QUEENSLAND FARMERS' FEDERATION

3 January 2008

Professor Ross Garnaut
Garnaut Climate Change Review
Level 2, 1 Treasury Place
Melbourne VIC 3002

Email: contactus@garnautreview.org.au.

Dear Professor Garnaut,

The Queensland Farmers' Federation wishes to make a submission in response to the Issues Paper dealing with Climate Change: Land Use – Agriculture and Forestry.

Should you require any further information regarding QFF's views and work on climate change issues, please do not hesitate to contact me. QFF would appreciate the opportunity to continue to consult with the Review, particularly as we gather further information as part of the Climate Change Adaptation project we have been contracted by DAFF to undertake over the first half of 2008.

Yours sincerely,

John Cherry
Chief Executive Officer

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Garnaut Climate Change Review Issues Paper 1 Climate Change: Land use - Agriculture and Forestry Queensland Farmers' Federation response

Queensland Farmers' Federation (QFF) is the peak rural industry body in Queensland, uniting 13 of the State's peak rural industry organisations, who collectively represent more than 13,000 primary producers across the State. The farmers QFF and its members represent contribute around $4.6 billion annually to the State's economy and employ over 30,000 workers in rural communities.

QFF Member bodies include:

- Australian Prawn Farmers Association
- CANEGROWERS
- Cotton Australia
- Growcom
- Nursery & Garden Industry Queensland
- Qld Chicken Growers Association
- Qld Dairyfarmers' Organisation
- Qld Irrigators Council Association Inc
- Flower Association of Queensland Inc
- Qld Chicken Meat Council

Emerging Primary Industries Group

- Australian Ginger Growers
- Biological Farmers of Australia
- Queensland Aquaculture Industries Federation

Through QFF, rural industry resources are pooled to ensure powerful representation and effective strategy development on important industry issues. QFF provides direction, leadership and representation on issues of common interest to the rural sector in Queensland. Our goal is to secure a sustainable and profitable future for our members, as a core and dynamic element of the economy.

Overview of agriculture in Queensland

QFF and its members represent the major intensive commodities in Queensland. Intensive agriculture makes a significant contribution to regional, state and national economies, averaging around 54% of the State's agricultural production. The drought has had a severe impact on intensive agriculture, particularly on cotton, dairy, vegetable production, amenity horticulture and southern areas of the sugar cane industry. Against that, there has been very strong growth in the fruit sector, poultry, dairy (due to milk price rises), aquaculture and cereals sectors (due to price rises) in the last year, which is projected to continue. Intensive industries rely very heavily on irrigation, with water availability and security key issues that farmers need to consider in assessing future risks, opportunities and investments.

Agriculture continues to be a major employer in Queensland. In 2000, prior to the drought taking hold, agriculture accounted for 103,000 employees or 6.2% of the Queensland workforce, employing more workers than the tourism and hospitality, mining, transport, communications or financial services industries. As the drought has taken hold, farmers have been forced to downsize, with 27% of jobs disappearing between 2000 and 2005. [1]

COMMODITY	**Value 2006-7 ($m) [2]**	**Irrigated area 2004-5 ('000 ha)[3]**	**% Total value irrigated 2004-5**
Cattle	3635	54.2	3%
Sheep	45	n.a.	n.a.
Pigs	210	n.a.	n.a.
Poultry	240	n.a.	n.a.
Other livestock	10	n.a.	n.a.
Wool	110	n.a.	n.a.
Milk	200	15.5	50%
Eggs	100	n.a.	n.a.
Fruit	975	34.7	66%
Vegetables	810	31.3	79%
Amenity horticulture	555	n.a.	31%
Sugar cane	1075	209.2	52%
Cotton	120	124.1	94%
Other field crops	260	20.9	3%
Cereal crops	490	52.1	3%
TOTAL AGRICULTURE	***8825***	***542.0***	
Fisheries	190		
Aquaculture	65		
Forestry	200		
AGRICULTURE FARM GATE TOTAL	***9280***		
FIRST STAGE PROCESSING			
Meat	980		
Sugar cane	450		
Milk	110		
Fruit & veg	175		
Flour	95		
Seafood	20		
Timber	345		
Lifestyle horticulture	665		
Cotton	15		
AGRIC. PROCESSING TOTAL	***2855***		
PRIMARY INDUSTRIES TOTAL	**12135**		

The contribution of agriculture to the economy is much larger than the 'official' statistics imply, particularly in regional areas. Research by Econtech suggests that adding in the value of all activities that occur to farm outputs post farm

[1] ABS Labour Force cat. No. 6291.0
[2] DPI Prospects 2007-8 September 2007
[3] ABS Water Account 2004-5 cat 4610.0 p.78

gate and the value of economic activities supporting farm production increases the farming/farm dependent component of the economy from 3.2% of GDP to 12.1% of GDP. Agricultural employment rises from 407,000 directly in 1998/99 to 1.6 million (17% of the labour force) when the farm output sector is included.[4]

General comments:

"The purpose of this paper is to raise, explore and seek input on four key issues facing Australian agriculture and forestry as a result of climate change, and their participation in the efforts to reduce greenhouse gas emissions:
_ adaptation in the agriculture and forestry sectors;
_ the mitigation options for agriculture and forestry;
_ the practical considerations in relation to the inclusion of agriculture and forestry in an emissions trading scheme; and
_ the recognition of carbon sinks and offsets."

