briefing note 2

Emissions Trading Briefing Note No 2

Economic Impacts – The value of action

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Introduction

The topic of emissions trading is prominent on the public and political agenda, with differing views being presented as to the potential negative impacts on the Australian economy.

This briefing note is the second[1] in a TEC series and analyses the economic arguments around implementation of a carbon emissions trading scheme in Australia. Most studies focus on the cost of taking action to reduce greenhouse gas emissions. Typical of this flawed approach is ABARE (2006) which underestimates the benefits of pursuing emissions reductions almost as significantly as it overestimates its costs. A complete analysis also needs to consider the cost to the economy of not taking action. A realistic context to the economic costs of taking action needs to be provided in order for an informed citizenry to determine whether the costs are acceptable in light of the damage avoided and value created. The vulnerability of the Australian economy to climate change ensures that delayed comprehensive action on emissions in Australia constitutes a significant level of economic irresponsibility. The creation of a domestic carbon market projected to be in excess of $100 billion dollars between 2011 and 2020 will drive innovation, growth, and job creation throughout the financial, agricultural, and clean energy sectors whilst safeguarding Australian industry from an otherwise inevitable 'carbon debt shock.'

Costs of Emissions Trading in Australia

The debate around the cost of emissions trading in Australia begins with the broader question of cost around greenhouse policy. In other words, what are the costs of reducing greenhouse gas (GHG) emissions? The Australian economy is carbon intensive with a heavy reliance on fossil fuels and Australian producers have never internalised any of the costs associated with carbon emissions. The inclusion of carbon externalities must, by definition, increase the cost of energy, leading to the singular conclusion by some that a price on carbon, either through an emissions trading scheme (ETS) or a carbon tax, would adversely impact the Australian economy.

In 2006, the Australian Bureau of Agricultural and Resource Economics (ABARE) conducted a study into the Economic Impact of Climate Change Policy: The role of technology and economic instruments. This study is the latest of a string of ABARE studies that have been heavily criticised by some commentators [17]. ABARE (2006) simulated the impact of the introduction of a carbon tax to achieve greenhouse gas emission reductions consistent with stabilisation of atmospheric GHG concentrations at 575 parts per million (ppm CO_2e). It was assumed that the economic impact of applying a carbon tax would approximate the impact of introducing an ETS in which the price of carbon would be determined by the market; an assumption that runs counter to the primary rationale for introducing an ETS - namely that an ETS will exploit the flexibility of the market to deliver a lowest cost of abatement than would the imposition of a 'blunt' carbon tax. [4].

ABARE predicted that in the absence of policies aimed at reducing GHG emissions, the Australian economy would grow to $2.67 trillion[2] by 2050 and concluded that all scenarios that entailed emissions reductions would result in reduced rates of GDP growth with a corresponding reduction in real wages.[3] The overall conclusion of the ABARE study was clear - the costs of emissions reductions in general, and of early action and steep cuts in particular, would be severely damaging to the Australian economy.

However in assessing the integrity of these results it is important to highlight several weaknesses and omissions of the study. The first point worth highlighting is that in deriving its business-as-usual (BAU) projections of GDP growth, the study ignores the costs that unabated climate change will impose upon the Australian economy and simply assumes that the economy will continue to grow unaffected by climate change; a projection that plainly ignores the facts. The second crucial omission arises from the study's failure to consider the myriad of economic opportunities that

1 Briefing Note 1 was entitled – 'The Adequacy of Proposed Emission Targets'
2 In 2005 dollars
3 Six scenarios were examined, which would deliver greenhouse gas abatement ranging from reducing to 50 per cent of 1990 levels by 2050 (early action with deep cuts at a carbon tax of 2005A$623 per tCO_2e), to reducing from business as usual growth back down to 1990 levels (late action with technology focus at a carbon tax of 2005A$77 per tonne of CO_2e).

will arise from the pursuit of emissions reductions. When deriving cost estimates of action the study concedes that 'no account is taken…of any benefits from avoided climate change' [4]. In this regard, the economic benefits of emissions reductions are highly underestimated. This bias is compounded by the over-estimation of costs that arises from the high level at which the carbon tax is set. In one scenario, the carbon tax is set at $623[4] per tonne of CO_2e, in another, the tax is set at $525[5]; figures that are over 500% greater than the per tonne social marginal cost (SMC) of CO_2e emissions calculated by the Stern Review (itself criticised by some for arriving at a 'high' cost of CO_2e [6]).[6]

