Submission to Senate Economics Committee Inquiry into the exposure drafts of the legislation to implement the Carbon Pollution Reduction Scheme

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Carbon Emission Controls will Undermine Australian Wealth

Executive Summary

Even under the most extreme assumptions about new technology developments, no policy approach that is presently conceivable can meet the targets said to be necessary to stabilize global emissions. The target level Australia has set for itself, notwithstanding its ambitious nature, is insufficient for the country to meet an equal per capita share of global emissions of CO2-e that stabilize at current levels of emissions of 29,000 million tonnes. Stabilisation would require Australian per capita emissions of CO2-e at less than one fifth of current levels.

The science for capture and storage of carbon is at best in developmental stage and the design, approval, construction and commissioning of a system will consume hundreds of billion dollars and many years to deliver. Nuclear energy provides a more realistic technological solution but faces seemingly implacable public opposition and to replace existing plant with nuclear power stations would also entail colossal costs.

Though carbon emissions can be reduced by investments in low emission generating plant, this is incapable of meeting stabilization goals. Attempting this approach is also likely to engender an industrial profile that is increasingly uncompetitive in international markets as a result of higher input costs and reduced new investment.

Australia is a relatively minor emission producer, in line with its modest size as a world economy. But Australia's industrial structure leaves it as perhaps the world's most vulnerable economy to measures that force up the price and curtail the use of carbon based fuels.

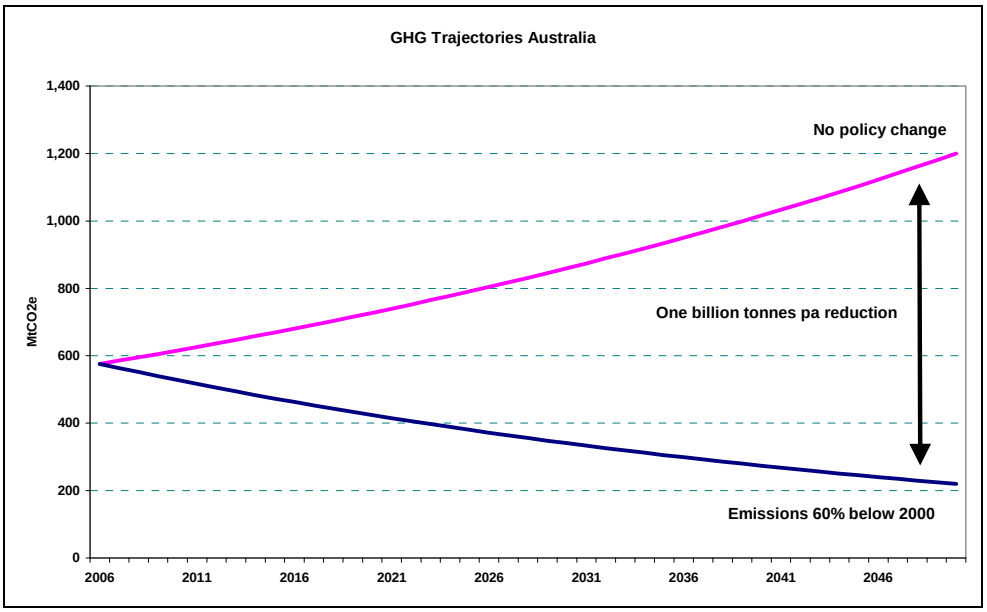
The material prepared by Treasury infers a low cost – some 0.3 per cent of GDP – if Australia were to defer abatement action until 2020 and subsequently make up the ground to the 2050 target date. Should the scientific theories of global warming be sustained in the interim decade and should a meaningful global agreement be put in place, a wait-and-see approach would prove to have been a low cost form of insurance policy. Should no global agreement be put in place, adopting this approach would save Australia considerable economic loss.

Introduction

The Government is proposing a massive reduction in Australian greenhouse emissions, to 60% of 2000 emissions or 220 million tonnes (Mt) by 2050 compared with 576 Mt in 2006 and a projected No Policy Change level of around 1,200 Mt in 2050.

Figure 1 illustrates these trends.

Figure 1



Source: DeltaQuest

Because of the pervasive nature of energy in production and consumption and the dominance of carbon based energy in the Australian economy, achieving growing levels of prosperity in the context of this widening gap will present considerable policy challenges.

Even so, the targets set understate those required.

Present per capita emission levels vary from 0.7 tonnes of CO2-e (Angola) to over 20 tonnes (US). The world average in 2004 was 4.5 tonnes per capita (and by 2008 some developing countries, notably China, had already surpassed that level). Carbon intensity, in terms of population and income levels in 2004, is shown in Table 1.