QFF welcomes the opportunity to comment on the Issues Paper prepared by the Garnaut Climate Change Review. We start by gently taking issue with the way in which the review has defined its task in respect of agriculture and land use (above). QFF does not see adaptation and mitigation as separate objectives. Agriculture is facing both risks and opportunities in responding to climate change. An integrated approach to reviewing the risks and opportunities and determining solutions is required. Adaptation and mitigation options overlap and interact.

We need to define the grounds of the debate better. Common terminology needed to reduce the degree of confusion arising due to different terminology being used within the sector. Standards need to be developed. An early task is determining the "boundary" of the farm, and the responsibilities of landowners. There is also a clear need to develop guiding principles to frame policy options.

For QFF and its member organisations, the need at this stage of the climate change roadmap is to develop a systematic checklist of actions for each sub-sector. Each commodity needs to consider questions like:

1. Has a risk and opportunities assessment been conducted for this industry across key regions?
2. When the above has been done, has a gap analysis been conducted on information needs, extension needs, research needs?
3. Who will conduct the research needed on impacts, adaptation and mitigation options?
4. What is current industry best practice and how might that need to be improved?
5. What are the information needs impacting on future investment decisions and how might those needs be met?
6. How capable is the industry to respond to climate change?

[4] Econtech "Australia's Farm Dependent Economy" Australian Farm Institute March 2005

QFF cannot provide comprehensive answers to many of the questions raised by this review because industry has yet to consider them. Having said that, QFF and its members are working on developing both commodity specific and sector wide action plans to ensure that landholders have the tools to assess the risks and opportunities associated with climate change and factor that into their ordinary business. Farmers have been dealing with climate variability for many generations, including, over the last seven years, the worst drought on record. Those who have the risk management skills best able to cope with climate variability now are best placed to deal with the risks of the future. That is why QFF is of the strong view that industry resilience can best be built by focusing on the uptake and further development of industry best practices as defined in industry Farm Management Systems programs now. Such programs have the flexibility to adjust to new information about adaptation and mitigation challenges, and, through industry bodies, provide a direct extension path to disseminate that information.

The following represents a general response to the consultation questions raised by the review. QFF's views will develop further over the next six months as we hold three Expert Panels on climate change adaptation and develop action plans for our commodities. QFF would appreciate the opportunity to explore these issues in more detail with the review at a later stage of the review's consultation.

3.1 Adaptation in the agriculture and forestry sectors

Questions for consideration

- *How might these adaptation challenges be addressed?*
- *What other factors affect the implementation of adaptation measures in the agriculture and forestry sectors?*
- *How should responsibilities be shared in dealing with adaptation?*

Adaptation is the most significant challenge for agriculture as future profitability is directly related to how effectively farmers do adapt.

The climate in the future is likely to be more variable. To be successful, farmers need to improve their capacity to manage risk. The first challenge is identifying the risks, and assessing them. Every rural industry needs to undertake a detailed assessment of future risks, vulnerabilities and opportunities under various climate change scenarios. Part of that analysis needs to be about finding the 'pressure points' (i.e. where practices need to change) and the 'tipping points' (i.e. where the entire nature of the business needs to change). Industry is only at the very early stages of this process, and programs need to map that out further. There is a real shortage of climate research expertise capable of undertaking such assessments.

'Pressure points' and 'tipping point' will vary from industry to industry. Often, it may be the increased likelihood of the extreme events (e.g. more 35 degree days, longer dry spells, more storms) that farmers need to consider. A long

two way conversation will be needed between farmers and researchers to identify these issues, as part of risk and vulnerability assessments.

Having identified risks and vulnerabilities on a commodity/industry basis, the next stage must be starting to develop options in response to that. Some of that will be about practices, some will need to be about changes to crop varieties, and some will need to be about major changes to businesses. The practice change issues are best worked through industry best management practices programs, as very often the best adaptation techniques are about using already identified (or a modification) of best practice techniques. For irrigated farms (around half of Australian agriculture), the biggest challenge from climate change is probably impact on water availability. Building on existing water use efficiency programs (e.g. the Queensland Rural Water Use Efficiency Program, the CRC Irrigation Futures, the National Plan for Water Security) is likely to be the best way to do it.

Changing crop varieties is a much more complicated issue that requires years of research and development. For example, the 'tipping point' for Queensland's $40 million lettuce industry and $45 million apple industry is rising temperatures, and it is fast approaching. R&D is needed to develop more heat tolerant varieties. It needs to start now. The 'tipping point' for Queensland's cotton and sugar industries is water availability. Biotechnology opens up the prospect of more drought tolerant genes. But, that long term research needs to be underway now.

Changing business is a decision only the farmer can make, but s/he needs to be presented with the options and risks. Part of that is scientific (e.g. at what point is it too hot or too dry to grow lettuce) and part is commercial (e.g. what else can the land be used for). Industry level and regional land use planning is essential to ensure the necessary infrastructure is planned for.

Adaptation to mitigation is another key challenge for rural industry. Inevitably, the cost of energy will rise. The cost of fertilisers based on petroleum-based products will rise, the use of more fertilisers to accommodate growing populations and markets will promote emissions of nitrous oxide, a greenhouse gas 300 times as potent as carbon dioxide. Farmers, particularly irrigated farmers, are heavy users of electricity as well as fossil fuels. Adaptation needs to include more on-farm focus on energy efficiency.