Whilst these issues will be fully explored below, what is perhaps most remarkable about the conclusion of ABARE (2006) is that despite its significant underestimation of benefits, and equally significant overestimation of costs, the study arrives at a remarkably low cost of emissions reductions. Under the cheapest scenario identified by ABARE (2006), it was calculated that in the presence of carbon constraints, 2050 GDP would be only 1.7% less than it would have otherwise been. A back of the envelope calculation demonstrates that such figures imply that whilst, under BAU conditions, Australia will enjoy 290% cumulative GDP growth between 2005 and 2050, in the presence of carbon constraints, Australia will enjoy 285% cumulative GDP growth.

Such small costs of emissions reduction accord with the findings of many others. The Australian Business Roundtable on Climate Change report, The Business Case for Early Action, concluded that the achievement of a 60% reduction on 2000 emissions levels by 2050 would reduce GDP growth by only 0.1% per annum [7]. This finding is consistent with the recent report of the Intergovernmental Panel on Climate Change (IPCC) Working Group III which found that stabilisation of atmospheric concentrations of CO_2e at 445-535 ppm would reduce global growth rates by less than 0.12% per annum. [14].[7]

The emerging economic consensus is that reductions in greenhouse gas emissions of 60 per cent by 2050 are affordable at a cost of a reduced GDP growth rate of 0.1 percent. However, there are two other parts to the cost equation - the costs of inaction on greenhouse emissions and the economic benefits that would flow from Australia's entry into a carbon constrained world.

Costs of Not Taking Action on Greenhouse Gas Emissions

In order to develop a true understanding of the choice we face the costs of emissions trading (or of any policy aimed at reducing greenhouse gas emissions) need to be compared with the costs of inaction. The Stern Review estimates that a business-as-usual emissions trajectory will see emissions grow from their current levels of 45 billion tonnes of CO_2e per annum to 84 billion tonnes of CO_2e by 2050; an outcome that would deliver atmospheric concentrations of 630 ppm CO_2e by 2050. This trajectory carries the 'certainty' of delivering over 3ºC of warming and a 50 per cent risk of more than 5ºC of warming. The accompanying costs of inaction on climate change have been put at a 'scale similar to those associated with the great wars and the economic depression of the first half of the 20th century' [6].

The costs of inaction will be particularly large for Australia and not only because Australia's fortunes are tied to that of the global economy. Whilst much is often made of Australia's coal industry, tourism and agriculture are worth much more to the Australian economy. Whilst coal accounts for $24.3 billion of Australia's exports, agriculture and tourism collectively account for $48.2 billion of annual exports - almost double that of coal. The importance of coal is further diminished when we consider that whilst tourism and agriculture collectively account for 770,000 Australian jobs (7.8% of total employment) coal provides for only 30,000 jobs (0.3% of total employment).[8] Australia's $31.3 billion tourism industry is highly climate dependent, as is highlighted by the Great Barrier Reef that supports a $1.5 billion industry (and employs more people than coal) - but faces destruction with a 2-3ºC

4 In 2005 Australian Dollars
5 In 2005 Australian Dollars
6 A $2005A623 price on CO_2e translates to a per tonne price of carbon of $2005A2,284, which puts the value of carbon emissions at an equivalent price to non-ferrous metals like aluminium with 3.67 tonnes of CO2e needed to make one tonne of carbon because of the molecular ratio of CO_2 to C of 44 to 12.
7 The stabilisation target was 445 – 535 parts per million carbon dioxide equivalents (ppm CO_2e), which is broadly consistent with a 60% reduction target.
8 Australian Commodities, March Quarter 2007, ABARE. Tourism Satellite Account: Australian National Accounts, 2005-06, ABS (5249.0). Australian System of National Accounts, 2005-06, ABS (5204.0). Black Coal Mining Industry in Australia, B1101, 13 June 2007, IBIS. Brown Coal Mining Industry in Australia, B1102, 3 October 2006, IBIS

increase in temperature; a blow to the tourism industry that would be compounded by the loss of a significant proportion of Australia's alpine environments, as well as 80% of the Kakadu wetlands with similar levels of warming [15].

