23 March 1998

Ian Dundas
The Secretary
Parliamentary Committee Inquiring into Trading
in Greenhouse Gas Emissions
Parliament House
CANBERRA ACT 2600

Facsimile: 02 6277 4424

Dear Mr Dundas,

The Australian Cogeneration Association (ACA) is pleased to make this submission to the Standing Committee on Environment, Recreation and the Arts inquiring into trading in greenhouse gas emissions.

I would like to apologise for the delay in making this submission and trust that it proves useful in your consideration of the potential for the implementation of emissions trading in Australia.

The ACA believes that the implementation of an emissions trading scheme is the best way to manage greenhouse gas emissions and will enable Australia to meet its greenhouse gas reduction targets at the least cost to the Australian community. We believe that an emissions trading scheme could be readily implemented within the energy sector and then extended to include other sources and sinks.

We would be happy to discuss our submission with you, your staff and members of the Committee in the near future as you think appropriate.

Yours sincerely

Ric Brazzale
EXECUTIVE DIRECTOR
att.

Submission to the Parliamentary Inquiry into Trading in Greenhouse Gas Emissions

Executive Summary

The Prime Minister's Statement of 20 November, "Safeguarding the Future: Australia's Response to Climate Change", announced a number of initiatives to reduce the growth in Australia's greenhouse gas emissions. The Commonwealth Government has, in effect, committed to go beyond a "no regrets" position in order to achieve emission reduction targets that have now been committed as part of the Kyoto climate change agreement. This is most evident in the proposed mandatory obligation on retailers to increase the proportion of renewable electricity generation they purchase by 2% and in the proposed establishment of minimum efficiency standards for new and existing fossil fuel generators.

The ACA believes that market based measures offer the most efficient "lowest cost" means by which to achieve Australia's targets. This approach is strongly preferred to command-and-control measures. The preferred approach is an emissions trading scheme. We believe that this will lead to the "least cost" reduction in greenhouse gas emissions to meet the Government's international commitments.

While a desirable policy principle is to achieve "comprehensiveness" in greenhouse response, it is unrealistic to expect to be able to design and implement a comprehensive trading regime from the outset. An emissions trading scheme could be implemented most easily within the electricity sector which accounts for the most significant share of carbon emissions, and could then be extended to include other emissions sources and, in time, sequestration or "sinks".

The ACA believes that the allocation of permits is an important issue that may create barriers to entry for low emission generation like cogeneration. We have recommended the adoption of an alternative approach which involves the trading of emissions around a market average. This can be readily implemented in the electricity market and will not create barriers to entry whilst minimising the cost impact on consumers.

1. About Cogeneration and the Australian Cogeneration Association

The Australian Cogeneration Association (ACA) is an independent, non-profit industry association that was formed in 1993 to further the interests of cogeneration and distributed generation in Australia. The ACA has approximately 100 members ranging from energy consumers, developers, electricity industry participants, fuel suppliers, equipment suppliers, financiers and service providers all of whom have an interest in the development of cogeneration and distributed generation in Australia.

Cogeneration is the simultaneous production of electricity and heat (typically steam but also hot water for heating and chilling applications) from the same primary energy source. It uses the heat which is otherwise wasted in conventional power generation and can achieve an overall efficiency of up to 85%.

Over time cogeneration is likely to make significant inroads into the electricity market[1] if it is provided and can act on price signals. The scope for cogeneration is extensive given that over 60% of natural gas sales to industrial customers is for heat raising. Cogeneration is also a potentially attractive option on a smaller scale and can be utilised by commercial energy users eg. hospitals, buildings, hotels, universities and other community facilities. Cogeneration involves the burning of fossil fuels to produce energy. Emissions trading will therefor be of extreme importance to the development of future cogeneration capacity.

There are 115 cogeneration projects operating in Australia as at 31 December 1997 representing 1,747 MW electric capacity. By utilising the energy that would otherwise be wasted in conventional power generation cogeneration results in a significant improvement in efficiency and significantly lower Carbon Dioxide emissions than conventional generation.

