Issues Paper 1

Climate Change: Land use – Agriculture and Forestry

Red Meat Industry Submission

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Submitted by
Cattle Council of Australia and Sheepmeat Council of Australia
PO Box E10
KINGSTON ACT 2604

Phone 02 6273 3688
Fax 02 6273 2397
rgalvin@cattlecouncil.com.au

1 Response to the Garnaut Review

1.1 Summary

The Australian red meat industry exports approximately $6.2 billion worth of red meat products annually to over 100 international markets. Australia's main competitors are Brazil, India, Argentina, USA and New Zealand, which raises trade exposure concerns as New Zealand is the only competitor likely to price carbon in the near term. Policy to reduce the impacts of the ETS on the cost structure of the industry must be developed to protect valuable market share in export markets.

Measuring greenhouse gas (GHG) emissions from agriculture, and particularly from livestock, is a difficult and inaccurate science. While the red meat industry acknowledges that its inclusion in an ETS will require some estimation of its emissions, the industry strongly urges the development of policy which allows agriculture to report net emissions, acknowledging the role that the management of plants, animals and soils in grazing systems play in sequestering carbon.

The lack of codes and standards to generate offsets from soils, native vegetation and agro-forestry requires significant attention before agriculture can realise its potential as an integrated player in the Australian mitigation effort.

The red meat industry is comprised of over 120,000 individual businesses and most of these businesses do not have an emissions profile that would trigger reporting and/or legal obligations under the ETS currently proposed. If a cap and trade system is to be used to regulate emissions from the red meat industry, then the industry would prefer net emission caps to be set at 1990 levels to recognise the significant net reductions that have been achieved over the last 17 years.

The red meat industry tentatively embraces a market based approach to achieving real long term greenhouse gas emissions but issues such as trade exposure, liability, reporting, verification and the credibility of offset mechanisms all require urgent attention before agriculture can successfully become part of the ETS.

1.2 Introduction

The total value of Australia's red meat industry (beef, sheep meat and goat meat) is $15.9 billion, of which approximately $6.2 billion is earned from meat exports (1.3 million tonnes to over 100 countries in 2006-07) and $0.8 billion from livestock export. The Australian Bureau of Statistics reported 74,000 cattle and 46,000 lamb and sheep producers in 2004-05 earning a significant part of their income from livestock production – this is the most common form of agricultural pursuit in Australia.

According to the Australian Greenhouse Office (AGO), livestock production is emissions-intense and accounts for about 58% of greenhouse gas emissions from agriculture in 2005. The red meat industry maintains that its emissions are overstated, possibly by 50%, because these inventory calculations report gross emissions only and ignore the vast amount of atmospheric carbon absorbed by grazed pastures and grasslands as part of their growth cycle, and which is the source of the carbon released as methane from rumen fermentation. However, despite this misrepresentation, AGO reports that total gross emissions from sheep and beef cattle have declined by 11% since the Kyoto base year of 1990, despite an increase in total meat production. This is in stark contrast to emissions in other sectors of the economy such as Stationary Energy +36%, Transport +30%, Industrial +16% (AGO, 2005).

An analysis of AGO estimates of GHG emissions against industry production statistics reveals that, between 1990 and 2005, the beef and sheepmeat industries have reduced GHG output per tonne of production by about 10% and 30% respectively, through increases in production efficiency.

AGO reports that livestock industry changes combined with land use changes, reduced Australia's net GHG emissions by approx 80Mt CO_2 –equivalents per annum by 2005, largely due to natural tree re-growth (following legislative changes that restricted tree clearing), reduced sheep numbers and increased efficiency in livestock production. The vast majority of this land use change has occurred on grazing lands, and this more than offsets the estimated total methane output from the red meat industry per annum (51Mt CO_2 –equivalents per annum in 2005).

In anticipation of likely introduction of a domestic ETS, the red meat industry requests that:

1. this considerable cost borne by the industry, which will allow Australia to come close to meeting its obligations under the Kyoto protocol, be recognised in deciding the baseline year for the commencement of any new domestic ETS for Australia;
2. regional and yearly variations in carbon absorption and emissions due to seasonal conditions also be taken into account in deciding the baseline year by averaging over a number of years; and
3. recognition be given to significant "less-permanent" offsets or abatement opportunities that can be produced as part of sustainable livestock production systems.

1.3 Adaptation challenges

The Garnaut issues paper 1 has identified a number of issues that may affect the adoption of adaptation opportunities. A response to each of these issues follows.

1.3.1 The need for funding and support for research and development into alternative technologies, improved climate data and monitoring

Funding to support alternative technologies to assist farmers to adapt to climate change is occurring via the Federal Government (Australian Greenhouse Office (AGO), the National Agricultural Climate Change Action Plan (NACCAP), Rural Development Corporation's (RDC's), State Departments (e.g. QCCCE), the CSIRO climate adaptation flagship, NRM regional groups and universities (e.g. SCU, FACE). Funding to support climate data and monitoring is being provided by rural RDCs and DAFF to the Bureau of Meteorology (BoM) and CSIRO.

