

Emission possible: the greenhouse market

Is the Kyoto Protocol a threat or an opportunity?

The details of how international agreements on reducing air pollution can be translated into reality are far from clear. But the so-called Kyoto Protocol is forcing countries including Australia to look at emissions trading systems.

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The Kyoto Protocol on countries' carbon dioxide emissions has loomed for some time as a business risk in Australia's carbon-intensive economy. However, at this stage many questions remain over the cost penalties and the nature of the threat to the Australian economy.

How Australia plans to implement the protocol at a national level remains unclear. Given our membership of the "Umbrella Group of nations", it is most likely that a domestic emissions trading system will be preferred.

Much is expected to become clearer as the signatories to the protocol prepare to meet in The Hague in November at the sixth Conference of the Parties (COP6). The aim of this meeting is to hammer out the rules which will apply to reductions in emissions liabilities through the various trading mechanisms proposed in the protocol.

INTERNATIONAL TRADING MECHANISMS

The Kyoto targets are an obligation of governments and have been set as a percentage of each participating country's baseline emissions in the year 1990.

In the case of Australia, the emissions target has been set at 108% of the 1990 level. All other signatories to the protocol (the

"Annex B countries"), except Iceland, have targets less than 100%.

It is the responsibility of individual governments to work out how their national targets are translated to the local level.

Figure 1 explains the basis on which an emissions trading system, in which surplus entitlements are bought and sold, could be established.

In this simple model suppose country A recognises that for its compliance requirements it will be under its assigned target of 100 units.

FIGURE 1 Target and actual emissions

At start of compliance period

Country A	Country B
Target emissions 100 units	Target emissions 100 units

At end of compliance period

Country A	Country B
Actual emissions 95 units	Actual emissions 105 units

The Kyoto Protocol

The Third Session of the Conference of the Parties to the Framework Convention on Climate Change (COP3) was held in Kyoto, Japan, in December 1997. The agreement known as the Kyoto Protocol placed climate change mitigation firmly on the international political agenda.

The conference was a difficult one for Australia because its circumstances required it to take a different position from most other developed countries. The outcome for Australia was generally regarded as a good one in the circumstances.

The collective agreement of the Kyoto Protocol was to reduce greenhouse gas emissions by 5.2% below 1990 levels by 2008-12. Individual countries or country aggregates were allocated different targets.

Australia's agreed target of limiting itself to an 8% per cent increase represents an estimated 30% decrease in business-as-usual emissions.

Australia's population is expected to grow by 30% from 1990 to 2020, compared with

3% in Europe. The achievement of Australia's Kyoto target will be a significant challenge, requiring the full implementation of existing and planned greenhouse mitigation measures.

Calculating the effects of land use change and the implementation of carbon sinks (such as forests that absorb carbon dioxide) is characterised by levels of statistical uncertainty that may reach plus-or-minus 80%. In contrast, estimating emissions from energy usage has high levels of certainty.

Forecasts show that to meet the Kyoto target of an 8% increase, energy and other emissions must increase by only 21% or less, compared with current projections of a 40% increase in energy emissions by 2010.

The rate of land clearing has declined because of changes in policy in most Australian states. The state that could be most affected as a consequence of the Kyoto Protocol is Queensland, which is clearing land at an estimated rate of 262,000 hectares a year.

In contrast, in the final result country B will be over its target by 5 units.

Trading in the 5 Assigned Emissions Units (AEUs) between Country A (as seller) and Country B (as buyer) brings both countries into compliance.¹ This is an example of permit trading. The size of the permit market is limited by the caps on emissions and on the technological limitations of emissions reduction.

It is expected that outside the permit market will develop the fully fungible credit market. Credits have the same effect as permits but they are external to the system. That is, they increase the supply of available emissions reduction mechanisms.

