



Submission to the Green Paper on Australia's Carbon Pollution Reduction Scheme

Alan Moran

Institute of Public Affairs
9 September, 2008

 **Institute of
Public Affairs**
Free people, free society

Australia's Carbon Dioxide Reduction Scheme

Summary

Climate change forecasts by scientists are having a dominant influence on policy throughout the world. Politicians and economists have popularised some of the more sensational scientific concerns regarding climate change outcomes. Dengue fever, malaria and the loss of the Great Barrier Reef have become key features of the debate in Australia. Fears about sea level rise are even impacting upon local planning approvals, with new house building applications being rejected on these grounds.

The Garnaut Report suggested Australia would incur an 8 per cent loss in income if no action is taken. This is four times higher than the Stern report's estimate of global costs. Such estimates are only made possible by accepting the forecasts of warming, overstating the costs of adaptation and using discount rates covering future costs that are, at the very least, unorthodox.

At the same time, costs of action to mitigate CO₂ emissions tend to be hidden by the nature of economic analysis and modelling. But Australia, like other western economies already has a huge drain of resources to accommodate fears of climate change. These amount to about \$3 billion a year for Australia and include:

- taxes to subsidise non-commercial research and 'demonstration projects'
- standards to require uneconomical expenditures on insulation etc
- specific incentives to use uncommercial power sources like wind

The detrimental effects of such measures are masked by national accounting conventions. However, the policies in place entail economic distortions and bring about three sorts of costs. The first are costs to consumers of the higher taxes and less efficient energy sources. The second are impacts on business of the higher costs of energy as inputs

into production and new investment decisions. The third are the risks that are created for new fossil fuel investments, especially those involving coal.

Energy saving standards and renewable energy requirements force consumers into using inefficient energy sources and to incur increased housing costs, both of which result in a reduction in real income levels. In proportion to the sums incurred, consumer costs from tax based systems, like the Emission Trading Scheme (ETS), are likely to be less than those forced by direct regulation—the deadweight costs of a tax are lower because the revenue is largely passed back to the consumer. Costs are however still incurred as a result of shifting expenditures to less efficient suppliers and as a result of the administrative expenses.

The effects of these impositions on producers bring far more invasive costs than those on consumers. Those producers using fossil fuel energy see costs increase—and a 10 per cent cost increase even where energy comprises only 2 per cent of overall costs still has an appreciable effect on profit, the driver of new investment decisions.

For energy producers, especially those contemplating investment in coal based electricity (dominant in Australia and many other countries), the risks of retrospective taxation are too great. New investment is therefore prevented. The corollary is a progressive increase in price as demand gradually outstrips supply or as higher cost new generators are commissioned. Aside from risks of power outages, this means increasingly costly marginal plant becomes the supply setting price. In Australia, the shortfall in new coal based electricity supply has brought a 60 per cent increase in wholesale electricity prices over recent years.

Australia is also, perhaps uniquely, pursuing schizophrenic policy directions with regard to coal. At the same time as new coal based electricity facilities are virtually banned and existing generators are encouraged to be phased out, activity is underway to expand coal exports, especially from Queensland. The burning of the coal domestically or overseas has identical effects (if any) on climate change, yet one is considered to be a pariah activity and the other is supported.

Carbon mitigation policies lead to lower levels of real wealth and income levels. They have contributed to wider economic woes as consumers and producers alike make adjustments. Europe has been in a slowdown for a number of years and the US is probably now in one. In both cases the cost impost that emission control policies have forced would doubtless have contributed as a result of the pervasive and largely unsubstitutable nature of electricity within modern economies. Europe's ETS and wind energy requirements have brought a doubling of electricity costs and in the US recession has hit hardest in states like California which have taken the lead on penalising fossil fuel use.

Over the past decade, Australia's economy has been buoyed up by being the quarry to the world's fastest growing economies. But notwithstanding our natural wealth, and economic reforms, we have struggled to grow at one third of the rate of less well placed countries like India and China. Moreover, the accumulation of regulatory imposts and threats, of which those on energy have increased most, is now contributing to recessionary warnings.

Australia has more to lose than almost any other country from the costs imposed by CO2 emission restraints. Cheap coal based electricity has been the bedrock on which much of our industrial development rests. Smelting industries in particular gravitated to Australia in the wake of the 1970s oil price hikes but low cost electricity has assisted the competitiveness of all our tradable goods industries. While we might speculate on the long term costs of global warming on Australia, the short term costs of increasing the price of electricity supplies are self-evident.

With only one per cent of world GDP, we are neither prominent among world nations nor particularly influential within world councils. And while Australia has many well qualified scientists few of these are considered to be world authorities on climate change. Accordingly, it is pure hubris for Australia to attempt to take the lead in abatement activity.

Any measures to mitigate Australian emissions

should be made contingent upon actions from the rest of the world, particularly those of our competitors. Further, the focus should be a single instrument, a tax or tradable right, on reducing regulatory barriers (especially to nuclear facilities) and should abandon measures like mandatory renewable targets, which are inefficient emission reduction instruments.

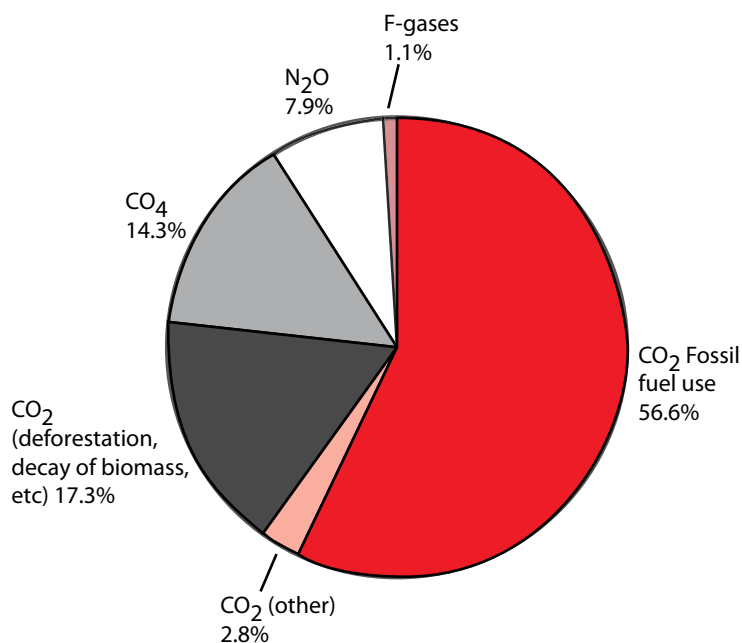
Introduction

Though it is impossible to measure the long term economic effects of measures to force reductions in fossil fuel emissions, all respected authorities now agree that the costs are considerable.

Globally the share of gases in the CO₂ equivalent is dominated by CO₂ especially as a fuel. CO₂ comprises three quarters of the gases targeted as causing global warming, as illustrated in Figure 1.

Though urging greater reductions in emissions, many countries have lowered their own emission reduction bar—Australia, for example, counts reductions in land clearing as contributing to its goal.

Figure 1 Share of Gases in CO₂ Equivalents



Source: www.ipcc.ch/pdf/assessment-report/ar4/wg3/ar4-wg3-ts.pdf p28

Almost all OECD countries however have incurred high costs in subsidies to renewables and other measures involving regulating use of energy and energy using goods.