Future funding to assist producers to adapt to climate change will depend on the effectiveness of the current suite of funding and new drivers to mitigate greenhouse gas emissions. The highest R&D priority identified for the red meat industry is the development of commercially-viable technologies which significantly reduce methane emissions from extensively-managed sheep and cattle. This release of methane as a natural by-product of anaerobic rumen fermentation has proven to be an intractable problem faced by livestock industries around the world.

The red meat industry, in cooperation with the Federal Government, currently funds a range of R&D programs in this area. Industry recognises the need to bolster the existing suite of programs to ensure it meets the needs of the community, Government as well as beef cattle producers. Industry and Government co-fund The Cooperative Research Centre for Beef Genetic Technologies (Beef CRC) where significant research is currently underway that aims to decrease methane emissions from beef cattle.

Coordination of funding, rather than the quantum of funding, is the issue that may limit adaptation opportunities. Examples of coordination across industries, organisations and funding streams include;

- the Managing Climatic Variability Program (MCVP),
- the Climate Change Research Strategy for Primary Industries (CCRSPI),
- the Centre for Australian Weather and Climate Research,
- the Future farming Industries CRC, and
- the Pastoral Greenhouse gas Research Consortium in NZ

Further coordination is required to maximise investment efficiency and to ensure that information seekers receive robust and consistent messages. This is not occurring at present. An example of the coordination required could be marrying climate change models with MCVP data to assist industries with planning for climate change impacts at a local level.

1.3.2 The need for cost-benefit analyses of adaptation options

This issue is not unique to climate change adaptation as all new technology requires some cost-benefit analysis before adoption. Calculating the costs and benefits of any adaptation will be regionally- and business-specific and therefore an extensive exercise, of limited use due to the complexity and diversity of grazing and integrated farming systems and a lack of robust mechanistic models. The price of carbon and emissions policy will also influence cost-benefit calculations, adding to the level of complexity and uncertainty. Given (1) the level of uncertainty that would be attached to any cost- benefit analysis and (2) the diversity of farming systems and environments in which livestock are produced, these analyses are likely to have limited value in increasing adaptive changes in management, unless they simply and explicitly address the issue in terms of increased business risk.

Utilising finite resources to undertake cost-benefit analysis slows the progress towards solutions which provide obvious advantages. The priority at this point is to generate solutions and reduce the costs associated with ill-directed or duplicated R&D. The red meat industry would prefer to see resources targeted towards pre-experimental modelling of adaptation options and/or research which creates real relative advantages from climate change adaptation.

Red meat producers will innovate when they are confident that a new technology will integrate into their system and generate cost savings, labour savings and/or increased production. Economic cost-benefit analysis alone will not identify the bio-physical benefits of climate change adaptation, but may be more beneficial as the marginal return on adaptation begins to diminish.

1.3.3 The need for institutional, financial and policy environments that support adaptation and manage the transition to new systems;

The Australian agricultural sector has experienced a number of industry-specific policy reforms over the past 10-15 years. Some examples include reforms in the dairy industry, citrus industry and the pork industry. It is critical that lessons learned during previous Australian structural adjustment processes are incorporated into any transition to a new ETS. Some support mechanisms otherwise known as 'safety-net' measures to minimise financial impacts of transition to an ETS could include:

- Financial grants for exit assistance
- Training programs
- Business advice
- Input subsidies and taxation concessions
- Development grants
- Short-term financial assistance decoupled from production, targeted towards producers most in need

History shows that producers can respond to change in the face of new policy environments, particularly where safety-net measures outlined above are available to facilitate change. The structural adjustment reforms experiences in Australian and New Zealand agricultural sectors show that impacts on farm profitability were generally short-term and transitional in nature (Harris and Rae, 2004).

1.3.4 Availability of information relating to climate change impacts and the benefits of adaptation

Red meat producers will experience climate change as a changing regime of seasonal variability and will adapt accordingly. Many smaller producers have struggled to adapt their management systems to "drought-proof" their enterprises, but those red meat producers who have remained profitable through the last decade are acutely aware of the benefits of adapting their production systems to seasonal variability and the benefits of adapting to climate change should already be quite clear. What isn't clear is how a new regime of variability will affect business risk, profitability and natural resource condition. Climate change impact information is emerging and improving, yet quantifying the impact of climate change at a regional level, which is relevant to most decision makers, is consistently raised as a research priority. Until the climate change impact information can be downscaled to a regional level and can be confidently used to assess business and natural resource implications, along with mitigation opportunities, then this lack of information will pose a significant barrier to climate change adaptation.

