

Kyoto — Threat or Opportunity?

Tony Beck & Malcolm Gray, AETF

The publication last month of Australia's latest national greenhouse gas (GHG) inventory (NGGI) marks only the second occasion on which a comprehensive projection of Australia's likely performance against its Kyoto target has been possible. It was only with the first results from the National Carbon Accounting System (NCAS), published last year with the NGGI for 2000, that a well-based estimate of the reduction in emissions required to achieve the Kyoto target became available. The latest NGGI, for 2001, shows little change in that estimate, down from about 14 to about 13MtCO₂e. Although these numbers have been the chief focus of public interest, this latest publication provides further evidence to support two propositions of potentially far greater interest. These are

- *on plausible assumptions, Australia could significantly over-achieve its Kyoto target*
- *the task of restraining emissions after 2012 is likely to be considerably more difficult.*

These propositions have a substantial impact on the outcomes that might be expected from alternative policy positions. This article looks first at the basis for these propositions then at their implications for the current and possible alternative policy stances.

Projections against the Kyoto target

According to the latest NGGI, Australia's 1990 emissions were 540MtCO₂e, giving a Kyoto target of 583MtCO₂e per year on average between 2008 and 2012. Projected average annual emissions

Continued page 2

In this Issue

The articles in this issue highlight the need for efficient price signals if appropriate investments are to be made in emission abatement and energy generation.

Kyoto—Threat or opportunity?

Australia has the potential to be a significant net exporter of emission credits during the first Kyoto commitment period, 2008—2012. This is one of the conclusions from an analysis of Australia's latest greenhouse gas inventory and its implications under alternative policy settings. *page 1*

The need for a carbon signal

Origin Energy argues that a clear policy signal that carbon will carry a value is vital for efficient investment decisions in Australia's electricity generating capacity. Origin supports a national regime of tradable greenhouse emission permits to provide an appropriate signal. *page 4*

Canada's domestic trading program

Canada's greenhouse gas emissions trading program is beginning to take shape. This article describes the 'backstop and covenant' approach that is being taken to allow specified emitters to use emissions trading to comply with negotiated greenhouse reduction targets. *page 6*

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From page 1

over that period now stand at 596MtCO₂e, leaving Australia 13MtCO₂e short of its average annual Kyoto target.¹ In proportionate terms, Australia's emissions are projected to climb to 110% of 1990 levels on average by 2008-12, against a Kyoto target of 108%.

A closer examination of the figures reveals that the overall outcome is composed of two sharply different components: that relating to land use and the rest. See chart. Emissions related to land use (forest sinks and Land Use Change) are projected to fall to 36% of their 1990 level on average by 2008-12. This yields a reduction in emissions some 87MtCO₂e greater than would be required to restrain land use related emissions to 108% of their 1990 level. Emissions unrelated to land use (energy, agriculture, waste and process) are, however, projected to increase to 132% of their 1990 level by 2008-12, leaving this component of emissions some 99MtCO₂e above 108% of its 1990 level. In other words, Australia's projected closeness to achieving its Kyoto target is almost entirely due to the abatement in emissions related to land use.²

Two important aspects of this projection need to be considered. First, abatement in emissions related to land use could well be even greater than projected. Secondly, it is inconceivable that emissions related to land use could make a similar contribution to greenhouse gas abatement in Australia beyond 2012.

Greater abatement possible

Reductions in emissions from Land Use Change, which relate to reduced land clearing, account for more than three quarters of the reductions in emissions related to land use. Estimating and projecting such emissions is notoriously difficult.

