Issues Paper 2
Financial Services for Managing Risk: Climate Change and Carbon Trading

This paper includes a summary of climate change and carbon trading issues as they relate to financial services and markets in Australia. The issues discussed in this paper are based on topics raised at the Garnaut Climate Change Review Public Forum on 31 October 2007. They do not represent the views of Professor Garnaut or the Review Secretariat, but instead seek to raise relevant questions and invite feedback from interested members of the community.

1 Introduction

1.1 The Garnaut Climate Change Review

The Garnaut Climate Change Review (hereafter 'the Review') was commissioned by Australia's State and Territory Governments on 30 April 2007. The recently elected Prime Minister of Australia has confirmed the participation of the Commonwealth Government in the Review.

The Review will examine the impacts of climate change on the Australian economy, and recommend medium to long-term policies and policy frameworks to improve the prospects for sustainable prosperity.

In carrying out this task, the Review will undertake an extensive consultation process to encourage open and informed debates on key climate change issues.

On 31 October 2007, the second of a series of public forums was held in Sydney on Financial Services for Managing Risk: Climate Change and Carbon Trading. This forum sought to explore the role of the Australian financial markets in facilitating the management of risks and opportunities associated with climate change and carbon trading.

1.2 Purpose of this Issues Paper

The purpose of this paper is to draw out discussion/questions from the Forum and to explore and seek input on some of the key issues facing Australian financial markets and services as result of climate change itself, and as a result of the introduction of an emissions trading scheme. Within this context the issues paper discusses the following key issues;

- Insurance
- Building Effective Carbon Trading Markets
- Positioning Australia as a Regional Hub in the Asia Pacific Carbon Markets

1.3 Submissions Process

All submissions in response to this Issues Paper should be received by 21 February 2008 either via email at contactus@garnautreview.org.au or sent to:

Garnaut Review Secretariat

Level 2, 1 Treasury Place

East Melbourne, Victoria 3002

Submissions will be made available on the Review website unless specifically requested to be confidential. If you have any queries, please contact the Secretariat via email at contactus@garnautreview.org.au or phone on (03) 9651 0631.

2 Context: Financial Services for Manaing Risk: Climate Change and Carbon Trading

Insurance services

The impacts of climate change, particularly the occurrence of more extreme weather events, are likely to cause significant damage to economic and social infrastructure. Access to a range of insurance products will be fundamental to ensure the financial security of infrastructure owners now and in the future. However, there is inherent uncertainty about the impacts of climate change which is likely to affect the availability and price of insurance products. Exploring and understanding these issues, and their potential economic consequences, will be critical in dealing with any impediments to the provision of insurance in the context of climate change. It will also assist in determining the appropriate role of Government and the resulting implications for government policy.

Building effective carbon trading markets

Financial markets will have an important role to play in supporting a successful Australian emissions trading scheme (ETS). Well functioning carbon trading markets will help to facilitate price discovery and stability. This, in turn, will be important to long-term investment decisions, for example relating to the development and deployment of new technology. The link between an ETS and international emissions trading regimes and carbon markets will also be a crucial consideration. Understanding these interactions, and the indicators and conditions for smoothly functioning carbon markets, will help in the appropriate design of an emissions trading scheme.

Positioning Australia as a Regional Hub in the Asia Pacific Carbon Markets

The financial sector will be at the forefront of financing structural adjustment to a lower carbon economy. There are potential large economic opportunities for Australia if it can position itself as a regional hub in global and Asia-Pacific carbon trading and financing markets.

3 The Issues

3.1 Insurance Issues

Insurance plays an important role in assisting individuals and businesses to manage risks to life, property and health. It is therefore desirable that the insurance industry has the capacity to provide the range of products and services required to manage and cope with risks.

The insurance industry will play an increasingly important role in managing risks of extreme weather events and other weather- and non weather-related risks associated with climate change.

Climate change and extreme weather events

Climate change is expected to increase the frequency and severity of extreme weather events such as cyclones, floods, bushfires and severe hail events.