Table 1 Carbon Intensity of Energy Emissions, selected countries

	CO2 emissions	
	Per capita	Per unit of GDP (kt of CO2 per million 2000 PPP US$)
Selected Countries		
Angola	0.7	0.29
Kuwait	37.1	1.81
UAR	34.1	1.57
Iran	6.4	0.93
Kazakhstan	13.3	2.07
India	1.2	0.44
China	3.8	0.7
Australia	16.2	0.58
United States	20.6	0.56
Canada	20	0.69
UK	9.8	0.34
France	6	0.23
Aggregate Areas		
Least developed countries	0.02	0.017
East Asia & Pacific	3.5	0.63
Former Soviet bloc	7.9	0.97
High-income OECD	13.2	0.45
World	4.5	0.55

Source: UNDP Human Development Report 2007/8

With one per cent per annum population growth between now and 2050, the required level of emissions per capita by that date is reduced to 2.8 tonnes. This requires Australia to achieve a reduction of over 80 per cent in emissions from its 2004 level of 16.2 tonnes, compared with the Government's target of 60 per cent.

For the world as a whole to achieve the emission reductions being called for without sacrificing income growth would require unprecedented ingenuity, cooperation and self-sacrifice. Not only must the developed economies reduce their emission levels, but emission restraint mechanisms would seem to place considerable impediments on catch-up growth of the developing countries. The task for Australia, with its coal based electricity supply system, popular and political sentiment adamantly opposed to nuclear power, and an energy intensive industry structure, seems to be insurmountable.

These issues for Australia would be compounded if, as a nation with only 1.2 per cent of global CO2-e emissions, we are to offer leadership and move in advance of other countries. Early examples of such seemingly pointless sacrifice are coming to the fore.

Thus, for example, Caltex has demonstrated[1] how, with the CPRS as proposed, it will need to spend between $23 and $40 million per year to purchase carbon credits, an impost that would not be borne by imported fuel. If the firm ceased to produce petrol and diesel in Australian refineries – as it surely would eventually - there would be no

[1] Inserted letter from the Managing Director in the Star Caltex's magazine Feb-Mar 2009

effect on world emissions and Australia would have wastefully destroyed a valuable production facility. The seven Australian refineries employ some 9000 people and contribute some $1 Billion in tax.

Onesteel has said that the CPRS would deliver steelmaking cost imposts that would be unique in the world. The proposal would be likely to bring about a boost in production form other sources, leading to the loss of Australian jobs and outputs but also, as the Australian facilities are highly efficient, to a lower level of industry productivity.

Similarly, Alcoa has warned that it would need to shut its two Victorian aluminum smelters[2], which are among the most important manufacturing facilities in the state. Again, the Australian output would be simply replaced, at great cost of scrapped plant, by new output in areas where an impost is not present.

Truenergy[3] has demonstrated how the financial pressures on it as a firm would force it to cease operating by 2015, an outcome which it considers would also apply to the other two main brown coal electricity generators in Victoria, Loy Yang and International Power. This would eliminate 90 per cent of the state's electricity capacity.

Finally, Xstrata has indicated that it would lose thousands of jobs[4] if an ETS were to be introduced. This, as it largely relates to exported coal, points to an even larger issue. An ETS if implemented globally, as it must be, would require the elimination of coal as a source of energy, unless a cheap means of carbon capture and storage were to be discovered. Australia has some 76 billion tonnes of coal reserves (8 per cent of the world total) and even if this coal has a worth of as little as $10 per tonne, that means as a nation Australia sacrifices some $760 billion of wealth – comparable to a year's national income. Compounding this lock-in of the valuable coal reserves, Australia also has considerable reserves of gas and shale oil which would also eventually need to be prices out of production resulting in further losses of national wealth.

An ETS would not only stifle current business operation but would virtually eliminate new investment in power generation as well as other energy intensive processing and manufacturing industry. Leakage of current energy intensive industry overseas is almost assured despite the EITE allowances which are in place with reducing benefits for some 10 years.

The ETS Proposal

Outline

The ETS scheduled to commence in 2010 entails a market based tradable rights system under which some emission rights will be given in a declining trend to coal

[2] The Australian 17 March, http://www.news.com.au/couriermail/story/0,23739,25197530-3102,00.html

[3] Interview of McIndoe, CEO with Kohler and Bartholomeusz 14 March http://www.businessspectator.com.au/bs.nsf/Article/KGB-INTERROGATION-$pd20090312-Q39XM?OpenDocument

[4] http://www.news.com.au/couriermail/story/0,27574,25197530-3102,00.html

based electricity producers and to businesses producing emission intensive tradable goods. Most of the emission rights are to be auctioned.