1.3.5 The need for potentially large upfront investment

Adaptation to climate change by dryland agriculture will most likely occur through gradual refinements to the system and not through radical restructure. A very different scenario may occur in irrigated systems which face reduced water allocations and major infrastructure re-structure (e.g. removal of orchards). The opportunity cost of modifying current dryland systems to meet the expectations of predicted scenarios in 2030 or 2050 will outweigh the benefits of pro-active action. Whether the size of the investment required will limit adaptation will depend on the financial position and scale of each business. Large is a relative term, and any additional investment by some small producers could seem insurmountable.

Large upfront investments to improve the water harvesting capacity of individual enterprises may be required in regions where the frequency of large rainfall events has already reduced. Significant investments of this nature will be difficult for many producers.

1.3.6 The need for support for community leaders in adaptation and change

Support for community leaders in adaptation and change is an important aspect in assisting producers to respond to opportunities and constraints posed by climate change. This will also assist in supporting producers to adapt to policy frameworks which seek to improve prospects for sustainable prosperity. However, this should not be carried out in isolation and should be integrated with other holistic natural resource management frameworks.

Supporting community leaders is vital for reducing resistance to change amongst producers and promoting broader uptake of adaptation strategies. Some key aspects and benefits of this approach are:

- Sharing knowledge and lessons learned amongst early adopters
- Provision of access to broader networks as well as expert help to share innovation
- Provision of funding for research in response to new knowledge requirements
- Provision of early warning regarding risks and opportunities posed by climate change
- Promotion of 'good news' performance stories

A multi-disciplinary approach which brings producers together with government departments, industry associations, RDCs and other key players is likely to be most effective yield the greatest benefits.

1.3.7 The difficulty for relatively small enterprises to deal with uncertainty and manage risk

Australian agriculture has been dealing with uncertainty and risk for over 200 years. The 130,000 small-medium enterprises which make up Australian agriculture are inherently resilient and generally well supported by industry and government programs. However, given the large number of enterprises, and wide geographic spread, it is not possible to offer one-on-one advice and support.

Research undertaken by the Australian Farm Institute shows that 80% of farm enterprises earn less than $100k p.a. while there is a trend to larger farms that are making a healthy profit due to economies of scale. They represent about 20% of farming enterprises.

It is unlikely that an inability to manage risk will play a significant role in preventing agriculture adapt to the physical challenges of climate change for those producers who have shown the ability to adapt over the last decade. However, many thousands of smaller livestock producers will find it difficult to adapt, and more producers may exit the industry. The uncertainty surrounding the costs and complexity of the ETS and emerging emission policy will create some resistance to adaptation.

1.3.8 What other factors affect the implementation of adaptation measures in the agriculture and forestry sectors?

Agriculture is a very diffuse industry which harnesses a broad array of social, technical and economic resources. Characterising adoption drivers is very difficult exercise. The adoption of new technology and/or the implementation of adaptation measures may be limited by;

- Social / personal preference / lifestyle choices
- Off farm income
- Complexity/ compatibility with existing business practice
- Drought
- Attitudes to requesting / seeking support

- Profitability/equity
- The lack of labour resources

Agriculture for many landholders is a lifestyle choice which is often supported by off farm income. Landholders who fall into this category are often not motivated to optimise profit, but maximise utility through meeting personal objectives. This type of landholder may be more or less responsive to adapting to climate change depending on their personal objectives. Landholders who are commercially driven will have a strong financial imperative to continually modify their production systems to a changing operating environment.

The greatest factor that will affect climate change adaptation is financial resources. Adaptation is not costless and the declining terms of trade and drought have undermined the financial resources of many red meat producers.

Australian Governments have been quite proactive in developing programs to understand the impacts of climate change. As our understanding of the issues improve, and as policy mechanisms such as the ETS are rolled out, new Government programs will be developed to assist adaptation to climate change and climate change policy. While attitudes to support programs may not be specific to Agriculture, the disperse nature of Agriculture and a culture which condemns paper work and promotes self reliance may limit the effectiveness of support programs to drive climate change adaptation.

1.3.9 How should responsibilities be shared in dealing with adaptation?

Climate change adaptation by red meat producers will generate both private benefits for individual businesses and public benefits for both the surrounding catchment and natural resources, and in lower food prices to consumers than would otherwise occur if producers do not adapt their businesses to climate change. Climate change adaptation by red meat producers will essentially involve continuing to improve the quality and quantity of biomass produced on farm, within a changing climatic regime. If producers resist climate change adaptation (i.e. try and maintain current plant/species mix), then biomass production efficiency will slowly decline as the genetic fit of plant species becomes sub-optimal. A decline in biomass production has the potential to generate negative externalities such as reduced carbon sequestration and increased soil erosion, weed invasion and salinity. Given that management actions on farm have the potential to generate both private and public benefits, then climate change adaptation should be a shared private / government responsibility.

1.4 The mitigation challenge

1.4.1 What potential is there for mitigation in the agriculture sector in the short term?

Agriculture is the second largest emitter of greenhouse gases in Australia and the livestock sector accounts for 58%, primarily through methane emissions from ruminant digestion. Despite R&D over the last two decades (primarily focussed on diverting "wasted methane energy" into a form that can utilised by the animal), this has proven to be an intractable problem for the red meat industry and is our biggest climate change challenge. There is some potential to reduce both methane and nitrous oxide emissions from agriculture, yet practical measures to do so are limited by viable solutions, the diffuse source of emissions and the difficulty in coordinating a response from a large number of small individual businesses.