Water availability is a key variable in agriculture and climate change, and water use efficiency a key adaptation challenge. Elevated levels of carbon dioxide in the atmosphere can potentially have positive effects on water use efficiency and yield in marginal environments, however sufficient water must be available in the first place. While rainfall and runoff is projected to decline, demands for water from growing urban communities, mining and industrial users are rising. Complications exist for example consider the 'tipping point' for nursery production which requires not only access to crop irrigation water however the product end user (urban, landscapes, timber and horticulture) must have access to water if they are to realise the full potential of the greenlife purchased. While the National Water Initiative and the National Plan

for Water Security are both major initiatives to deal with the transitional processes involved with water scarcity, adjustment issues will arise. Even before that, modelling issues arise. In the Murray Darling for example, the modelling of run-off in 2030 under the CSIRO Sustainable Yields projects are producing (across 15 GCMs) an incredibly wide range of estimates. In the recent Border Rivers report, 40% of the models showed an increase in runoff, and 60% showed a reduction. These reports, despite this high level of modelling range, are likely to form a key basis for the Basin Strategic Plan, which is turn will be used to determine by how much (if any) water entitlements should be reduced in the future. Those decisions impact on hundreds of millions of dollars of production. The modelling uncertainty needs to be addressed as a matter of urgency in water planning.

The most important message from industry bodies on adaptation is that most of what is required in adaptation (and indeed mitigation) is already recognised as industry best practice, or should be. It has benefits not just for climate change policy, but for broader sustainability (e.g. water quality, soil health, biosecurity) and long term productivity. Federal and State Governments need to invest far more into industry best management practices and Farm Management Systems as the best means of providing farmers with the risk management tool kits that they need to face future challenges. Programs will need to be revised and updated, but the base of work is already in place.

3.2 Mitigation options for agriculture and forestry

The mitigation challenge

Questions for consideration

- *What potential is there for mitigation in the agriculture sector in the short term? What practical options for mitigation are likely to become commercially viable in the near future?*
- *What incentives, policy innovations and/or market-based mechanisms would guarantee an optimal contribution to the national mitigation effort?*
- *What is the best way to deal with trade exposure if policy measures are implemented to reduce emissions from the agriculture and forestry sectors?*

QFF represents intensive agriculture. Such farms tend to be highly developed, with little land available for revegetation (other than in small lots). It is important for policy makers to recognise that most farmers are not in a position to offer carbon credits in the form of vegetation (other than on a very small scale). Intensive agriculture in that respect differs from broadacre agriculture (particularly pastoral) which could offer more substantial benefits.

As such, for intensive agriculture, mitigation almost certainly will increase the costs of farming without an offsetting direct income stream. There may be scope for farmers to offer carbon credits in other forms (e.g. soil carbon sequestration, zero tillage, nitrous fertiliser management, methane capture, limited revegetation, energy efficiency), but the science underpinning almost

all such carbon credits options is currently underdeveloped, and probably some years away from providing the rigour needed to be recognised. Soil carbon sequestration does however offer ancillary benefits which underpin sustainable agricultural production. Even small increases in soil carbon as a result of best management practices will increase native soil fertility (and reduce expensive fertiliser N inputs), reduce erosion and contribute to overall soil health and food security.

Methane is a good case in point with respect to uncertainty in the magnitude of potential credits. It is the largest of rural greenhouse gas emissions, and the most difficult to control. The rural R&D corporations are in the early stages of research on changes to feedstocks, stocking regimes, recapture and so forth, but they are a long way away from offering commercial alternatives for adoption by industry.

At some stage, Governments have to make tough decisions on who should receive the carbon credits that are available. In the interests of food security, insisting on mitigation impacts that can only be met by cutting food production should be regarded as contrary to the provision of food security, and contrary to the national interest.

Further, in asking how much of the mitigation burden agriculture should take on, Governments need to look at the broader risk situation. Between 1990-2005, emissions from agriculture were static (87.9 Mt CO_2e), and fell sharply when land use is taken into account (from 216.6 Mt to 121.6 Mt). By contrast, emissions from the energy sector rose by 36% in the same period (from 287 Mt to 391 Mt). This data highlights three factors about agriculture and greenhouse gas emissions:

1. Agriculture has carried the burden on Australia's rising energy emissions by the imposition of land clearing controls;
2. Excluding land clearing, agricultural emissions are static and do not represent the major risk of rising that energy and industrial emissions do;
3. Agriculture, at 16% of emissions (rising to 22% with land use changes added in) is still a significant part of Australia's emissions and needs to play its role.

