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## **Climate Change Policies in Australia**

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## **Executive Summary**

The Australian Government has made it clear that it believes that Australia should not have signed the Framework Convention on Climate Change, that it is not willing to accept mandatory emissions reductions obligations that require Australia to reduce its emissions and that Australia may withdraw from the Convention if its position is not accommodated at Kyoto in December.

The Australian Government believes that Australia would experience much higher economic costs than other Annex 1 countries if mandatory emissions reductions are agreed. On this basis it advocates 'differentiation' under which countries that have high economic growth and high emissions per unit of GDP, and which depend on exports of fossil fuels and emissions-intensive products would have more lenient targets.

The Government's position has been bolstered by economic modelling analysis that purports to show that Australia would be especially hard hit. It is projected that wages in Australia will be 19% lower by 2020 under a scenario that reduces emissions by 10% below 1990 levels in 2020. It is also claimed that the economic cost for each Australian would be 22 times higher than for each European. These extraordinary claims have been challenged by many experts including 131 Australian academic economists who signed a statement declaring that policies are available to slow climate change without harming employment or living standards in Australia.

It is also apparent that the modelling results have been presented in ways that are highly misleading. Despite the fact that the model is constructed in a way that exaggerates the impact of emissions reductions on the Australian economy, the results actually show that the impact would be extremely small. Under business-as-usual, the doubling of per capita income in Australia would occur on around 1st January 2025. If one believes the model results then this doubling would be delayed by two months if the emissions reductions went ahead, a trivial economic cost.

It is important to note that although the Government's modelling has been carried out by a public research agency – the Australian Bureau of Agricultural and Resource Economics – most of the funding for the modelling work has been provided by the fossil fuel industries. For a contribution of \$50,000 corporations can acquire a seat on the Steering Committee overseeing the development of the modelling work.

The possibility of carbon leakage through the shift of emissions-intensive industry to developing countries has been emphasised by the Australian Government in an attempt to undermine the expected efficacy of mandatory obligations at Kyoto. The extent of carbon leakage has been exaggerated and does not provide any reason to question the need for mandatory measures now, especially if developing countries agree at Kyoto to meet mandatory reductions at some time in the future.

The Australian differentiation position is deeply flawed as a negotiating position. It would be highly damaging to Australia's economic interests if it happened to be adopted. However, it is inconceivable that the international community would concede to Australia's demands. Australia's position is wholly contrary to the

polluter pays principle, and would have the perverse effect of permitting Australia to have increasingly lenient targets as the rest of the world took stronger measures to reduce emissions. Eventually Australia would become the outstanding global emitter of greenhouse gases and would have locked its economy into greater dependence on fossil fuels just as the rest of the world was moving away from them.

As part of its differentiation position Australia argues that high population growth should be a reason for more lenient targets. Australia wants the benefits of a particular policy (high levels of immigration) without meeting the costs (higher levels of environmental damage). Moreover, the Australian Government has been arguing that developing countries should be brought quickly into any agreements to reduce emissions because they will be responsible for the most of the emissions in the future due to their high rates of population and economic growth. So according to the Australian position, whilst high population and economic growth rates in developing countries are reasons for insisting that developing countries be required to *reduce* their emissions, the same factors are used to argue that Australia should be given *more lenient* targets, and this despite the disparity in incomes.

The Australian Government has argued strongly that support for differential targets by other countries vindicates its own position. But in every case, proposals by other Parties would result in countries with higher per capita emissions, lower marginal abatement costs and higher GDP per capita being required to reduce their emissions by more. These conditions apply to Australia. In other words, every other proposal would see Australia required to reduce its emissions by *more* than the average, not less.

In fact, Australia is in a very strong position to reduce its emissions to any likely agreed level at low cost. As a profligate user of fossil fuel energy in the past – due to abundance and low prices – there are many no-cost or low-cost options available. The ease with which Australia could reduce its emissions has recently been confirmed by a review carried out by the International Energy Agency. A range of studies in Australia indicate that energy-related emissions in Australia could be cut by 20-48% at no net cost.

The Australian Government argues that its credentials in reducing domestic emissions are good. In fact, the Federal Government has recently cut or abolished several of the most important programs promoting energy efficiency and renewables. Its voluntary agreements program with industry is more of a public relations exercise than a serious attempt to cut emissions. Backsliding by the Federal Government stands in sharp contrast to the important and innovative emissions reduction programs undertaken by the Government of New South Wales.

It is difficult to avoid the conclusion that the negotiating strategy of the Australian Government is to spoil efforts to reach an agreement on mandatory reductions at the Kyoto Convention. If the Australian Government adheres to its current intransigent and unreasoning position, the likelihood that the Kyoto Convention will reach an agreement to deal with the global problem of climate change would be increased if Australia withdrew from the Convention now.

## 1. Introduction and outline

The Australian Government has taken an increasingly intransigent stance in negotiations to tackle the problem of global climate change. While claiming that it recognises that climate change is a reality and that nations must take measures to reduce emissions, the Prime Minister Mr Howard has stated publicly that Australia should never have signed up to the Framework Convention on Climate Change.<sup>1</sup>

The Foreign Minister Alexander Downer has made the alarming statement that ‘the only target that Australia could agree to at Kyoto would be one that allowed reasonable growth in our greenhouse emissions’.<sup>2</sup> The Minister for Resources Senator Parer, who has de facto carriage of the Government’s greenhouse policy, has actually stated that he does not believe that climate change exists.<sup>3</sup>

Members of the Government and industry representatives are now muttering darkly about withdrawing from the Convention if Australia’s position on differentiation is not accepted. Despite increasingly forceful and cogent arguments from experts in Australia, the Government’s position has been hardening over the last 12 months. There is no distinction between the Government’s position and that of the fossil fuel lobby and the Government has become so entrenched in its beliefs that it seems incapable of stepping back and assessing what is in the national interest.

The basic position of the Australian Government is as follows. Since Australia is heavily dependent on fossil fuels for export revenue and relies on fossil fuels as the chief source of domestic energy, uniform emissions reductions targets would be very costly and would impose a disproportionate economic burden on Australia compared to other Annex 1 countries. It advocates ‘differentiation’, that is, allocation of different targets for Annex 1 countries on the basis of the economic costs caused by emission reductions. It argues that targets should be set so as to impose equal economic cost per capita for each Annex 1 country. Australia would, under the this proposal, have more lenient targets than most other countries. Australia also calls for developing countries to be required to adopt mandatory targets sooner rather than later.

There are many flaws in the Australian Government’s position and an increasing number of Australians – scientists, economists, energy experts and ordinary citizens – are raising voices of protest at the short-sighted and self-defeating stance taken by the Government. In June a statement signed by 131 professional economists, including 16 full professors of economics, called on the Government to reverse its position. Summarising, the statement (reproduced in Appendix 1) said that:

1. Global climate change is a serious environmental problem.
2. Policy options are available that would slow climate change without harming employment or living standards in Australia, and these may in fact improve Australian productivity in the long term.

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<sup>1</sup> ABC Radio, 28 April 1997

<sup>2</sup> Speech to an Australian Business Seminar, 7 July 1997.

<sup>3</sup> ‘We are now going through all this greenhouse stuff. I don’t have any figures to back this up, but I think people will say in 10 years that it [greenhouse] was the Club of Rome’ (quoted in the *Sydney Morning Herald*, 14 March 1997). Senator Parer is a former executive with the Queensland Coal Association..