In spite of this and notwithstanding that the first level of cuts is likely to be the easiest, few signatories to the Kyoto convention will meet the obligations they set for themselves. The OECD group as a whole in 2005 had increased its emissions by 20 per cent over their 1990 levels.

Table 1 is drawn from the latest United Nations Framework Convention report and indicates levels of achievement compared to the 2008-12 targets expressed as the emissions in excess of or below the 1990 base level. The latest data is for 2005 and the levels are expressed on two bases: with and without counting land use changes as a result of policy towards clearing land for cultivation. Only the EU taken as a whole is close to the agreed targets and this is largely due to German unification and Britain's shift from coal to gas based electricity generation for reasons unrelated to global warming concerns.

Table 1 *Kyoto Commitments and Achievements over 1990*

Baselines	2008-12	2005 actual	
	Target	Inc. clearing	Exc. clearing
Australia	8%	4.5%	25.6%
Canada	-6%	54.2%	25.3%
EU	-8%	-4.0%	-1.5%
Japan	-6%	7.1%	6.9%
NZ	0%	22.7%	24.7%
Norway	1%	-23.1%	8.8%
US	-7%	16.3%	16.3%

Source: UNFCC <http://unfccc.int/resource/docs/2007/sbi/eng/30.pdf>

Far more draconian emission reductions are required than agreed to at Kyoto for the period to 2012 if the world is to see a reduction in the concentration of carbon dioxide and other gases said to be responsible for global warming. This would require vigorous action by all countries, including developing countries, the emissions of which have now surpassed those of the developed world. Developing countries at present have no emission reduction obligations but, on average, they currently have only one quarter of developed countries' per capita emissions.

Australian Emission Reduction Goals in an International Context

The Government has expressed its goal in emission reductions as one that will achieve a 60 per cent reduction on 2000 levels by 2050. Nicholas Stern, in Britain, and Garnaut have argued, correctly, that to stabilise carbon dioxide in the atmosphere, countries like Australia need to reduce emissions by 80%-90%.

If emission reductions are to be seriously pursued as a means of combating global warming, a 60 per cent reduction for Australia is clearly inadequate. The objective should be at least a stabilisation of emission levels by 2050 if CO₂ is the cause of unacceptable warming and if we are to prevent CO₂ levels from rising. Many are so concerned with the need for action that they are calling for far more than this—thus, German Chancellor Angela Merkel has called for a halving of emission levels. Table 2 shows emissions by major country group and for the world as a whole. In 2004 levels for the world were at 4.5 tonnes of CO₂ equivalent and with population growth estimated at 60 per cent to 2050, this becomes 2.8 tonnes per capita.

Table 2 *Global Emission Levels by Country Group*

	2004	per capita	2050 emission
	(m tonnes)	(tonnes)	levels (tonnes)
OECD	13319	11.5	
E. Eur	3168	7.9	
Developing	12303	2.4	
Total	28790	4.5	2.8

Source: UNDP

The magnitude of the emission reduction task is clear once the above data is married to some country statistics. Some of the poorest countries like Angola emit far less than the average 2.8 tonnes goal; some oil rich countries are among the world's biggest per capita emitter (Kuwait is twice Australia's level) and many in the former Soviet bloc continue to have high emissions, particularly in relation to their income levels. China is already emitting in excess of the stabilisation level of 2.8 tonnes, though, reflecting its different path to growth, India remains below that level.

Current levels of emission for Australia and other selected countries are shown in Table 3.

To contribute equally to global emission stabilisation Australia needs to see a cut from 16.2 tonnes to 2.8 tonnes per capita by 2050, a cut of 83 per cent or over 90 per cent once population growth is factored in. The government's target cut of 60 per cent would leave Australian emissions at 6.5 tonnes per capita even with no population growth or about 3.5 tonnes given annual population growth of about 1.5 per cent. (It is not clear what if any population growth is factored into the Green Paper target).

Table 3 is also important in showing the outcome for France. France has opted for a nuclear based electricity industry, with fossil fuels significant only to provide peaking and fast start capacity. France has also seen a great deal of its smelting industries depart for countries with lower energy costs. Even so, at 6 tonnes per capita, France has over twice the level of emissions that would be required for a stabilisation regime. This vividly illustrates the difficulties of moving to a fossil fuel free economy, whether by a nuclear route or, if one becomes available, a renewable energy route.

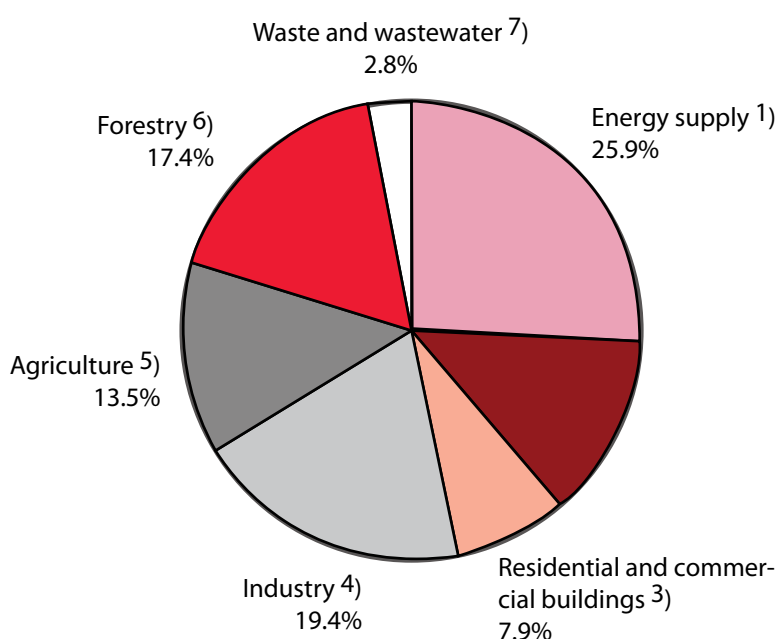
The source of emissions (as shown in Figure 2) indicates that to reduce beyond the levels France has reached, electricity from non-fossil fuel sources would need to displace usages such as liquid fuels

Table 3 CO₂-e per capita Emissions 2004

Selected Countries	
Angola	0.7
Kuwait	37.1
Iran	6.4
Kazakhstan	13.3
India	1.2
China	3.8
Australia	16.2
United States	20.6
Canada	20
UK	9.8
France	6
World	4.5

Source: UNDP

Figure 2



1. Excluding refineries, coke ovens etc., which are included in industry.
2. Including international transport (bunkers), excluding fisheries.
3. Including traditional biomass use.
4. Including refineries, coke ovens etc.
5. Including agricultural waste burning and savannah burning (non-CO₂). CO₂ emissions and/or removals from agricultural soils are not estimated in this database.
6. Data include CO₂ emissions from deforestation, CO₂ emissions from decay (decomposition) of above-ground biomass that remains after logging and deforestation, and CO₂ from peat fires and decay of drained peat soils.
7. Includes landfill CH₄, wastewater CH₄ and N₂O, and CO₂ from waste incineration (fossil carbon only).

in planes, cars, shipping and other vehicles. This would entail a total revolution within the transport industry including the development of batteries for better loading and storing charges and a totally new service infrastructure.

Ensuring Global Participation

Carbon Leakage

It is well recognised that imposing a tax that simply results in carbon intensive activities migrating to areas where the impost is not present (or lower) has no benefits for the aggregate level of carbon emissions. Indeed, such a production shift may increase emissions if the activity is transferred to areas with higher emissions per unit of output or if the activity entails some additional transportation activity.