QFF would submit that the best means for agriculture to contribute to mitigation is by further roll out of industry best management practices regimes. A few examples illustrate this:

a. Nitrous oxide: Best practice application of nitrogen fertilisers should align fertiliser application to plant growth, and increase nitrogen use efficiency thereby reducing losses to the atmosphere and as runoff (e.g. Nursery production utilising controlled release fertilisers)..
b. Soil management: Best practice farm management includes 'controlled traffic' which reduces disturbance of the soil, and reduced till.
c. Water use efficiency: As well as an adaptation technique, water use efficiency reduces energy usage from pumping as well as the

possibilility of water logging, which can accelerate emissions (e.g. nitrous oxide);

d. Energy efficiency: Energy efficiency audits and practices help reduce the carbon footprint as well as reduce costs.
e. Effluent management: A key challenge for intensive animal industries, this has the potential to impact on methane and nitrous oxide emissions.
f. Mulching: The move in the cane industry to trash blanketing rather than burning of cane has significantly reduced emissions.
g. Tree buffers: Tree buffers assist with air, visual pollution and biodiversity in intensive farms.whilst also providing a carbon sink.
h. Break crops: Planting of break crops (e.g. legumes) helps to improve the carbon and nitrogen levels in the soil.
i. Feedstock management: The link between feedstock efficiency and methane emissions is still being developed, but some advice is already available.
j. Drought risk management skills: Use of risk management skills can help ensure that the farm is better prepared for drought, and thus not over stocked or over farmed on a risk management basis.

Industry Farm Management Systems also need to be constantly updated to take into account ongoing research. This will require close and ongoing relationships between industry bodies and rural R&D corporations, as well as continuing investment into updating FMS programs. Management of methane remains a key challenge for rural R&D.

As previously stated, intensive agriculture has little scope to provide vegetation carbon offsets. However, intensive agriculture could be able to provide other offsets in terms of practice changes. These open up complex issues about the recognition of 'short-term' offsets, or the legal enforceability of commitments to change practices 'permanently'. Practices such as zero tillage for increased soil carbon storage, reducing nitrogen fertiliser use for nitrous oxide abatement, and reducing stocking rates in drier seasons for methane reduction, all have the potential to provide carbon offsets if the ETS recognises short-term offsets. This is a key challenge for the review team. QFF submits that the ETS needs to recognise short-term offsets (as does the Chicago Climate Exchange), where landholders give a binding undertaking to maintain a particular practice for a specified period. The offset obtained for general practices, at least in the early stages, should be based on general research (e.g. on the impact of zero tillage). Where there is an easily verifiable value (e.g. fertiliser use), this could be documented and accounted for.

Nitrogen fertiliser usage might be an early candidate for a specific offset measure. Intensive industries such as sugar cane are developing new best practices guidelines on a regional basis that recommend significantly lower application rates by aligning fertiliser application to plant growth. Similar best practice guidelines need to be developed for other industries, particularly horticulture. It would not be too large a step to include nitrogen fertiliser use as a possible voluntary offset arrangement in the early stages of the ETS.

This would require a detailed benchmarking study on current levels of fertiliser use (on a commodity and regional basis), followed by identified offsets for practice changes and application rates. A reduction in nitrogen fertiliser use is also sustainable with current best management practices and would be an immediate and permanent reduction re current nitrous oxide production, with minimal transaction costs.

The generation of renewable energy is another key potential contribution of agriculture. While most of this will be driven by demand off farm (e.g. ethanol, biodiesel, biogas, site selection for wind turbines), some could also be driven on farm. Government programs should identify and promote to scale plants which could promote on-farm energy generation which could be plugged back into the farm or sold back into the power grid. These could include:

a. Farm production of biodiesel for own use or possibly limited local sale. This would require changes to excise arrangements and regulatory arrangements.
b. Methane capture for power generation. Scale is a major issue, as few Australian intensive animal plants produce sufficient methane that can be captured for power. But, to scale issues could be further developed.
c. Solar/wind turbines.

Careful consideration needs to be given to national ethanol policy to ensure that an effective balance between food security and greenhouse gas reductions is developed. Such a policy might consider carefully whether the current market-based preference for grains-based ethanol over other, more expensive but more greenhouse gas-efficient ethanol sources (e.g. cellulose from cane trash, crop residues and potentially pastures) needs to be reviewed.

Mitigation policy options

Questions for consideration

- *Accepting existing practical limitations, is direct inclusion in an ETS the most appropriate mechanism for encouraging mitigation in the agriculture and forestry sectors?*
- *What policy mechanisms would be more appropriate for these sectors? How would these measures interact with an ETS covering other emitting sectors?*
- *What would be the economic impacts on the agriculture and forestry sectors of a domestic ETS covering stationary energy and transport?*

Economic theory and political practicality suggests that as much of the economy should be included in the ETS. However, the practicality of this needs to be considered. QFF is of the firm view that the tools do not yet exist to effectively monitor on-farm emissions in a precise and cost-effective way. As such, the agriculture sector cannot enter into the ETS fully in its first stages. In terms of design of the ETS – QFF agrees with the proposal that the application of agriculture should be phased in. Rather than considering agriculture to be sink or offset, the sector should be thought of as being an

active trading participant as the carbon footprint of the farm will need to be accounted (e.g. http://www.isr.qut.edu.au/tools/index.jsp) As with other entities needing certainty around what exactly is the carbon footprint, agriculture in the future will inevitably be the same. Within that, sinks or offsets would be seen more as an opportunity in a range of risks and opportunities that farmers will need to consider.

In terms of benefits and costs, the decision to enter into the ETS is a very different one for the intensive agriculture sector as opposed to the broadacre industries. Intensive farmers will have far fewer opportunities to provide vegetation carbon offsets, and as a result, for most intensive farmers, the ETS will represent a new net cost and regulatory burden with little scope for new income streams.