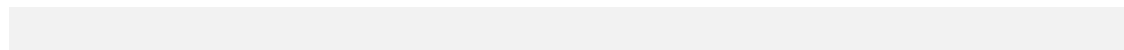
3. The economic modelling studies on which the Government is relying to assess the impacts of reducing Australia's greenhouse gas emissions overestimate the costs and underestimate the benefits of reducing emissions.
4. Economic instruments will be an important part of a comprehensive climate change policy.
5. Since OECD countries are responsible for over 80% of increased greenhouse gases in the atmosphere, and are in a stronger economic position to reduce their emissions, they should take the lead in cutting emissions.
6. Countries which are responsible for high per capita emissions and which are more wealthy should do more to reduce their emissions.
7. Withdrawal from the FCCC could seriously harm Australia's long-term interests, especially if Australia became locked into a fossil-fuel based economic structure while the rest of the world shifts to low-emission energy sources.

The signatories to this statement represented a large proportion of Australia's professional economists, and the issuing of it reflects a deep concern among economists about the advice on which the Government is basing its policies.

This paper is arranged as follows. The next section considers arguments and evidence about the economic costs of emissions reductions in Australia. It concludes that the Government has deliberately exaggerated the costs of meeting emissions reductions targets and the economic modelling results and estimates of costs to Australia have little credibility. Despite this, the economic modelling results which are used to justify Australia's position actually show that the costs of meeting targets would be very low, although they are used to argue the opposite.

Section 3 considers the issue of carbon leakage and concludes that the amount of leakage is overestimated by the Australian Government. Section 4 details some of the major flaws in the Australian position, including its abrogation of the polluter pays principle, the perverse consequences if the Australian position were adopted and the implications of differentiation for Australia. It argues that if differentiation were accepted by the Kyoto conference then it is likely to be worse for Australia than uniform targets would be and concludes that Australia's differentiation position is untenable and contrary to Australia's interests.

Section 5 contrasts the claim by the Australian Government that it is taking measures to reduce emissions with its actual performance. It also considers the opportunities for Australia to reduce its emissions and concludes that Australia is in a strong position to reduce its emissions sharply through energy efficiency at no or low economic cost and this gives it an advantage over other countries. Moreover, Australia is in a stronger position than most other countries to benefit from the development of renewable energy sources. The final section draws some conclusions.



## **2. The economic costs of reducing emissions**

### *2.1 Economic impacts on Australia*

Australia will potentially experience two types of economic cost as a result of mandatory reductions in greenhouse gas emissions. The failure to distinguish between the two has led to a deeply confused debate.

The first is the cost of reducing Australia's own emissions to the agreed level over the agreed period. Many people – including the 131 economists who signed the recent statement – believe that Australia could reduce its greenhouse gas emissions to the European target of 15% below 1990 levels by 2010 without any cost at all to the Australian economy.

The second is the cost to Australia of activities by other countries in fulfilling their obligations under the FCCC. As other countries reduce their emissions they will shift away from coal and towards natural gas, energy efficiency and renewables. As worldwide demand for coal slows and then declines Australia's terms of trade with the rest of the world will deteriorate. Although it is not obvious from the reported results, this second set of costs is the dominant one in the Government's economic modelling reviewed below.<sup>4</sup>

The question arises as to what Australia can do to reduce these costs. In relation to the costs of reducing its own emissions, there is a great deal that can be done through energy efficiency, fuel switching and controlling emission sources such as land clearing. These are discussed in Section 5 below.

In relation to the costs imposed by the actions of other countries, there is nothing Australia can do other than attempt to persuade other countries to reduce their emissions more slowly. However, Australia can have little influence over the outcome of the Kyoto negotiations, and the simple fact is that Australia will need to adjust to the changing pattern of world trade in response to climate change. The real issue for Australia is to decide whether it will either continue to attempt to expand markets for coal in a world that will increasingly turn away from that form of energy or whether it will focus attention and resources on developing the forms of energy that the world will increasingly seek out, in particular energy efficiency technologies and renewable energy technologies.

To this point the Government has formed its policies with the purpose of protecting the coal industry. There must now be a strong suspicion that the Australian Government has decided that the best strategy at Kyoto Conference of the Parties is to attempt to sabotage the negotiations and prevent any agreement on mandatory emissions reductions.

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<sup>4</sup> This is suggested by an experiment reported in Appendix B of ABARE (1997). In this experiment, a rate of price induced fossil fuel energy efficiency improvement in Australia is assigned a value of 0.5% per annum higher than in the business-as-usual scenario representing a 70% increase in the annual rates of efficiency gain (ABARE 1997:91). The growth rates of labour and capital productivity are adjusted downwards so that the overall rate of increase in efficiency of input use remains unchanged. The impact of this large improvement in the technical change in energy use is to reduce the estimated impact on gross national expenditure from 3.4% to 3.1% in 2020.

## 2.2 *The Government's economic modelling*

The Government has used the results of the MEGABARE economic model to support its belief that uniform targets would seriously damage the Australian economy. The model has been developed over 3-4 years by the Australian Bureau of Agricultural and Resource Economics, a public research agency. On the basis of these modelling results the Australian Government has made some very strong claims about the high costs to Australia of any international agreement to reduce emissions. For example it has claimed that:

- Australian wages would be cut by 20% below business-as-usual levels by the year 2020;
- GDP would be cut by 2% by 2020;
- each Australian will lose \$9,000 from their savings accounts;
- tens of thousands of jobs would be lost; and
- the economic cost for each Australian would be 22 times higher than for each European.

Despite the evident absurdity of some of these claims, they are fervently believed by the key ministers involved, including the Prime Minister Mr Howard. Even if one accepts the results of the MEGABARE model, a close look at the reported results shows that the impact of stabilising Australia's emissions on the economy would in fact be extremely small (ABARE & DFAT 1995, ABARE 1997). This is despite the fact that the MEGABARE model is constructed in a way that tends to exaggerate the costs of greenhouse gas reduction measures by:

- assuming that there are no 'no-regrets' energy saving measures, i.e. the absence of costless energy savings; and
- assuming that emissions abatement measures would induce no additional energy-saving technological change.

Most non-economists (and indeed most economists) are puzzled, to say the least, when it is suggested that policies designed to reduce emissions sharply will not induce any technological change.

The absence of no-regrets measures arises from the assumption that the economy is operating on the production frontier, and this reflects the ABARE belief that markets work perfectly. Clearly, in the absence of no-regrets measures to reduce emissions in the Australian economy, any emissions reductions required will come at a higher cost.

The economic costs of reducing emissions depend on the level of emissions reductions required and the marginal costs of emissions abatement. Data and the assumptions used in the MEGABARE model see Australia emerging with marginal



costs of abatement at about the average for Annex 1 countries (ABARE 1997: 41).<sup>5</sup> Clearly, if there are substantial reductions in emissions that can be had for no cost or low cost then the marginal abatement cost will be lower. The information presented in Section 5 indicates that ABARE has seriously overestimated marginal abatement costs for Australia and thus the economic costs to Australia of emissions reduction policies.

