' which could use some of the revenue from sale of emission permits to provide financial incentives for market intermediaries to facilitate reduction of emissions by end-users. For each emission-reducing product sold, its manufacturer would receive a rebate based on the lifecycle reduction of emissions achieved - a copy of the proposal is attached. This is a critically important complement to the proposed emissions trading scheme. Without it, SEIA considers

that it is most unlikely that a scheme that concentrates on large emitters, and relies on flow-on of price signals to influence small emitters and end-users of electricity will lead to distorted outcomes.

What will happen to the Revenue?

The AGO Discussion Papers seem to make no mention of how the revenue from emission trading ($3 billion per year at a permit price of $10/tone of CO2). This seems to be a critical omission. These funds could be used for a range of possible purposes, the impacts of which could be very varied. At the same time, some applications of these funds could undermine the effectiveness of emissions trading.

As noted above, SEIA considers that the introduction of financial incentives in the form of a 'Reverse Carbon Tax' would be a very important means of enhancing the effectiveness of emissions trading. But other questions need to be publicly debated, such as:

- To what extent might Government 'grandfather' emissions or, alternatively, rebate funds to existing emitters? To what extent would it make these rebates dependent upon satisfactory commitment to emission reduction investment activity and/or potential for those emitters to achieve 'world best' emissions intensity standards?
- Would funds be used to assist new market entrants, to balance the advantages existing emitters may gain from any transition arrangements?
- Would funds simply go to consolidated revenue?
- Would some funds be used to reduce payroll tax and other costs associated with employment? The Australia Institute's studies have shown that such actions could be very positive for the Australian economy.

SEIA urges the Government to prepare a further Discussion Paper to open these issues to public discussion. High priority should be placed on allocation of funds to:

- *Financial incentives for market intermediaries, small emitters and end-users of electricity, as proposed in SEIA's 'Reverse Carbon Tax' proposal*
- *Reduction of employment-related costs to promote increased employment*
- *Where funds are rebated to businesses that have purchased emission permits, these rebates should be tied to implementation of emission reduction actions and the long term potential of that industry to meet 'world best' levels of emissions intensity.*

Concerns about carbon leakage to countries that do not yet have to meet emission targets are ill founded

Much has been made of the risk that strategically important industries may leave Australia and shift to countries that do not have to meet greenhouse targets. This is not a major issue if one expects that tougher targets will be needed beyond Kyoto, and that concerted global action will occur as governments appreciate the serious implications of global warming. The reality is that new industrial plants must be viable over decades. Any business that shut down a plant in Australia and relocated to a developing country in the hope that they would escape their responsibilities to pursue emission reductions would be taking a serious financial risk. And that business would be an obvious target for criticism and sanctions for failing to be responsible global citizens.

In any case, where a business can demonstrate that it has the potential to meet world-best greenhouse emissions intensity, there is a case for it to receive assistance in achieving that goal within Australia.

Transport has received insufficient emphasis to date, yet is critically important

Transport activity generates almost a quarter of Australia's energy-related greenhouse gas emissions, and is the fastest growing emissions source after the commercial sector. Yet there has been little tangible greenhouse emission reduction activity. Indeed, the vehicle market has shifted towards larger, less fuel-

efficient vehicles (including four wheel drives that pay much lower import duty than passenger vehicles). Ordinary new cars can out-accelerate the 'muscle cars' of the past. Public transport continues to struggle for funds. Urban sprawl continues. And renewable transport fuels receive tiny support compared with the hundreds of millions of dollars of subsidies promised to high greenhouse impact oil shale developments.

This lack of performance seems puzzling, given that transport fuels are the most expensive energy sources most people use, and that imports of this increasingly scarce and expensive resource are projected to increase.

The Australian car components industry is about to unveil its 'production-ready' Axcess II 4 litre/100km hybrid vehicle, and General Motors will unveil a hybrid car at the Olympics. So the capability is there to dramatically improve vehicle fuel efficiency. How soon will all Ministerial cars use these fuel-efficient technologies? Why are taxis and other high-usage vehicles not using the best fuel-efficient technologies?