The frequency of tropical cyclones in Australia, while difficult to predict and assess, is expected to change in the coming years as a result of climate change. Australian tropical cyclones are expected to become more intense, move further south in Queensland, and hit the Australian coastline with greater frequency (Leslie *et al.*, 2007a). The impacts of some of these cyclones will be damaging winds, flooding and storm surges (Leslie *et al.*, 2007a). Severe hailstorm events are also likely to become more frequent and severe in New South Wales (Leslie *et al.,* 2007b).

Such events pose significant risks to social and economic infrastructure and could result in considerable financial costs for individuals and business if such risks are not adequately managed.

Box 3.1. Economic Impacts of Weather Events

In March 2006, tropical cyclone Larry crossed the north Queensland coast resulting in significant damage and interruption to industry and households through disruption to infrastructure, utilities and agricultural crops. Munich Re has estimated the total amount of loss at US$1,300 million, including destruction of banana and sugar plantations of around US$400 million (Topics Geo, Natural Catastrophes 2006).

Over the last 38 years, hailstorms have contributed over one third of the total insured costs caused by all natural hazards in Australia (Schuster et al, 2005). The 14 April 1999 Sydney hailstorm resulted in the largest property insurance losses in the last forty years, estimated at $2 billion (Insurance Council of Australia, 2007).

The examples provided in Box 3.1 demonstrate that weather-related events can result in significant economic loss. Despite the potentially large damages that could result from extreme weather events, assessing the potential future risk is problematic. There is considerable uncertainty as to the location, occurrence and severity of extreme weather events. For example, Munich Re estimated that if tropical cyclone Dinah (Category 3, 1967) were to hit Brisbane, the Gold Coast and the Sunshine Coast (100-150 km south of its actual location) now, the potential insured losses would be in the range $10 – 17.5 billion (Munich Re, 2006).

Implications of climate change for insurance

Impacts on insurance premiums

The public forum of 31 October 2007 highlighted a general view among insurance industry representatives that the industry is well placed to deal with increased risks of weather events as a result of climate change. However, insurance premiums are likely to rise to reflect the increased uncertainty and potential impacts of climate change over the coming years. Increases in insurance premiums will have a direct impact on the affordability of insurance, and consequentially, access and take-up up of insurance services for many groups, in particular low-income households. Increased insurance premiums as a result of climate change may exacerbate existing rates of non-insurance and the intensity of under-insurance of property. However, some commentators consider our insurance sector is also relatively well-positioned because the size of our insurable market is comparable to a healthy number of other cities, allowing for opportunities for re-insurance and diversification of risk

Under-insurance and non-insurance of property

Recent evidence suggests that 1.8 million Australian households (representing 23 per cent of Australian homes) do not have a building or contents insurance policy (ICA, May 2007). Anecdotal advice received by the Review suggests that individuals with fewer savings (and hence most vulnerable to loss) are likely to be disproportionately represented amongst the non-insured.

There may be potentially large costs to society from non-insurance and under-insurance if Government is expected to provide assistance to those adversely affected by damage, particularly if such damage is forecast to increase as a result of climate change.

Understanding the reasons for under-insurance and non-insurance, and the potential compounding of these issues due to climate change, will be important to future government policy. There are likely to be numerous reasons for under and non-insurance of property, including lack of information by individuals about potential risks to property from weather related and other risks, as well as affordability issues. The ICA estimates that State taxes on insurance could also be adding 15-20 per cent onto insurance costs (ICA, May 2007).

An issue for the Review is whether there is any element of market failure requiring government policy response. For example, is there market failure behind provision of information or low and declining take-up of insurance? A thorough understanding of these issues will be required before definitive policy options can be proposed.

Insurance Gaps

In addition to potentially large rates of non-insurance and under-insurance, climate change may also highlight and expand gaps in the insurance market. Many insurance products do not cover land

values or insure against damage caused by flooding, both of which are likely to be affected by climate change.