	Thermal Efficiency (higher heating value)	**CO_2 Emissions**
Cogeneration - Natural Gas	**77%**	**0.26 t/MWh**
Conventional Generation		
Combined Cycle - Natural Gas	48%	0.39 t/MWh
Thermal - Natural Gas	38%	0.49 t/MWh
Thermal - Black Coal	35%	0.93 t/MWh
Thermal - Brown Coal	29%	1.23 t/MWh

(Source: Assessment of Cogeneration. Sinclair Knight Merz for the ACA, 1997)

[1] The development of Cogeneration in Australia is lagging behind other developed economies.

2. Background

The Prime Minister's Statement of 20 November, "Safeguarding the Future: Australia's Response to Climate Change", announced a number of initiatives to reduce the growth in Australia's greenhouse gas emissions. The key initiatives relevant to the energy sector were:

- "accelerate energy market reform to lower the rate of growth of emissions by improving economic efficiency of energy supply. This initiative would involve measures which
  - extend electricity and gas reform
  - deliver integrated and compatible national frameworks for gas an electricity
  - identify greenhouse intensity of energy sources in energy market trading pools
- a mandatory target to source an additional 2% of electricity from renewable energy sources by 2010, to promote the development and uptake of new renewable energy sources
- efficiency standards for fossil fuel electricity generation to be implemented by 2000, ensuring Australia adopts best practice generation efficiency."

The Commonwealth Government has signed the Kyoto Protocol and committed to ensure that Australia's anthropogenic emissions of the six defined greenhouse gases do not increase by more than 8% above 1990 levels by the first "budget period" 2008-2012. The 8% target is achievable, on the basis of the calculations revealed at the time of the Prime Minister's announcement, and subsequent statements about past and projected emissions from land clearing, only if the emissions savings (other than from land clearing) announced by the Prime Minister are attained. As noted above, some of the measures announced at the time move beyond "no regrets".

A key part of the Kyoto agreement involves the establishment of an international emissions trading scheme. Emissions trading is not part of the Commonwealth Government's current policy

A Staff Research Paper published by the Industry Commission in December 1997 - "Framework for Greenhouse Emission Trading in Australia" strongly supported the view that market based measures such as an emissions trading scheme would be the most efficient means of reducing Australia's greenhouse gas emissions.

> "*Market-based instruments are generally more cost-effective than command-and-control measures because the burden of reducing emissions is shared across those polluters who are able to reduce emissions at least cost. Market based measures also provide polluters with an incentive to develop new methods of meeting their obligations over time. For this reason alone they are generally regarded as more preferable to command-and-control measures."*
> (excerpt from page 2.)

3. Electricity reform has failed to deliver lower greenhouse gas emissions

Contrary to initial expectations, energy market reform has not provided opportunities for cogeneration and renewable technologies to help reduce greenhouse gas emissions:

> *" … micro-economic reform will see the steady growth in the use of natural gas for new electricity generation and direct use … and the increase in gas fired cogeneration are expected to continue resulting in a lowering of the average greenhouse gas intensity of electricity …" (Source: National Greenhouse Response Strategy – Discussion Paper, March 1997, p.41)*

Unfortunately this has not occurred; no major cogeneration projects have been committed in the past two years; and the emission intensity in electricity generation in south east Australia (where electricity reform has been implemented) is increasing, not decreasing. Carbon dioxide emissions from electricity generation in south east Australia will increase by 17% from 1994 to the year 2000 with the emission intensity in electricity generation increasing nearly 5% from 0.983 tonnes/MWh to 1.011 tonnes/MWh.[2]

Electricity industry reform obstacles

Irrespective of environmental considerations, electricity industry reform should deliver a "level playing field" – a framework - that allows cogeneration and distributed generation (including renewable technologies) to compete on their merits. Moving beyond 'no regrets' in greenhouse responses demands exploiting all 'no regrets' opportunities first — and opportunity to create a level playing field in electricity is certainly one of the 'no regrets' opportunities that remains to be exploited.

The level playing field has not been allowed to emerge due to (i) transitional energy market distortions and (ii) ill considered market design. Both of these have the effect of locking alternative technologies out of the market.