Welfare changes in the MEGABARE model are measured by changes in annual per person real gross national expenditure (GNE). The model results indicate that real GNE falls below the 'business-as-usual' path by amounts ranging from -0.27% in the year 2000 to -0.49% in 2020 (ABARE & DFAT 1995). It is most important to recognise that this does *not* mean that the *growth rate* of GNE is lower by these amounts, but that the absolute levels of real GNE are lower by these amounts.<sup>6</sup> It is also important to recognise that these estimates have been made using the modelling assumption that there is no unemployment as a result of these policies. This has not prevented Australia's political leaders from simultaneously claiming welfare losses as estimated by ABARE *and* massive job losses. This is explained in more detail in Appendix 2.

One way of understanding the size of the costs predicted by MEGABARE is to compare them to income levels in the future. If the Australian economy grows on average by 3.5% then *per capita* incomes will reach double their current levels around 1 January 2025. If Australia adheres to its international commitments and reduces its emissions then, according to the MEGABARE estimates, the doubling of per capita incomes will have to wait until around 1st March 2025, a delay of two months.

These MEGABARE results are very embarrassing for the Government. The Government has thus resorted to distorting the figures to support its case. The Minister for Resources, Senator Parer, has recently gone on record as saying that stabilisation of greenhouse gas emissions at 1990 levels by the year 2000 would

have a cumulative effect upon our economy equivalent to a loss of some six per cent of our 1996 gross national expenditure ... [and that this] would be equivalent to a loss in the savings of every Australian of \$1,900 in 1996 dollars or a reduction in the savings of a family of four of about \$7,600 (*Senate Hansard*, 26 November 1996).

This extraordinarily misleading statement is based on advice from ABARE which manufactured these figures out of the results of its MEGABARE model.

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<sup>5</sup> The reason why ABARE estimates relatively high total costs on the basis of average marginal abatement costs is twofold: since Australia is projected to have higher emissions growth under business as usual its abatement task is bigger, and, because a large share of the costs are due to declining terms of trade rather than domestic abatement policies.

<sup>6</sup> The MEGABARE model results are obscured in the ABARE/DFAT report and are presented in a way that makes it difficult for the casual reader to understand what is being measured. The report focuses on the sectors which experience the largest falls in output (coal, oil and gas) and relegates to Appendix C output changes in sectors which would expand. Thus under the stabilisation scenario, output would expand in agriculture (3.73% by the year 2020), processed agricultural goods (1.85%), manufacturing (2.58%) and services (0.38%).

The only way to make the numbers ‘look big’ is to take a series of very small numbers over a very long period (25 years from 1996-2020) and aggregate them. Thus Senator Parer, on direct advice from ABARE, aggregates projected short-falls in GNE for each year over the period 1996-2020 to arrive at a total figure (after discounting at 5%) of \$1,900 per person or \$7,600 ‘for a family of four’. Senator Parer and ABARE say that this is ‘equivalent to’ taking \$1,900 from every person’s savings account or \$7,600 from the savings of a family of four.

ABARE has used the devices of using present value lump sums rather than annual flows, thus multiplying the estimated impact by a factor of between 15 and 20. Then it estimates the impact on a family of four rather than per person. Both of these deviate from normal practice in reporting modelling results. In effect, ABARE takes the number and multiplies it by 60 before putting it into a media release. The \$7,600 per average family should in truth be compared to the accumulated income over the same period which, in present value terms, would be around \$1.75 million.

More recently, ABARE has revised its model. The new results multiply the costs to Australia fourfold, so that now Senator Parer claims that the expected targets would cost each Australian \$9,000<sup>7</sup>. The principal reason for this is a change in the model which limited the options to switch to hydroelectricity. If making a small change to the assumed response by the economy to abatement measures can quadruple the estimated economic costs, the whole structure of the model must be questioned.

It is worth noting that while the Government bases its international arguments on cost estimates that assume the *absence* of no-regrets reductions, the Government’s domestic greenhouse strategy is built almost entirely on the *existence* of no-regrets measures. The Greenhouse Challenge Program of the Department of Primary Industries and Energy (DPIE) – discussed in more detail in Section 5 below – comprises voluntary agreements with major emitting companies. An examination of the agreements already signed, and the Government’s literature on the Greenhouse Challenge, indicates that they are based on no-regrets measures. Thus the Government is telling domestic industry that substantial emissions reductions can be had virtually for nothing, but is telling the international community that emissions reductions will impose large costs on Australia.

### 2.3 *The funding of climate change policy modelling*

The fossil fuel industry has been funding ABARE’s modelling work. The extent of the funding is reported in the table in Appendix 3. A financial contribution to the MEGABARE modelling work entitles the contributor to a seat on the Steering Committee and immediate access to all standard simulation results of the model. In providing these figures, extracted from the Government by persistent questioning in the Senate, Resources Minister Senator Parer assured the Senate that members of the Steering Committee ‘have no influence over results and the manner in which the results are reported publicly’ (Senate Hansard, 2 May 1997). The fossil fuel industry has rapidly increased its funding of ABARE’s climate change modelling over the last four years, to the point where in 1996-97 it provided fully 80% of the funding.

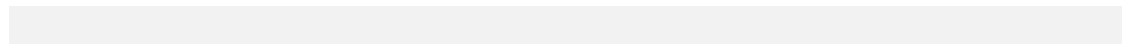
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<sup>7</sup> For the modelled ‘less stringent’ target of stabilisation at 1990 levels by 2010 and a 10% reduction by 2020 (ABARE 1997: 6).

While it is not suggested that the economic modellers in ABARE have changed their model construction or results under pressure from industry, they certainly share a worldview with the fossil fuel industry. One must ask the question: if the fossil fuel industry did not believe that the results of ABARE's modelling were working in its commercial interests, would it continue to fund the work at ever-increasing levels? In private conversations coal industry executives have made it very clear that they believe that their contributions to ABARE climate change modelling have been an excellent investment.<sup>8</sup>

The Commonwealth Ombudsman has announced an investigation into the issue of the transparency of funding of ABARE modelling and influence on it by the fossil fuel industry (*The Weekend Australian* June 14-15, 1997: 4).

After consideration of the structure and assumptions of the MEGABARE model, the results of the model and their presentation, and the funding of the modelling work, it is not surprising that the model and its advocates have been met with almost uniform scepticism in international policy circles and criticism by other modellers.



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<sup>8</sup> However, after sustained criticism at home and abroad, including withering comments from Tim Wirth, US Undersecretary of State for Global Affairs (Satellite Hook-up by USIS 24th July 1997), some doubts are creeping into the minds of industry about the political value of the modelling work.

### 3. Carbon leakage

Carbon leakage refers to the phenomenon whereby carbon-intensive industrial activities such as iron and steel and aluminium shift to non-OECD countries because OECD countries lose a competitive advantage as a result of emissions reductions measures. The problem is compounded if the countries to which industry moves have higher levels of emissions per unit of output.

How much of Australia's greenhouse gas emissions occur in sectors that might have their international competitiveness affected by emissions reduction policies? Table 1 shows the shares of emissions from all sources except land clearing and forestry from the inventory for 1993/94. Emissions from electricity generation<sup>9</sup> have been allocated to the sectors of final use. The percentages in Table 1 do not give any indication of the energy-intensity of output. For example, non-ferrous metals will be more affected than pulp and paper because energy use accounts for a higher proportion of production costs.

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<sup>9</sup> But, as a small technical point, not from gas processing and oil refining.