Flood risk

The occurrence of flooding is likely to increase as a result of climate change, through storm surges, river flooding, flash flooding etc. However, due to the small proportion of individuals facing flood risk [1] and the complexities and uncertainty associated with assessing flood risk to individual properties, it is often not viable for insurance companies to provide flood insurance. As a result, most private insurance companies in Australia do not provide flood insurance for private households.

In many instances, property owners, or prospective buyers, are not aware of the risks of flooding to their properties. Combined with the unavailability of flood insurance in Australia, this lack of information is likely to exacerbate the costs to individuals and the community from flooding.

The role of providing information on flood vulnerability (sometimes referred to as flood mapping) is often taken on by water authorities and local government. However, such responsibility appears to be inconsistent, varying from authority to authority (Institute of Actuaries, 2007).

Coastal vulnerability

Australia is particularly vulnerable to rising sea levels and coastal inundation and erosion. Both of which are expected to occur as a result of climate change. Approximately 50 per cent of Australian addresses and population are within 7km of the shore, and approximately 6 per cent are within 3km of the shore in areas less than 5 metres above mean sea level (Chen and McAneney, 2006). Additionally, coastal property values are relatively high.

Insurance policies generally only cover damage to building and contents and not damage caused to the value of land. In some cases, building damage that is caused by land erosion is not covered. This lack of insurance opportunities, combined with the concentration of addresses and population near the coast and the fact that claims will coincide making it harder to pool risks across population, means that the financial impacts of rising sea level and coastal erosion could be significant.

There may be a number of potential options for the insurance industry and individuals to manage such risks. At the forum on 31 October 2007, the IAG discussed a possible 'whole of life' coastal insurance property scheme whereby insurers guarantee a pay out of a fixed insured sum (for a fixed annual premium) once the land becomes inundated by the sea[2]. However, as discussed by the IAG, such a scheme poses numerous practical issues, including risk of faster than expected sea level rise and risk of limited voluntary take up. This could mean that insurers are unable to spread risks widely enough to provide cover.

Government could also attempt to minimise the potential future impacts of rising sea levels and coastal erosion by imposing development restrictions and/or conditions on new developments in areas at risk from climate change. Some precedents have already been set. For example, on 27 November 2007 the NSW Land and Environment Court overturned a development approval by the NSW Planning Minister based on failure to consider whether changed weather patterns would lead to increased flood risk in connection with the proposed development.

Questions for consideration

Does the insurance industry have the capacity to provide adequate and affordable insurance products in a future of climate change?

Are there any market failures associated with the provision of insurance that are specifically related to climate change risk?

What are the key insurance gaps relating to climate change?

What kinds of innovative products could the insurance industry provide to deal with increased weather related risk associated with climate change?

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[1] In most countries the proportion of people thought to face flood risk is less than one percent (Chen and McAneney, 2006)

[2] Further information is available at http://www.garnautreview.org.au/CA25734E0016A131/pages/public-forums

Roles and responsibilities in climate change risk management

Clearly defining who should bear the risk of damage from climate change is likely to become an increasingly important issue as climate change worsens and its impacts are felt more strongly.

Some will argue that responsibility for managing risk of climate change should spread across various levels of government (Local, State and Federal) and the community. Are there circumstances in which Government should share the risk? What are these circumstances? Determining the appropriate burden of risk sharing between these groups will be important.

One of the key roles of government would relate to identification of any market failures associated with the management of risks. Is there a role for Governments in provision of appropriate information to assist individuals in assessing private risks of climate change, or in working with the insurance industry to resolve any impediments to the provision of insurance?

Government could also play a role by helping communities build resilience to climate change. This could be through building standards and/or other regulatory mechanisms, such as restricting urban development in areas prone to risk. A case could also be made that government should act as a safety net for the truly vulnerable in times of loss.

However, government intervention needs to be considered in the context of the potential perverse incentives it may create. For example, the expectation of government rescue may increase incentives for risky private behaviour, or poor risk management practices. Government's role should be primarily focussed on assisting individuals make informed decisions and on ensuring there are no impediments or restrictions to accessing private insurance.