One means of preventing this is by employing the stick of penalties for non-participation. Among others, the Australian Manufacturers Workers Union has called for a carbon tariff to ensure equality of treatment of imports vis-à-vis import competing products.

To incentivise countries to act with appropriate global responsibility, the Garnaut Report cites, with apparent approval, the suggestion of the economist Joseph Stiglitz that a tariff be placed on goods for recalcitrant countries which are not playing the game. Garnaut also notes that the head of the WTO, Pascal Lamy supports this as a 'distant second best solution'.

Such suggestions offer many attractions in view of the importance of even minor cost factors in facilities location and therefore of minor distortions to production. Globalisation has created footloose firms which will shift locations in response to cost drivers that would once have been considered trivial. Easier location choices have allowed firms to adopt a global focus upon profit maximisation from meeting consumer needs most cheaply.

Profit is the key driving force of firms' locational decisions and its potency is amplified by its residual nature in the total costs of production. If a firm obtains a profit equivalent to 10% of the costs of a good, a cost saving as small as 2% is material since it increases profits by 20%. Any firm that turned its back on such an improved return would find itself outcompeted and firms' managements are, accordingly, constantly on the lookout for such cost savings.

The Green Paper estimates that on average industry uses 348 tCO₂-e per million dollars of revenue. A carbon price at \$40 per tonne would mean the average firm incurring about \$14,000 per million dollars of revenue or, on the basis of profit comprising 10 per cent of revenue, 14 per cent of profits, which in the case of firms' tradable goods would not be recouped in prices. This would have a major impact on investment and production.

The foregoing indicates that the 'broadly comparable' criterion used to determine whether other countries are imposing the same costs may be inadequate. Carbon dioxide abatement, if it is to be pursued, should be undertaken wherever this is cheapest. The abatement activity itself should be fungible and the carbon price should therefore be identical in the same way as oil prices pretty much are.

While potential tariff measures may be a background threat to be used to encourage a 'voluntary' solution, should this not emerge, the sort of countervailing duty measures that would be entailed would prove extremely difficult to devise. They would entail a careful estimate of the fossil fuel content of every good and service. That estimate would clearly be highly variable between products and over time and the Green Paper recognised the difficulties it would entail.

In these respects, the Secretary of the Department of Climate Change, Martin Parkinson¹ argues against measures that tax only domestic emissions of CO₂ because the tracking of inputs would be too difficult. He considers it to be preferable to tolerate measures that reduce the competitiveness of

1 <http://www.theaustralian.news.com.au/story/0,25197,24251897-5013480,00.html>

our own producers in the domestic market rather than having the debate bogged down.

Mr Parkinson also opposes exempting emissions from new domestic sources of, for example, natural gas even when these are in full competition with non-exempt sources overseas. Distortions like this would bring economic loss to the particular detriment of those imposing the tax.

Parkinson argues that abatement reduction measures are particularly important for Australia as the country has more to lose from climate change than other economies and should therefore take the lead in adopting abatement even if these will prove costly in the short run.

Taking the lead is rarely the safest approach because it requires others to recognise the authority of a self-identified leader. Alongside the EU Australia proposes to place itself in the forefront in taking action, a bold position for a country so dependent on fossil fuels. Indeed, the policy approach is akin to unilateral disarmament in the hope that such actions will be reciprocated by others. As always in such decision frameworks the issue arises about what is to be done if others do not follow suit². This is all the more pertinent since the same information source that Parkinson uses to suggest Australia will be more adversely affected than other countries by climate change also indicates that Russia may gain and that China will experience only a slight loss.

Nobody argues that abatement will be useful unless it involves the great majority of emissions. Australia produces only one per cent of the world emissions and if similar actions to those of Australia are not taken across the world, Australia's own actions will be an empty but costly gesture.

With regard to trade restraints in support of abatement enforcement, it is important to recognise that any moves along these lines could have the most serious consequences for the international trading system. In the face of sharp disagreements, it is not difficult to see an attempt to require measures to ensure compliance with a widely agreed level of carbon pricing as bringing about the end of the present rules under which the global trading system operates.

Incentives for Developing Country Participation

There have been suggestions that rather than imposing trade restraints as a means of bringing about compliance, the developing countries should be brought into an emission reduction scheme by granting them tradable emission rights. This offers superficial attractions of all round wins. Developing countries would be given rights that would be surplus to their requirements, rather like when post-communist countries in the former Soviet bloc were brought within the system. Those countries' adoption of capitalist production and pricing methods had encouraged conservation of resources and meant their previous emission levels were far higher than their reformed economies required. Granting them their existing levels of emissions and allowing them to trade the surplus amounts handed them windfall gains.

The treatment of the former Soviet bloc countries in this way was crucial to getting their agreement to the Kyoto Convention and in turn to the Convention receiving the global support necessary for it to come into force as an international treaty. But at the same time this vastly expanded the quantities of permitted emissions, by activating 'sleeper' emission rights. In this way it somewhat undermined the basic intent of the protocol.

Moreover an approach involving an ability to sell surplus emissions would not find favour with those developing countries, for example China, which are already or soon will be up against the future per capita emission level ceiling and which would need to buy rather than sell surplus credits.

Perhaps as a sweetener for some developing countries, Garnaut also suggests that Indonesia and PNG could become vast sinks to offset other countries' emission levels and suggested that Australia is geographically well placed to take advantage of such opportunities. It is however not likely that geographic proximity would have any advantages. Moreover, though the strategy of tree planting may allow for a windfall gain for the two economies, there are not enough potential new trees for the measure to offer significant offsets.

² Garnaut's 5 September *Targets and Trajectories* report has a fallback, discussed later, of cutting the emission task in half if Australia's lead is not followed.

An ETS and Australia's Economy

Existing Carbon Emission Reduction Measures

In its submission to the Garnaut report, the IPA pointed to a plethora of measures already in place in Australia and estimated their effects in carbon tax equivalents. Existing measures fall within three categories:

- The Mandatory Renewable Energy Target (MRET), and state schemes which together call for some 10 per cent of electricity to be supplied by sub-economic renewables at an annualised cost of \$843 million (based on penalty levels) or \$600 million (based on market prices). This has since been markedly increased by Government announcements.
- Direct subsidies identified in this year's budget are \$518 million for 2009/10, though with state schemes and measures not directly classified as greenhouse related would be closer to \$900 million.
- Regulatory impositions, the most important of which has been the 5 Star measures for housing which account for a tax equivalent of some \$1-2 billion.

All of these are command-and-control types of measures, though the MRET scheme contains market elements in allowing choices in ways of meeting the renewable obligation. State schemes, like that of NSW, in principle have rather greater flexibility in this regard since they allow obligations to be met by using lower CO₂ emitting sources as intended with the ETS.

The existing expenditures identified above work out at some \$3 billion a year. Allocated as a tax on stationary sources (280 Megatonnes), this is equivalent to a tax of \$10 per tonne of CO₂ for electricity generation or \$5 per tonne on all emissions.

A feature of these charges and regulatory measures is the diversity among different Australian jurisdictions. This is evident with rooftop solar panels. In addition to Commonwealth Government means tested grants for half the cost of these panels' installation, some State governments also require electricity retailers to buy back surplus energy from the panels at 60 cents per kilowatt-hour. While ostensibly 60 cents is 'only' fourfold the cost to the customer, the true value of the electricity to the forced buyer is virtually zero.