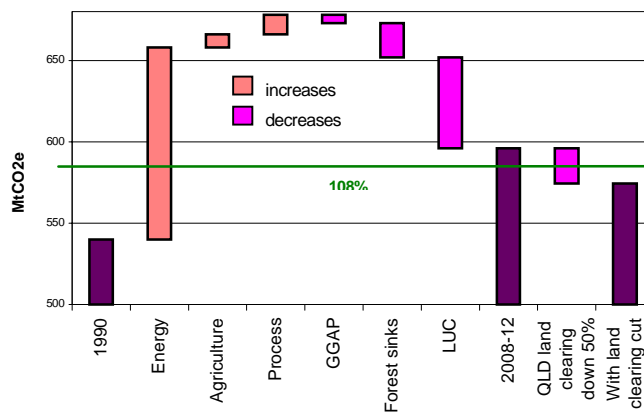
¹ These are the so-called "with measures" projections, which include the impact of policy measures in place at the time the projections were made.

² Some sub-components of emissions unrelated to land use also achieve or go close to achieving their sub-component Kyoto targets, eg waste and agriculture.

Australia's NCAS represents world's best practice in this area. Nevertheless caution is advised in dealing with the estimates of emissions, especially for recent years. In the most recent NGGI, a very conservative approach has been adopted.³

The 2003 NGGI was completed too early to factor in any estimates of the likely impact of the land clearing agreement between federal and Queensland governments on emissions from Land Use Change in Queensland. Over the last decade or so, Queensland has accounted for about two thirds of national emissions from this source. While a breakdown of the projected level is not provided, it would be reasonable to assume that

Queensland would account for about two thirds of this or about 43MtCO₂e. A reduction of 30% in these emissions would be enough to give projections that would meet the Kyoto target. Reductions in excess of that would see Australia's projected emissions fall below its Kyoto target. (See chart.) The AGO has estimated that the proposal could deliver a reduction of



Decomposition of Australia's Projected Emissions in 2008-12

25MtCO₂e in the first commitment period.

Life beyond Kyoto will be harder

Longer-term projections show Australian emissions increasing much more strongly after 2012 to reach 126% of 1990 levels by 2020. Emissions unrelated to land use are projected to continue to grow at rates similar to those projected for the earlier period. Emissions related to land use are, however, projected to be stable from 2004 onwards and are therefore still projected to be at 36% of 1990 levels in 2020. In other words, the growth in emissions unrelated to land use finally swamps the reduction in emissions related to land use that has occurred mainly in the 1990s.

In the case of Land Use Change, the projected level of emissions represents a historic low from which further reductions seem unlikely. Even if

³ The methodology adopted in the 2002 NGGI was to project "based on the simple extrapolation of recent average Land Use Change emissions". The approach in 2003 seems to be substantially similar except that the data for the last two years, which show lower emissions, seem to have been largely ignored.

emissions from this source were entirely eliminated by 2020, total emissions would still be projected to be 113% of 1990 levels. There may be some scope to increase the rate of sequestration in forest sinks, but these increases would have to be on an implausibly massive scale to have a significant impact on total projected emissions.

While emission targets beyond 2012 lie in uncharted territory, it is difficult to imagine that Australia will not be expected to make substantial reductions on these projected levels.

Policy possibilities

The two propositions just discussed raise some fundamental questions about Australian GHG abatement policy. It is useful to characterise alternative policies in terms of the price for GHG emission permits in Australia that they imply. There are three possible situations

- A) a permit price of zero with Australia meeting its the Kyoto target with a mix of regulation (eg MRET) and partial market instruments (eg GGAP)
- B) a positive permit price determined nationally
- C) a permit price determined by the international trade in permits mandated by the Kyoto protocol.

Current policy settings put Australia in situation A. Introduction of a domestic trading scheme with limitations on international trade in permits, eg by not ratifying the Protocol, would put Australia in situation B. Ratifying the Protocol and allowing domestic traders untrammelled access to the international market would put Australia in situation C. Given Australia's projected closeness to its target, it is likely that the permit price in situation B would lie below that in situation C.