The goal is to reduce emissions by 2020 by 5 per cent if other countries do not arrive at a meaningful agreement and by 15 per cent should such an agreement be reached. Emissions are to be reduced by 60 per cent by 2050. Prices are to be capped at $40 and thereafter rise by a real 5 per cent per annum. (Estimates are that to achieve the 5 per cent reduction a price of $32 of CO2-e would be needed and to achieve the 15 per cent reduction, the price would need to be $50 per tonne).

Industry programs and emission rights allocations

The ETS is the equivalent of a tax on business and on consumers and is designed to change behavior. It has been accompanied by funding which seeks to drive technical solutions. According to the Department of Climate Change, these amount to $219 million in the latest financial year. The revenue collected (or imposed and foregone) with a comprehensively set ETS of $12.65 billion where output is 550 million tonnes of CO2-e and the price is $23 per tonne ($21 billion at a $40 price). Australia's scheme is designed to cover around 75 per cent of Australia's emissions.

The existing Commonwealth expenditures on industry programs are itemized below.

Table 2 Commonwealth Industry Program Expenditures

Program	2008/9	2010/11
Energy Efficiency of Electrical Appliances	2.0	3.9
Green Building Fund	22.5	15.0
Retooling for Climate Change	10.9	17.8
Climate Ready Program	13.1	15.5
Clean Energy Innovation Centre	5.0	5.0
Energy Innovation Fund	40.9	21.7
National Clean Coal Fund	34.8	97.8
Renewable Energy Fund	55.5	101.0
Green Car Innovation Fund		100.0
Australia's Farming Future	36.0	25.0
Total	**219.7**	**402.7**

On top of these existing allocations, further disbursements are planned from the revenues obtained from issuing permits. These amount to around $3 billion per annum though much of this is to be directed to small community organizations.

Though these allocations are dwarfed by the value of taxation revenue/rights allocation measures, it is unlikely that a cheaper solution would emerge from increased Australian expenditures in pursuit of cheap technological solutions. Drivers for discovering cheaper solutions are already in place with the taxation penalty and reward for avoiding it. Moreover, Australia is unlikely to fund more than a per cent or so of research into technology advances that substitute carbon inputs from production and any such discoveries are likely to be widely available on a global basis. Areas where this may not be the case are where Australian production has certain unique features, for example in brown coal or possibly agriculture.

With regard to emission rights, around 30 per cent of allocations (valued at $3 billion in 2011) will be granted free to the emission intensive trade exposed industries. The allocation is to decline by 1.3 per cent per annum.

Compensation (worth $700 million in 2011) is also being provided in free emission rights to the black and brown coal generators. According to modeling consultancies commissioned for the White Paper, the losses of these firms from the ETS would range between $4.5 billion and $10.5 billion. The firms have been allocated assistance worth an estimated $3.5 billion.

The consultancy reports forecast the following plant closures.

Scenario	McLennan Magasanik Associates	ACIL Tasman	ROAM Consulting
CPRS -5	Three brown coal generators Six black coal generators	One brown coal generator Two black coal generators	One brown coal generator Three black coal generators
CPRS -15	Four brown coal generators Six black coal generators	Three brown coal generators Five black coal generators	Two brown coal generators Three black coal generators

Any such closures are likely to present serious supply deficiencies unless they are replaced by new capacity and moreover, in the light of the information revealed by Truenergy these closure estimates are likely to prove to be highly optimistic.

Operational characteristics of an ETS

Because the ETS is not ostensibly a revenue raising measure, absent a general recession induced reduction in income levels, its tapering effect must be achieved through either an increasing price or (more hopefully) by technological advances that allow cheap substitution of carbon based fuels or the low cost capture and storage of CO2. The Treasury analysis assumes that there will be many lower cost carbon saving opportunities outside of Australia. It estimates that Australia in 2050 will be spending $26 billion per annum in acquiring these, presumably financed by exports from industries that are not yet viable

There is no option of continuing to absorb the price for carbon credits by paying a "fine" for exceeding the target levels unless that "fine" is paid for by trading other countries' rights, something likely only to be open if other countries face economic stagnation. This remains the case even though the government intends to put a cap of $40 per tonne on the price.

Although there have been many estimates of what the carbon price would need to be, these are pure conjecture. A decade or so ago, most estimates placed the de facto tax required to reduce emission levels to the degree required were around $10 US. Even the latest IPCC report after studying over 100 peer-reviewed papers found the average tax effect required to be $12 US per tonne.