Other measures are also in place. Victoria also has its own energy efficiency target that will force energy retailers to incur new costs in buying energy from high-cost sources and pass them on in customer bills. Such fragmentation of policies between the States was previously attributed (by the State Governments) to the shortsightedness of the former Liberal Government in Canberra. That explanation now lacks any credibility.

The Government's Proposed Approach

Central to the Green Paper proposals is the ETS tradable rights program which is designed to be the main driver to a phased-in reduction of total emissions of 60 per cent of those in the year 2000 by 2050. Emission rights will be auctioned and in some cases vested free of charge. Although the ETS is designed to be broadly based, at least initially it will in effect be confined to the non-transport fossil fuels.

In addition, there are to be increased uses of traditional command-and-control measures. Chief among these, a considerable forced expansion of renewables use is foreshadowed by the decision to require renewable energy to comprise 20 per cent of electricity. The only such sources at present that are commercial are from hydro electricity, accounting for about 8 per cent of supply. Hydro supply cannot be increased under current political circumstances and has highly limited further potential even if new dams were to be permitted. Hence, if electricity demand continues to grow the hydro share is likely to fall over time and the requirement for sub-economic sources would need to rise.

Taxes, permits and command-and-control as emission reduction mechanisms

Nature and advantages of taxes and permits

Pollution taxes and marketable pollution permits are economic instruments designed to provide polluting firms and households with the appropriate signals and incentives to reduce emissions. Taxes set the price of pollutant emissions and allow the quantity to adjust. Permits, as proposed with the ETS, set the total aggregate quantities of emissions, and allow the price of these to adjust.

The popularity of tradable rights regimes developed from highly successful US experiments with pollution control in specific areas or river systems. These were documented in pioneering work by Crandell³ and Levin⁴ on air pollution.

The ETS, unlike the European Union's approach, is for emissions to be allocated largely by auction. Some are to be given free partially to compensate firms producing internationally tradable goods and embodying more than specified amounts of CO₂-e in the value of those goods. Others are to be allocated to major emission producers.

Economic instruments generate and harness information about costs from a vast number of users and producers. They are, therefore, almost certain to bring about a more efficient outcome than if the control decisions were mandated by particular standards. This is because market instruments incorporate the same cost paring and profit searching incentives that have driven higher living standards in market based economies.

The alternative of using command-and-control regulation is inferior to market solutions for two principle reasons. First, it requires that regulators have intimate knowledge of millions of productive processes and their alternatives so that an optimum regulatory structure can be set. Secondly, it relies on decisions not being clouded by political exigencies. For these reasons, almost all authorities argue that measures like mandatory renewable targets are inferior and more costly than taxes or tradable rights.

Even so, Minister Wong recently re-affirmed the Government's approach to require a 20 per cent market share for renewables, having been apparently unmoved by the advice of the Productivity Commission⁵ which argued that such measures with an effective ETS in place, would:

- not achieve any additional abatement but impose additional costs
- most likely lead to higher electricity prices
- provide a signal that lobbying for government support for certain technologies and industries over others could be successful.

Wind turbines currently require the least subsidy of any known and plentifully available renewable energy supplies. Geothermal sources are theoretically possible and the Australian Government has announced a \$50 million project to explore this. It is claimed that 1 per cent of Australia's hot rocks supply could produce 26,000 times the country's current annual energy use. However the rocks are a considerable distance beneath the earth's crust and economically tapping this form of heat will require huge technology breakthroughs.

Additional costs from the 20 per cent renewables requirement, if growth increases along business-as-usual lines is likely to comprise some \$3 billion a year by 2020 solely in terms of the premium for the energy itself. In addition to that other costs would be entailed in fast start back up and new transmission lines to remote power sources.

3 Crandell, R.W., 'Controlling Industrial Pollution', Brookings, Washington, 1983

4 Levin, M.H., 'Building a Better Bubble at EPA' Regulation, March/April 1985 pp.33-42

5 http://www.pc.gov.au/_data/assets/pdf_file/0003/79716/garnaut.pdf. Page X

Taxes and permits compared

EFFECTIVENESS IN ACHIEVING A TARGET: A marketable permits approach has an apparent advantage over a tax in that the quantity target is built into the instrument being employed. To attain the target using taxes, the authority may have to alter the tax several times before emitters adjust to the target level of emissions. However, the advantage of permits is illusory in this respect, because in setting a quantity, an implied price is also set. If this were not the case, it would mean that no trade-off between price and abatement was being made (and there would be no reason not to have total abatement). The price at which permits trade must be allowed to feed back on their total authorised levels, otherwise a higher than expected permit price will mean that too few permits have been issued, and vice versa.

With taxes, there are no transactions costs other than administrative costs which are likely to be similar for both a taxes and tradable rights regime; each emitter simply responds directly to the incentive provided by the tax. In contrast, trades of permits involve the costs of identifying potential buyers and sellers and haggling over prices. If these costs are seen as large relative to the gains from trade, there will be little or no trade, and permits will not end up with those who value them most. Again however the additional costs of buyers and sellers locating each other might not be large. Many markets like those for company shares have evolved to provide low cost transaction costs.

Taxes or auctioning of quotas accords with notions of fairness in making the polluter pay for a 'good', the environment, that is usually considered to be owned by the whole community. However, such payment is not necessarily the appropriate approach. Rights are normally assigned to those who have first claimed them—especially when, at the time of appropriation, the rights were not considered to be particularly valuable.

This is best illustrated by the case of a polluting facility being located in a remote area where its emissions imposed no harm on anyone; over time new arrivals to the area—perhaps attracted by opportunities that the facility offers—may seek reduced levels of emissions. But, it is arguable that they should be obliged to offer compensation to the incumbent facility. Vesting rights to the present polluters and allowing these to be traded may therefore be a de jure recognition of a de facto situation.

Failure to offer the rights to the incumbent emitters creates the sovereign risk of expropriation, with potentially severe adverse repercussions on investment decisions generally. In this respect the Garnaut report favoured no compensation for incumbent emitters on the grounds that 'there is no tradition in Australia for compensating capital for losses associated with economic reforms of general application (for example, general tariff reductions, floating of the currency or introduction of the goods and services tax) or for taking away windfall gains from changes in government policy (for example, reductions in corporate income taxes)'. This is incorrect. In the case of tariff reform, aside from the Whitlam Government's 1973 25 per cent across-the-board reduction, all major changes in assistance have been accompanied by phase-ins of the reduction and often by financial assistance.

It might be argued that the knowledge of possible greenhouse mitigatory measures has been long in the public arena and the compensation case is therefore weak. However there are several points that reduce the validity of this.

First, most power station investments were made long before any prospect of a carbon tax was being debated in the mainstream.

Secondly, even when carbon taxes were being considered they were at low levels. For example even the report of the Allen Consultancy Group commissioned in 2006 by the state ALP Premiers discussed carbon taxes in the US\$3.75-7.5 per tonne of CO₂.

Thirdly, a great many measures are constantly under active consideration by Governments. Many

of these fail to materialise, recent examples being more punitive taxes on luxury cars. If firms were to be regarded as forewarned whenever a measure that might penalise them was mooted there would be considerable risk aversion in investment. This in turn would tend to bring greater reticence on the part of government in publically airing possible taxation and regulatory changes with adverse consequences on the level of public debate about issues.