Situation A

Situation A has some apparent attractions. Little or no additional abatement pressure need be applied to emitters thereby imposing no additional costs on them nor on Australian consumers. Australian companies could continue to emit with only minimal voluntary constraints being applied. Competitiveness would be maintained or even enhanced because Australian companies would have a cost advantage relative to companies in the Kyoto Annex 1 block that would be subject to emission constraints. Similarly they would not be disadvantaged relative to developing country competitors. Some government support could be given to R&D in the expectation that this will deliver further abatement beyond 2012.

This situation, however, also has its negative aspects. Australian exporters could be seen as

gaining an unfair trade advantage that could provoke trade sanctions or discrimination. At the same time the potential benefits from access to the international market in permits would be foregone.

In addition and perhaps more importantly, Australian emitters would be given very little incentive to reduce emissions or undertake the investment required to secure future emission reductions. This could see Australia left in a highly vulnerable position at the end of the first Kyoto commitment period when the continuing growth in emissions unrelated to land use has outstripped the one-off benefit of the reduction in emissions related to land use. Without incentives to invest, Australia is likely to be poorly placed to exploit any new emission reducing or sequestering technologies that may have become available. In effect, Australia could be seen as giving up 10 years worth of adjustment opportunities.

Situation B

Situation B would go some way to remedying these negatives by providing some price signals and, perhaps, encouraging more efficient abatement activity. It would not, however, allow Australia to realise the gains from trade in emission permits. If the nationally determined price turned out to be higher than the world price, Australia would be denying itself access to cheaper abatement options. In the more likely event, as it now appears, that the nationally determined price were below the international price, Australia would be denying itself the opportunity to export permits.

The revenue from permit exports could be substantial. Any reductions that take Australian emissions below its Kyoto target represent export potential. If, for example, Australia's emissions in the first commitment period represented 104% of its 1990 emissions, this would generate over 100MtCO_{2e} of unneeded emission permits over the 5 year Kyoto commitment period. With a price of, say, \$5-\$10 per tonne in the international market these permits would represent \$0.5 to 1 billion in potential export earnings. More restricted access to international markets, of the kind that might be possible without ratifying the Protocol, could offer some export opportunities but volumes and prices are likely to be low.

Situation C

Full access to the benefits of international trade would be available in situation C. This could be expected to bring net benefits to the community as a whole but, as is usual with trade liberalisation, there could be winners and losers amongst individual groups and sectors. This raises the question whether the losers should be compensated in some way. Here, the partial coverage and transitory nature of the Protocol raises some

particular issues including in relation to the protection of trade-exposed emission-intensive sectors.

Under situation C, Australia would also have the option of banking any surplus permits. Article 3.13 of the Protocol states:

If the emissions of a Party included in Annex I in a commitment period are less than its assigned amount under this Article, this difference shall, on request of that Party, be added to the assigned amount for that Party for subsequent commitment periods.

The conditions that Australia was able to negotiate for the first Kyoto commitment period are unlikely to be matched in any subsequent international negotiation of commitments. A further increase in Australia's emissions beyond 108% of 1990 levels is unlikely to be acceptable beyond 2012. Australia could attempt to stand aside from coordinated global action in the post-Kyoto period but this is likely to be increasingly unacceptable to the global, and possibly the domestic, communities. The Protocol's provisions for banking surplus credits from the first commitment period for use in the second, in effect, allow Australia to capitalise on the relatively favourable conditions that it negotiated for the first commitment period to ease the burden of likely

tougher constraints beyond 2012.

The nature of global efforts to manage emissions in the post-Kyoto era will soon become the focus of international negotiations under the UNFCCC. In parallel with this process, a forward market for emission permits for use in subsequent commitment periods will develop. Price conditions in this market should ultimately provide Australia with the basis for determining the relative value of exporting versus banking of any surplus permits.

Conclusions

The information provided in the latest NGGI raises fundamental questions about how Australia should manage its greenhouse policies over the next 10 years. A key point is that it is the one-off benefit of reduced land use related emissions that will allow Australia to meet its target while energy and process emissions continue to grow. Soft-peddling on further emission abatement policies now appears to deliver some immediate benefits, but at the expense of any gains to Australia from exporting or banking any surplus permits and leaving it likely confronting a much tougher adjustment task down the track.