**Table 1 Summary of Australian Greenhouse Gas Emissions by End-use Sector, 1993/94** (excluding forestry and land-use changes)

Sector	Percent of GWP total*
Energy	
Coal mining	5.2
Gas processing and supply	5.0
Oil refining	1.7
Non-energy mining	2.1
Iron and steel	3.8
Non-ferrous metals	8.9
Chemicals	1.8
Pulp and paper	1.2
Non-metallic minerals	1.8
Food, beverages and tobacco	1.7
All other manufacturing	2.1
Construction	0.7
Civil aviation	0.9
Road transport	13.3
Rail and pipeline transport	0.8
Navigation	0.4
Commercial/institutional	7.4
Agriculture etc.	1.4
Residential	11.1
Military and other	0.4
<b>Total energy</b>	<b>71.5</b>
<b>Industrial processes</b>	<b>1.8</b>
<b>Solvents etc</b>	<b>0</b>
Enteric fermentation	15.4
Manure	2.3
Rice	0.1
Agricultural soils	2.1
Burning of savannas and field residues	2.5
<b>Agriculture</b>	<b>22.4</b>
<b>Waste</b>	<b>4.3</b>
<b>Total</b>	<b>100</b>

\* GWP = Global Warming Potential

Source: H. Saddler, 'Analysis of Australia's Greenhouse Gas Emissions', unpublished (Energy Strategies, Canberra, 1997)

The sectors whose competitiveness may be affected by emissions reduction policies are non-energy mining, iron and steel, non-ferrous metals, chemicals and pulp and paper. These account for 17.8% of total emissions excluding forestry and land-use change. The coal mining industry is also a big emitter, but capturing methane from coal mines is likely to improve the competitiveness of the coal industry. In the case of gas processing and supply, a traded good, while a measure such as a carbon tax would increase the relative price, this effect would be swamped by increasing demand for natural gas as its price fell relative to coal. Other sectors are either not traded (residential and road transport), or changes in energy prices would have no significant impact on costs (such as elaborately transformed manufactures) or are unlikely to be affected significantly by greenhouse policies (agriculture).

Since emissions from land-use changes are being revised it is not possible to say *precisely* how much of Australia's total emissions are accounted for by activities that produce traded goods. The figure will be in the region of 14-15%. Thus, around 15% of Australia's total greenhouse gas emissions are generated in sectors that may be subject to carbon leakage. The issue of carbon leakage arises only for those industries that both produce traded goods *and* are intensive in the use of fossil fuels.

Within these sectors, to what extent are emissions reductions measures likely to lead to carbon leakage to non-OECD countries. Decisions by corporate investors in Australia that result in carbon leakage depend on several factors:

- the emissions reductions levels and timetables agreed at the climate change negotiations;
- the types of policies adopted by the Australian Government to meet greenhouse gas reduction obligations;
- whether domestic policies provide relief to export industries that may be significantly disadvantaged;
- the extent to which policies result in an increase in the prices of these goods in Australia compared with major competing nations;
- to the extent that domestic industries suffer a loss in price competitiveness compared to non-Annex 1 countries, whether investors expect those countries to agree to mandatory emissions reductions at some stage in the future; and
- the extent to which emissions per unit of output in non-Annex 1 countries exceed those of Annex 1 countries.

Different modelling exercises show differing levels of likely leakage, including some that show it to be very low, a few percentage points of reductions only (BIE 1995). The MEGABARE model estimates a rate of carbon leakage of 13.9% for its more stringent scenario, i.e. for every million tonnes of CO<sub>2</sub> reduction in Annex 1 countries, an additional 139,000 tonnes will be emitted by non-Annex 1 countries (ABARE 1997:30-31).

Thus ABARE estimates a rate of carbon leakage of around 12-13% and this varies little with the severity of the cuts mandated at Kyoto. ABARE's estimate is based on a number of assumptions that all result in an inflation of the estimated level of carbon leakage. The analysis assumes:

- that a carbon tax is the single measure adopted by governments to meet targets. Such a tax would need to be very high to achieve the reductions required by the modelled scenarios. Many studies have shown that a combination of policy measures, of which a carbon tax would be one component, can reduce emissions at much lower cost than a stand-alone carbon tax;
- that this single tax rate is applied uniformly across the economy without any adjustment for industries that might be subject to pressures to move off-shore;

- that producers are operating at full efficiency so that none of the price impact of the carbon tax could be offset by increased energy efficiency, i.e. it is assumed that there are no ‘no-regrets’ measures available that will allow aluminium producers in particular, or more precisely electricity generators and distributors that supply the aluminium industry, to reduce energy consumption at no or very low net cost;
- that there would be no technological response to the policy change that would result in a fall in the relative price of low-emissions energy sources;
- that the major competing countries lie outside Annex 1 *and* that investors assume that these countries will not be subject to emissions reductions obligations over the next several decades; and
- that competing producers use energy less efficiently than Annex 1 countries.

Quite clearly, these are strong assumptions. In practice, the following are likely to prevail:

- governments will adopt a mix of policies and these policies may, for a time at least, give some relief to energy-intensive exporters;
- in the face of emissions-reduction policies the metal-processing companies will take measures to reduce their energy costs, including development of cheaper low-emission sources and energy-efficiency;
- the Kyoto agreement will clearly foreshadow the application of obligations to reduce emissions to developing countries by 2005 or 2010, albeit at lower levels than for Annex 1 countries. This will reduce any anticipated price differential emerging for energy-intensive exports; and
- any newly installed metals processing capacity in developing countries will use globally available state-of-the-art technology.

In the face of these more likely outcomes, the level of carbon leakage would be much lower than estimated. In short, with sensitive policies the issue of carbon leakage becomes a minor one. However, those who are attempting to prevent any measures to reduce emissions frequently exaggerate the problem in order to undermine confidence in the effectiveness of mandatory obligations by Annex 1 countries.

The Government argues that Australia should be permitted to become a global specialist in the use of fossil fuels because Australia uses fossil fuels much more efficiently than Asian countries in producing, for example, metals. Therefore global emissions will be lower if Australia, rather than developing countries, carrying on such activities. It is true that current electricity production from coal in Australia is 15-25% more efficient in the use of coal and thus carbon dioxide emissions than installed capacity in typical Asian countries. However, the efficiency of electricity production in many of the relevant developing countries is rapidly catching up with that of Australia, and any new capacity installed anywhere to take up the slack offered by Australian withdrawal from new metal smelting is likely to use globally

available state-of-the-art technology. Current relative efficiencies are no guide to future relative efficiencies.

Moreover, the efficiency advantage of Australian electricity production is often overstated. The newly privatised Hazelwood power station in the Latrobe Valley has had its life extended by 30 years. Yet the thermal efficiency of Hazelwood is only 24%, less efficient than many existing coal-fired stations in developing countries.

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## 4. Flaws in Australia's differentiation position

Australia's position – which is little understood even within policy circles – is to oppose uniform emissions reductions targets in favour of differential targets. It is argued that since Australia is more heavily dependent on fossil fuels for domestic production and exports, imposing uniform targets would impose a higher economic cost on this country. Australia has probably the highest levels of greenhouse gas emissions of any country in the world (Hamilton 1994).

Australia has put forward a number of indicators that it says should be used to determine each country's emission reduction target. These indicators would allow more lenient targets for countries which:

- have high GDP growth
- have high population growth
- have high emissions per unit of GDP
- export fossil fuels heavily, and
- depend heavily on fossil fuels to produce exports.