A good example of a carbon-credit generating mechanism is a Kyoto-compliant forestry project. In this case, emissions of a country may remain over the assigned baseline but

the credits from carbon sequestered from the atmosphere (eg, through tree growth) will offset the emissions above the target and bring the nation back into balance.

Because of the emissions-intensive nature of Australian energy production and the extent of our land resources, the federal government is an aggressive advocate of land-use change and forestry activities (LUCF) as a means of meeting emissions targets.

Three trading mechanisms have been identified under the Kyoto Protocol:

- International Emissions Trading (IET) — this is demonstrated in principle in the model in Figure 1.
- The Clean Development Mechanism (CDM) — emissions are reduced in a non-Annex B country (not a signatory to the protocol) and the credits are claimed by an Annex B country which has invested in the emissions-reducing project. The CDM

is, so far, unique among the mechanisms, in that credits accrued under the CDM will apply from the year 2000 onwards.

- Joint Implementation (JI) — two Annex B countries undertake emissions reduction activities and agree to share those emissions reductions as a part of meeting their targets.

It is the aim of the COP6 to reach agreement on the rules for the operation of international emissions trading, the CDM JI and LUCF.

Priority at COP6 is expected to be given to the CDM, as this will assist in bringing non-Annex B countries into the CO₂-reduction process.

CREATING A DOMESTIC TARGET

The problem of how a national emissions trading target is translated into an obligation of emitters within a country is the province of individual governments.

Two broad schools of thought have emerged:

The Umbrella Group of nations (including Australia, the US, the Ukraine, Russia, Japan, New Zealand and Canada) advocates full and open trading as a mechanism to meet the protocol's targets, with no limits on the amount which may be traded or the volume of credits to be obtained.

The European approach advocates that trading should be supplemental to actions taken domestically. It is likely that, if approved, this will significantly raise the costs of compliance.

Europe is currently proposing that buyers be limited to purchasing up to 36% of the gap between expected emissions and their Kyoto target. The European position is based on the theme contained in articles 6, 12 and 17 of the protocol (dealing with JI, the CDM and IET) that trading should be supplemental to domestic actions.

PRICE SIGNALS

It is often argued that there is no price signal available in the marketplace. This is certainly the case in the sense that there is no easily available price discovery mechanism for tradeable CO₂ instruments.

However, benchmarks are being set which enable two things:

- The opportunity for firms developing emissions reduction strategies to evaluate the cost of implementing these strategies.
- Early adopters of emissions trading (there are few of these in Australia) have a benchmark against which to measure the cost of the permits they can purchase now relative to the cost of waiting for greater certainty in the rules and mechanisms which will apply.

The basis for measurement or evaluation of prices is drawn from:

Taxes — In Europe, the UK, France, Denmark and Norway are among countries at or close to implementation of carbon taxes

Forecasts — Economic modelling on future emissions prices has been undertaken extensively. The Australian Greenhouse Office (AGO) has available estimates of trading under a variety of scenarios.

Actual trades — A small amount of actual trading has been undertaken and some pricing indications are publicly available.

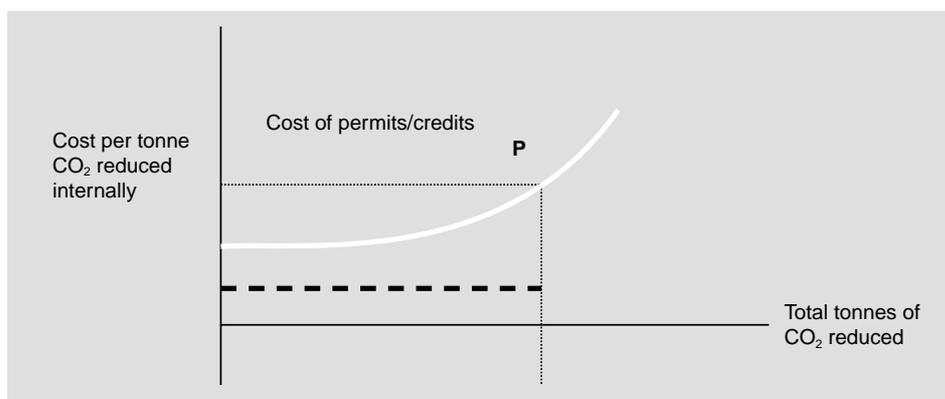
Other constraints — obligations such as Australia's national 2% target for renewable energy, although not directly an emissions trading mechanism, contain implicit values for carbon. The proposed greenhouse trigger in the Commonwealth's Environment Protection and Biodiversity Conservation Act is another example of the development of implicit CO₂ emissions values.