The views expressed in this article are those of the authors and not those of the AETF, which does not take positions on issues.

The Need for a Carbon Signal

Tony Wood, Origin Energy

Origin Energy's overarching policy position throughout the ongoing debate on climate change is for the development of a national strategy that delivers climate change policy outcomes, including the 108% target for the first commitment period of the Kyoto Protocol, at least cost to the Australian economy.

Carbon will carry a value

Investment in energy supply infrastructure, necessary to meet future demand whilst accommodating the limited capacity of the environment to absorb greenhouse gases (GHG) without unacceptable environmental impact, will require a clear policy signal that carbon will carry a value, enabling industry to factor its assumptions of that value in its investment decisions. A least cost economic outcome will be achieved through cross-sectoral abatement implemented using some

form of tradable rights mechanism.

Ideally, such an approach incorporates non-energy sector abatement opportunities including transport, agriculture and industrial processes, and demand side management initiatives such as mandatory building standards. This will be a complex task. Whilst further details do need to be resolved, Origin supports a national regime of tradable greenhouse emission permits as meeting the primary objective. The nature of the developing energy market in Australia, with physical and financial inter-connection and recently announced moves to national regulatory structures, strongly suggests a national policy approach.

Origin is opposed to the further fragmentation of greenhouse policy within Australia that would result for example, from additional State-based schemes. We understand that the Federal Cabinet



is working through its Energy and Sustainable Environment Committees to develop a coordinated National Energy Policy and a Forward Strategy on Climate Change. Origin supports these initiatives and encourages the CoAG to ensure that the national approach embraces the best strategies – whether they originate from either State or Federal ideas. Origin also believes that policy options in relation to climate change cannot be fully explored without consideration of issues affecting energy supply and demand in the long term.

Future electricity demand

Growth in energy demand and specifically demand for electricity, has been significant and is forecast to accelerate over the coming decades. Various such forecasts (for example by ESAA and NEMMCO) have predicted a shortfall in supply before the end of the current decade and expressed concern that the requisite base load capacity is not already on the drawing boards, given the long lead times for such infrastructure.

However, an analysis of the nature of the increasing demand indicates that much of the growth is being driven by demand for peak capacity. A shortfall in peak supply is best served by gas-fired generation with shorter construction lead times and lower capital costs. Despite the higher fuel cost than for coal-based plant, gas turbines are competitive in meeting peak demand.

Gas fired generation is inherently less carbon intensive than are coal plants (Figure 1).

Accordingly, when a carbon value is imposed on the cost analysis, the merit order changes significantly (Figure 2). When these two factors are considered together, it is clear that a least cost approach to GHG mitigation will feature a shift in the generation portfolio towards lower emission fuels and technologies such as combined cycle gas turbines.

The supply of natural gas

In a number of ABARE and industry forecasts of recent years concern arose that existing supplies of natural gas from the then producing basins had insufficient reserves to meet future needs. However, as contended by Origin, it has become clear that the perceptions of gas shortage in eastern Australia had more to do with industry structure prior to deregulation.

As the industry has been deregulated, the opening of markets has stimulated gas exploration, pipeline infrastructure and re-contracting, in association with increased interconnection of gas and electricity markets.

The result has been a dramatic change in the gas market, achieved in a rational and commercially competitive manner:

- Since 1995, over 6000km of transmission pipelines have been built or are under construction in eastern

Australia;

- Upstream gas developments include Minerva, Patricia/Baleen, onshore Otway, BassGas, Thylacine/Geographe, and Coal Seam Gas fields in the north Bowen Basin, the South Bowen Basin and the Sydney Basin; and
- Since August 2001, around 4000PJ of gas supply has been contracted from local sources to local markets.