Having said that, some farmers will be in a position to offer vegetation carbon offsets, and such people should be able to voluntarily enter into the ETS. Whether such landholders should be required to provide a full carbon accounting for their operation to offer an offset is a key policy question. The broad approach suggested by the Chicago Carbon Exchange is for participants in the ETS to make certain commitments on their emissions status. QFF would submit that a batch of 'best practices' could be identified for each commodity sector for landholder wishing to enter into the ETS, which provide at the least that any benefits from providing vegetation carbon offsets are not cancelled out by other additional activity on the property.

As argued in the previous section, the key priority needs to be about improving information about greenhouse gas emissions, particularly methane, and identifying practical and commercially realistic practice changes to manage that. Research is also needed to develop most cost effective means of accounting for greenhouse gas emissions at farm scale. Such accounting also need to be able to fully account for any mitigation measures to ensure that landholder get full credit for improving practices. QFF is of the view that such developments are still some years away. In the meantime, the priority on farm should be on promoting best practices in industry Farm Management Systems that have the further benefit of reducing greenhouse gas emissions.

The inclusion of the stationary energy and transport sectors into the ETS will have a significant cost impact on agriculture. This will be particularly felt in the intensive agriculture sector, the majority of which is irrigated. Farms and irrigation schemes are heavy users of electricity, and a major increase in electricity costs will have significant consequences for farming, particularly for sugar and cotton. Intensive animal production also are heavy users of electricity for water cycling (e.g. prawnfarming and aquaculture), cooling (poultry meat), milking (dairy) and greenhouses (nursery production). Energy efficiency is a key challenge for the farming sector. According to ABARE, fuel prices as a farmers' input cost rose by 14% in 2003/4, 22% in 2004/5, and will rise by a further 20% in 2005.6. Fuel costs this year will be double what they were eight years, while farm revenues have risen by just a quarter.[5]

[5] ABARE *Australian Commodities* 2005

Farm fuel bills - 1998 - 2006

Year	1998/9	1999/0	2000/1	2001/2	2002/3	2003/4	2004/5	2005/6
Fuel cost $m	1250	1450	1671	1580	1520	1626	1765	2118
% total costs	5.1%	5.7%	6.3%	5.8%	5.5%	5.6%	5.9%	6.8%
% revenue	4.3%	5.0%	4.9%	4.0%	4.7%	4.4%	4.9%	5.9%

Energy efficiency modules have been included in industry FMS programs, but will need to be ramped up. Access to energy auditing information and advice for particular types of equipment and processes is also essential, and will need to be constantly updated. QFF, utilising a Federal grant, has initiated an energy efficiency research program utilising the National Centre for Engineering in Agriculture to assess farm operational energy inputs and develop appropriate tools. We would he happy to brief the review on progress with this program in mid 2008.

In summary, the policy measures for an agricultural response to mitigation should be:

a. Intensive agriculture should not be included in the ETS initially because of the high cost of calculating emissions with any degree of certainty with current knowledge. Intensive agriculture has little scope at this stage for providing carbon offsets, has had little growth in emissions, and has few practical measures yet identified to significantly reduce emissions (particularly of methane) and as such the cost of complying with the ETS at this stage cannot be justified.
b. Accelerate research on mitigation opportunities for agriculture with a view to developing practical best practices for inclusion in industry Farm Management Systems programs;
c. Develop a research program to improve the cost effective measurement of emissions from agriculture, particularly capable of capturing mitigation measures;
d. Allow landowners to offer carbon offsets on a voluntary basis, possibly with a commitment to adhere to identified commodity-specific best practices on the farm to minimise the carbon footprint;
e. Invest in major sector wide energy efficiency measures for inclusion in and support of industry FMS programs as a means of dealing with increased energy prices.

Providing opportunities

Questions for consideration

- *What are the opportunities available to the agriculture and forestry sectors as a result of mitigation policies?*
- *How should uptake of these opportunities be maximised?*
- *Do these opportunities create perverse outcomes and, if so, how should these be managed?*

The approach to vegetation based offsets and shorter-term practices based offsets has been discussed above. In this section, we wish to focus mostly on renewable energy options.

There are probably three primary contributions that Queensland agriculture can play in providing renewable energy:

a. Production for crops for biofuel (e.g. ethanol or biodiesel);
b. Production of biofuels (e.g. biodiesel)on farm for own use;
c. Provision of biomass for generation of electricity either on farm (e.g. methane capture) or off-farm (e.g. cogeneration in sugar mills).

In all three cases, public policy will play a key role.

Ethanol Policy: QFF supports the development of a commercially viable biofuels industry in Australia. Such an industry needs to be viable without longer term subsidies or artificial mandates, which have the potential to distort the market place. Further, development of biofuels policy needs to carefully consider the impact that the policy will have on broader food security issues. The distortions in world grains markets flowing on from US corn subsidies could have significant long term consequences for food prices and food security. Obviously, higher grains prices have a very significant impact on intensive animal industries (e.g. pork, poultry, dairy, beef feedlots) for which grain is a significant food stock. Given that Australia's grain harvest is highly variable dependent on climatic conditions, there is a strong case that insufficient attention has been paid to food security and price issues in the development of ethanol policy for Australia with the heavy reliance the industry currently puts on grains. The Federal Biofuels Taskforce also noted that if ethanol production was based on grain, this could cause an increase in grain prices in the short to medium term., increased feedstock costs for intensive animal production industries such as pork, poultry, dairy and feedlot cattle.[6] The Australian Dairyfarmers Federation warns that there have been several major shortages of feed grain in Australia, where the domestic price rose well above the world price, exacerbated due to Australia's strict quarantine rules on grain imports. The ADF argues that providing subsidies to grain-based ethanol production in Australia will create a longer term deed grain supply shortage and a permanent disadvantage for diary farms in the