Such low levels of costs would now appear to be unlikely. In spite of recession has driven European carbon prices down to around $US15, far deeper cuts and hence higher prices would be necessary if emissions are to be reduced by the two thirds that the EU need to achieve for global stabilisation. Moreover, even if cheaper carbon reductions become possible this would still present major costs for a country, like Australia, highly dependent on fossil fuel energy. As power and stationary energy generators contribute some 50per cent of Australia's CO2-e, it would require the retirement of existing electricity plant, refineries and their replacement by low

emission substitutes. By definition the replacement plant is less competitive and higher cost (otherwise it would have been selected in the first place).

Hence, there is a dual loss: premature scrapping of capital equipment in the energy producing industries and higher cost energy subsequently with repercussions for all industries, particularly those that are energy intensive. The government's plans are to cushion those losses by providing free permits to the coal fired generators and to the energy intensive trade exposed industries. However, the compensation is only partial and, as we have seen, would not prevent the bankruptcy of major electricity generators or the departure of aluminum smelters, still less would it permit any growth in these important industries.

Solutions and their Feasibilities

We dismiss wind and other exotic alternative energy as a significant solution. Though breakthroughs cannot be ruled out, the present consensus is that wind and other solar energy sources will remain very costly – at least twice the price of conventional energy sources. In addition, their poor controllability would require considerable back-up investment and would in any event limit these sources to no more than 15 per cent of electricity. There would appear to be three possible routes to achieving the target reductions:

- A comprehensive adoption of nuclear power
- A rigorous carbon capture and storage approach
- A mixture of conservation, sequestration and other measures

Nuclear Power

Nuclear power faces apparently overwhelming political obstacles and even if adopted by the Commonwealth government, as in Japan would face considerable local opposition to new sites. Moreover, the replacement of existing power stations would require capital costs of several $100 billion. It would also signify the end of the energy cost advantage Australia has enjoyed for over thirty years, since nuclear would cost of the order of $70 per MWh, some 70 per cent more than coal based electricity.

In addition, nuclear would need not only to substantially replace fossil fuels for electricity but it would need also to (indirectly) replace oil based products in transport. This would entail the progressive replacement of motor vehicles and other transport modes by those based on batteries. The technologies for this are not presently available.

Carbon Capture and Storage

There are no CCS systems operating commercially on any scale anywhere in the world. It is doubtful that Australia will pioneer such technology. Some pilot programs are being trialled including:

- Sleipner, Norway[5] – offshore oilfield GHG reinjection
- CO2 CRC trials in Victoria with trial storage being experimented
- Enhanced Oil Recovery[6] in the USA & Canada for which no retention of CO2 has been measured.

[5] http://www.bellona.org/factsheets/1191928198.67

Current estimates are that post combustion plant capture costs are at $60 – 80/tonne CO2e. And in addition to this the energy required to capture and compress these gases brings a 30 per cent increase in energy consumption. These matters aside, Australia faces the question of the availability of adequate storage basins. The quantities involved are of the order of 200 – 300MT yearly for next 50 years.

Furthermore, a new carbon system of gathering pipes through major cities, similar to that of a sewer system would be required. This would need to feed into a series of transmission pipes to move the emissions hundreds of kilometers to sources like Bass Strait for NSW & Victoria, for Queensland some western basin, and for South Australia the Cooper Basin. The environmental design, land acquisition and approvals are likely to take many years to achieve let alone the actual time to construct, install and commission such a network. Liability issues for system integrity also remain unanswered at this time.

The total costs of this network would unquestionably be in the hundreds of billions of dollars and its technological proving would involve a considerable gestation period. Typically a laboratory bench scale technology takes 25 yrs to reach commercialisation, pilot scale proven technology 10 to 15 yrs and broad adoption by industry involves a further 20 years plus rollout.

A Combination of Measures

The Government sees price based taxes/tradable rights as the key to achieving a lower carbon economy. It has however a range of measures. These include:

- users adopting energy conservation to reduce GHG component
- implementation of conservation measures with support from **low carbon energy** input
- Low carbon construction regulations which would seem to be an inefficient command–and-control option that the "economic instrument" of a carbon tax/ETS is designed to avoid
- Sequestration options, which are currently at bench or pilot scale status and involve long gestations of at least 20 years to commercialisation.

Revenues and costs

Australian abatement of CO2-e carries a price tag related to the no policy change business–as-usual emission levels and the carbon price imposed. The revenue actually raised has only a loose relationship with the actual economic costs.