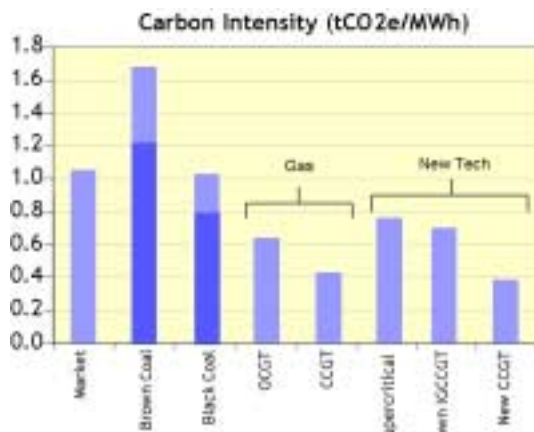


Figure 1: Emission intensity varies with fuel and technology

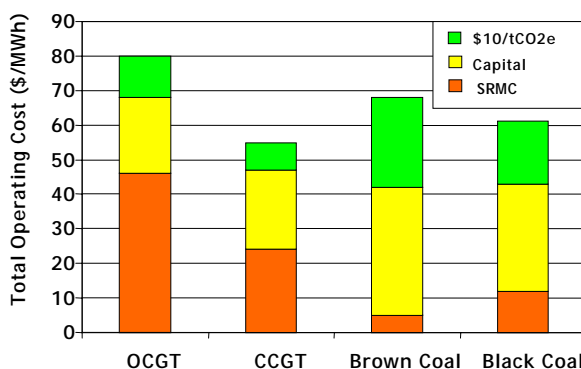


Figure 2: Influence of carbon value on relative cost

These developments support Origin's contention that the competitive supply of natural gas is not likely to be a real constraint on the options to reduce greenhouse gases that may be under consideration.

Gas-fired generation technologies such as combined cycle gas turbines (CCGT) also offer lower greenhouse gas emissions and are proven technologies available at competitive costs. CCGT

plants operate around 400kg/MWh of GHG emissions compared with about 1200kg/MWh for the most efficient of the Latrobe Valley plants, Loy Yang. It is important to consider that:

- Gas-fired technologies offer low technological risk that in turn means certainty for investors and reliability of supply for consumers;
- Origin's modelling of future demand profiles indicates that peaking and intermediate plant will be required in the medium term, not additional base-load capacity;
- Gas-fired generation is flexible and ideally suited to meeting peaking and intermediate supply patterns;
- Gas-fired generation offers a significant advantage over brown coal-fired generation in GHG emissions; and
- Gas markets in SE Australia are competitive and sufficient reserves are under development to meet the growing needs of the Victorian and South Australian markets.

An investment signal required now

As a significant investor in energy infrastructure, Origin would strongly advocate that a carbon signal is vital for investment decisions. We favour a national approach and have highlighted that we are not asking for full certainty but rather a clear understanding of the policy framework that will be adopted for post-2012, on the basis that Australia is likely to be on track with current policies and measures to meet the 108% target for 2008-12.

Investments within the energy sector have long asset lives and therefore it is important to give as much lead-time as possible prior to the introduction

of a cross-sectoral measure such as emissions trading but the signal is required now. If the Federal Government were to decide on a post-2012 framework and announce it this year, then incumbents and new investors would have 9 years for adjustment — we believe that this is sufficient lead-time to take account of a cost of carbon and to implement carbon price risk mitigation strategies.

Without such a signal, it is likely that further high GHG intensity plant could be built and this would have a detrimental long-term impact on Australia's efforts to curb emissions. As soon as a framework is established for national emissions trading, innovation and strategic development would ensure that the market delivers competitive energy even in a carbon-constrained world.

Origin supports the introduction of emissions trading for the post-2012 period and believes that, in the intervening years, there is much work to be done to build capacity within Australia, for example in the areas of greenhouse measurement, reporting, verification and validation. We would support the introduction of programs whereby major point sources of emissions are initially required to report, followed over time by smaller emitters. It is critical that this capacity building be undertaken such that there will be confidence in the trading market.