[6] Biofuels Taskforce report p.9

international marketplace. [7] Modelling for Meat and Livestock Australia suggests that diverting 28 million tonnes of grain to ethanol production would have a major impact on prices and profits in animal industries[8] The grains ethanol production process produces a by-product of a high protein meal (distillers grain) suitable for use as an animal feed.. However, distillers grain while high in protein, is low in energy, making it less suitable as a food source for feedlot cattle.[9]

It is also worth noting that ethanol produced from grains has much lower greenhouse gas emissions reduction relative to petrol (17%) than ethanol produced from sugar (50%). Sugar industry analysis suggests ethanol from grain can be produced at around 65 cents per litre, ethanol from molasses at around 70 cents per litre and ethanol from low grade sugar streams at around 75-80 cents per litre. As ethanol from grains is cheaper to produce, investment is continuing to go into a less efficient (in terms of carbon mitigation) industry sector with flow-on effects for the entire food chain, than into sugar. The review should give consideration to modifying the excise rates on ethanol to reflect the greenhouse gas emissions of the feedstock. On this basis, the excise on grains-based ethanol might be 17% lower than for petrol, and sugar based ethanol 50% lower.

Ethanol production from cellulose could provide the breakthrough needed to make ethanol more cost competitive. Research commissioned by US State Governors from the Energy Information Agency suggests that producing ethanol from biomass (i.e. cellulose) has great potential, with a substantially cheaper feedstock and greater energy efficiency. However, to be commercially viable, further technological development of cellulose conversion technology is required to reduce the cost of the enzymes needed in the enzymatic hydrolysis of cellulose in the conversion process. There are some encouraging technological developments in the US which suggest that the current cost of production could be halved, [10] and may be cheaper than grains-based production on a cost per tonne of greenhouse gas basis within a few years.[11]

On farm production of biodiesel: Biodeisel generates even larger greenhouse gas reductions per energy than ethanol. The Biofuels Taskforce estimated the lifecycle reductions for biodiesels as 23% to 90% compared with straight diesel, depending on the fuel feedstock.[12] However, the production costs of biodiesel are such that is even further away from being economically viable than ethanol without substantial continuing subsidies or mandates. ABARE estimates that without subsidies, the estimated cost of producing biodiesel in new facilities using used cooking oil is 18c/L above,

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[7] Australian Dairy Farmers Federation submission to the Biofuels Taskforce p.3
[8] CIE *Impact of ethanol policies on Feedgrain users in Australia* August 2005
[9] Stockfeed Manufacturers Council of Australia submission to the Biofuels Taskforce p.6
[10] DiPardo J *"Outlook for Biomass Ethanol Production and Demand"* EIA Jan 2005 on www.ethanol_gec.org/infomration
[11] International Energy Agency/OECD, *Biofuels for Transport: An international perspective* (2004), p 68.
[12] Biofuels Report chapter 5

and using tallow is 24c/L above, the long-term energy equivalent benchmark price for biodiesel against petrol.[13] Nevertheless, there are substantial plans in place to increase biodiesel capacity in Australia from the current level of 15.5ML to over 500ML. But, the biodiesel industry faces some serious policy challenges to become established in Australia. A University of Western Australia information sheet describes these as:

> The oil companies appear to have successfully lobbied the Federal Government to hinder the progress of this industry in Australia: They have caused an excise to be imposed on biodiesel before the industry begins - natural gas has been excise free for the last 20 years to enable it to grab a sustainable share of the market place. They have introduced a licensing system that favors large corporations. They have written an Australian Standard that requires biodiesel to be a significantly better fuel than dinosaur diesel - which it easily meets. The standard requires a direct test of CTANE rating in a variable compression diesel engine - made only in Chicago, and at the time of writing the standard only approx. 24 existed on the planet and the only one in Australia was non-functional. Dinosaur diesel does not need to be directly tested in the standard whereas biodiesel must be.[14]

The NSW Farmers Association has pointed to the particular impediments in place for on-farm production of biodiesel, with a regulatory system designed around large fuel production rather than small-scale production. Excise duty must be paid on all fuel produced, but biodiesel is not included as an eligible fuel for agricultural activities, particularly for private use. If excess fuel is to be sold to neighbours, registration as a fuel supplier with the ATO is required. Mandatory testing of fuel (at $3000 a test) is needed The NSW Farmers Association contrasts this very rigid and restrictive approach with the United States, where no excise duty is payable on production of biodiesel for private use. Transportation requirements are also very onerous.[15]

Yet, farm scale biodiesel production could be of great benefit to farmers. A farm scale plant using canola developed by a Wimmera-based canola grower Steven Hobbs was developed for around $20,000 and able to produce biodiesel at around 62 to 78 cents per litres (ignoring the costs of canola seeds or the revenue from the canola meal, glycerol or other by-products produced)., rising to around 78-94 cents when the opportunity cost of canola is added in.[16] The Review should give consideration to pilot projects on onfarm biodiesel production, which could help improve the carbon footprint of farms as well as reducing Australia's reliance on imported diesel.