The no policy change estimate of emissions in 2050 is 1,200 million tonnes. Estimates of costs to achieve the abatement are as low as $20 per tonne ranging up to over $100 per tonne. The former would impose annual first stage revenue and regulatory costs of $24 billion and the latter $120 billion. There is no experience on which to base the effects of such imposts on the economy. The Treasury forecasts are

[6] http://www.fossil.energy.gov/programs/oilgas/eor/

more accurately labeled, as is the case with IPCC projections, "storylines and scenarios". The proposal to move to a CPRS involves

- Significantly higher operating costs
- Reduced profits with potential for low or no re-investment in industry
- Reduced competitiveness at home and in international markets.

In addition there are vast frictional costs in moving to revolutionise the structure of Australian industry and energy production. And the stakes are so considerable that there will be – has already been – considerable sums wasted in lobbying efforts and administration

International Agreements and Industry Competitiveness

Recently we have seen the US, while adopting a strong rhetoric, downgrading the Congressional priority to a global treaty on climate change measures. And we have seen the EU refocusing political attention to the global financial crisis.

All governments recognise the difficulties of achieving a general global coalition that implements emission abatement policies and are mindful that no country acting alone would have any impact. Moreover, governments that have enacted emission reduction measures are also persuaded that such a coalition is possible (or that to reject any such action would place them as international pariahs and possibly subject to sanctions).

Our own investigations into the likely actions by other governments have found an increasing caution to embark on costly actions to take their emission mitigatory actions a great deal further. These views would have been partly coloured by the recession but even prior to that we saw:

- Japanese policy indicating an unwillingness to reduce emissions from current levels partly because Japan considers itself to be a highly efficient energy user and partly because of difficulties in obtaining approval for nuclear plant sitings.
- The EU offering emission reductions that were posited on a business-as-usual basis rather than a more onerous base year.
- China, while having embarked on an ambitious wind program, has probably already surpassed the world benchmark level necessary for emission stabilisation and plans to more than double current per capita emission levels over the next 20 years.
- Canada abandoning its Kyoto target which it is likely to exceed by over 30 per cent.

Concluding Comments

Many business entities favour action because they hope to make gains for their own shareholders (and if directors were promoting such action on any other basis they would be acting unlawfully). For some, the gains they have in mind stem from receipt of a free allocation of valuable emission rights or because they have positioned themselves to be able to trade in those rights. Achieving this is made even more

improbable by the Government's plan to direct half of the revenues from permit issuance to over-compensating some 2.9 million low and middle income households for the higher prices the scheme will create.

Some business supporters of action by governments are motivated by what they consider is a need for certainty to enable forward planning. However it is impossible to provide such certainty – even the EU ETS, which falls far short of what is required to achieve stability, has seen the price of carbon rising to over € 35 and falling to below €10. It should go without saying that any badly constructed policy cannot provide certainty.

Though in some quarters it is claimed that an emission constraining policy will bring benefits, few are now persuaded by this. It is undoubtedly true that those who have been given carbon credits free of charge are winners and this prospect has been very useful to bring about political constituencies in favour of an ETS.

However, it is now generally agreed that for the nation as a whole there will be losses from the regulatory restraint of carbon. Those losses, in the view of the advocates of action, are more than offset by losses avoided from global warming.

The Commonwealth's ETS policy proposals are underpinned by Treasury's forecasts of abatement and price relationships. These embody some highly optimistic projections of as yet untested and even barely imagined mitigatory technologies. Treasury's decarbonisation forecasts might be more achievable if Australia were to fully adopt nuclear power, though this would still entail the scrapping of all coal and gas electricity generators and considerable change in motor vehicle technology.

One key outcome of the Treasury modeling offers a particularly promising policy approach. This is the Treasury estimate of the costs of doing nothing to 2020 and then catching up with the 2050 target thereafter should the need and achievability of such action prove necessary. That cost is inferred at 0.3 per cent of GDP by 2050.

Even if this is not overstated, 0.3 per cent of GDP seems a reasonable insurance policy price to pay rather than imminently embarking on measures that will be in the White Paper's words, "the most significant structural reform of the economy since the 1980s". By 2020 we will be clearer on the need for emission reduction policies and will, presumably, have access to all the technological advances that Treasury claim will be forthcoming.

The appropriate policy response therefore is to prepare an emission reductions plan that would become operational in 2020 if the science becomes more certain and if the world has developed a consensus to abate. In the interim, the relatively low catch-up costs incurred in maintaining business-as-usual for the next decade then embarking on an accelerated program should this prove necessary offers a compelling alternative approach to the certain cost and dislocation involved with current plans.