Investment in new roads is swamping investment in new public transport infrastructure. And, while there are plans to buy new rolling stock for Victorian public transport, will it be the most energy-efficient technology available?

The Government has provided some funding for ethanol production. But there is a strategic argument for the development of renewable transport fuel production in rural areas, where it can create employment and economic activity, reduce dependence on diesel fuel refined from imported oil, and provide a response to criticisms that oil companies charge excessive prices for fuel in rural areas.

SEIA acknowledges that Australia's car industry is in a difficult position, as it has focused on production of large cars - the only niche market in which it could compete and remain profitable. The challenge is for the Government to make manufacture of fuel-efficient vehicles profitable. And, as noted above, recent developments in hybrid car technology provide one way of resolving the technical problems.

The Inquiry should recommend urgent implementation of an effective transport emission reduction strategy.

ATTACHMENT 1

ABARE's pre-Kyoto Modelling Studies Revisited

The Government's position at Kyoto was heavily reliant on the outcomes of economic modelling of the cost of greenhouse response carried out by ABARE. This research was widely interpreted as identifying high costs for the Australian economy from greenhouse response. Further analysis of ABARE's finding raises serious doubts about that validity of such conclusions.

ABARE modelled a 'worst case' scenario in which:

- a very high carbon tax was applied to all fossil fuel use, and the income was simply fed into consolidated revenue instead of being used strategically (such as to reduce payroll tax or encourage investment in energy efficiency and structural adjustment)
- very little energy efficiency improvement was considered economic - in the greenhouse scenario, total energy consumption in 2010 was only 7% lower than under Business As Usual
- most emission reduction was achieved by premature replacement of coal-fired power stations by expensive renewable electricity - indeed, ABARE's greenhouse response scenario is based on both Australia and the US satisfying 60% of their total electricity requirements from renewables by 2020. Not even the most optimistic renewables advocate would imagine that scenario. Yet it seems that ABARE had to include this remarkable assumption to make their model limit greenhouse gas emissions, because it factored in very little potential for cost-effective energy efficiency and assumed little change in transport emission trends.

Despite these conservative assumptions, ABARE's modelling showed that over 80% of Australian business would either experience negligible impacts or would benefit financially from greenhouse response. No consideration was given in the study to the scope for those industries that suffered to make strategic responses to limit impacts or even gain benefits.

So how was it that the findings of the study were seen as showing that greenhouse response would be costly for Australia? The critical graph which showed the impacts of the proposed greenhouse response scenario were as shown in the light bars in Figure 2. This showed the relative impact on each industry sector *as a percentage of that sector's BAU output.* However, this created a distorted impression: the impacts of greenhouse response on industries that make small contributions to economic output were given as much weight in the graph as those with large economic output. The dark bars in Figure 2 show the impact on the overall economy, when the impact on each industry sector is adjusted for that sector's contribution to the Australian economy.

When the original ABARE graph (light dotted bars in Figure 2) is studied more closely, it can be seen that:

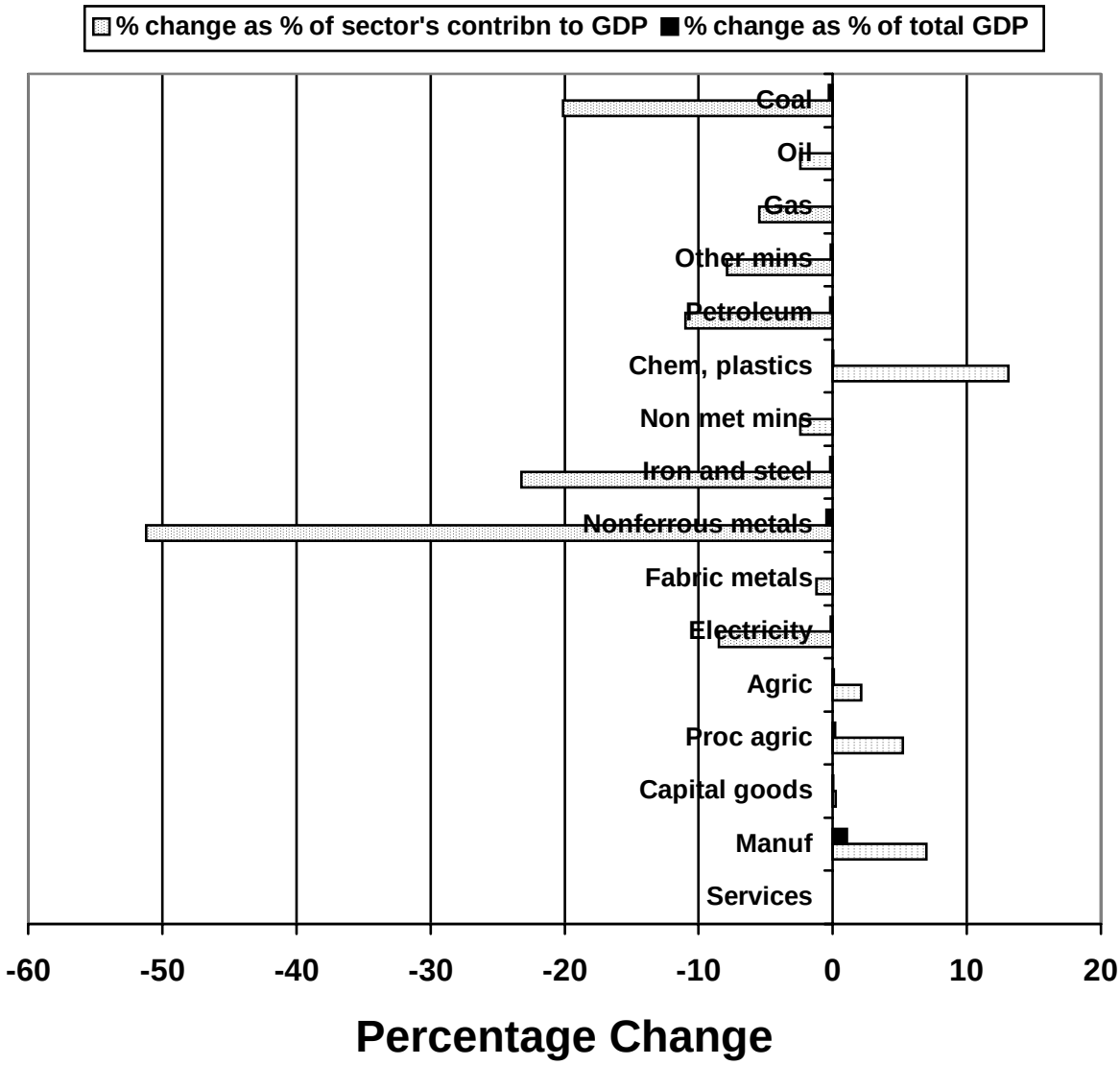
- the economic output of the services sector (close to 60% of the Australian economy) is unaffected by a large carbon tax
- manufacturing, agriculture and processed agriculture benefit, with greater economic output
- a limited number of industries - mining, metals, fossil fuel and non-metallic mineral processing, suffer negative impacts. Together, these comprise less than 15% of Australia's GDP. Inclusion of the gas industry as a 'greenhouse loser' seems surprising - this is certainly not the view held by the gas industry, who have recently left the Australian Industry Greenhouse Network so they can take a more constructive position in the greenhouse debate

In reality, many of the supposedly adversely affected industries are already achieving significant emission reductions, and have potential to make further savings within an economically rational framework. So they have scope to create advantage from the situation, or to at least limit the size of the negative impacts on them. For example:

- The cement industry is switching from the 'wet' process to the 'dry' process, which uses up to 60% less energy. And increasing use of cement extenders such as fly ash and blast furnace slag can deliver reductions in emissions per tonne of up to 60%.
- The steel industry is moving to much less greenhouse intensive production technologies such as electric arc furnaces and hot briquetted iron, and is increasing the percentage of recycling
- Mount Isa Mines has halved its greenhouse gas emissions per tonne of output since 1990

Yet the ABARE study fails to factor in this potential to limit greenhouse gas emissions.