It is not surprising that the international community has reacted so negatively to Australia's proposal. It means that countries that have the highest emissions would be required to do the least to reduce them, while countries that have done most to reduce their emissions already would be required to do more. What are the major problems with the Australian position?<sup>10</sup>

### 4.1 *The polluter pays principle*

The Australian position is wholly contrary to the polluter pays principle that has been the basis of environmental policy in Australia and abroad for years. Not only is this principle seen as equitable – those who cause the problem should be responsible for cleaning it up – but it is also the most economically efficient because it is based on the internalisation of external costs and therefore brings about an efficient allocation of resources.

The argument that targets should be differentiated so as to impose equal economic costs per capita on each country is fundamentally inequitable, especially if developing countries were – as the Australian Government argues – brought into the process sooner rather than later.

### 4.2 *Effects of fossil fuel trade*

The Australian position's treatment of fossil fuel trade is especially perverse. As a result of targets, two types of economic costs would be imposed on Australia – the costs of meeting domestic emissions targets and the costs of losses in revenue from

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<sup>10</sup> The following paragraphs draw heavily on The Australia Institute (1997).

fossil fuel exports as other Annex 1 countries reduce their emissions. The effect of the Australian ‘equal economic cost’ proposal would be to make domestic targets in Australia even more lenient, as economic costs are increased if other countries import less coal in order to reduce their own emissions. Under the Australian position, to offset lower coal exports, higher emissions in Australia would be permitted. Thus the more ambitious are other countries’ greenhouse measures, the less demanding Australia’s would be. Depending on the formula used, this could lead to demands by Australia that the other Annex 1 countries actually pay compensation to Australia, a position that is explicitly advocated by OPEC countries.

If it were to be adopted, the effect of the Australian position would be that as the rest of the industrialised world progressively shifted away from fossil fuels, Australia would become ever more firmly entrenched as a carbon dioxide emitter. We would actually see carbon leakage from the rest of the world into Australia. In time, instead of being among the highest polluters, Australia would be the outstanding global emitter of greenhouse gases.

#### *4.3 Locking in the past*

When the estimated costs of reducing emissions are as small as those estimated by MEGABARE then the relative costs become largely irrelevant. Nevertheless, part of the reason that Australia appears to have relatively high costs of abatement is that the modelling assumes away the existence of low-cost and no-cost energy savings and because it assumes away technological progress. As soon as we allow for these – including energy efficiency, energy conservation and demand management, and the growth of renewables – then Australia is in fact in a strong position to reduce its emissions.

The Government’s thinking and ABARE’s modelling assumes that Australia’s ‘comparative advantage’ in fossil-fuel based industries is fixed and given. This reflects the rigid and short-term thinking about Australia’s economic future which we have spent 20 years trying to escape from. A major theme of Australia’s official position is that Australia’s international competitive advantage lies in the use of fossil fuels, especially coal, to provide low-cost electricity to smelt metals from Australia’s mineral reserves. It is argued that this is the optimal course both for Australia and the world. This advantage is part of the reason emissions reduction costs are said to be higher in Australia than in other industrialised countries which specialise in less energy-intensive activities, such as elaborately transformed manufactures. However, we need to take a longer-term view. In a decade or two much more demanding greenhouse targets are likely and all industrialised and industrialising countries will be faced with the need to turn decisively to alternative energy sources. At this point a very different picture of comparative advantage emerges, one in which any country that has specialised in fossil fuels will be at a severe disadvantage.

#### *4.4 Role of population growth*

The Australian position also seeks higher emissions for Australia because of higher projected population growth. In effect the Government is saying that, as a result of our past and expected immigration policies, we expect higher population growth in

the future than other developed countries and this will make achieving a fixed reduction target more difficult. We therefore seek to change the target to a per capita goal so as to escape the responsibility for global climate impacts of our higher population growth. It is as though one part of our emissions should not be counted because of a completely unrelated policy. The Australian policy accepts the economic benefits of immigration but wants to absolve Australia of responsibility for the costs. Why should other Annex 1 countries find this a credible position?

The Australian position is mired in contradictions. The Government has been arguing that developing countries should be brought into any agreements to reduce emissions because they will be responsible for the most of the emissions in the future due to their high rates of population and economic growth. So according to the Australian position, whilst high population and economic growth rates in developing countries are reasons for insisting that those countries be required to reduce their emissions, the same factors are used to argue that Australia should be given more lenient targets.

#### *4.5 Other differentiation positions*

Pursuit of differential targets by some other countries has been hailed by the Australian Government as a vindication of its position. However, proposals by other countries for differentiation would be worse for Australia than uniform targets. Other countries that oppose uniform targets want *larger* reductions for countries like Australia with high emission levels.

Norway, for instance, which Australia seems to regard as a major ally in seeking differentiation, takes the following position:

Parties should take their share of the burden in proportion to their relative contribution to the climate change problem. Those who currently emit more than their fair share should thus contribute more. Also, Parties that have greater capacity, economic or otherwise, to deal with the problem, should in principle do more than other Parties to reduce emissions (Dovland 1997).

This is wholly contrary to the Australian position. Under the Norwegian proposal, a country would be required to reduce its emissions by *more* if it has:

- higher emissions per capita;
- higher GDP per capita; and
- higher emissions per unit of GDP.

The first and third of these three indicators are the precise opposite of Australia's proposed indicators, and the second (GDP per capita) is not helpful to the Australian position. These differences are shown in Table 2. Japan, which Australia sees as a potential ally, has low emissions per capita and per unit of GDP and is entering an era of lower economic growth. Thus under the Norwegian differentiation position it would have more lenient targets while under the Australian position it would have more stringent targets. The Japanese Government understands this, but the Australian Government does not.

**Table 2 Indicators leading to higher or lower targets, Australia and Norway**

<b>Indicator</b>	<b>Australia</b>	<b>Norway</b>
High GDP growth per capita	Lower	Higher
High population growth	Lower	Irrelevant
High emissions per unit of GDP	Lower	Higher
Export fossil fuels heavily	Lower	Irrelevant
High emissions intensity of exports	Lower	Higher
High emissions per capita	Irrelevant	Higher

The European Union (EU) has been criticised by Australian representatives for adopting differentiation among its member countries while seeking uniform reductions for other countries, as though this justified the Australian stance (*Australian Financial Review*, 26 February 1997, 7 March 1997). However, this is a shallow criticism for two reasons. Firstly, the EU negotiates as one party for the purposes of negotiations under the Convention and other international agreements, and is increasingly one economy. The legal position of the EU countries as signatories remains unclear, but it is possible that each EU country will sign up to a uniform target but there will be some provision in the protocol to allow ‘burden sharing’ within designated groups of states. As a result, the richer countries of the EU are likely to end up subsidising the poorer countries. Australia would perhaps be free to enter a similar arrangement if it could find some Annex 1 countries that were effectively willing to subsidise it.

Secondly, the EU countries which have more lenient targets within the EU are not chosen for the reasons that Australia is claiming more lenient targets. Generally they are low GDP, low emitting, non-fossil fuel exporting countries, such as Portugal, Greece, Spain and Ireland. If Australia were a member of the EU then it would probably be treated more like Britain and Germany – with high emissions, high GDP per capita and relatively low marginal abatement costs– than Portugal and Greece, and would therefore be required to reduce its emissions by *more* than the average.