As for agriculture, Australia's $17 billion of exports from the livestock industry face risks from more heat stress, more pests and disease whilst the national livestock carrying capacity in native pasture systems is predicted to fall by 40% if temperatures increase by 2ºC. Water flows in the Murray-Darling Basin, responsible for approximately 40% of Australia's agricultural and pastoral production [19], are also predicted to fall by 15% with similar levels of warming. [7]. The obvious costs that this will present for Australian agriculture will be compounded by the fact that climate change will lead to the climatic dominance of El Nino weather systems. The variability of rainfall that this will bring will not only stunt crop reliability but will ensure significant topsoil loss as the frequency of floods increase. Refinement on the actual costs of climate change for Australia are anticipated to be released in the second half of 2008 with the Garnaut Climate Change Review, specifically tasked with examining 'the costs of inaction and impact of climate change on the Australian economy and jobs' [8].

Such implications for Australian industry ensures that inaction on emissions constitutes the greatest form of economic irresponsibility. There will be those who will respond to such an assertion by arguing that as Australia accounts for only 1.5% of global emissions it alone will not be able to prevent the ravaging of the Australian economy by unabated climate change. This is true - only a global response will mitigate the extent and likelihood of climate change. However, Australia has an important role in ensuring that the world sets down the path of achieving the emissions reductions required to give the world a fighting chance of avoiding dangerous climate change.

The EU has pledged to reduce its emissions by 20% by 2020 and will increase this to 30% if matched by other developed nations. As for developing nations, the recent *Midnight Sun Dialogue on Climate Change* (attended by China, India, Brazil, US, Australia, and the EU) reinforced the long standing principle that developing nations would follow the lead of the developed world in addressing emissions; the longer that Australia stalls on emission reductions the longer it will take for the developing world to ratchet up emissions growth mitigation measures. A comprehensive movement on Australian emissions reduction will 'grease the wheels' of the global action required to avoid dangerous climate change.

This will require reducing greenhouse gas emissions to target a stabilisation concentration that limits the risk of global warming to 2ºC or less. Anything other than an emissions reduction target of 30 per cent by 2020 is unlikely to mitigate this risk [9].

Costs, Damn Costs and Economics - Putting Reductions in GDP into Perspective

The potential costs of taking, or not taking, action needs to be put into the context of 'future costs which will be balanced against future economic growth.' For example, consider the 'cost' of taking action on greenhouse issues as a loss of 4 per cent GDP against business-as-usual. This means that at 2100 'We can have an annual income in today dollars of $185,000 and risk everything, or an annual income of $177,000 and help stabilise the world's climate' [10]. Put in this context, seemingly large reductions in GDP seem inconsequential in light of the risk profile associated with greenhouse gas emissions.

Even the 'actual' costs of emissions reductions (dollars spent now as opposed to foregone future standards of living) are invariably overestimated because modelling costs is an easier task than estimating market reaction to price signals. However markets will respond to costs, and carbon emissions trading would provide a clear price signal and context for the market to take action.

For example, putting an emissions reduction target regime in place signals to industry that high carbon footprints will be expensive. For the motor industry this would set a timeline and goal for increasing the fuel economy of cars. The result is that although petrol cost would increase by 2.3 per cent if 30 per cent of emissions needed to be offset at $35 per tonne of CO_2e - the gain in efficiency would more than offset this cost by making the per kilometre cost of travel cheaper by 17 per cent (see the case study opposite).

Arguably the costs of design improvement for cars would be added to the price of a new car, and should be accounted for under a complete economic analysis. However motor vehicle manufacturers already have budgets for new model development, and the

additional cost in engineering for efficiency would be low or nothing. Those companies that 'win' the efficiency race could actually capture additional market share and turnover. Similar arguments could be made across a multitude of products and sectors – a price signal on carbon will drive efficiency measures that will mitigate cost increases. Also there will be winners in a decarbonising economy (for example, more work for Small and Medium Enterprises (SMEs) in installing and maintaining energy efficiency measures, distributed power supplies, solar hot water systems, rain water tanks and conversions to multi-fuel engines for motor vehicles.