Transitional barriers

The current electricity vesting contracts granted to existing generators in New South Wales and Victoria significantly distort the market price. For example, some contracts are locked in for several years with retailers paying $40-$44.50 per Megawatt hour – considerably more than any assessment of the current new entrant price. With this healthy profit margin on financial contracts, existing generators are then able to bid very large quantities of power into the pool at their marginal cost, which is far below the average cost which new market entrants such as cogenerators and renewable energy technologies must seek to recover.

[2] Australian Cogeneration Association submission on the National Greenhouse Response Strategy Discussion Paper - March 1997.

Market Design Barriers

- Transmission costs are highly averaged and are not paid by the users of the system – the generators. These costs should be borne by the generators on a cost-reflective basis, rather than being arbitrarily allocated to distributors, as currently happens in New South Wales, Queensland and Victoria. Locating a generating plant adjacent to major electricity demand centres obviously reduces the need to augment transmission lines from existing, remote generators — but the pricing method adopted fails to recognise this benefit. The market's design does not adequately provide these 'locational signals' to induce lowest cost investment. This arrangement also acts to stifle regional development as there is no advantage for industry locating close to power generation. Revision of the way in which transmission costs are charged would signal the desirability of energy intensive industry locating in areas such as the Hunter and Latrobe Valleys.
- Transmission and distribution costs should be transparent and unbundled. This would enable appropriate investment decisions to be made and would encourage the effective demand response that the proponents of electricity market reform have always promised.
- Other barriers to distributed generation (that is, generators located close to markets rather than being centralised on the coal fields) include: excessive connection costs, lack of transparency in network negotiations and excessive technical requirements for distributed generation compared to existing generators.

Why it is important to remove barriers to cogeneration?

Cogeneration delivers a number of benefits including the following:

Economics

- Cogeneration provides the only source of competition to monopoly transmission and distribution networks;
- Cogeneration provides competition to existing generators that is essential to constrain their current market power (a key concern of the ACCC);
- Cogeneration provides energy cost savings to its thermal host, making the host organisation more internationally competitive and enabling it to underwrite future investments and jobs; and
- Cogeneration enables development of the natural gas market which should result in development of new infrastructure and the evolution of a truly competitive 'energy' market in Australia.

Environment

- Cogeneration significantly reduces greenhouse gas emissions (when compared with conventional alternatives);

- Cogeneration has been recognised by industry as a primary method of reaching emission reduction targets (notably those who have signed the Commonwealth Government Greenhouse Challenge); and
- Cogeneration can also utilise waste products, thus solving what may otherwise be another environmental problem (eg bagasse in the sugar industry and sludge gas from sewerage treatment plants).

Energy Efficiency

- In comparison to conventional electricity generation that generally harnesses only 33% energy from the fuel source, cogeneration generally harnesses more than 75% (and can achieve up to 85%).

4. Initiatives that move beyond "no regrets".

The Government's initiatives on generator efficiency and mandating retailers to purchase an additional 2% of electricity from renewables go beyond "no regrets" and impose additional costs on to electricity consumers and the Australian community. It is also not clear how these measures will (or even if they can) be implemented within a national competitive market framework. In addition, these measures have the potential to create barriers to entry in the retail and generator market sectors both of which are now contestable. This will result in further cost increases to the community.

The ACA's long stated position[3] is that the Government should use market based measures if it wishes to achieve environmental outcomes. Command and control measures by their nature impose unnecessary costs as they provide no incentive for least cost options to be discovered and implemented. Market based measures have the potential to deliver the Government's lower emissions policy outcome at the least cost to electricity customers and the community at large.

2% Renewables target

The Prime Ministers Statement of 20 November 1997, "Safeguarding the Future: Australia's Response to Climate Change" outlined the following initiative with regard to the purchase of electricity from renewable sources:

> **Mandatory Targets for the Uptake of Renewable Energy in Power Supplies**
>
> Targets will be set for the inclusion of renewable energy in electricity generation by the year 2010. Electricity retailers and other large electricity buyers will be legally required to source an additional 2% of their electricity from renewable or specified waste-product energy sources by 2010 (including through direct investment in alternative renewable energy sources such as solar water heaters). This will accelerate the uptake of renewable energy in grid-based power applications, and provide an ongoing base for commercially competitive renewable energy. The program will also contribute to the development of internationally competitive industries which could participate effectively in the burgeoning Asian energy market. $3.8 million

[3] The ACA submission the Commonwealth's Energy White Paper process in February 1997

It has been estimated that some 2,000 to 3,000 MW of renewable generation needs to be installed by 2010 to meet this target. This is almost certainly an underestimate.