## 5. Domestic greenhouse response

The Australian Government has mounted a major public relations offensive to convince the world community that Australia should be given special dispensation to pollute more than other Annex 1 countries. Part of its campaign is to attempt to gain credibility by arguing that Australia is already making considerable efforts to reduce its emissions at home.

Nothing could be further from the truth. Since taking office in March 1996 the Coalition Government has wound back or abolished several of the already meagre federal programs aimed at reducing emissions. In the following sections we:

1. review the recent record of the Australian Government in promoting energy efficiency and renewables;
2. consider the impact of the Greenhouse Challenge Program, a program of voluntary agreements with industry that is the cornerstone of the Government's claim to be serious about reducing emissions; and
3. contrast the performance of the Federal Government with the programs of the Government of New South Wales, Australia's most populous state.

### *5.1 Backsliding by the Federal Government*

Since coming to power in March 1996, the Government has failed to introduce any new measures to promote energy efficiency and the use of renewables and has cut some of the few programs in place.

#### National Energy Efficiency Program

This program, although relatively small, has been the Commonwealth's major contribution to stimulating more efficient use of energy throughout the Australian economy. In the 1997-98 budget its appropriation was cut by 60%, from \$4.7 million in 1996-97 to \$1.9 million. The largest single consequence of the cut was the abolition of the Enterprise Energy Audit Programme, which subsidised the cost of energy audits for businesses.

The budget papers described this cut as 'a rationalisation of Commonwealth energy programmes ... as a consequence of increased State and local government activities and outcomes achieved through energy market reforms'. This is not a convincing argument; only one state, NSW, has increased its efforts in this area, and most of the others have reduced them. It is in fact an abrogation of responsibility for national efforts to reduce emissions.

#### Energy Research and Development Corporation (ERDC)

The Government has announced that this very effective body is to be abolished. The rationale – that there are other sources of support for energy R&D – is unconvincing, and fails to recognise the unique role played by the ERDC. The ERDC's work has been significant in:

- concentrating on research projects which offer strong prospects of successful commercialisation;
- bridging the development and demonstration ‘gap’ between a research project and a commercial product;
- only investing in projects if at least 50% of private sector funding could be achieved; and
- facilitating private sector contributions by performing the necessary assessments of prospective projects, thereby greatly reducing the risks for other investors.

Two external assessments of the ERDC have been made and both concluded that it had been very successful in making investments that would increase national welfare and that its investments have stimulated increased private sector energy investment and the level and scope of energy innovation in Australia.

As a result of the abolition of the ERDC, funding to the Cooperative Research Centre for Renewable Energy, the principal focus of renewable energy research in Australia, will be reduced.

#### National Greenhouse Response Strategy (NGRS)

The effect on emissions of measures included in the original NGRS, agreed in 1992, has in almost all cases been smaller and slower than projected in 1992. It was this realisation that led the previous (Labor) Government to introduce additional measures in its ‘Greenhouse 21C’ program announced in March 1995. The most important of the new measures was the Greenhouse Challenge Program, discussed below. Other measures introduced at the time included support for the CRC on Renewable Energy (for which funding has been reduced), Green and White Papers on renewable energy, and a scheme to support the renewable energy industry. Nothing has come of the last measure. A Green Paper produced by the previous Government was scrapped by the new Government and replaced by a new Green Paper. There is as yet no indication whether a White Paper will appear.

The Government argues that deregulation and restructuring of the electricity and gas industries will have a significant impact on emissions. However, while deregulation has stimulated gas cogeneration it is likely that any gains have been offset by falling prices and aggressive marketing that increased demand for electricity and generate higher emissions.

#### *5.2 Greenhouse Challenge Program*

The Greenhouse Challenge Program (GCP) is a federal government scheme involving voluntary agreements with major emitting companies. The agreements specify measures that companies agree to undertake to reduce their greenhouse gas emissions. The Program is complex and not always clear in its objectives and no evaluation of its effectiveness has been carried out to date. The GCP is based explicitly on ‘no regrets’ measures, i.e. measures that are worthwhile undertaking for commercial reasons irrespective of their impact on greenhouse gas reductions. It should be noted that the

Federal Government spends only \$2.4 million per year on the GCP. Thus the Government is shifting the costs of programs to reduce Australia's emissions onto business and avoiding responsibility itself.

Major emitting firms in Australia have been enthusiastic about signing up to voluntary agreements. An informal deal was done between the former Labor Government and industry groups whereby if measures such as a carbon tax were to be avoided industry would need to demonstrate its commitment to reducing emissions. There is therefore strong pressure within the corporate world for major firms to demonstrate their good faith. There is no doubt that some of the firms that have signed agreements have made serious efforts to develop emissions reductions plans – EnergyAustralia, a NSW electricity distributor, is a case in point. In addition, the GCP serves the important function of raising awareness among the business community about the importance of climate change and the need for the corporate sector to play a major role.

However, the effectiveness of the Program overall is very limited for the following reasons.

1. Many of the measures specified in the agreements to reduce emissions are measures that the companies planned to undertake irrespective of the agreement. They cannot therefore be claimed to be due to the Greenhouse Challenge Program but should be part of the 'business-as-usual' scenario.
2. In calculating the emissions reductions due to the GCP, a 'frozen efficiency' assumption is made, i.e. it is assumed that the companies in question would make no improvements in energy efficiency over the next several years. The effect of this is to exaggerate the claimed reductions in emissions due to the Program.
3. The details of the agreements are treated as commercial-in-confidence so it is not possible for the public to make a proper assessment of how real the claimed emissions reductions are. Essentially the public is expected to take the claimed reductions on faith, something only the naive would do.

A strong indication of the manipulation of figures is provided by the GCP's own 1996 Progress Report (GCP 1997) where estimates are made of emissions by signatory companies to the year 2000 under 'frozen efficiency' and under the impact of voluntary agreements. The document claims that emissions will be reduced by 15 Mt of CO<sub>2</sub> equivalent by the year 2000, down from a projected 93 Mt to 78 Mt – see Figure 1. This represents a cut of 16%. However, a simple extrapolation of the emissions of these companies based on emissions in the years 1990 (71 Mt) and 1995 (73 Mt) would see these companies emitting only 75 Mt by the year 2000, less than projected under the voluntary agreements.<sup>11</sup> In sum, although the details of the agreements remain shrouded in secrecy, there are good grounds for believing that the emissions reductions claimed by the Program are gross exaggerations, and that the

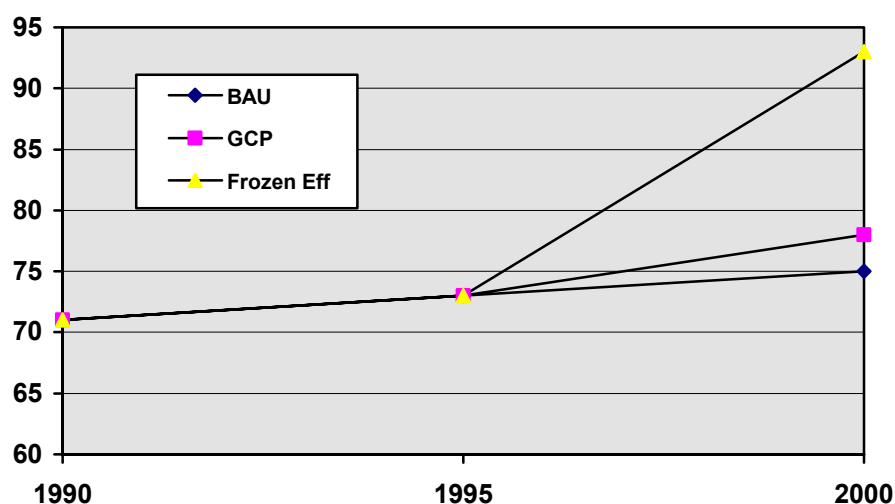
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<sup>11</sup> The document attempts to explain this anomaly as follows: 'The explanation of this is a fairly flat economic period with little to no growth which inhibited significant emissions growth. Some sectors also made progress in reducing their greenhouse gas emissions'. (Greenhouse Challenge Office 1997:11). In fact, the opposite has been the case with real GDP growth in the order of 3.5 to 4.0% since the recession in 1990-91.