Biomass and electricity generation: The introduction of a 20% renewable energy target has great potential to accelerate investment in renewable energy, including energy generation based on biomass. There is considerable scope to further expand cogeneration from the State's sugar mills, and scope to explore other biomass opportunities. The investment into

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[13] Biofuels Report p.110
[14] University of Western Australia http://www.sustainability.fm.uwa.edu.au/
[15] NSW Farmers Association submission to Biofuels Taskforce 2005 p.9
[16] Ibid p.10-11

these mills will follow if the market is developed for the energy and the 20% MRET is crucial to that. The challenge is ensuring that the 20% renewable energy target remains for genuinely renewable energy. This would contrast with the Queensland Government's approach of including so called 'low emissions' technology in its State 10% renewable energy target as a means of 'providing an additional incentive for the uptake of clean coal technologies'. Such technologies are clearly not proven and until they are, should not be favoured over genuine renewable energy alternatives.

3.3 Practical considerations for including agriculture and forestry in an emissions trading scheme

Summary of the potential advantages and practical difficulties for the inclusion of agriculture and forestry in an emissions trading scheme

Potential advantages	Practical difficulties
Efficiency Inclusion of all sectors in a domestic ETS would enable the pursuit of greenhouse gas reductions at a lower overall cost. **Difficulty in applying traditional regulation techniques** The cost and value of mitigation options varies considerably between individual entities, and is therefore difficult to apply traditional regulatory measures. **Mitigation incentives** Market-based mechanisms provide incentives and flexibility for mitigation. **Increasing competition for land** A market mechanism could resolve the competition for land between forests, biofuels and food production. **Opportunities for landowners** Landowners could gain from participating in an ETS if it provides further opportunities for land management and access to the international carbon market. **Economies of scale** The cost and complexity of determining emissions reductions from individual projects as required by existing voluntary offsets schemes may discourage involvement. The development of verification and measurement rules as part of inclusion in an ETS could therefore increase overall mitigation.	**Knowledge gaps regarding mitigation capacity and cost** The costs of mitigation in agriculture are relatively unknown in an Australian context. If mitigation options are limited and costly, inclusion of agriculture and forestry in an ETS could increase the cost of mitigation for other sectors included in the scheme. **Capacity to administer** The ability of small individual landowners to meet requirements and actively participate in an ETS could be limited and/or administratively burdensome. **International consistency** Land-use, land-use change and forestry emissions and their accounting have been widely debated during the Kyoto process. Rules inconsistent with international processes could confuse the market and limit international trading. **Liability for landowners** If agriculture and forestry are included in an ETS, landowners will then become liable for emissions and ensuring the permanency of carbon sinks. **Sectoral diversity** The agriculture and forestry sectors cover a diverse range of production systems, entity size and location. Different groups will be impacted differently, which may add complexity to the design of an ETS.

Point of obligation

Potential design options include:

- *Involve groups of farmers, trade bodies or downstream wholesalers such as abattoirs or manufacturers;*
- *Establish brokerage bodies that specialise in the purchase of permits from small operators – such as the 'Offset Aggregators' under the CCX; and*
- *Make initial participation in the scheme (including liability for emissions) voluntary, encouraging involvement only from those that would benefit, or are willing to take the risk. This approach has been proposed by the New Zealand Government for land managers wishing to get credit for post-1989 afforestation*.

Questions for consideration

- *Do the economic efficiency gains from including small emitters in an ETS justify the costs of compliance?*
- *How could transaction costs be minimised?*
- *What should be the point of obligation for agriculture and forestry industries in an ETS?*
- *Should a threshold for liability be applied, and how should it be defined?*

It is our submission that the economic efficiency gains from small emitters in an ETS do not justify the costs of compliance. Any measurement of onfarm emissions on present knowledge is likely to be 'rough and ready', and the level of precision required to properly account for offsets would be a significant burden on either regulators or, more likely, landholders.

In terms of provision of offsets, it should be possible to develop fairly generic estimates of at least some classes which might be made available to landholders. Planting of trees is the obvious offset, and there is plenty of science already on how much carbon credits should be applied. Other farming practices might also be 'accreditted' with a value over time, e.g. zero tillage, nitrous fertiliser management etc. However, participation in offsets trading should be voluntary at least in the first stage of the ETS until measurement issues and mitigation practices are better understood.

QFF supports the development of offset aggregators as part of any design of the ETS. We have been involved in discussions with the FEX regarding inclusion of aggregators in the voluntary carbon market. However, the role of an aggregator should be as an agent for the landholder, who is ultimately responsible for the continued delivery of the offset (either by maintaining vegetation or continuing a practice).

In terms of thresholds, if a decision is made to include agriculture in the ETS, then QFF would support this being done in a phased process that has regard to both risk, opportunity and size of emissions. Risk should be related to growth in emissions. As much of agriculture has stable or falling emissions, the priority should be on those sectors where emissions are rising. Opportunity should be about whether there are clearly identified opportunities for mitigating emissions in any significant way. As research into mitigation of

both soil carbon and methane is still some years off developing commercially practicable practice changes, opportunity needs to be carefully weighed up. Finally size, is obviously an important issue as only larger landholders are likely to have the capacity or incentive to invest. However, if inclusion in the ETS results, as we expect it will, in significant addition costs for landholders, the decision about a 'size' threshold needs to be thought about carefully as it would place larger operators at a cost disadvantage versus smaller operators. Against this, of course, larger operators already enjoy a cost advantage due to economy of scale. Nevertheless, a range of factors would need to be considered.