The insurance industry is generally viewed as having responsibility for providing appropriate and affordable insurance products. However, the industry can also play a role in the provision of information to individuals to assist with risk management. This could be advice on building construction in the event of damage to assist individuals construct buildings that are more resilient to climate change. The lower risk of damage would then be built into insurance premiums.

Questions for consideration

What is the appropriate burden of risk sharing responsibilities between Government, individuals and the insurance industry?

Is the insurance industry likely to provide an adequate range of insurance products in the absence of government intervention?

More generally, is there a useful role for government in providing a mandatory, regulatory insurance against climate change risks, or is the general prudential supervisory role of government enough?

3.2 Building Effective Carbon Trading Markets

The success of an Australian ETS will be in part driven by the capacity of the Australian financial market to provide the necessary infrastructure and institutions required to support emissions trading and permit price discovery.

Australia's financial markets are currently supporting the second largest ETS scheme in the world, the NSW Greenhouse Gas Abatement Scheme (NSW GGAS). In 2006, the value of the GGAS scheme was more than five times that of the Chicago Climate Exchange (ASX, 2007). These markets have also been effective in supporting participants in the National Electricity Market (NEM) through the provision of highly liquid electricity futures (ASX, 2007).

An Australian ETS will be significantly larger than current Australia environmental markets.

Forum participants generally agreed that Australia has the necessary infrastructure and institutions required to support an ETS of the size proposed by the Task Group on Emissions Trading in 2007.

Questions for consideration

Are there any institutional inhibitors to the emergence of an Australian ETS?

Despite the strong financial markets and institutions currently in existence in Australia, the capacity of such markets to efficiently operate in the context of emissions trading may be impacted by the design of an Australia ETS. In particular, Forum participants noted that undue free allocation of permits and potential restrictions on the use and trade of permits could hinder the financial markets capacity to facilitate price discovery and strong forward markets. Both of these market factors are fundamental to drive the long term investments required to move the economy to a lower carbon future. These issues are discussed further below.

Auctioning

The issue of permit allocation, that is free allocation or auctioning, is often one of the most widely debated and controversial design features of any ETS. Since the permit price under an ETS will be identical for all participants, incentives to abate under both allocation mechanisms should be aligned. The potential for profit will see permits move towards their highest value use irrespective of whether they were initially allocated for free or auctioned. However, in practice, both allocation methods are likely to result in vastly different distributional impacts and influence incentives, and therefore overall outcomes, in different ways.

There are numerous efficiency and equity implications associated with the free allocation of permits, many of which are discussed in the Stern Review. The most critical of these for financial markets is the possibility that free permit allocation may dampen or delay abatement incentives (as firms do not have to face upfront permit costs). As shown by the European Union scheme, this may mean that decision-making is not immediately focussed on abatement (because the free allocation is essentially a subsidy) resulting in fewer permit trades and hindering price discovery.

The benefits of auctioning have been recognised by Evans and Peck (2007) in a paper prepared for the National Emissions Trading Taskforce (NETT) on auction proposals identified in the NETT Discussion Paper (2006). Evans and Peck note that '*auctioning permits (including future vintages) before the start of the scheme is a device well suited to generating early and transparent price signals and is likely to help companies in their investment decisions regarding abatement measures*' (p3).

The efficiency of auctions as a mechanism for promoting price discovery has been evident in environmental markets as part of the United States Acid Rain Programme for sulphur dioxide (SO_2) and nitrogen oxide (NO_x). Evans and Peck (2007) note that the auctioning of SO_2 permits as part of the acid rain programme was important in setting more accurate early price signals than the signals received from early bilateral trades.

Questions for consideration

Is permit price realisation and discovery best facilitated through the use of auctioning under an ETS?

To what extent, and on what basis, might it be desirable that permits are not allocated via an auction system?

Facilitating Forward Trading Markets - Banking and Borrowing of Permits

While auctioning is likely to facilitate the promotion of an efficient spot permit price, and therefore contribute to the efficient operation of existing technologies and investments, some forum participants suggested that it is the forward markets that are likely to drive long term efficient investment decisions and drive emissions reductions. Forward markets also play an important role in allowing project developers to secure new funding for new investments.