Methane produced from enteric fermentation is a natural by-product of ruminants, and a difficult issue to address as the biochemical processes are complex, having evolved as a very efficient way to extract energy from low energy and low protein native grasses and shrubs over many thousands of years. Attempts to modify the rumen via genetic selection and/or methanogen inhibitors have yielded variable, and generally marginal, results, with significant levels of uncertainty due to the difficulty in measuring methane emissions from livestock. The potential to reduce methane production from livestock will only be understood once results can be replicated and measured with some degree of certainty.

The management of soils and pastures to increase soil carbon (eg by increasing perennial species) may offer our best opportunity as an industry. The potential for agricultural soils to sequester carbon is highly variable, depending on management practices, rainfall, pasture species and soil type. The AGO estimates that on average, Australian agriculture soils may be able to sequester up to 40t/ha of carbon over 40 years. Opportunities to achieve such gains whilst maintaining a viable livestock enterprise are likely to be limited to more intensively-managed properties in the high rainfall and cereal cropping zones in southern and eastern Australia, but this still represents a very significant carbon sink, if recognised in any future ETS. Therefore, it is a priority for the red meat industry to actively pursue significant R&D in this area.

1.4.2 What practical options for mitigation are likely to become commercially viable in the near future?

Any change in management practice that increases production efficiency generally also reduces methane output per unit of meat produced. An analysis of AGO estimates of GHG emissions reveal that, between 1990 and 2005, the beef and sheepmeat industries have reduced GHG output per tonne of production by about 10% and 30% respectively, through increases in production efficiency. However, such gains are relatively slow and incremental, driven by the adoption of more efficient production practices needed to maintain profitability.

With current technology, improving the feed use efficiency of ruminants, dietary additives for dairy and feedlot cattle, and improved fertiliser management are the only options available to directly reduce greenhouse gas emissions from sheep and cattle (<20%). Feed use efficiency can be improved marginally via genetic selection and to a moderate degree by manipulating the quality of feed ingested by animals. Rumensin can be added to feedlot rations to increase feed use efficiency and fertiliser technology is currently being evaluated to reduce nitrous oxide production in New Zealand. While these management actions can reduce scope 1 greenhouse gas emissions, further work must be done to evaluate the life cycle impact of supplementary feeding grain and/or producing and applying urease and nitrification inhibitors. Any response to mitigate greenhouse emissions must ensure that attempts to reduce scope 1 emissions do not increase scope 2 and 3 emissions.

The commercial viability of these practices is borderline without pricing emissions. Rumensin is commonly used in feedlots and producers are always trying to improve feed use efficiency, however, it is unlikely that these practices would intensify (and produce a real reduction in emissions) without an additional commercial driver. An ETS which starts to price greenhouse emissions may provide the additional incentive; however, the commercial viability will be highly dependent on the price of carbon and emissions policy.

It is important to recognise that none of these technologies are currently applicable to the majority of ruminants which graze extensively on pasture and rangeland where dietary modification is impractical.
If the potential sequestration and accumulative retention of carbon can be justified through R&D, than soil carbon sequestration may be a prospective commercial viability.

1.4.3 What incentives, policy innovations and/or market-based mechanisms would guarantee an optimal contribution to the national mitigation effort?

Developing an optimal solution is likely to involve striking an appropriate trade off between levels of incentive and mitigation. Defining an optimal solution for mitigation of GHG emissions is outside the scope of this response. Key aspects which should be addressed in any agricultural GHG mitigation program targeted at red-meat producers are:

- Mitigation mechanisms should be broad based to ensure comprehensive coverage of emissions;
- Mitigation efforts for red-meat producers should be livestock production focussed, recognising that these production systems absorb as well as emit carbon, and have potential to increase carbon sequestration;
- Recognition of both the sequestration and emission dynamics of livestock production, and that offset/abatement opportunities through soil carbon sequestration may be significant in magnitude and less riskier (in terms of loss through fire) but of shorter term duration than through tree plantations;
- Clearly targeted incentives to reduce emissions;
- Mitigation measures should be characterised by low transaction costs;
- Costs associated with adjustment should be shared equitably across the markets in which red-meat producers participate;
- Market Based Instruments funded by the auction of emission permits are likely to maximise mitigation benefits and reduce associated compliance costs;
- Mitigation measures should be internationally recognised; and
- Mitigation measures should be trade neutral, given that commodities will not be able to capture CSR benefits.

1.4.4 What is the best way to deal with trade exposure if policy measures are implemented to reduce emissions from the agriculture and forestry sectors?