Renewable generation capacity in Australia at 30 June 1995 was 7466MW and this generated 15654 GWh or some 9.5% of total electricity generation[4]. Without the construction of major new hydro-electric projects, and with continuing growth in electricity demand, the renewables share of generation (in the absence of these new initiatives) was forecast to decline to 7.5%, notwithstanding a very rapid growth in the contribution by non-hydro renewables.[5] On the basis that electricity consumption at the rate projected by ABARE (1.9% pa on average between 1996 and 2010) [6] total generation by 2010 would be 214,900 GWh. Renewables would need to account for 24,720 GWh in that year. This would imply 3818 MW at a 25% load factor. The capacity of the Snowy Mountains Hydro Electric Scheme is 3756MW and the load factor of all present renewables generation is 24%. In other words, additional capacity of the order of the Snowy Scheme is needed for installation by 2010.

Renewable generation includes hydro, solar, wind, tidal and biomass electricity generation but conventionally excludes landfill gas, coal seam methane, waste generation and cogeneration (other than that which utilises biomass).[7]

Implementation difficulties within a National market context?

All electricity customers will eventually be contestable and will be able to chose the retailer of their choice. Retailers are presently licensed on a state by state basis with some states already imposing additional conditions (eg in NSW retailers have an obligation to source generation from low emission generators so as to reduce the emission intensity of electricity generation).

> The electricity spot market provides a wholesale trading mechanism linking generators, retail authorities and wholesale end use customers. All wholesale energy is traded through the spot market. Generators bid to supply electricity and wholesale purchasers (distributors and large customers) buy electricity requirements at the spot price which is set every half hour.[8]

Electricity is an undifferentiated product that is no longer sold on a "physical basis" - supply and demand are cleared through a pool trading mechanism. Retailers generally purchase energy through the pool[9] and then enter into hedge contracts with generators (or others) to manage price risk.

---

[4] ESAA - Editorial in Electricity Supply Magazine in February 1997 based on a paper delivered by the ESAA Managing Director to the Solar 97 conference in December 1997.
[5] ABARE Energy Demand and Supply Projections to 2010.
[6] ABARE Energy Demand and Supply Projections to 2010.
[7] There is considerable debate as to what should or should not be included as renewable eg. considerable energy is expended to create solar panels and producing biomass. In addition, some organisations wanted to include landfill gas and waste but exclude hydro unless it is "run of river" in any definition of 'renewables'.
[8] National Electricity Market management Company - www.nemmco.com.au
[9] Under clause 2.2.5 of the National Code generators can enter into physical supply contract with retailers (typically local retailer) if the net sent out electricity is less than 30MW. There is however some uncertainty as to how this clause will be applied.

Implementing the Prime Minister's initiative through the national market will be both difficult and, possibly, counterproductive.

In the first instance, the only contract a retailer (or an end-user) can have with a generator under the pool rules is a hedge contract (a financial contract). The energy bought from the pool cannot be "tagged". Hence if retailers are required "to source" additional renewable energy, the only contractual way to do this is to use financial (hedge) contracts with generators of renewable power. If this "mandatory" requirement is in any way binding, the electricity contracts markets will develop a second tier: the demand for renewable power will be more intense than the demand for non-renewable power (and the price paid for contracts with renewable generators will rise). There is no limit on the total quantity of power any market participant can "cover" in the hedge markets: and no reason at all why a hydro generator cannot not contract to "sell" much more power than it has capacity to generate. In these circumstances, the entirely predictable result is that renewable generators will tend to be "over contracted" (committed to pay price differences — strike price versus the pool — on quantities of power in excess of their own capacity). And that would be a positive signal (and strong incentive) for investment in new renewables generating capacity.