Fourthly, mixed messages are given by governments even in regard to facilities that might be severely prejudiced by measures under consideration. Thus:

- The NSW Government with support from the Commonwealth has been seeking to privatise the state owned generators, facilities that might have no value with a high carbon tax.
- The Victorian Government has also offered comfort to coal based power stations. For example, Energy Minister Theo Theophanous said he wanted IPRH to reduce carbon dioxide emissions in line with 'reasonable' community expectations. 'We're negotiating over the amount that this (reduction) should be, but from my point of view we're looking for up to 30 million tonnes of CO₂ savings over the life of the project,' he said.
- Queensland Premier Beattie's 2006 paper Energy Powering our Future, gave no indication that coal power stations would face any penalty. He wrote, 'There are three supercritical coal-fired power stations in Queensland—Callide C Power Station, Millmerran Power Station and the Tarong North Power Station. These three power stations supply around 27% of the State's electricity each year. Kogan Creek, a fourth supercritical coal-fired power generator, is currently under construction.' The Queensland Premier also praised coal power investment in the State, saying 'since the National Electricity Market started in 1998, Queensland has had the greatest level of investment (around \$4.7 billion of the \$6.3 billion, or approximately 75 percent of the investment in committed generation across the entire market) in committed generation—approximately 4,000 MW of generation capacity, including the Kogan Creek (750 MW, to come on line summer 2007), Tarong North (450 MW), Callide C (930 MW), Millmerran (870 MW), Swanbank E (385 MW), Oakey (320 MW), Mt Stuart (290 MW) and Roma (80 MW) power stations and the conversion of Yabulu power station (165 MW to 220 MW)⁶.

COSTS UNDER UNCERTAINTY: With uncertainty about the costs and benefits of lowering pollution, the initially selected abatement target is unlikely to be the most appropriate target. Errors are likely whether a tax or permits approach is used. Compared with permits, tax based systems bring reduced costs from errors where abatement costs to emitters rise faster than damage costs. A tradable rights system is preferable where abatement costs to emitters rise more slowly than damage costs. Both require considerable oversight to ensure obligations are met and it is not apparent that one would bring lower paperburden costs than the other.

DISTRIBUTIONAL ISSUES: Depending on how they are set, taxes and permits have different effects on the distribution of income and welfare between emitters and recipients of pollution. In the case of taxes, a charge is normally levied where none previously existed. The initial impact of the tax is on the users, but its final incidence will depend on whether they are able to pass it on. Different allocations of the right to pollute can be achieved by combining different emissions standards with a tax on emissions in excess of the standard and a subsidy on reductions below the standard. In the case of marketable permits, different allocations of rights can be achieved by combinations of free distribution and auctioning of permits.

EFFECTS OF ECONOMIC INSTRUMENTS ON INDUSTRY SIZE: In the longer term, both taxes and permits will increase costs in polluting industries. The result will be some firms leaving the industry and others finding ways of adjusting so that normal levels of profitability are restored for the production that remains.

6 Building a better Queensland—Seven Smart years of Beattie Government, June 2005

RISKS OF POLITICAL INTERFERENCE: One apparent advantage of permits is that, as rights, they may be less susceptible to governmental modification than taxes. Once vested, governments would be uneasy in seeking to raise further revenues from them, since to do so would be to impose a highly selective tax on a property right. However, governments may issue more permits than they originally said they would, thus devaluing those initially issued. Similarly, certainty is not guaranteed if a tax is chosen, since there is likely to be continuing conflict as to the appropriate rate.

The great advantage of property rights is the incentive they give their owners to constantly search out the most efficient means of deploying them. While taxes might provide a more convenient means for government to search for the best solution, aside from the risk that political considerations will be prominent, the iterations involved in this process are likely to impact adversely on firms' abilities to plan with confidence. Being more difficult to change than taxes, tradable rights provide a more secure basis for investment by firms and households. Permits also have the advantage that they involve only modest alterations to existing pollution control arrangements.

The GST as a model for an energy tax

The aim of the proposed carbon tax is to incentivise everyone to use less carbon dioxide emitting fuel. This is markedly different from the GST—whereas a carbon tax is designed to bring less usage of the taxed goods, the GST was designed to raise revenue or to allow for a switch in the focus of revenue raising from direct to indirect taxation.

Nonetheless, the GST demonstrates how a new, highly complex and relatively universal tax involving voluminous paperwork can be introduced. The level of complexity of a carbon tax is not greatly different from that of the GST and a carbon tax is designed with a far more revolutionary intent.

Monitoring a consumption based approach modeled on the GST would not be easy. But nor would the proposed production based approach. Although monitoring of the ETS is said to be limited to under 1000 entities, this cannot be the outcome. If smaller entities avoid scrutiny they will increase in number and, to the degree that the scrutiny of larger firms is as onerous as intended, those firms will tend to be reduced in importance—many may opt for de-aggregation, forcing a progressive increase in the number of covered entities.

If in fact a new regulatory tax system were to be put in place to cover carbon emissions, a major part of the data base to enable this is already in place. Considerable volumes of data are already collected to administer the MRET and state government schemes and every electricity generation unit has designated and monitored ratios of CO₂ to energy output levels as well as carefully measured levels of output. Similarly, every energy retailer has to account for its energy sourcing in ways that allow it to specify its aggregate greenhouse gas emissions and to report these both to governments and to customers.

Hence, establishing a carbon ledger for every firm is no more onerous than the task undertaken with the GST. Establishing inputs and outputs in this way would allow carbon costs to be passed on in the case of business-to-business emissions and to be exempted from exports leaving the tax to fall on domestic consumers. This would not avoid all distortions: it would create an incentive to allocate fossil fuel intensive production for exports and would leave import competing supplies disadvantaged from competing goods that were not burdened by a carbon tax.

These distortions would be further influenced by subsequent price realignments. Important among which is the exchange rate. If the encouragement of exports were greater than the encouragement of imports, the \$A would be likely to appreciate, reducing further the competitiveness of disadvantaged import competing goods (as well as all other tradable goods). If imports were encouraged more, the \$A would be likely to depreciate, thereby cushioning the impact on tradable goods.

A Tradable Rights Regime The Government’s Proposed Measures to Reduce Regulatory Costs

Recognition of the additional cost impositions of a carbon tax has led the Government to propose measures to cushion its impact. Those identified for assistance include low income people, industries estimated to have trigger levels of emissions embedded within their output and electricity firms that are major emitters. The level of assistance is only broadly addressed in the Green Paper. Regarding free allocations to businesses, the proposal is for:

- up to 30 per cent of permits are to be for emission intensive trade exposed activities
 - those with over 2000 tCO₂-e (aluminium, cement) would get around 90 per cent of existing usage
 - those with 1500-2000 tCO₂-e (ceramics, alumina, iron and steel, other metallic mineral products, oil and gas) would get around 60 per cent
- assistance will be given in the form of permits to brown and black coal electricity generators—the ‘strongly affected industries’.

All free allocations would be reduced over time. The allocations to the trade exposed industries are not envisaged as being tradable. They would be forfeited on termination of the activity. Some forms of conditional trading opportunities are foreshadowed in the case of coal based electricity generation.

Clearly such proposals offer vast opportunities for firms to obtain profits (or minimise profit reductions) by successful lobbying on the nature of each break point and on where they might fit within them. Moreover, within these broad categories of businesses is a considerable diversity between firms. This presents opportunities for windfall gains from over-allocations as well as distress from under-allocations. One industry, cement, which would qualify for the highest target has indicated this is insufficient to prevent production being forced overseas.