Case Study: Personal Cost of 30% Emissions Reduction in Transport

The transport sector represents a significant contributor to emissions in Australia and around the world. As an example of the costs associated with achieving emission reductions through offsetting a car, consider a requirement to offset 30 per cent of greenhouse gas emissions from the transport sector by 2020, at a price of CO_2e of $35 per tonne (estimated from [11]). This would provide a strong signal to the motor industry to improve fuel efficiency. Each litre of petrol releases 2.6 kg of GHG on a full fuel cycle basis. Hence to offset 30% of the emissions from 1 litre petrol would cost 0.3 * 0.0026 * 35 or $0.027, which is 2.3% of the petrol cost at $1.20 per litre. However this is not the full story as the real cost of petrol is a litre per kilometre equation. 'What is the cost of petrol to move my car one kilometre?'. Say an existing car travels 10 km per litre of petrol. At a cost of $1.20 per litre this equates to 12 cents per kilometre travelled. It is reasonable to expect the motor industry to achieve a 20% increase in fuel efficiency, which means that holding all other things equal, a comparable car to the one above would now get 12 km per litre (an extra 20%). One litre of petrol with 30% of emissions offset would cost (in today's dollars) $1.23 (rounded to nearest cent). At this price and efficiency the cost per kilometre travelled for petrol is $1.23/12 = 10 cents – which far from being more expensive, is actually cheaper by 17% in terms of price paid per kilometre travelled.

The Value of Emissions Trading

Opponents of emissions trading suggest that the cost to Australia would be significant. What is ignored in these arguments, however, are the economic benefits that could be gained by engaging with emissions trading and developing and implementing the products, services, technology and financial infrastructure required to achieve emissions abatement.

The scale of carbon abatement required is significant. Figure 1 shows greenhouse gas emissions in a business as usual scenario (red upper line) and under significant reductions (green lower line), with the difference indicating the required levels of abatement. For example, in order for Australia to meet a 30% reduction in GHG emissions by 2020 and meet per capita requirements for a global 70% reduction, Australia will need nearly 3.2 billion tonnes of CO_2e abatement products, services, technology and infrastructure between 2011 and 2020, and at least an additional 23 billion tonnes for 2021 to 2050. [9]

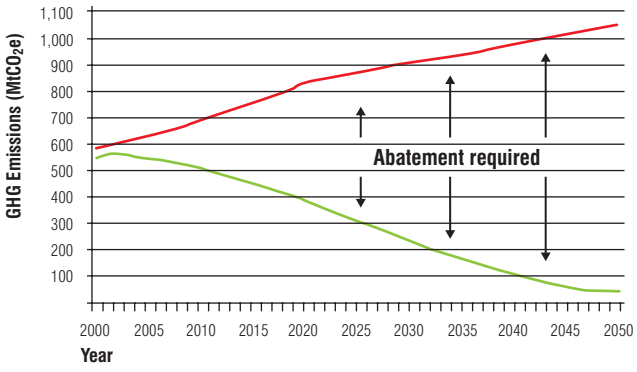

Figure 1 – Abatement = Market Opportunity - Australia will need nearly 3.2 billion tonnes of CO_2e abatement products, services, technology and infrastructure between 2011 and 2020 - And at least an additional 23 billion tonnes of CO_2e from 2021 to 2050.

The direct carbon market in Australia alone is likely to be worth in excess of $100 billion for carbon abatement services, at an average price of $35 per tonne of CO2e for 3.2 billion tonnes of abatement between 2011 and

9 BAU to 2020 derived from [12], BAU to 2050 uses 0.8% per annum increase as per [4]. 2050 reduction target of 90% reduction derived from [6], where global reduction target was 14 $GtCO_2e$. Global population forecast to be 8.9 billion at 2050 (www.un.org/esa/population/publications/longrange2/worldpoptotals.doc), which is carbon birthright of 1.6 tCO_2e. Mid range pop estimate of 28 M for Australia at 2050 (www.abs.gov.au) – Australian 'birthright' carbon allowance would be 44.8 $MtCO_2e$ or a reduction of 92% on 1990 levels. 90% has been used here for convenience in communication.