Less obviously, but equally predictable, is that this condition would make renewable generators, notably hydro plants, indifferent to pool prices (on account of the commercial imperative to bid available generating capacity covered by contract *at marginal cost*. The effect of this, given the structure of the Australian electricity generation industry, would be to make the electricity pool market unmanageably volatile, with the only remaining capability to contain the volatility being substantial "demand side bidding". While DSM is most certainly to be encouraged, the extent of it required to contain the volatility predictable in these circumstances would most certainly bite deeply into economic activity. And this is hardly likely to be a 'least cost' outcome.

A further related issue is that the implementation of embedded generation projects, including renewable projects, requires the negotiation of connection agreements with the local distributor. These agreements will cover the connection costs to be paid by the generator and may also include the cost of stand-by supply. As embedded generation projects compete on a "delivered" cost basis they avoid network costs and the need to augment electricity distribution system - in other words, they compete with the service that the distributors themselves provide. Negotiation with a monopoly network service provider (who also will be an electricity retailer) will therefor tend to be difficult and frustrating and will tend to reduce the viability of embedded generator projects[10], and increase the cost of providing renewable capacity.

Who will bear the additional cost?

Irrespective of the above difficulty and unwelcome outcome, the impact of requirements on retailers to seek out and contract with renewable power suppliers will be to increase the cost of procuring energy. Retailers will have to pass this cost on to electricity consumers. Retailers that have a domestic customer base and have implemented a "green power"

[10] An important example is that embedded generators are generally expected to pay deep connection costs ie. they must bear the costs of augmenting the network beyond their connection point to accommodate their load, whereas the existing large thermal power stations only pay shallow connection, ie the direct cost of connecting to the network.

scheme[11] will have a market into which they can sell their higher priced power and will thus be able to compete more effectively in supplying larger industrial customers.

Customers who are prepared to pay more (ie environmentally conscious domestic customers and some commercial customers) may well pay the higher prices - this currently happens at present in NSW, Victoria and the ACT through "green power" and similar schemes.

It remains to be seen what impact the PM's initiative will have on the green power schemes as customers who currently are prepared to pay more for their power — so as to underwrite new renewable projects - may no longer be prepared to do so as a new, government-sponsored mechanism will exist. The green power schemes may come to be seen as a way for some domestic users to cross subsidise industrial users (ie domestic consumers paying more will not see any additional renewable projects developed - it will merely go to reducing industrial prices).

Whatever the initiative's final impact on electricity prices, it will be an increase and a cost to electricity users which will get progressively higher.

The cost of this initiative will be quite substantial - certainly significantly more than the actual cost of producing the power. The most attractive renewable projects will be able to capture additional value - they should be selling their power to the highest bidder - the price of which should be set by the most marginal project that will achieve the mandated target. Who will capture this additional value? - the proponent? - the retailer? - certainly not the customer.

Efficiency standards for generators

The Prime Ministers Statement of 20 November 1997, "Safeguarding the Future: Australia's Response to Climate Change" outlined the following initiative with regard to efficiency standards:

> **Efficiency Standards for Power Generation**
>
> The Commonwealth will work with the States to achieve movement towards best practice in the efficiency of electricity generation conversion by implementing efficiency standards for different fossil fuel classes, so as to deliver reductions in the greenhouse gas intensity of energy supply. Standards will apply to new electricity generation projects, significant refurbishments and existing generation. *$4.1 million*

Investment in power generation requires consideration and trade-offs on a life-cycle cost analysis. This is true for power generation utilising different fuels as well as within the same fuel class. Tradeoffs are made between capital cost, fuel cost and operating costs to determine the lowest life-cycle cost. The cost of transporting power to market is currently not a consideration; however, we trust that the National Electricity Code Administrator review later in the year redresses this issue.

[11] Scheme run by the Sustainable Energy Development Authority in NSW - that accredits renewable power generation as "green power" which retailers can then sell at higher prices to their customers.

A key concern with this initiative is that it puts even more barriers in the way of *new* entrants. Any standards could need to be applied to existing generators as well to ensure a level playing field - however this would only be achieved at considerable expense which would then have to be recovered in some way not immediately obvious.