Monitoring and verification of emissions and mitigation

Questions for consideration

- *What 'proxies' would be appropriate for the estimation of emissions in the agriculture and forestry sub-sectors?*
- *What systems are available that would allow for efficient and accurate monitoring of emissions at the operator level?*
- *What are the implications if the stringency of monitoring, reporting and verification requirements vary between sectors and sub-sectors?*

QFF is of the firm view that there are no systems available for the efficient and accurate monitoring of emissions at the operator level at anything resembling reasonable cost. As such, the implications of monitoring and reporting are almost certain to be very onerous for industry as a whole. QFF would support continuing research into monitoring of agricultural emissions, particularly at the operator level.

In terms of 'proxies', some proxies do exist. Inputs can be measured (e.g. fertiliser, diesel, electricity, water, vegetation) which can provide some information about emissions intensity. However, these do not touch greatly on the biggest source of emissions – methane – for which the only 'proxy' value is the number of stock. It would be perverse if the only way for farmers to reduce their emissions was to reduce production, particularly given that the world wide growth in demand for food is likely to continue to outstrip the growth of supply.

Sub-sectoral coverage

Questions for consideration

- *Should all agriculture and forestry sub-sectors be included in an ETS?*
- *What sub-sectors might be better suited for inclusion?*
- *How should economic distortions within the sectors be dealt with?*

As discussed above, if any consideration is given to including sub-sectors in the ETS, then this should be done by looking at risk and opportunity.

Phasing and timing

An option could be a transitional approach in order to allow testing of a range of implementation solutions without impacting on the main ETS. This could involve the following stages (LWA, 2007, DEFRA, 2006, Keogh, 2007):

- *Stage 1: Initial period of research and development, while participating in an ETS through the provision of offset credits. The high transaction costs of one-off accreditation for offset creation could disadvantage smaller entities.*
- *Stage 2: Development of a stand-alone, baseline-credit scheme, possibly with voluntary involvement to encourage adoption of best management practices. A stand-alone scheme would not necessarily require the same level of emissions accuracy as the main ETS.*
- *Stage 3: Full participation of agriculture and forestry in a cap-and-trade ETS, where the sectors will become liable for emissions as well as providing credits to the scheme, supported by research and experience gained in the earlier phases, and subject to comparable treatment by competitors in major markets for internationally tradeable farm products.*

Questions for consideration

- *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?*
- *What sort of transitional arrangements should be incorporated in the initial design?*

QFF would support a staged approach to inclusion of agriculture in the ETS. The Issues Paper has correctly identified the key pros and cons of inclusion in the ETS. Agriculture needs to be at the table as the rules of the ETS are developed from day one, with a view of eventual inclusion. However, that inclusion cannot happen until a cost effective and practical system of monitoring and accounting of emissions can be developed that can also recognise mitigation efforts at the individual property level. The phased inclusion of agriculture should also follow a risk and opportunities approach – the 'risk' of increasing emissions and the 'opportunity' for verifiable mitigation opportunities. On this basis, some sub-sectors might be included earlier. Some landholder might wish to voluntarily become part much earlier to capture offset opportunities, or even to be seen to be addressing the risk (e.g. for 'clean and green' marketing opportunities). The design of the ETS should be flexible enough to allow for this.

QFF would not favour a firm deadline of dates for the phasing in of agriculture into the ETS. The key trigger should be rather an acceptance by key stakeholders that research and knowledge has reached stage that has overcome the technical difficulties that currently exist.

3.4 Recognition of carbon sinks and offsets

Questions for consideration

- *What types of carbon sink and mitigation measures should be included as offsets or within an ETS? Are there practical and cost effective monitoring solutions available for these measures?*
- *How should positive incentives to reduce emissions or perverse incentives to increase emissions prior to inclusion in an ETS be managed?*
- *Should offset regimes recognised under an Australian ETS be limited to those that satisfy international carbon accounting protocols?*

In first instance, vegetation should be included in the ETS. There is sufficient science to demonstrate the carbon sequestration for planting of trees and retention of vegetation, particularly on broadacre scales. This should include vegetation both planted and not cleared since 1990. In addition, it should include thickening of vegetation, subject to appropriate verification. Vegetation should allow landholders with small plots to access offsets. The Landcare CarbonSmart offsets allow plots as small as 0.2 hectares, and this (and possibly smaller) should be allowed.

In second instance, farm practices that provide for mitigation should be allowed in the ETS. This should be subject to being supported by sufficient science to demonstrate what the carbon benefit of a particular practice change would be. The offset should be available for the period that the landholder commits to follow the practice. Practices should only be recognised as offsets if the science is sound. Offset values may need to be calculated on a commodity and a regional scale, and benchmarking studies to establish starting points might also be required.

Offsets might also be provided for specific carbon sequestration practices where the carbon benefit can be verified, such as bio-char sequestration, zero tillage, legume rotations, methane-reducing feed supplements, changes to pasture management and possibly later 'plant stone' carbon. The offset should follow the science, and it would be the practice rather than the emissions that would be measured. The emissions reduction can then only be 'assumed' based on the science. Of course, the difficulty with a 'practices' approach to offsets is that the offset is only available while the landowner continues the practice, and a binding commitment (e.g. for five years at a time) would be required.