2020. In seeking to meet such targets Australia will benefit from the development of a strong sustainable energy sector, including stimulation of innovation and implementation of new technologies, products, services, and the development of the financial infrastructure required to promote such abatement. The economic benefits offered to Australia by introducing an emissions trading scheme include:

Promotion of Australia's sustainable energy sector

The development of an emissions trading scheme constitutes an integral component of a suite of measures that would act to promote the development of the sustainable energy sector in Australia. The Business Council for Sustainable Energy (BCSE) defines this sector to include renewable energy, gas fired generation, and energy efficiency and estimates its annual value at $5.7 billion in revenue terms, and $400 million in exports, whilst also directly employing over 20,000 people. The inevitable shift to a low carbon global economy will position such sectors for rapid export growth in the future. According to recent reports from the Carbon Disclosure Project (CDP) the United Nations predicts that clean technology financing could reach $1.9 trillion by 2020 and global wind and solar markets in 2005 alone increased by 47% and 55% to $11.8 billion and $11.2 billion respectively. The current absence of incentives has led to the situation where Australian innovations are being bought out by foreign companies only to be sold back to Australia in future decades; ensuring that Australia will not only miss out on a rapidly growing source of export income but also tie itself to an increasing stream of future imports from foreign competitors. [16] Furthermore, this sector is, and will continue to be, strongly characterised by the development of Small and Medium Enterprises. As drivers of innovation, SMEs have a particularly important role to play in the growth of the economy: in addition to creating jobs, the growth of SMEs often contributes to growth in support industries.

Position Australia for its emergence as a hub in the global carbon trading infrastructure

The development of a domestic emissions trading scheme presents Australia with the opportunity to emerge as a hub in a future global emissions market. Despite having less than 0.5% of the world's population, Australia boasts the 9th largest equities market, and the 7th largest foreign exchange market in the world. Australia also hosts one of the largest derivatives markets in the region, and one of the worlds most sophisticated financial services industry. The determinant factor in the rapid development of Australia's financial services sector was the opportunity for capacity building presented by being the first mover on compulsory superannuation. The same early mover advantage exists in regard to Australia's potential role in the emerging global emissions market; a market that is predicted to be worth hundreds of billions of dollars annually. Between January 1 and September 30, 2006, the global carbon market was estimated to be worth US$21.5 billion, more than doubling in value over the previous year. As the US, Europe, England, and China seek to position themselves for this emerging market, the early development of an emissions trading capacity will position Australia as an important node in the international carbon trading infrastructure and ensure that Australia continues to punch above its weight on international financial markets. [16] Another sector that could benefit from emissions trading is the agricultural sector, with one estimate suggesting that the value of emissions trading would be $2.5 billion to farmers between 2008 and 2012 [18].

The decision to move 'early' on emission reductions will pave a smoother reductions path for industry

The final economic motivation for early engagement in emissions trading mechanisms is that it is clear the earlier emissions reductions are initiated, the lower the impact will be on industry; the later that emissions cuts are initiated, the greater will be the required trajectory of emissions reductions needed to meet necessary cuts. Early movement on emissions reductions will allow for a smoother transition for domestic industry and will offer domestic industry a competitive advantage over those nations that choose to stall on emissions reductions and thereby later impose upon industry more onerous and drastic annual cuts in emissions. [16]

Conclusion

The value component of the carbon equation is often absent from discussions on the costs of emissions trading as a strategy to reduce greenhouse gas emissions. However, this value is significant, with small and medium businesses likely beneficiaries. Furthermore, the value of future proofing the Australian economy against a 'carbon-debt shock' (where deep carbon constraints are rapidly mandated) cannot be overstated. Given the capacity of the market to innovate to overcome constraints, thereby reducing personal cost impacts, the value proposition of emissions trading is compelling from an economic and environmental perspective.

Useful References

1 CAF, 2007, 'Communique', Council for the Australian Federation, Sydney, accessed at http://www.emissionstrading.nsw.gov.au/__data/assets/pdf_file/0016/6343/CAF_communique_9feb07.pdf , May 2007.

2 NETT, 2006, 'Possible Design for a National Greenhouse Gas Emissions Trading Scheme', National Emissions Trading Taskforce, Sydney, accessed at http://www.emissionstrading.net.au/key_documents/discussion_paper , May 2007.