GCP as it is currently constituted will not significantly reduce Australia's emissions below the levels they would attain in the absence of the Program.

One of the often-noted features of the Program is the great emphasis that is placed on public relations. Each batch of agreements is launched with fanfare by the Minister, full-page newspaper advertisements are taken out, and expensive (but uninformative) publicity material is produced and distributed widely. Unfortunately the achievements of the program are far less impressive than the promotional efforts.

**Figure 1 Greenhouse gas 'reductions' due to the Greenhouse Challenge Program**



### 5.3 Progress in New South Wales

Since the election in 1995 of the Carr Labor Government in Australia's biggest state, considerable progress has been made in NSW in the development and implementation of greenhouse gas reduction policies. While a detailed analysis is not possible here, the main advances have been as follows.

1. Legislation now requires electricity retailers in NSW to develop and implement strategies to reduce emissions associated with the supply of electricity. Energy use accounts for around half of greenhouse gas emissions in NSW, and electricity is responsible for around half of that. The Government has indicated that it will set a target for the electricity retailers to reduce their emissions by as much as 20% by 2010.
2. The Government has established the Sustainable Energy Development Authority (SEDA) with significance levels of funding to promote energy efficiency and the use of renewables.
3. SEDA has established a Green Power Accreditation Program which provides electricity consumers with the opportunity to purchase accredited 'green power', that is, electricity from renewable sources.



4. The State government has announced a program to reduce the energy consumption of government buildings by 25% by 2005.
5. Several other programs established by SEDA including: Energy Star Office Equipment Program, the Cogeneration Investment Program, Energy Smart Business, Energy Smart Homes and the Sydney 2000 Olympic Solar Village.
6. These reforms have already given a significant fillip to demand-side measures by retailers and to alternative energy producers in NSW, especially gas cogeneration, recovery of coal seam methane, and grid-connected wind generation.

The commitment of the NSW Government to innovative programs to reduce greenhouse gases in that state stands in sharp contrast to the backsliding of the Federal Government. They demonstrate that substantial progress can be made using cost-effective programs.

#### *5.4 Opportunities for low-cost emissions reductions*

For a country that needs to reduce its greenhouse gas emissions, heavy dependence on fossil fuels may be a blessing rather than a burden. The key question is not so much whether the country consumes a large quantity of fossil fuels, but how efficiently it consumes it. The more inefficient a country has been in the past the easier and cheaper it will be to reduce consumption. This is precisely why Australia has supported the development of joint implementation, whereby Annex 1 countries can claim emissions reduction credits for projects that reduce emissions in non-Annex 1, especially developing countries, where it is believed there is more inefficiency in the combustion of fossil fuels.

ABARE acknowledges this basic fact in the case of Japan in explaining why the MEGABARE model shows that the costs of uniform targets would be very high for Japan.

Japan experiences high costs because Japanese industries have already taken major steps to improve energy efficiency and reduce fossil fuel use. Further action to reduce emissions by significant amounts in Japan would imply further structural adjustment to the Japanese economy, carrying large costs (ABARE 1997: 5).

Of course, this fact cuts both ways. Countries which have not already taken major steps to improve energy efficiency and reduce fossil fuel use will find it relatively cheap to do so. This is precisely the case for Australia, a fact that will now be demonstrated.

Firstly, we compare the energy efficiency performance of Australia and OECD countries over time. Over the period 1970 to 1992, energy-related CO<sub>2</sub> emissions per unit of output in Australia declined by 13%, while they fell by 36% in the OECD (Hamilton 1994: Chart 8). This difference may be explained by changes in industry structure rather than inefficiency of energy use, but there is a wealth of evidence to suggest that inefficient energy use is a major factor.

The most recent analysis of Australia's energy performance is provided by the International Energy Agency (IEA 1997). The IEA notes:

- over the last ten years, energy consumption in Australia has increased at the rate of 2.1% per annum, compared with the IEA average of 1.1%;
- the average ratio of energy use to output (measured in real \$US converted at purchasing power parity) is significantly higher than in Europe and about comparable with the USA;
- Australia ranks third among all IEA countries in fuel consumption per passenger car, with only the USA and Canada having more thirsty vehicles;
- most energy consumed in Australia is fossil fuel and therefore 'energy savings can reduce the level of CO2 emissions'; and
- energy is cheap in Australia because of the abundant supply of low-cost energy resources and low energy taxes. 'This low level of energy prices makes investments in energy efficiency less profitable than in the average IEA country';

The IEA concludes as follows: 'the results of the industrial energy audits, the absence of general mandatory standards for buildings and domestic appliances and the high level of fuel consumption by passenger cars all indicate that there is a *great potential for improvements in energy efficiency*' (emphasis added).

The IEA recommends, *inter alia*:

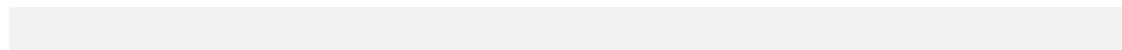
- mandatory energy efficiency codes for buildings and electrical appliances, including air conditioning;
- stronger fuel efficiency targets for passenger and commercial vehicles;
- higher fuel taxes; and
- improvements in interstate public transport.

In Australia there have been several studies estimating the potential for reducing greenhouse gas emissions in cost-effective ways. In other words, these studies estimate the reductions in emissions that would repay the investments required in capital equipment. While the studies vary widely in the assumptions about levels of energy savings, end-use fuel substitution, cogeneration and supply-side fuel substitution, the conclusions are remarkably similar. Wilkenfeld (1996) divides the studies into two groupings and concludes that one group estimates that the potential for cost-effective CO2 reductions is in the range 20-30% and the other group estimates reductions in the range 40-48%. The results are summarised in Table 3. The largest savings are in the residential sector, but the industrial, commercial and transport sectors all have substantial potential reductions.