Notwithstanding the "barriers to entry" issue, the imposition of minimum efficiency standards is overly prescriptive, distortive and economically inefficient as it ignores site specific and market issues. Examples of this are that "low cost fuels" may be available — however, the extra capital required to achieve the mandated level of efficiency makes the project uneconomic. Instead other capacity may be developed (eg brown coal) that needs to achieve a much lower efficiency standard. This would result in the perverse outcome where what could have been a more economic and lower greenhouse emission project is not implemented and a higher cost project with higher emissions is implemented instead.

Another example of market distortion is the implementation of peak and mid-merit generation plant. In the case this type of plant capacity, construction time, startup times, reactive power are all key considerations that may warrant a type of plant other than the most efficient combined cycle gas turbine (CCGT) plant which is current best practice. A second hand gas turbine may be much more effective for certain duty than the latest CCGT.

We believe that this initiative has the potential to create havoc in the future development of the electricity industry and may in fact constrain the ability of the market to deliver the capacity that is so desperately needed in some regions at present. Further it seems illogical to impose standards on gas fired generation technology which can achieve efficiency standards of over 50% when brown coal plant is less than 30%.

Whilst the ACA accepts the Government's requirement to increase the efficiency (and by definition reduce greenhouse gas emissions) of the electricity industry, for the mandatory standards approach to be made workable it would need to cater a myriad of site specific and market specific issues. We do not believe that having "site specific" standards are appropriate nor indeed workable - it would create a regulatory nightmare that distorts investment, creates barriers to entry and does not permit flexible and innovative solutions to meet market energy needs.

In fact, it would be a regressive step that erases many of the gains that have been made with the advent of the Hilmer reforms in general and energy reform in particular. It would have the effect of taking us back to the central planning and command and control era, that we thought we had left behind. But in this case it would be the Commonwealth Government that would be determining what plant gets built, where and when.

Measures may have negligible impact

Installing over 3,500 MW of renewables may have negligible impact on emission intensity and the overall level of emissions if the current fuel trend is continued and further coal plant is established. Further the capacity utilisation of coal plant is increasing significantly with

these generators being provided with free access to currently constrained markets in South Australia and Queensland.[12]

Since competitive electricity markets have been established in Victoria and NSW it is distressing to note that the new investments in electricity generation plant that have been committed are coal fired generation.

Redbank and Hazelwood Power Stations

The Prime Minister recently announced a new coal-fired power station in NSW, Redbank, to proceed with support of tax payers' money through the Federal Government's Infrastructure Bonds program. Greenhouse gas emissions from Redbank will be higher than the current NSW pool average and are significantly higher than alternatives such as cogeneration or renewable technologies and may reduce opportunities for these to be established in the future.

Victoria's Hazelwood Power Station, Unit 7 in the Latrobe Valley, with 200 MW capacity, has been re-opened in 1998 following a refurbishment after seven years of closure.[13] Hazelwood Power Station is a brown coal generator that has the highest emissions of any of the large thermal generators operating in Australia.

Once operational the impact of the above investments will be to generate approximately 3,222 GWh/a and produce 3,986,000 tonnes of greenhouse gas emissions (average intensity of 1.24 tonnes/MWh combined). If the same generation capacity was provided by cogeneration, greenhouse gas emissions would be reduced by three quarters.

Redbank and Hazelwood have an unfair advantage over low emission generators such as gas-fired cogenerators. Under the current electricity market, neither Redbank nor Hazelwood have to pay to deliver their power to customers.

A number of coal fired power stations are currently under development by several consortiums in Queensland's Bowen Basin. One of these proposals is by Shell Coal and CS Energy[14] to build a 800 MW coal power station. These power stations will obtain free connection to the NSW and Queensland's market as the proposed Westlink interconnect goes through the Bowen Basin. This effectively subsidies this new capacity which will produce significantly more greenhouse gas emissions than a number of other cogeneration projects under development in Queensland and NSW.

To enable Australia to achieve the emission reductions targets committed to as part of the Kyoto agreement the emission intensity of electricity generation needs to be substantially reduced which can only effectively be achieved through fuel switching away from coal to gas and renewables.

---

[12] Substantial transmission investment is being planned; Westlink connecting Qld and NSW and Riverlink connecting S.A and NSW. The impact of both of these investments is to increase the level of emission intensity.