The Australian red meat industry exports approximately $6.2 billion dollars worth of red meat products to more than 100 international markets. Australia's main competitors are Brazil, India, Argentina, USA and New Zealand, which raises trade exposure concerns given New Zealand is the only competitor likely to price carbon in the near term.

Trade exposure is a significant issue for international commodity producers like Australia agriculture. Commodity producers generally differentiate their products based on price and unless all commodity producers are costing greenhouse gas emissions, then un-costed supply chains will have an advantage. It is highly unlikely that all international commodity producers will begin to cost greenhouse emissions by the time Australia introduces its ETS, therefore the introduction of the ETS will reduce

Australian agriculture's competitive advantage. In some sectors where Australia has a strong competitive advantage (lupins, wool), then the introduction of the ETS may erode profitability, but not market share. In highly competitive sectors (wheat, beef), then the introduction of the ETS will erode both profitability and market share. Ideally the introduction of the ETS would be trade neutral, however, policy designed to achieve this outcome would probably be unnecessarily complicated.

Identifying the best way to deal with trade exposure is beyond the scope of this response, however, options could include;

- Compensation indexed to competitors
- Carbon credits priced and transferred with products
- Direct input cost compensation (fuel, electricity, fertiliser)
- Free emissions permit allocations

The competitive position of commodity suppliers can be highly dynamic and it is important that any trade exposure policy can differentiate the opportunity costs of an ETS from normal fluctuations in competitive position. A retrospective compensation package for loss of market share would not only be inaccurate, but it may also been seen as a mechanism to support trade.

Indexing compensation based on the emissions costs encountered by competitors would be complicated, but it may provide a greater level of transparency to competitors. Most agricultural commodities are exported to many countries and calculating compensation packages would be overly complex due to the dynamic nature of trade. Calculating compensation indexes would also be very difficult as it would require an intimate understanding of the cost structures of competing supply chains.

In niche markets it may be possible to transfer emissions costs to consumers with corresponding carbon credits. Rather than the supply chain of origin claiming emission reductions as a result of mitigation policy, it may be possible for the supply chain of origin to pass the costs of mitigation and the carbon credits onto the importer or destination distribution chain. To achieve this, each supply chain would have to verify its emissions savings and associated costs via bilateral agreement. The demand for such a product would only work if the importing organisation required offsets to meet CSR and/or regulatory obligations and the supply chain could generate carbon credits cheaper than offset providers in the destination country.

Allocating free permits to trade exposed industries which are covered by the ETS will improve the international competitiveness of those industries. Free allocations alone will not, however, go far enough as businesses will still be disadvantaged as they will have to absorb emissions reporting costs, the higher costs of energy intense input costs and other costs associated with non-ETS mitigation policy.

The most practical solution would be to subsidise the cost of energy-intense input costs for trade-exposed producers. Trade-exposed producers could apply for fuel, fertiliser, transport, pesticide and energy subsidies. This type of policy would address the competitiveness of Australian supply chains by reducing their cost structures.

1.5 Mitigation policy options

1.5.1 Accepting existing practical limitations, is direct inclusion in an ETS the most appropriate mechanism for encouraging mitigation in the agriculture and forestry sectors?

To effectively mitigate greenhouse gas emissions from the red meat industry, a significant proportion of red meat producers will have to experience the affects of the mitigation policy. If agriculture was included under the current ETS proposal, very few red meat producers would meet reporting thresholds and very few producers would receive an emissions cap. While it seems sensible to have a single mechanism to mitigate emissions across industries, the emission thresholds of the proposed ETS would need to be reduced to begin to influence the production practices of most red meat producers. Furthermore, industry-driven quality assurance programs could be a vehicle to assist producers with regard to best management for appropriate and cost-effective adaptation and mitigation measures.

1.5.2 What policy mechanisms would be more appropriate for these sectors? How would these measures interact with an ETS covering other emitting sectors?

The ETS applied to other sectors will have an effect on agriculture through increased input costs. Direct agricultural policy will compound the costs of mitigating emissions without providing an avenue to offset the total cost generated by mitigation policy. Agriculture should be given the opportunity to offset the additional costs of increased input costs via participating in recognised mitigation practices. This policy would provide an incentive for agriculture to reduce emissions, while also providing an avenue to offset the costs passed onto agriculture from other sectors. Ultimately each business should have the opportunity to offset the costs of mitigation policy by investing in mitigation technology (i.e. costs are borne in a productive way).

1.5.3 What would be the economic impacts on the agriculture and forestry sectors of a domestic ETS covering stationary energy and transport?

Energy intensive inputs such as electricity, fuel, transport, fertiliser and pesticides represent a significant proportion of operating costs for a red meat producer. The introduction of an ETS will create mitigation and administrative costs for suppliers of energy intensive products and these additional costs will be passed onto primary producers. Modelling performed by CSIRO has found that the introduction of an ETS would most likely increase the cost of diesel and fertiliser by approximately 15% (depending on the price of carbon). Hatfield-Dobbs (2007), estimates that the introduction of an ETS would increase total agricultural operating costs by approximately 3% by 2025 (over and above inflation). The specific impact on the cost structures of red meat production systems has not been modelled.