Evidence of the lobbying effort already underway is abundant. Not only do such activities mean a deadweight cost to the economy but they also result in an undermining of entrepreneurial initiative in seeking to please the consumer, replacing it with initiatives that focus on pleasing government. Forcing such ‘statist’ approaches in business brings it closer to the sort of government direction and control of industry that has proven economically debilitating in the past.

The Importance to Australia of Coal in CO₂ Emissions

Coal and Electricity Generation

Coal requires considerably more carbon emissions than gas or petroleum, as shown in Table 4.

Renewable energy and nuclear power have no emissions. Additional competitively priced renewable energy (given that hydro potential is at its physical/political limits) is not a feasible solution for electricity generation except as a minor source. Nuclear could replace coal at a premium cost of about 25 per cent in Australia, (less than this in many overseas jurisdictions). The Government has rejected the option of nuclear power for Australia.

Coal presently accounts for over 80 per cent of Australia’s electricity production with gas accounting for 7 per cent.

Table 4: Emission Factors by Fuel Source

Energy Source	kg CO ₂ e/GJ
Coal	93-110
Gas	57-70
Fuel Oil	78
Petrol	74
Ethanol	54

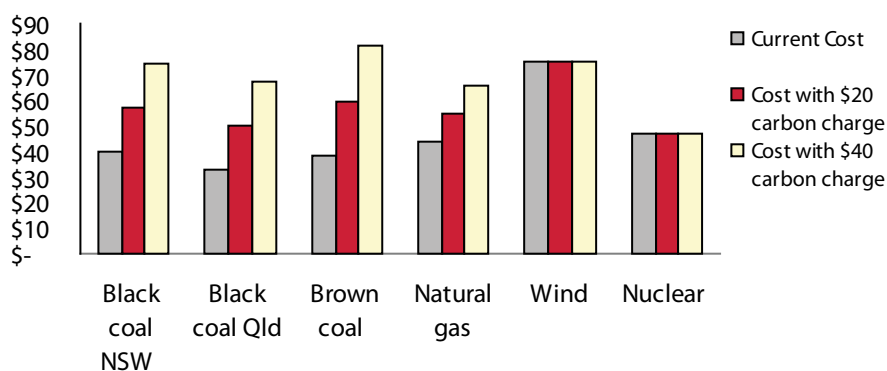
Source: AGO

With taxes or charges at the \$20-40 per tonne levels mentioned in the Green Paper, the cost of coal based electricity becomes more expensive than gas. However, the gas prices at around \$3.50 per gigajoule are considerably below world prices and with a significant increase in demand Australia is likely to see increased local gas prices, perhaps to \$9 per gj, which would still leave coal as more competitive.

Wind would be unable to expand greatly at any price indicated below because its role is limited to at most some 10 per cent of supply. This is as a result of its irregularity and because many of the more usable and convenient sites have been taken up and increased wind use will require complementary investments in new transmission.

Table 5 illustrates costs of electricity sources under different carbon prices.

Table 5 Electricity plants Generation Costs



Of course, to the degree that there is no substitution to lower carbon intensive sources, any of the designated reduction in emissions that takes place must do so by forcing demand to contract. The price that is necessary to bring about the desired demand contraction is a function of the responsiveness of demand to price (demand elasticity). The Garnaut Targets and Trajectories report estimated that \$20 per tonne rising by a real 4 per cent per tonne would increase household electricity bills by 40 per cent.

Considerations in Devising Measures to Bring Reduced Fossil Fuel Usage

Energy demand is highly price inelastic as demonstrated by the recent evidence of petrol prices. Though there are doubtless lags to work through the system, we have seen with petrol that very high price increases have little effect on demand. In Australia, a 50 per cent price increase over the past year or so has had a very minor effect on overall fuel use. This experience appears inconsistent with the conclusion cited in the Green Paper that transport fuel has an elasticity of demand of -0.7 (a 10 per cent price increase brings a 7 per cent reduction in volume demanded). Based on recent experience, it may take a tax on electricity of \$100 per tonne of CO₂, bringing a 70 per cent price increase, to shave even a modest 10 per cent from demand.

Many were keenly awaiting the publication of economic models designed to give insights into the way the economy will respond to price increases resulting from carbon taxes. The problem is that economic models can only project the effects of small and well-trodden changes in price or availability of broad product categories.

It is not difficult, for example, to model the effects of a tax specifically imposed on, say, fish. There

would be some changes in behaviour and loss of consumer satisfaction due to people reducing their consumption and switching to other, untaxed, foods that would otherwise not be preferred. All this can be measured.

But the same analysis with food as a product group would be far different. This is an essential part of human consumption and would take huge price increases to force the lower levels of consumption and/or to shift people from their preferred types of consumption like meat to those with higher calorie to CO₂ inputs like cereals. Energy from fossil fuels as a class of goods has similar characteristics to food. There is no empirical data on which to model the effects of different levels of carbon tax.

The only recent occasion when a whole class of basic human needs was subjected to a big price rise was the quadrupling of oil prices in the 1970s. Although similar to the carbon tax proposals, two factors mark it as different.

The first of these is that oil, not energy, was the product that faced the price increases induced by the Organisation of the Petroleum Exporting Countries. Though more important than fish within its product group, there are many substitutes for oil. With the oil price increases, coal, gas and, for a time, nuclear energy, showed an upward surge in supply. These were rather more costly/cumbersome to use than oil. They were, however clear alternatives, and were adopted though the additional cost and dislocation exacted a penalty that would have amounted to several percentage points of income growth.

Secondly, and more importantly, the 1970s increase in oil price did not bring a reduction in oil use, except for a blip that was largely due to its accompanying recession. This cannot be the outcome with a carbon tax, which would be designed for no other purpose than to bring reduced use. If no reduction were to materialise in carbon emissions, an even higher tax would need to be imposed.

Unless some inexpensive means is found of extracting and storing the carbon dioxide from coal, its use must be eliminated if there is to be any possibility of emission reductions of the order that are being contemplated. This will mean a marked increase in electricity costs in Australia with an impact both on households directly and on industry. It will also mean the cessation of Australia's coal exports (directly accounting for some 13 per cent of the total exports) which would be incompatible with a global program of emission reductions.

It is impossible to escape the conclusion that a program to stabilise carbon emissions would have greater adverse effects on Australian income levels than those of any other country. No other economy has Australia's coal wealth and infrastructure for its production and associated export income and low prices for electricity.

Effects of Existing Australian Carbon Mitigation Measures

Mention has already been made of the \$3 billion a year in taxes, subsidies and regulatory distortions presently in place designed to mitigate CO₂ emissions. In addition to this effect, the risk of an emission tax is preventing major new coal based power stations from being built. Although a Queensland government financed coal power station was commissioned in 2007, the last private power station built was completed in 2002.

There is also anecdotal evidence to suggest that there has been some reduction in expenditures on maintenance in the light of the risk of a dwindling worth of coal base power stations. Eventually these effects on reducing supply relative to demand will be compounded as existing stations become obsolete and are scrapped, itself likely to be accelerated due to reduced maintenance spending.

Evidence is accumulating that the effect of the discouragement of new supplies is being progressively felt. Generators cannot obtain forward contracts because neither they nor retailers know what the future tax effect and therefore price is likely to be.