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Canada's Emissions Trading Program

Elisabeth DeMarco, Macleod Dixon and Erik Haites, Margaree Consultants

Canada's greenhouse gas (GHG) emissions trading program is starting to take shape. The Climate Change Plan for Canada promised a "backstop and covenant" system that will allow specified emitters to use emissions trading to comply with negotiated GHG emission reduction targets. Three "unofficial" discussion papers on the *Allocation of Greenhouse Gas Emission Targets to Large Industrial Emitters* (the "Allocation Paper"); the *Offset System* (the "Offset Paper"), and the *Structure and Issues of the Climate Change Covenants* (the "Draft Covenant") provide an indication of features of the emissions trading program.

The Climate Change Plan for Canada sets a target

of reducing the projected "business as usual" GHG emissions of large industrial emitters by 55 Mt CO₂e per year during the first commitment period. The Canadian domestic GHG emissions trading system (DET) will apply to firms in the Large Industrial Emitters Group (LIEG) including the thermal electricity, oil and gas, and mining and manufacturing sectors. Emitters in these sectors that have average annual GHG emissions per facility of 8 kt CO₂e or more and average annual emissions of 20kg CO₂e or more per C\$1000 of output will be included in the DET. The estimated 500 to 700 firms in this group are forecast to account for about half of Canada's total greenhouse gas emissions in 2010.



LIEG companies included in the DET will be subject to a "backstop and covenant" system. The "backstop" will take the form of legislation and regulations that will define default emission intensity targets, emission measurement methodologies, emission reporting requirements, provisions for emissions trading (including the use of domestic offset credits and Kyoto Protocol units), penalties for non-compliance, and conditions for the negotiation of a voluntary covenant between a firm and the government regarding its GHG reduction commitments. A covenant could modify backstop regulatory requirements to respond to competitiveness concerns or to address early action.

To date there have been few indications of the scale of the reductions to be required of the LIEG other than a government promise to the Canadian Association of Petroleum Producers (CAPP) that the reduction target for the upstream petroleum industry will not exceed 15% from the projected 2010 emissions intensity. Equity considerations suggest this could become a ceiling for all LIEG sectors. The government has also indicated that if a firm achieves its intensity target but has greater than anticipated production, the federal government will be responsible for the emissions associated with the additional output. The government also promised CAPP a price cap of C\$15/t CO₂e (estimated to be about US\$10/t CO₂e) for domestic permits in 2010, however no details as to how this cap will be implemented have yet been provided.

The Draft Covenant

The Draft Covenant is based on the UK Climate Change Agreements, the Quebec/Aluminum Association Agreement and the Canadian Chemical Producers Association Agreement with Canada, Ontario and Alberta. The covenants are intended to be voluntary but legally binding and provide the flexibility required to respond to sectoral and/or company-level circumstances. They will be negotiated by industry associations (as a framework agreement) but entered into by specific companies (through a specific facility or entity agreement). Elements will include emission intensity based targets, stipulated emission measurement methodologies and best industry practices, and mandated annual reporting, verification and auditing requirements. If necessary they may also modify regulatory requirements to respond to competitive concerns and early action.

A covenant would cover all six GHGs emitted from stipulated stationary sources. Each year, the

company would: (i) receive free emission permits equal to its emission intensity target multiplied by its actual production; and (ii) be required to surrender eligible emission commodities equal to its actual emissions. Eligible emission commodities include permits issued to LIEG participants, domestic offset credits, and Kyoto Protocol units. Companies that do not comply with their covenant obligations will be provided with notice and opportunity to correct the default. If the default is not remedied, the company will be subject to penalties and provisions for termination, which will be specified by the backstop legislation.

The Allocation Paper

The Allocation Paper sets out initial policy direction regarding the allocation of emission reduction targets to the LIEG. Although industry reaction has been critical of the lack of specific target information included, the Allocation Paper does provide direction on issues of Equity, Competitiveness and Early Actions.