1.6 Providing opportunities

1.6.1 What are the opportunities available to the agriculture and forestry sectors as a result of mitigation policies?

Mitigation policies will encourage all industries to reduce direct greenhouse emissions and reduce energy consumption. Mitigation policies may also encourage industries to offset emissions via purchasing carbon credits from third party carbon credit generators. The three industries which provide the greatest opportunities for agriculture are;

- the stationary energy industry
- the transport industry, and
- the voluntary offset industry servicing CSR aspirations across all industries

Opportunities for agriculture to service its own mitigation obligations may also be required, depending on the nature and coverage of mitigation policy.

The stationary energy sector is the target of the ETS, and a regime of tightening emissions caps and perhaps an increase in the price of offsetting emissions will generate opportunities for agriculture to either supply land for solar and wind installations and/or sequestration projects which generate recognised carbon credits. Capturing methane from waste products generated at feedlots and/or processing plants may also provide an opportunity to generate electricity.

The magnitude of the opportunity will be highly dependant on the aggressiveness of the cap reduction trajectory and the rate that the stationary energy sector can develop and install mitigation technology. Low emission technology such as nuclear power generation is a well established technology which offers the stationary energy sector real scope to comply with emission caps. Lead times of up to 15 years may be required to establish commercial nuclear facilities but the stationary energy sector is seriously considering nuclear generators as part of their longer term mitigation strategy. If emission caps begin with a relatively flat reduction trajectory, then longer term options like nuclear generation will be favoured by the energy sector over short term solutions such as purchasing carbon credits and emerging technology like wind or solar generation.

Many organisations are beginning to position themselves as carbon neutral in an attempt to improve their socially responsible profile. Whether this strategy will continue or pass as another fad is yet to be seen, however, a niche market will most likely continue unless there is a consumer backlash against the credibility of offset programs. While the primary demand for carbon credits generated by a third parties will come from organisations trying to meet their emission caps, opportunities will also be created by organisations wishing to move from their regulatory obligations (meeting their cap) to a carbon neutral position. The voluntary offset market is likely to continue to generate opportunities for third parties who can generate carbon credits.

Carbon credits generated by third parties are likely to be the strategy of last resort as they will not provide the long term operational efficiencies or the CSR credibility of internal mitigation projects. Third party carbon credit generators will always play a role to cover short term cap breaches and/or in instances where the external generator can create credits at a lower cost than internally generated offsets.

1.6.2 How should uptake of these opportunities be maximised?

To become a mainstream supplier of carbon offsets, agriculture must develop recognised methodologies under AGO's Greenhouse Friendly initiative that are based on practical production practices and/or projects that integrate into Australian farming systems. The Greenhouse Friendly initiative recognises projects which improve energy efficiency, create renewable energy, encourage reforestation and avoid deforestation, however, new methodologies which recognise no-till cultivation, reduced stocking, cell grazing, perennial pastures and reductions in fertiliser use must be developed to engage mainstream agriculture. In developing agriculture specific offset methodologies, novel approaches to measuring and validating the mitigation performance of the methodologies, including allowance for shorter term sequestration periods, must also be considered to ensure that they are relevant to agriculture. Measuring mitigation in units of emission intensity rather than absolute emissions would assist agriculture overcome some of the measurement issues which may prevent agriculture complying with conventional offset methodologies.

1.6.3 Do these opportunities create perverse outcomes and, if so, how should these be managed?

Encouraging agriculture to participate in either the generation of offsets or renewable energy could create at least three perverse outcomes;

1. A reduced capacity to offset its own emissions once it becomes liable under an ETS
2. A reduction in the area for productive agriculture and food-producing capacity
3. Negative externalities generated from offset projects (reduced water flows, reduced biodiversity, etc)

Preserving the capacity to offset future emissions from agriculture is a difficult issue to manage while issues of coverage and liability are unknown. Communication projects planned by primary industry organisations intend to raise this issue with producers and make them aware that selling carbon credits in the early stages of the ETS may not be the optimal strategy. Given the preparedness of the industry and the innovation rate of the agricultural sector, it is unlikely that this issue will create a significant problem.

Given that the ETS is a market-based system, then it seems reasonable to assume that productive agricultural land will only be substituted for renewable and/or offset projects when it is profitable to do so. If substitution occurred quickly, food prices could increase and food security could become an issue if international trade was disrupted.

The methodologies developed for agricultural offsets could address the issues of negative externalities. For example, reforestation projects could specify requirements for mixed species of native plant instead of monocultures (particularly of introduced species).

1.7 Point of obligation

1.7.1 Do the economic efficiency gains from including small emitters in an ETS justify the costs of compliance?

Uncertain and outside the scope of this response. The cost of compliance will depend on the methods required to measure and verify emissions. Ideally a relatively simple approach will be implemented. The implementation of the GST indicates that a broad based system can be implemented and be relevant to both large and small organisations if it is supported by well resourced and competent government programs.