The tighter supply developments have brought an increase in wholesale prices. Average electricity prices in NSW and Victoria during the past couple of years have been \$50 a megawatt hour. Ten years ago they were about \$30 a megawatt hour. That increase is already equivalent to a tax of \$20 a tonne of CO₂ (a bit more in Victoria and less in NSW and Queensland because of the difference in CO₂:energy ratio of black and brown coal). A \$20 per tonne CO₂ tax is what the green paper estimates will mean a—presumably acceptable—16 per cent rise in electricity prices. We are yet to see this increase in wholesale prices actually reducing emission levels, because most consumers are largely temporarily insulated from higher prices because their retailers have contracts with generators at the previously prevailing prices.

Policy Approaches

Australia's vulnerability to carbon restraint measures

Much is made in the Garnaut report, the Green Paper and in addresses by many politicians, including the Prime Minister about the alleged greater exposure of Australia to the harmful effects of global warming. The Prime Minister has cited numerous adverse potentialities including increased incidence of dengue fever, the destruction of the Great Barrier Reef, and enhanced drought.

Most such adverse outcomes are at the very least highly speculative and a large number are fabrications endlessly repeated. For example if a 2 degree temperature increase were to bring greater incidences of tropical disease to Australia, why now are there not such problems in the parts of this and other wealthy countries where such temperatures already prevail? In fact the Garnaut draft report estimated the cost Australia will face if global warming takes place is actually only 2 per cent of GDP by 2050 (4.8 per cent by 2100). This was in spite of the report's enthusiastic parading of the many costs that it says are likely (Garnaut too warns of dengue fever sweeping down the east coast of Queensland and a dramatic decline in irrigated agriculture production in the Murray Darling—92 per cent no less).

In the modeling work by the Garnaut Review issued 5 September 2008, much greater estimates of costs from inaction were made than other authorities have suggested. Using discount rates of between 1.35% and 2.65% the costs from failing to take actions were put at some 8 per cent of GDP by the end of the century. These costs do not include the unquantifiable risk of catastrophic loss (which the Review suggests includes an 85-100 per cent chance of an irreversible melt of the Greenland ice sheet).

The costs are estimated at 1.9-2.6 per cent of GDP if stabilisation is to be at 550 parts of CO₂-e per million ppm) and 2.6-3.3 per cent if stabilisation is to be at 450 ppm. The report asks whether it is worth paying the additional one per cent for the 450ppm strategy (this would still lead to damage to the GBR). A more reasonable question if the costs and benefits are as is suggested is why not go even further? Garnaut's modeling does not extend to 250 ppm but if the benefits are so large and the costs so small, we would be foolish to take the chance. Clearly Garnaut doesn't expect others to be persuaded by his logic because he considers it 'just feasible' to achieve the 'unprecedented levels of global cooperation' for a 550 scenario and unrealistic to expect a 450 scenario.

The costs side of the ledger are far more credible and carry much greater substance than the estimates of damage. Australia is one of the world's most exposed economies' to measures that seek to reduce emissions of CO₂:

- We are more vulnerable as an economy to cost increases caused by emission reduction measures largely because of the importance of low cost coal both to our domestic energy supply and as an export commodity.
- We are more vulnerable to carbon leakage than other OECD nations because of the

importance of energy intensive industries to our economy.

- We have taken a strong and ‘principled’ approach against adopting nuclear energy, the only feasible technology that might be substituted for fossil fuels at an acceptable cost.

Australia is a minor producer of greenhouse gasses in line with its relatively modest position within the pantheon of world nations. Much as we flatter ourselves for ‘punching above our weight’, except in matters of sport this is not so recognized overseas.

Hence we would appear to have much to gain from adopting a low profile on introducing measures designed to suppress CO₂ emissions, preparing for action rather than embarking upon measures that will prove costly and may prove unnecessary. This is all the more the case in view of the considerable doubts about the science underpinning forecasts of global warming. Delaying taking costly actions would also make the costs more affordable should they prove to be necessary. After all, contrary to what some, including Garnaut argue the longer we defer taking action, the wealthier we are likely to become and the more affordable are the cost impositions. As Garnaut himself argues, technology will improve and material wellbeing will be higher in future years, phenomena that suggest merit in delaying draconian measures.

Garnaut’s Targets and Trajectories report appears to adopt a perspective closer to a ‘wait for technology to emerge’. The report argues for a 10 per cent reduction (with a year 2000 base) in emissions by 2020. Nonetheless, this becomes 30 per cent in per capita terms once population growth is factored-in. Garnaut also offers the first official suggestion of a Plan B to be adopted if other emitters fail to follow Australia’s lead. In that event the 2020 target is to be halved

Notwithstanding the higher cost from measures that penalize coal and other fossil fuels, the Australian Government is proposing leading the world in carbon emission reductions, a matter that has already raised eyebrows with the international media⁷. Canada, a country with many similarities to Australia in terms of resource endowment and income levels, was, under a previous regime, at the forefront of nations calling for early and vigorous action to combat climate change. It has now decided that it cannot attain the actions it was calling for.

Taxes versus Tradable Rights

One feature of ‘economic instruments’ whether as a requirement to buy credits as proposed by the ETS or as a more conventional charge on sales or incomes is that, as discussed earlier, beyond a short transition period, their incidence falls on domestic consumers. All taxes fall not on ‘business’ but on individuals—the customers, workers and shareholders of the firm and their suppliers. The business entity is simply a vehicle through which income flows. Though one-off charges can be made on the business (i.e. its shareholders) if this is done more frequently the business itself takes measures to protect its shareholders’ wealth, measures that prove debilitating to an economy’s productive use of resources. A business entity cannot be sustainably milked.

The introduction of the GST brought a strong consensus among policymakers that a consumption tax levied at a constant rate was more efficient than the mix of measures we previously had. Levied at a constant rate, a consumption tax was to end the discriminative imposts levied on goods rather than services. It also avoided placing an impost on exports of goods and services.

In practice, the GST’s principles were adulterated from the outset. What we actually have is a consumption tax at several effective rates—zero for food and much more than 10% for petrol, cars, alcohol and gambling. Nonetheless, the GST recognised the short-sightedness of levying taxes on business—as did the Commonwealth/state agreements to eliminate various state-based business taxes as part of the GST deal. More fundamentally, an ETS like a GST aims to be neutral between activities. Beyond some suitable transition period, it is therefore likely, whether in the form of a pure tax or the proposed auction/tradable right, to bring about market determined and therefore more

efficient resource allocation than is achievable through more conventional regulation.

A GST approach would allow the basis of charging to be set on a CO₂ equivalent basis. Revenues gathered would be allocated back to the generators in values based on their rated emissions per kWh and their volumes of outputs. This would allow the generators to undertake mitigatory activities, possibly by arranging for trades where high carbon emitting generators would buy electricity from low carbon emitting sources and back off their own facilities.

Compensating Consumers

Whether or not a GST approach is followed, any measures adopted should not be accompanied by compensation to households, low income or not. It is consumers not businesses that must pay for any programs that are entered into. Attempting to force businesses to pay is like trying to hold water in a sieve. Business entities are not persons but agencies owned by persons. These agencies seek to discover and meet consumer needs and will either pass on costs of doing so or not continue in the business. Those who consider businesses can be exploited or held responsible do not understand the nature of a market based economy. A business can be expropriated but this can only be a one-off activity since once undertaken, the people who are the owners of businesses will not allow further such losses. Commonly they avoid further losses by exiting activities vulnerable to expropriation and not proceeding to invest when they otherwise would.