3 Prime Ministerial Task Group on Emissions Trading, 2007, 'Issues Paper', Department of the Prime Minister and Cabinet, Canberra, accessed at http://www.pmc.gov.au/emissionstrading/docs/emissions_trading_issues_paper.pdf , May 2007.

4 ABARE, 2006, 'Economic Impact of Climate Change Policy: The role of technology and economic instruments', Australian Bureau of Agricultural and Resource Economics, Canberra, accessed at http://www.abareconomics.com/publications_html/climate/climate_06/cc_policy_nu.pdf , May 2007.

5 Allen Group Report (2006) 'The Economic Impacts of a National Emissions Trading Scheme: Report to National Emissions Trading Taskforce, National Emissions Trading Taskforce, Sydney, accessed at http://www.emissionstrading.net.au/__data/assets/pdf_file/0008/2015/060811_Final_MMRF_report.pdf, May 2007.

6 Stern Review, 2006, 'The Economics of Climate Change', HM Treasury, London, accessed at http://www.hm-treasury.gov.uk/independent_reviews/stern_review_economics_climate_change/stern_review_report.cfm, May 2007.

7 Australian Business Roundtable on Climate Change, 2006, 'The Business Case for Early Action', accessed at http://www.businessroundtable.com.au/pdf/F078-RT-WS.pdf , May 2007.

8 Rudd, K., 2007, 'Garnaut Climate Change Review: Media Statement - 30th April 2007', Federal Australian Labor Party, Canberra, accessed at http://www.alp.org.au/media/0407/msloo300.php , May 2007.

9 ACF, 2007, 'Australian leaders should listen to Stern', Australian Conservation Foundation, Melbourne, accessed at http://www.acfonline.org.au/articles/news.asp?news_id=1208, April 2007.

10 Cosier, P., 2006, 'Will Climate Change Cost Us the Earth', Green Capital, Sydney, accessed at http://www.wentworthgroup.org/docs/Will_climate_change_cost_us_the_Earth1.pdf, May 2007

11 McLennan Magasanik Associates Pty Ltd, 2006, 'Impacts of a National Emissions Trading Scheme on Australia's Electricity Markets', National Emissions Trading Taskforce, Sydney, accessed at http://www.emissionstrading.net.au/__data/assets/pdf_file/2016/060811_Final_MMA_Report.pdf , May 2006.

12 AGO 2006, 'Tracking to the Kyoto Target: Australia's Greenhouse Emissions Trends 1990 to 2008-2012 and 2020', Australian Greenhouse Office, Canberra, accessed at http://www.greenhouse.gov.au/projections/pubs/tracking2006.pdf , May 2007.

13 Carbon Disclosure Project (2007), accessed at http://www.cdproject.net , May 2007.

14 IPCC. 2007. Working Group III contribution to the Intergovernmental Panel on Climate Change. Fourth Assessment Report. Climate Change 2007: Mitigation of Climate Change. Accessed at http://www.ipcc.ch/SPM040507.pdf , June, 2007.

15 CSIRO. 2006. Climate Change Impacts on Australia and the Benefits of Early Action to Reduce Global Greenhouse Gas Emissions. CSIRO Marine and Atmospheric Research.

16 TEC. 2007. Submission to the Task Group on Emissions Trading Scheme. Total Environment Centre. Accessed at http://www.pmc.gov.au/emissionstrading/submissions/112_sub_emissionstrading.pdf , May 2007.

17 Hamilton, C., 2007, 'Scorcher: The Dirty Politics of Climate Change', Black Inc. Agenda, Melbourne.

18 TCIA, 2006, 'Missing Billions: How the Australian Government's Climate Policy is Penalising Farmers', The Climate Institute of Australia, Sydney, accessed at http://www.climateinstitute.org.au/cia1/downloads/280207_missing%20billions%20report.pdf , May 2007.

19 Connell, D. 2007. Water Politics in the Murray Darling Basin. The Federation Press

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Established in 1972 by pioneers of the Australian environmental movement, TEC is a veteran of more than 100 successful campaigns. For over 30 years, we have been working to protect this country's natural and urban environment, flagging the issues, driving debate, supporting community activism and pushing for better environmental policy and practice. We rely on donations and grants for our survival.

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