1.7.2 How could transaction costs be minimised?

Transaction could be minimised by:

- Ensuring transactions are not subject to any form of indirect taxes, such as stamp duties;
- Providing sufficient capacity to ensure investment certainty;
- Ensuring coverage of emission sources by a tradable permit scheme (and coupled policy measures) be as wide as possible;
- Encouraging self regulation and using random auditing rather than stringent verification;
- Reducing the frequency of reporting requirements;
- Practice or process verification, rather than direct measurement/estimation

1.7.3 What should be the point of obligation for agriculture and forestry industries in an ETS?

Ideally the point of obligation should occur with individual businesses to maximise mitigation of GHG emissions. A pooling approach through established intermediaries is likely to reduce direct feedback to individual decision makers implementing mitigation practices (i.e. an arms length approach may dilute the impact of the mitigation policy).

It is important to note that an intermediaries approach may have the following disadvantages to producers:

- Potential for intermediaries to profit from over estimation and administration of emissions reporting and transactions.
- Pooling of emissions may also create a situation where progressive producers are disadvantaged by systems that produce average costs/benefits
- Inconsistencies created between supply chains

In reality, some aggregation of obligation will probably have to occur to facilitate the introduction of agriculture.

1.7.4 Should a threshold for liability be applied, and how should it be defined?

No, the system should be simple and apply penalties and rewards as transparently as possible. Thresholds create inequality and loopholes. Mechanisms to accommodate arbitration and lenient re-payment terms may be required to manage liability in the early stages of the system.

1.8 Monitoring and verification

1.8.1 What 'proxies' would be appropriate for the estimation of emissions in the agriculture and forestry sub-sectors?

The following proxies could be used to estimate greenhouse gas emissions;

- Type and quantity of product produced
- Production practices that reflect reduced emissions per unit of output
- Operational and system design
- Quality and quantity of native vegetation, plantations and pastures.

It is important to recognise that grazing enterprises operate as both sources and sinks of greenhouse gas and that, under current inventory calculations, only emissions are accounted for. An equitable, credible and effective system must account for carbon absorption and net emissions, and offer incentives to improve carbon absorption/sequestration where possible.

A combination of proxies may be required to estimate an accurate emissions profile.

1.8.2 What systems are available that would allow for efficient and accurate monitoring of emissions at the operator level?

The lack of accurate and efficient systems to monitor emissions in agriculture is a major impediment for the inclusion of agriculture in the ETS. Measuring emissions via SF6 and/or laser path technology are currently under development for livestock but these technologies are a long way off integration into commercial farming operations. Systems such as NCAS and OSCAR are currently being developed to model emissions; however, their ability to account for the nuances at an organisation level must be extremely robust before they are used to calculate liability.

A recent CSIRO study has found that a methodological error in their earlier estimations of methane emissions by livestock has overestimated Australian (and global) cattle emissions by 17% (Hunter, 2007). Similarly, there are issues surrounding the measurement of soil carbon. While the tools to measure soil carbon are well advanced, sampling error and the relatively small increments of change (which add up to significant amounts of carbon) makes the calculation of absolute emissions unreliable. While this area of science continues to evolve, creating systems that generate financial liability is problematic and likely to be damaging to individual organisations.

Before agriculture can be included into the ETS, a reliable system to measure both carbon emissions and carbon sequestration must be developed. The red meat industry is particularly concerned that its emissions continue to be measured in gross terms while its inherent ability to sequester carbon is ignored. Any system that monitors emissions must do so on a net basis.

Lessons from the water industry have demonstrated that trading natural resources requires a competent authority with the resources, expertise and the courage to effectively monitor and reduce natural resource impact. Any emissions mitigation policy designed for agriculture must be supported by an excellent program to accurately monitor net emissions.

1.8.3 What are the implications if the stringency of monitoring, reporting and verification requirements vary between sectors and sub-sectors?

It is unlikely that variation between sectors would cause significant sectoral adjustment unless emission reporting becomes extremely arduous and/or non-compliance penalties become common in a sector (i.e. producers of specific products can no longer meet their emission caps).

1.9 Sub-sector coverage

1.9.1 Should all agriculture and forestry sub-sectors be included in an ETS? What sub-sectors might be better suited for inclusion?

Yes, with trade exposure exemptions, and provided the sector is a 'covered' sector. Broadening the base should drive down costs and reduce inequities.

1.9.2 How should economic distortions within the sectors be dealt with?

Pricing emissions will alter the operating environment for all businesses in Australia. Sectors must adjust to a new operating environment just as they did when the foreign exchange rate was floated, GST was introduced and reserve price schemes have been dismantled. Short term measures may be required to smooth the transition; however, support mechanisms must be phased out to allow for sectoral re-adjustment.