[13] Unit 8 (200 MW) which had been operating at a reduced capacity factor was also refurbished and will be able to achieve a capacity factor of 90%.

[14] CS Energy is a Queensland Government Corporation that includes the Callide and Swanbank Thermal Coal power stations.

It is worth reiterating that unless we get cost reflective transmission pricing whereby generators bear the cost of delivering their power to market we will not get economically efficient investment and certainly not environmentally efficient investment. This will again have implications for regional development and the efficient location of energy intensive industry.

Whilst the Government's initiatives will provide support to renewables they may have no impact on the nature of the next power generation plant built, as the Redbank, Hazelwood and the Bowen Basin examples illustrate. The impact of these investments will be to squeeze alternative low emission generators out of the market.

Criteria for evaluating the impact of measures

In considering the effectiveness of certain measures for the reduction of greenhouse gas emissions the ACA has established the following criteria:

- measures must change the pattern of future investment whereby high emission generation must be more expensive or low emission generation must be made cheaper or otherwise more attractive
- measures that have the impact of making low emission generation more attractive must be transparent and "bankable"
- lead to lowest cost outcome for electricity consumers (minimise electricity price increases)
- costs are internalised within the industry and are not leaked out through taxation or pseudo- taxation measures (levies, fees and charges)
- measures must have minimal impact on the operation of efficient competitive markets
- must not create barriers to entry
- must minimise transactions, administration and compliance costs
- be equitable

Market Based Initiatives will be the most successful

The ACA believes that the Government should focus on providing a policy framework that empowers industry to develop lowest cost solutions rather than introduce a number of ad hoc interventions that further distort the operation of energy markets.

A market environment should be created that provides incentives for the reduction of greenhouse emissions and facilitates fuel switching from coal to cleaner and more efficient natural gas - particularly natural gas fired cogeneration. To provide the right environmental signals, greenhouse gas emissions need to be incorporated into investment decision-making processes. The ACA believes that an Emissions Trading Scheme is the best way of doing this, and best meets the above criteria provided the permits are initially allocated in an appropriate manner.

5. Emissions Trading Scheme

Greenhouse gas emission reductions could be accelerated if appropriate environmental signals are established that reward technologies that emit less greenhouse gas emissions per unit of energy used.

Whilst the ACA supports initiatives that have the effect of reducing greenhouse gas emissions in Australia and improving electricity generation we have serious concerns with the direction of Commonwealth policy that impose strict regulatory controls. Using only regulatory "command-and-control" measures is somewhat outdated as market based measures have been demonstrated to be far more effective in managing environmental problems.

The ACA believes that emissions should be managed through an emissions trading system rather than simply addressing certain sources through regulatory means. The use of an emissions trading system can achieve real emissions reductions with least overall cost to industry and the community at large. Further there are a number of examples of such schemes which have been summarised in the Industry Commission paper.

The objective of a scheme implemented in the Australia in the electricity industry would be to minimise the distortions in investment decisions, minimise regulatory uncertainty and minimise the cost impact on electricity consumers and the Australian economy whilst reducing the level of underlying emissions growth.

Australia is targeting an 8% increase in emissions from 1990 to 2010. The energy sector is the largest emitter (predominantly electricity generation) and it is this sector which will experience the most significant increase in emissions to 2010.

An Alternative Emissions Trading Approach

The scheme proposed by the ACA has each sector responsible for retaining emissions growth to within 8%. Implementation of this scheme in the electricity market would reduce the costs of reducing emissions compared to the initiatives included in the Prime Minister' package of 20 November 1997.

Management of emissions is at source and signals should be provided to those that will actually be creating the emissions through the combustion of fossil fuels.

Targets for emission growth would be 8% to 2010 and some intermediate targets would be required at say 4% growth by 2000 and 6% growth by 2005. If electricity consumption increases by more than the above targets then emission intensity needs to be reduced. Using ESAA estimates of future electricity demand in Australia we can obtain the following table:

eg. emission intensity (tonnes/MWh) could be as follows:

1990	**2000**	**2005**	**2010**
0.89	0.85	0.77	0.71

Under the ACA's proposed emissions trading scheme every generator that produces electricity is automatically granted an emission entitlement equivalent to the targeted market average as determined above. Grandfathering existing emissions levels would create artificial resource scarcity allowing existing high emission generators to extract monopoly rent. Under the above approach generators that have emissions higher than the average above would have to purchase emission entitlements from either generators with lower than average emissions or from other holders of emission entitlements that could be outside the electricity industry (eg Credits earned from sinks and plantations).