**Table 3 Estimates of cost-effective energy measures to reduce CO2 emissions from the Australian energy system (all sectors) (%)**

<b>Reference</b>	<b>Potential reduction</b>
ABARE 1991	30
AMEC 1990	25
ESD 1992	22
ESD 1992	29
GWA 1991	20
GWA 1991	30
<i>Range, this group</i>	<i>20-30</i>
<i>Average, this group</i>	<i>26</i>
Greene 1990	47
Greene/NIEIR 1990	48
NIEIR 1990	40
<i>Range, this group</i>	<i>40-48</i>
<i>Average, this group</i>	<i>45</i>

*Source:* Wilkenfeld 1996, Table 1



## **6. Future implications for Australia**

These studies strongly suggest that Australia could meet any likely uniform targets relatively cheaply. Alternative policy packages, such as one outlined by the Australia Institute involving a carbon tax-payroll tax trade-off and mandatory fuel efficiency standards for vehicles, indicate that large reductions in emissions could be obtained along with a net expansion of output and employment in Australia (Hamilton, Hundloe and Quiggin 1997).

What would really be the economic cost of a phased reduction of emissions in Australia over the next 10-20 years? If serious measures were taken to reduce Australia's emissions – including a carbon tax, a tradeable emissions system in electricity and mandatory fuel efficiency standards for vehicles and appliances – then we would expect the principal response to be a shift to less polluting energy forms in the first instance and then a major change in energy technologies. Technological change, including new technologies and sharp improvements in existing technologies, is fundamental to dealing with climate change.

In addition, around one quarter of Australia's greenhouse gas emissions are due to land clearing (Hamilton 1994). Most of the land clearing in question is highly marginal from an economic viewpoint, and entails large environmental costs other than the release of carbon dioxide. Ending, or dramatically reducing, land clearing in Australia would be means of meeting any foreseeable targets at almost no cost and possibly with net economic benefits.

In the absence of a sensible approach to reducing Australia's emissions, Australia will become locked into a fossil-fuel based economy at exactly the time the rest of the world is starting to move away from those forms of energy. It would become an industrial anachronism. Moreover, the costs of beginning to shift out of fossil fuels in two or three decades are likely to grow. In the meantime, Australia cannot expect governments in the rest of the industrialised world to sit back and watch Australia continue to emit at high levels while they are taking measures to reduce their emissions. Sanctions are a certainty sooner or later. It is time for the Australian Government to separate the public interest from the short-term commercial interests of the coal industry.

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## Appendix 1

### A STATEMENT BY PROFESSIONAL ECONOMISTS ON CLIMATE CHANGE

1. A report by over 2000 distinguished international scientists under the auspices of the Intergovernmental Panel on Climate Change has determined that ‘the balance of evidence suggests a discernible human influence on global climate’. As economists we believe that global climate change carries with it significant environmental, economic, social and geopolitical risks and that preventive steps are justified.
2. Economic studies have found that there are many potential policies to reduce greenhouse gas emissions for which the benefits outweigh the costs. Policy options are available that would slow climate change without harming employment or living standards in Australia, and these may in fact improve Australian productivity in the long term.
3. The economic modelling studies on which the Government is relying to assess the impacts of reducing Australia’s greenhouse gas emissions overestimate the costs and underestimate the benefits of reducing emissions.
4. Economic instruments – such as carbon taxes and trading of emission permits within and between countries – will be an important part of a comprehensive climate change policy. ‘Joint implementation’ policies, in which Australian firms carry out emission-reduction investments in developing countries, can also play a significant role. Revenues raised from taxes or the sale of permits can be used to reduce the budget deficit or to lower existing taxes.
5. Developing countries will need to take measures to reduce significantly their greenhouse gas emissions in due course. But since OECD countries are responsible for over 80% of increased greenhouse gases in the atmosphere, and are in a stronger economic position to reduce their emissions, they should take the lead in cutting emissions.
6. An appropriate equity and efficiency principle for the distribution of the emissions reductions is one where countries which are responsible for high per capita emissions and which are more wealthy should do more to reduce their emissions.
7. Withdrawal from the Framework Convention on Climate Change could seriously harm Australia’s long-term economic and diplomatic interests. It would be damaging to our longer-term economic interests if Australia became locked into a fossil-fuel based economic structure while the rest of the world shifts to low-emission energy sources over the next decades.

*Signed by 131 professional economists*

## Appendix 2

### Employment losses in economic modelling

General equilibrium modellers must ‘close’<sup>12</sup> their models by making an assumption about how the labour market works. Either the level of employment can be fixed so that wages vary to clear the market, or the real wage rate is fixed and employment varies.

The MEGABARE model uses the common modelling assumption that employment is fixed and wages vary. As a result the model results show that wages and incomes fall as a result of policies to reduce emissions, but there is no additional unemployment as a result of these policies.

Thus the estimated decline in national income (GNE) predicted by the model is made on the assumption that labour market adjustment will result in no job losses. Thus ABARE makes the projection that the effect of OECD countries reducing their emissions to 1990 levels by 2010 and by a further 10% by 2020 would see real wages in Australia 19% lower than they would otherwise be by the year 2020.<sup>13</sup> But this has not prevented Australian politicians – including the Prime Minister, the Foreign Minister and the Resources Minister – stating in public that wages would fall by 20% *and* that there would be large job losses. The modellers, who fail to correct the politicians who quote their results, and the politicians themselves, cannot have it both ways. If there are large job losses then, even if one believed the MEGABARE model results, wages will fall by much less than 20%.

This may be seen as splitting hairs, because, it would undoubtedly be argued, however we look at it the economic costs are large. The point is to reinforce the observation that the figures generated by ABARE have been used in reckless and alarmist ways. The model and its results have no independent validity at all, and are wholly tendentious in intent and deployment.

In practice, labour markets are neither perfectly flexible nor perfectly sticky and, if the policies modelled by MEGABARE had the claimed effects on the economy, there would be some unemployment. Job losses could be due to both the changes in relative prices (depending on changes in the relative price of labour compared to other inputs) and income effects. The income effects refer to the decline in economic growth due to a less efficient allocation of resources and to the change in Australia’s terms of trade with the rest of the world due to falling demand for, and prices of, exported coal. Most job losses that might occur would be due to income effects, especially due to declining terms of trade, rather than price effects. Indeed, price effects may well offset terms of trade effects.

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<sup>12</sup> These models have a few more variables than equations so that a few variables must be determined from outside the model (‘exogenously’) so that the model can be solved as a system of equations. The process of selecting variables to be fixed is known as ‘closing’ the model.

<sup>13</sup> ABARE, *Current Issues* Issue 2 April 1997

### Appendix 3

#### Funding of government climate change modelling

**Appendix Table 1 Fossil fuel industry support for MEGABARE & GIGABARE models**

<i>Company/Organisation</i>	<i>Contributions</i>	<i>Share of total contributions</i>
<b>1993-94</b>		
Australian Coal Association	\$50,000	
<b>Total</b>	<b>\$50,000</b>	<b>28%</b>
<b>1994-95</b>		
Australian Coal Association	\$50,000	
Business Council of Australia	\$60,000	
<b>Total</b>	<b>\$110,000</b>	<b>52%</b>
<b>1995-96</b>		
Figures not supplied		
<b>1996-97</b>		
Australian Aluminium Council	\$25,000	
BHP	\$50,000	
Business Council of Australia	\$50,000	
CRA Ltd	\$25,000	
Den Norske Stats Olijeselskap (Statoil)	\$50,000	
Electricity Supply Association	\$50,000	
Exxon Corporation	\$50,000	
Mobil Oil Australia Ltd	\$50,000	
Texaco Corporation	\$50,000	
<b>Total</b>	<b>\$400,000</b>	<b>80%</b>

*Source:* Senate Hansard, Questions on Notice No. 565, 2 May 1997