Targets. Three options for allocating the 55Mt reduction commitment among and within the sectors of the LIEG are set out. First, the government could assign a numerical emission reduction target

to each covered sector on the basis of physical or financial data. Second, the government could implement a process based allocation approach similar to the Netherlands Covenant benchmarking approach or the UK "all cost effective measures" approach. Third, the government could apply a hybrid of the two approaches with numerical targets for broad sectors and a process approach to address the specific circumstances of the many sub-sectors. Sources involved in consultations believe the hybrid approach is favoured by the government.

Competitiveness. The Allocation Paper also sets out five principles that will be used to guide the government in assessing competitiveness concerns. First, competitiveness is a sector-wide and not firm-specific concern. Second, competitiveness is an inherently financial consideration that is not evidenced solely by the need to purchase credits under the DET. Third, the age of a facility will factor into the competitiveness assessment such that it will be more difficult for older facilities to argue competitiveness concerns. Fourth, the burden of proving competitive distress lies with the industry sector and may be discharged through evidence of state of the art technology; investment and capital stock timelines, and the long term persistence of competitiveness concerns. Fifth, the financial feasibility of emission reduction targets will be assessed largely on the basis of rate of



return on equity and a sector's profit margin.

Early Actions. Finally, the Allocation Paper considers early action measures in the context of attempting to eliminate or decrease any disadvantage – not to provide an advantage – to firms that have taken significant early actions to reduce GHG emissions. The Paper contemplates implementing a limited credit to entities that surpass an early action threshold, with the amount of the credit being linked to the surplus relative to threshold and an undisclosed maximum to ensure that the 55Mt reduction is reached. The threshold criteria include evidence that the early action was real and financially additional, the entity's emission intensity is among the best in the world, the entity's current emission intensity relative to 1990 has improved more than a yet to be defined amount, and there is a marked change in its emission intensity trend.

The Offsets Paper

The Offsets Paper was released to facilitate national consultations on the proposed federal offset system that would allow emission offsets to be created in certain sectors not covered by the LIEG, and to be used for compliance by the LIEG. The paper sets out policy options and issues related to the design, administration, and specific application of the offsets system to the forestry, agriculture and landfill gas (LFG) sectors.

The specific design proposals would allow a domestic offset credit to be created from emission reductions that: (i) are reflected in Canada's national inventory; (ii) result from projects commenced after a date to be defined; (iii) occur during the first Kyoto commitment period; (iv) are real, measurable, verifiable, surplus to regulatory requirements and other government climate change measures, and unique; and (v) are the subject of

secure and transparent ownership rights.

Ultimately, the offsets design document is intended to include a number of "quantification protocols" to facilitate the creation of offset credits in at least the forestry, agriculture, and LFG sectors. Other projects may also be eligible to create offset credits if they conform with baseline, boundary, leakage, and permanence rules that are in the early stages of consideration by the federal government and informed stakeholders.

The government intends to codify the offset credit creation process in a regulatory framework, a guidance document and a series of quantification protocols. Currently, the review process involves: (i) ex ante validation of emission reduction/removal projects through submission, review and registration of a Project Document; (ii) ex post verification of the GHG reductions and removals; and ultimately, (iii) final approvals of the reductions/removals and the issuance of offset credits. The government intends to implement some form of climate change contribution from offset projects to assist Canada in reducing its national GHG inventory. Such a contribution may be implemented through baseline adjustments or mandatory retirement of a percentage of the resulting credits.

While the foregoing developments demonstrate considerable progress in the design of the Canadian domestic emissions trading system, much remains to be done prior to implementation in 2006 as is currently planned.

Margaree Consultants are energy and environment consultants based in Toronto. Company president, Dr Erik Haïtes, has consulted to a number of governments and the UNFCCC Secretariat on emissions trading issues.

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