The above scheme can be readily made to work within the National Electricity market context thereby reducing transactions and administration costs. Such a scheme internalises costs and would produce minimal impacts on electricity pricing. The "low cost" impact has been demonstrated by the US SO_x trading scheme which produced SO_x reduction costs 100 times less than the cost estimated under "command-and-control" measures.

The above scheme achieves all the criteria outlined previously other than the universal coverage. This scheme has been tailored to the electricity industry and produces lowest cost outcomes in the place of other initiatives that would directly impact on electricity.

Similar principles could be applied to natural gas industry and mobile emission sources (motor vehicles). However, in the case of these sectors it is not possible to manage at the source of combustion — and emission entitlement equivalents would need to be granted to gas retailers and fuel retailers at the point where the fuel entered the Australian economy.

6. Addressing Terms of Reference

Electricity generation currently accounts for a substantial proportion of greenhouse gas emissions and this sector will experience substantial growth together with an increasing intensity. We believe that there are compelling arguments for emissions trading to be introduced into this sector first.

Mechanisms for measuring, verifying and monitoring emissions and the compliance with contracted arrangements.

This is readily achieved in the electricity sector as a national market will exist for the dispatch of generation plant. The actual number of emitters are relatively small with monitoring and compliance being easily able to be implemented through licensing obligations. We believe that this function could be undertaken by the National Electricity Market Management Company (NEMMCO) who currently have the responsibility for licensing generators and managing the dispatch and settlement process under the National Electricity Code.

Mechanisms to integrate emissions trading with the development of carbon sinks including the science, measurement and security of such arrangements.

The cost of "emissions" can be established by the operation of a trading scheme in the energy market (principally electricity) - this is where the demand for emissions credits will come from. This can then be extended to include carbon sinks.

The allocation of the right to emit greenhouse gases.

By adoption of a trading scheme that deals with "trading around the average" or trading emissions reductions - the initial allocation issue becomes less of a concern. There are no barriers to new entrants who are at or below the average.

The ACA has some concerns regarding "grandfathering" emission rights to existing polluters due to:

(i) has the potential to create barriers to entry. New entrants will need to acquire permits whereas existing polluters will not. This raises "competitive neutrality" concerns as new entrants into the electricity market will tend to be privately owned generators whereas existing generators are generally government owned.
(ii) the "optics" of this arrangement seem perverse whereby polluters profit rather than polluters pay.

The setting of the target is also extremely important as clear signals need to be in place so that there is a change in the nature of investment into low emission technologies. The target cannot exceed 1990 levels plus 8%, and then a proportion of emissions credits need to be retained and allocated to new entrants.

Regulatory Mechanisms to support a National market and potentially an international market in emissions trading.

Licensing, monitoring and administrating emissions should be undertaken through existing institutions. In the case of energy the organisation best placed to do this is NEMMCO. NEMMCO will have the systems and expertise to deliver this service at lowest cost.

Trading in emissions credits is likely to be best handled by market organisations such as the Sydney Futures Exchange.

Possible Emissions Traders, Administration and Transaction Costs

There should be no limitation as to who should trade emissions - the greater the number of participants the more effective the market. Transactions costs should be minimised by utilising existing institutions outlined above.

Roles and Responsibilities of Government and other Stakeholders

The Commonwealth Government should set the framework and clearly define the future targets for CO2 reductions. Future investment requires as stable and as well defined

arrangements as possible. Once this is done the Government should let the market get on with it.

Impact of Emissions Trading on the Environment and Industry and the economic and Social Welfare of the Australian Community

The ACA has outlined earlier in this submission that an emissions trading scheme can result in more clearly defined outcomes at a lower cost to industry and the community. Certainly an emissions trading scheme will be much more effective in delivering defined emission reductions at a lower cost than the "command - and - control" measures announced in the Prime Minister's pre-Kyoto package.