1.10 Phasing and timing

Land use change by farmers since 1990 has been the major reason for Australia meeting its Kyoto emissions targets. Most of this land use change has occurred on grazing land with disproportionate costs being carried by livestock producers. Any proposal to shift baseline year forward from 1990 disadvantages all those producers who have made significant commitments to reducing emissions or increasing sinks. Therefore, it is imperative that those producers who have demonstrated such commitment, either through forced land clearing reductions or management changes (minimum tillage, grazing etc) post-1990 must be recognised.

1.10.1 If a domestic ETS excludes agriculture and forestry initially, but includes them at a later point in time what are the advantages/disadvantages of involving these sectors in the scheme through the inclusion of offsets, or an 'opting in' baseline and credit trading scheme?

Advantages for non-participants could include:

- No need for business operators to actively reduce annual net GHG emissions
- No requirement to monitor GHG emissions
- No requirements for submitting an annual return verifying emission performance; and
- No need for reconciliation of emissions permits (Keogh, 2007)

Disadvantages could include:

- High likelihood that individual farm businesses will incur additional costs passed on by major emitters supplying goods and services;
- No opportunity for individual farm businesses to pass on additional costs, given global market prices applicable to red meat producers;

- Non-participants may have less opportunity to offset any additional costs passed on by service providers through reducing emission or actively pursuing other activities which sequester GHGs; and
- Government may implement additional regulatory measures to capture non-participants (Keogh, 2007).

1.10.2 If a domestic ETS excludes agriculture and forestry initially, but includes them at a later point in time what sort of transitional arrangements should be incorporated in the initial design?

It is envisaged that the design of the ETS will evolve over time to account for inadequacies in the initial design. As long as the evolution of the ETS does not affect the price of carbon and/or disadvantage the initial members of the trading system, then the red meat industry would prefer to delay the development of transitional arrangements until many of the uncertainties regarding agriculture become clearer.

Transitional arrangements need to encourage red meat producers to reduce emissions prior to entering a domestic ETS, but also not penalise them due to delayed entry. The consequences for participating in voluntary offset schemes and implications for including the same abatement activities in any future mandatory national ETS scheme need to be clarified as soon as possible.

Because the red meat industry competes internationally in over 100 markets, it requires free emissions permits for the period of any domestic ETS during which its major competitors (Brazil, Argentina, USA) do not face similar carbon emissions costs.

1.11 Recognition of carbon sinks and offsets

1.11.1 What types of carbon sink and mitigation measures should be included as offsets or within an ETS?

Some key principles for identification of appropriate carbon sinks and mitigation measures to be included are;

- Ones which pass the permanence and additionally tests, but taking into account potential to include carbon sinks with shorter periods of permanence than currently proposed
- Ones which avoid negative externalities
- Ones which integrate with normal production practices
- Ones which reduce the risk of carbon leakage

Examples include;

- encouraging biomass thickening of special purpose remnant vegetation
- soil/pasture/livestock management practices which are shown, through R&D, to increase soil carbon storage management practices shown
- soil/pasture/livestock management practices which are shown, through R&D, to significantly reduce methane emissions from livestock
- implementing precision farming to reduce fuel use
- replacing diesel pumps with solar pumps

The lack of codes and standards to generate offsets from soils, native vegetation and agro-forestry requires significant attention before agriculture can realise its potential as an integrated player in the Australian mitigation effort. If Australia is going to meet long term mitigation targets, landholders must receive a broad range of market signals which recognises and encourages carbon sequestration.

1.11.2 Are there practical and cost effective monitoring solutions available for these measures?

There may be some solutions which could be modified from the forestry industry to monitor reforestation but none currently exist for enteric fermentation from livestock and no-till cultivation. Examples for nitrogen management may be able to be sourced from New Zealand.

1.11.3 How should positive incentives to reduce emissions or perverse incentives to increase emissions prior to inclusion in an ETS be managed?

Positive incentives to reduce emissions and encourage sequestration should be encouraged through recognition of the dynamic cycling of carbon through grazing systems. Averaging emissions over 3-4 years should assist to reduce perverse incentives to increase emissions prior to the allocation of caps. Averaging net emissions is also important to account for seasonal variations in emissions and sequestration.

1.11.4 Should offset regimes recognised under an Australian ETS be limited to those that satisfy international carbon accounting protocols?

The Australian Government has now given a clear indication that it will participate in an international effort to reduce greenhouse gas emissions. The Australian ETS must generate measurable emission reductions that are recognised internationally.

With this end in mind, Australian offset programs must ultimately be recognised internationally. With this said, it is important that local codes and standards are developed which account for regional nuances and practical solutions for industries, and which accurately reflect the fluxes in the carbon biological cycle and contribute to real reductions in net emissions (rather than just satisfy the current accounting system methodology). It is also important that voluntary systems are allowed to experiment and develop new codes and standards to ensure that the number of recognised codes and standards increase over time, rather than be limited to the current suite of recognised international codes and standards. Flexibility must be retained to introduce changes as new knowledge is generated.

1.11.5 References

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