Figure 2. Impacts of ABARE greenhouse scenario on Australian economic activity as a percentage of each sector's Business as Usual economic activity, and as a percentage of the total economy.



Furthermore:

- in the economic models, industry and energy supply sectors are averaged, so:
    - many opportunities to close old, outdated and inefficient plants are not recognised. For example, closure of old cement plants can make economic sense; and much of Australia's existing coal-fired power generation plant will be more than 30 years old by 2010
    - industry subsectoral differences are ignored - for example, alumina refining is much more profitable and much less greenhouse intensive than aluminium smelting, but both are lumped

together. And recycling of aluminium (a very low energy intensity source of metal) is not addressed as an option. If averaged data is used, the models may also lump together relatively low energy intensity minerals production activity with energy-intensive activity such as LNG production, thus overstating the impact of energy price rises on that industry
    - profitable market niches are not recognised
- the effects of existing more efficient technologies flowing through the economy over time are not fully captured in most modelling. While MEGABARE allows for 0.5% to 0.8% per annum 'autonomous energy efficiency improvement' to allow for this (and ongoing improvement - see next point), there is a case for much larger allowances. For example, if new household appliances are 30% more efficient than the products they replace, the annual reduction in energy use in this area is 2% if all old appliances are replaced over 15 years
- the scope for ongoing technology improvement is limited in the models - for example, neither cogeneration nor advanced coal-fired power generation were adequately included in the MEGABARE model
- predicted impacts on the fossil fuel industries are exaggerated by modelling assumptions. For example, the gas industry seems to see plenty of opportunity for expansion under a greenhouse response scenario, yet it is predicted to suffer. And the future of the coal industry is being re-evaluated by potential investors in light of a decade of very poor financial returns. Even if the global warming issue did disappear, it seems that the coal industry's future is less than rosy.
- the devastation of the coal industry predicted by economic models as an outcome of greenhouse response is much overstated. As noted earlier, the MEGABARE study predicts that 60% of Australian electricity would be generated from renewables by 2020. This is simply unrealistic, and reflects a far-from least cost greenhouse response scenario. There is substantial scope to rationally manage the role of coal to optimise the economics.

Towards greenhouse gas emission reduction AND economic growth

If Australia wants to maintain 3% pa economic growth, by 2010 our economy would be 40% larger. To maintain emissions at today's level, this would mean reducing greenhouse gas emissions/$GDP by approximately 30% (100/140).

How can we do this?

- Encourage low greenhouse intensity business activities: the services sector and light manufacturing, including high employment and 'smart' industries
- Reduce greenhouse intensity of low greenhouse intensity industries: improve energy efficiency, promote cogeneration and some fuel switching: this cuts their business overheads and improves competitiveness
- Reduce the greenhouse intensity of greenhouse-intensive industries: measure could include switching input fuels from coal to gas (eg MIM), upgrading plant efficiency, and switching to new technologies (eg BHP HBI). Industry has been improving technical efficiency (ie reducing ghgs/unit of product, but the decline in real commodity prices has meant we have to produce more product per $ of GDP, so the two factors have largely cancelled out!)
- Drive de-materialisation, use of recycled materials and switching to low greenhouse intensity materials to reduce 'embodied ghgs' (subject to lifecycle considerations)
- Increase the economic return per unit of product or service - add value. It seems that some commodity prices are 'bottoming out', so this should help Australia to achieve a reduction in greenhouse emissions/$ of GDP

These actions are consistent with an industry policy that:

- Promotes high employment services and smart industries (and helps them to minimise their energy and material overhead costs)

- Helps energy intensive industries with potential to increase export (and/or local) price/tonne and match world-best greenhouse efficiency targets (eg aluminium refining could do this, but smelting with coal-fired power would struggle)
- Promotes environmental industries, including recycling/resource recovery and sustainable energy

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