Liquidity in Australia's ETS is expected to gravitate to the forward markets (ASX, 2007). Forward market trading is often at multiples of the underlying physical market.

The forum on 31 October discussed a range of requirements necessary to support efficient carbon trading markets, with a particular emphasis on the need for long term and credible signals that are supported by adequate regulatory rules. There was a clear message from some forum participants that financial markets should be free to operate unhindered and that Governments should not attempt to intervene in the market by setting or obstructing prices.

The issue of permit use restrictions (such as limits on banking and borrowing of permits) was not recognised as a significant impediment to the operation of strong forward markets.

Banking and borrowing of permits are usually referred to in the context of ETS regimes that date stamp permits for use in a particular year. Banking of permits allows permits to be held over from one

period to the next for use in future years. Conversely, borrowing of permits allows future date stamped permits to be brought forward for use in earlier years. Under banking, emitters may choose to bank permits if they have an excess of permits - for example, due to cyclical movements in production or simply as a result of lower cost abatement opportunities early on in the scheme. Alternatively, some institutions may wish to purchase and hold permits for future use or sale. Under borrowing, if firms expect lower cost abatement opportunities in the future (through technological advancement or through already planned changes in technology) compared to early years, then compliance costs can be minimised by borrowing permits from those future periods.

Most existing and proposed ETS regimes around the world allow banking, but few (if any) allow borrowing of permits. Borrowing of permits appears to be restricted based on the idea that borrowing may delay emissions reductions and create compliance issues for emitters later down the track if the emitter cannot access permits at a manageable cost to cover future obligations as they arise. This could put pressure on Government to intervene through this issuance of additional permits (which would undermine the environmental integrity of the scheme) or by meeting the compliance cost of emitters (which transfers costs to taxpayers).

It was suggested at the forum that regimes that involved limited restrictions on the use of permits (by allowing borrowing) would likely create a more efficient permit trading market than a regime that disallowed borrowing. However, this efficiency appears to have been traded off in the design of most ETS regimes due to a potential compromise to the environmental and political integrity of the scheme. Whether such efficiency losses impact on the economic costs of achieving the environmental objective of ETS remains untested.

Questions for consideration

What features of an ETS might impede the emergence of forward markets?

Is it possible to have strong and efficient forward markets with restrictions on the use of permits, such as limited banking and borrowing?

3.3 Positioning Australia as a regional hub in the Asia Pacific Carbon Markets

The forum on 31 October 2007 highlighted a strong view by most forum participants that Australia has a potentially large opportunity to become a leader in many aspects of the emerging carbon markets. Most of this opportunity was thought to reside in the management of carbon investment funds, services and business markets.

It was considered that Australia's delay in ratifying the Kyoto Protocol has meant that it may have missed numerous potential business opportunities. While there have been some success stories, Australian participation in the provision of offsets as part of the Kyoto Protocol had to proceed in an informal and complex way.

In addition, as a result of the increased recognition of climate change as a serious issue, and the need for market based mechanisms such as emissions trading to help mitigate climate change, there is currently a significant degree of mobilisation in the carbon investment market. Such mobilisation could mean large opportunities for Australia, both in terms of helping facilitate new technologies through project financing and also by creating business opportunities for project developers, engineers, etc.

Some forum participants suggested that Australia has some of the best capacity in the world, through a strong skills base in areas such as financial services. Natural resource and agriculture and land use issues will be important areas in the move towards a lower carbon future, all of which are in likely to be strong areas of comparative advantage for Australia.

While there is likely to be significant competition internationally for leadership in the Asia Pacific carbon markets, including from Singapore and Hong Kong, Australia has particular competitive advantages. Forum participants suggested that identifying these areas and helping facilitate a regional hub (including removing any impediments) presents a key opportunity for Government.

Questions for consideration

How can governments help facilitate Australia becoming a regional hub in the Asia - Pacific Carbon Markets?

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