HOW ARE FIRMS RESPONDING SO FAR?

Risks such as carbon leakage are often cited by firms as a reason for protection from carbon liabilities. Carbon leakage occurs where businesses shift purchase decisions, or even operations, to countries which are not signatories to the protocol and therefore do not have to factor-in the costs of CO₂ compliance. It is argued this will cause large-scale shutdown and loss of opportunity to our industrial and mining base.

This is one possible scenario although by no means the only one. Other factors such as political risk, electricity supply reliability or the demands of the ultimate consumer in developed countries could all yet act to change this landscape. The CDM

FIGURE 2 Marginal cost of abatement curve



may also encourage carbon-compliant industries in developing countries.

Two broad categories of strategic response to these threats have emerged:

- *Denial*, under which companies form coalitions aimed at preventing the protocol's implementation at all costs; and
- *Proaction*, in which firms accept the protocol and act to mitigate its effects, or, in other cases, to take advantage of the opportunity it presents.

It might be argued that a spectrum exists with the denial and proactive responses lying at either end and most firms' responses falling somewhere between.

In some cases a firm may wish, perhaps for political or industry policy reasons, to maintain a denial response as its public position but take a much more aggressive stance in setting its internal policy.

Firms such as the Ford Motor Company have recently shifted along that spectrum

In October 1997 the *New York Times* reported that the Big Three US automotive companies had criticised President Clinton for considering legally binding limits on emissions. Ford at the time raised the possibility that manufacturers would move offshore.

In December 1999 Ford announced that it was leaving the Global Climate Change Coalition — the industry-funded lobbying group aimed at convincing the public that there was no climate change threat. This followed similar actions by Shell and BP. Ford said it wanted to move forward in

“progressive and constructive ways to address environmental issues”. It is interesting that Ford's religious institutional shareholders had been in dialogue over the issue with the company's chairman for the previous 12 months.

The Ford story highlights one of the features of the protocol's gradual infusion into corporate thinking. That is that implementation of the protocol happens because of both the “push” effect from the threat of the protocol being ratified and the “pull” effect from the demands of investors and stakeholders for more environmentally responsible behaviour.

Whatever the public stance of a company, there is no doubt that the protocol represents a significant *contingent* business risk for all emitters. In this respect it cannot be ignored in, at a minimum, the internal business strategy process.

THE FIRM'S STRATEGY APPROACH

As the probability of a carbon-constrained world rises, firms at least need to:

- measure the risks;
- have in place a strategy dealing with those risks which encompasses both internal opportunities for climate-change mitigation and the chance to trade with external parties where the price is lower; and
- have in place an execution plan for the strategy which diversifies timing of entry into the market and sets specific goals or triggers for entry.

As a firm develops a strategy, it will become clear that much can be done now. This includes:

- determining the baseline emissions on available data;
- accounting for future emissions;
- getting involved in current programs, for example the greenhouse challenge;
- understanding the emissions risks faced by customers;
- identifying and working with firms that face similar risks for the purpose of making the company's position known, particularly in government;
- keeping key personnel informed through conferences, the Internet, etc;
- understanding the price signals in the market; and
- potentially entering the market, ahead of ratification of the protocol, at a lower cost.

Taking these steps should enable a firm to develop its marginal cost of abatement curve.