In addition to these considerations, although the government has argued there is a case for compensating the poor, as Henry Ergas points out⁸ the poor are automatically compensated as a result of indexation of pensions on which they rely. Giving additional funding would be over-compensating. If the compensation is to extend beyond the poor who are recipients of pensions, the measure starts to resemble something that is denying the fact that the costs need to be incurred by consumer.

Timing the Introduction of Regulatory Measures

Impacts on Business and Business Strategies

The primary issue however remains whether a CO₂-e tax is necessary or more saliently whether a broadly similar approach which imposes a common world price on CO₂ emissions will come into effect. In the Green Paper, the Government recognised that moving to adopt a scheme in advance of competitor nations would put Australian traded industries at a disadvantage and set out proposals to confer free emission rights to defray some of these costs. But it is easily demonstrated that the effect of quite small imposts on profit, the driving factor in location and productivity, is quite substantial. Simplified but realistic assumptions show that a \$40 tonne CO₂-e tax would have an initial effect of reducing the profit of the average firm by 14 per cent.

In this regard, modeling of 14 businesses undertaken by Port Jackson Partners for the Business Council indicated that with a moderate tax equivalent of \$40 per tonne, three businesses would be left with negative worth and a further four would see over 30 per cent of their worth destroyed. Even the less affected firms (and the sample was deliberately chosen to select businesses likely to be affected more than average) showed reductions in worth of over 9 per cent.

Hence, although beyond the short term the costs of an ETS will fall on the consumers, in the transition to this, considerable damage to shareholder value is likely for those firms whose investments are locked in. In the post Communist era, few firms want to become involved in political matters. And while some firms will press for measures that confer their shareholders advantages, if such measures can be clothed in a 'market failure' respectability, hardly any will press for actions involving challenges

8 Ergas, H., *New policies create a new politics*, Concept Economics, August 2008.

to received wisdom of environmental correctness on the basis of enhancing overall income levels. Capital and entrepreneurial skills know few boundaries and firms' managements will normally take the political environment as given and adapt to it or, in the event that it offers few promising profit opportunities, relocate their resources.

In the case of greenhouse concerns, firms are overwhelmingly focused on using public anxiety to enhance their own image for marketing and other purposes. But such marketing matters aside, the only issues for businesses are to protect their shareholders from being stranded with severely depreciating assets. Accordingly, a key strategy of the affected businesses is one of seeking compensation for the losses policy changes entail.

A second strategy is to take mitigatory action. Most privately owned energy firms have sought to diversify into generation that is less carbon intensive than coal. In the case of gas this may also have been in accord with sound pursuit of business opportunities as a result of Australia having inherited a fleet of generators that were established by uncommercial state owned businesses, which tended to be over-weight in larger and less flexible units than would have emerged from a market and profit oriented series of generation businesses. Moreover the trend to a peakier demand profile (as a result of the increased popularity of air conditioning) also favoured gas. These considerations did not apply in the case of wind power which is both high cost and highly inflexible.

In protecting themselves somewhat from the regulatory pressures of an impending ETS, businesses have also avoided investment in the lowest cost forms of generation. The most recent private sector major coal fuelled power station (Millmerran in Queensland) was commissioned in 2002. As a result, demand pressures have brought a progressive tightening of supply, driving up prices from around \$30 per MWh to \$50 per MWh in the spot market.

The higher prices and protective measures that energy firms have taken are mirrored by strategies of many other firms apparently vulnerable to high power prices. Aluminum smelting is a case in point. Following the 1970s oil crisis, aluminum became a major growth industry for Australia largely as a result of cheap coal in Queensland, NSW and Victoria. Now, new developments are in countries, like the Gulf states and Russia, which the producers judge to be most unlikely to introduce any form of carbon tax. Indeed, no new aluminum smelter currently under active consideration around the world, is planned for Australia or other OECD countries. Australian aluminum businesses which are not relocating to 'carbon friendly' countries will seek to obtain whatever compensation is available and gradually run down the capacity.

Such strategies are less open to those refining agricultural produce like sugar or to those firms that tend to be less geographically spread like brick manufacturers.

The narrow perspective that can be taken by businesses with geographic relocation options or an ability to escape some penalties by diversifying into higher cost production (and to obtain compensation by means of free credits) is not open to government. If losses to the economy take place these remain losses; indemnifying some of the biggest losers simply shifts the aggregate costs. While a government has options over whether or not to provide compensation, the decision is one that trades off costs from damage to confidence as a result of enhancing sovereign risk as opposed to shorter term electoral costs which may be buffered if more of the costs are forced onto corporate entities.

The Garnaut modeling suggests losses of 0.1 per cent per annum from the 2010 \$20 per tonne tax rising at a real 4 per cent per annum to 2020. There can be little confidence in such estimates—modeling may work adequately in stable situation for a horizon of a couple of years. It may also be able to predict affects of a policy shock on specific industries some more years into the future. However a major price shock on fossil fuels, the use of which pervade the whole economy and which have no immediate low cost substitutes, is subject to massive uncertainties. This is particularly the case with Australia since cheap energy is a dominant factor in the nation's industrial profile.

Policy Flexibilities

The investment strategies of taking advantage of low cost fossil fuels outside of the OECD area which multinational companies and nationally based firms are pursuing raises the issue of the policy response to a failed global emission control pact. The Green Paper did not contemplate the actions that would be necessary in the event of international agreement not being forthcoming. It did however note the importance of Australian industry's major competitors in progressing the phasing out of assistance to the emissions-intensive trade-exposed industries. A corollary of that, one which government statements have only addressed in passing, is that the taxation edifice should be dismantled in the event that international agreement is not forthcoming. After all, Australia is a trivial contributor to emissions of CO₂ and it would serve no purpose to deliberately harm the economy without any prospect of a universal adoption of the same measures.

From such logic, it follows that, rather than embarking on a process that will clearly impact on all industries, an approach should be devised that confines the cost imposts to the final consumer. If we extended the GST principle to carbon, should a tax be put in place, we could apply a small surcharge on electricity and gas sales to the final consumer without this impacting upon business. The surcharge would be passed on and reclaimed by businesses in exactly the same way as the GST is passed through. The revenue could be used in part to compensate fossil fuel based electricity generators.

As to the preferred approach, a tax scheme that is modeled on the GST is of proven workability. It would help avoid some of the inevitable lobbying costs and arbitrary decisions that must accompany offering compensation at specific break-points like 1500 tCO₂-e per \$1 million of revenue. It would also facilitate the removal of the taxes if (some say when) catastrophic global warming turns out to be a myth. It would also allow for the taxes to be ratcheted up if the evidence about global warming becomes more persuasive.

Alongside such measures the government should abandon plans for increased renewable energy. Those plans offer no possibility of adding to the aggregate emission reduction outcome while clearly bringing enhanced costs. Motivated by vested interest they have no role in the pursuit of sensible rational policy. Indeed, if global warming is such an immense issue, shackling its solution to a mix of naked rent seeking and mysticism severely detracts from the credibility of those promoting action.

One overdue reform is the removal of the barriers to nuclear power. If preventing CO₂ emissions is as urgent as some claim in combating global warming nuclear power provides a safe, proven and relatively low cost means of reducing emissions. Opposition to it becomes a pure ideological position and one that suggests the claimed urgency regarding action to abate emissions is contrived in the case of those who simultaneously promote this and oppose a nuclear solution. Removing the barriers to nuclear power is an important test of government leadership.