MARGINAL COST OF ABATEMENT

For most firms it is likely that the marginal cost of reducing CO₂ through the actions of the firm alone rises with each additional tonne reduced (see Figure 2).

One of the key advantages of trading is that it enables firms with low abatement costs to share the CO₂ savings, beyond their own requirements, with firms with higher abatement costs.

At point P on the graph the firm is better served from a cashflow perspective by purchasing credits in the marketplace rather than undertaking further internal emissions abatement activities.

The cost of permits may well be the cost of purchasing emissions offsets in a market in which trading is well established. The dotted line recognises the cost at which permits may be purchased in the current market. The differential between the cost of permits currently and the expected future value creates, for some firms, a justification for mitigating future risks by purchasing current credits.

In most, but not all, cases, the risk that credits purchased may not comply with any national or international trading regime rests with the buyer.

Even if a firm does not choose this route, it is fundamental that in any eventual trading

regime companies diversify their timing of entry to the market and their sources of emissions reductions. This is a strategy which can be established now, if not necessarily executed immediately.

It is important to remember that most new projects currently being considered will extend into the 2008-12 commitment period.

PERMIT ALLOCATION

How a government elects to translate CO₂ targets from an international obligation to a domestic target is the key issue in determining how the costs of emission reductions are allocated across the economy.

It appears that in Australia the cap and trade model is the preferred allocation mechanism, particularly for large emitters.

The question is whether certain sectors of the community should receive a free allocation of rights to emit and on what basis. The government has yet to announce its preferred allocation system. The merits of the various allocation systems are discussed in detail in the second of the AGO papers on emissions trading.²

The two issues encountered most often in relation to permit allocation are: *Grandfathering* — where permits are allocated free to emitters on the basis of particular circumstances. For example, an allocation may be made on the basis of historical emissions to firms with high adjustment costs. *Auctioning* — where permits are auctioned to the highest bidder; 100% auctioning is favoured by economic rationalists as the optimal allocation system.

Permit-based emissions trading systems such as the SO_x and NO_x systems in the US have employed combinations of grandfathering and auctioning in the initial allocation of permits.

WHEN WILL TRADING START?

Companies need to weigh the cost of acting now against the risks of putting all eggs in one basket and waiting until the protocol is ratified or a domestic emissions trading system is introduced.

On the basis of the information now available, it seems unlikely that Australia will go it alone on emissions trading. It is

more probable that Australia will wait until most competitor nations also force carbon constraints on their domestic economies. It would appear that this largely relies on the US putting in place some kind of emissions trading regime.

It would be useful for firms to know what form of rules the government proposes even if it is not yet ready to implement a trading system.

RATIFICATION

Some EU and G77 countries are aiming to ratify the protocol in 2002, the tenth anniversary of the Rio earth summit. One scenario says that with sufficient European and non-US participation we may in fact see the Kyoto Protocol become binding on all countries under the 55/55 rule. That is, once 55 countries representing 55% of global emissions have ratified the protocol, then it comes into force.

Interestingly the US has a history of not ratifying protocols but observing them anyway, so the current reluctance on behalf of the US to ratify need not necessarily prevent the world behaving as if it had.

This view is borne out to some extent by the fact that the significant CO₂ trading between firms that has been reported has involved US firms as buyer, seller or both.

CONCLUSION

The probability continues to shift in favour of a carbon-constrained world. Predictions of economic Armageddon are a natural response to the issue and for some businesses, particularly those hoping to benefit under the grandfathering of permits, a rational one.

One thing which cannot be ignored is the price risk firms or their customers face. Mechanisms to evaluate and address these risks are available now.

NOTES

1 This model may over-simplify the situation in that it assumes the full compliance requirements are required to be met at the end of the compliance period. It is not yet clear whether this will be the case.

2 "Issuing the Permits", AGO Discussion Paper 2, 30 June 1999