

### BACKGROUND

In May 2009 the Macalister Demonstration Farm (MDF) made a successful application to the Australian Government for FarmReady Industry Grant funding to undertake the 'Carbon Ready Dairy Demonstration' project. The project will use the MDF as a case study to identify the source and size of carbon emissions generated by normal farm operations. This information will then be used to develop a Carbon Emissions Reduction Plan that includes strategies to minimise and offset carbon emissions and an analysis of the financial impact of the plan on the farm business. The Carbon Emissions Reduction Plan will be completed by October 2010 with a review in March 2012 against any changes in the 'rules' for carbon emissions.

A key to the project is to gather and interpret information in a practical way so that farmers can make informed decisions about their investment in carbon emissions reduction or offset. This is the first information sheet in a series which looks at the proposed Carbon Pollution Reduction Scheme (CPRS) and is largely made up of extracts from a range of references that have only been changed to allow the text to flow. Reference numbers in the text refer to the entire section back to the previous reference or heading.

This paper doesn't consider the impact of a changed climate on dairying, however further details of anticipated changes to climate for Gippsland can be found in *What does climate change mean for dairy in Gippsland* (Feb 08) produced by GippsDairy.

### THE KYOTO RULES

#### Greenhouse Gases

Australia, as a signatory to the Kyoto Protocol, will operate under the Kyoto rules until the end of 2012. New discussions at the Copenhagen round of talks at the end of 2009 will try and develop rules for the period beyond 2012. After Copenhagen this paper may need to be updated.

Under the Kyoto rules a number of greenhouse gases are identified:

- Carbon dioxide (CO<sub>2</sub>) produced by burning fossil fuels - power, heavy manufacturing and transport.
- Methane (CH<sub>4</sub>) generated from breakdown of waste in landfills and effluent; coal mining and ruminant digestion.
- Nitrous oxide (N<sub>2</sub>O) generated by the breakdown of nitrogen fertilizers in the soil.

- Sulphur hexafluoride (SF<sub>6</sub>) generated by the electronics and the power industry.
- Hydrofluorocarbons (HFCs) and Perfluorocarbons (PFCs) generated in industrial processes.<sup>(Ref 1)</sup>

Agricultural stakeholders encouraged the government to negotiate changes to the international rules or to implement a domestic scheme that is not consistent with Kyoto rules to allow for greater flexibility (eg inclusion of soil carbon). The government has confirmed that it will comply with any negotiated international rules<sup>(Ref 13, p 6-45)</sup> and all Kyoto gases will be covered by the CPRS.<sup>(Ref 13, p 6-4)</sup>

Carbon emissions are measured in carbon dioxide equivalents (CO<sub>2</sub>-eq) with the 'Global Warming Potential' of each gas measured against the impact of carbon dioxide. Carbon dioxide represents 1 CO<sub>2</sub>-eq, each unit of methane is 21 CO<sub>2</sub>-eq, each unit of nitrous oxide is 310 CO<sub>2</sub>-eq, each unit of SF<sub>6</sub> is 23,900 CO<sub>2</sub>-eq, each unit of HFC is 140 – 11,700 CO<sub>2</sub>-eq, and each unit of PFC is 500 – 9,200 CO<sub>2</sub>-eq.<sup>(Ref 13, p 12-84)</sup>

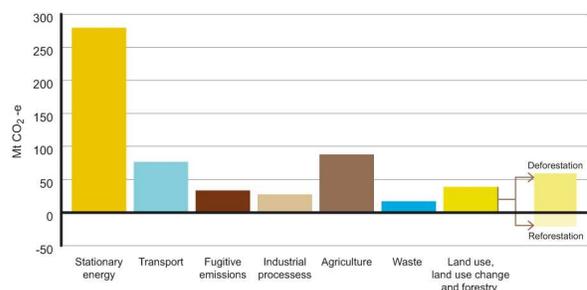
### Soil Carbon

Because soil carbon is not included under the Kyoto rules it will not be considered in this review.

### GREENHOUSE GAS EMISSIONS

Around 80% of global emissions are generated by 15 countries (EU is counted as one country).<sup>(Ref 13, p 12-84)</sup>

**Fig 1. Australia's Emissions Profile 2006**<sup>(Ref 13, p 6-3)</sup>



The top 1000 carbon emitters generate more than 25,000 tonnes CO<sub>2</sub>-eq/yr each which accounts for about 75% of Australia's emissions. This group of emitters is the initial target of the CPRS.<sup>(Ref 18)</sup>

Agriculture in Australia is the second largest source of greenhouse gases behind the burning of fossil fuels, generating 16% of Australia's carbon emissions (Fig 1). But it is responsible for 60% of Australia's methane emissions and 84% of nitrous oxide emissions.<sup>(Ref 1)</sup>

Livestock are responsible for 70% of agricultural emissions which is equivalent to 11% of total Australian carbon emissions. <sup>(Ref 4)</sup>

The main sources of carbon emissions in dairying are ruminant fermentation (65%), soils (cultivation) (12%), animal waste to pasture (5%), and effluent management (4%). <sup>(Ref 1)</sup>

### CARBON POLLUTION REDUCTION SCHEME (CPRS)

An emissions trading scheme controls the quantity of emissions through the issue of permits and leaves the price to be determined in the carbon market. (In contrast, a carbon tax controls the price of emission and leave the market to determine the quantity). <sup>(Ref 13, p 8-30)</sup>

Scheme obligations will apply to businesses with a facility that has direct emissions of 25,000 tonnes of CO<sub>2</sub>-eq. <sup>(Ref 13, p 6-8)</sup>

Coverage of an industry or business under the CPRS will create a demand for emission reduction technologies and practices. Over time this will bring forward new ways of producing goods and drive down the cost of these technologies. <sup>(Ref 13, p 6-6)</sup>

### The 'Cap and Trade' emissions trading scheme

The aim of the CPRS is to reduce carbon emissions by encouraging companies to invest in low carbon emission technology. The Government will set a carbon emissions cap and will issue tradable carbon pollution permits up to the level of that cap. Initially the number of permits will cover just those businesses drawn into the Scheme but the number of permits will be expanded as new sectors (like agriculture) or businesses are included. The number of permits issued will decline each year until the emissions target is met.

The cap sets a limit for emissions in each year but does not limit the emissions of any individual company. Companies will compete with each other to buy enough permits each year to cover their emissions. Permits will be auctioned and can be traded between companies so the market will set the price. The Government estimates that 70% of permits will be auctioned.

Companies will purchase permits if the cost of reducing emissions is higher than the cost of the permit. This means that the easiest, least expensive emission reduction measures will be done first. As the cost rises then the more expensive actions will become more attractive. Generally, these costs will be passed on to the consumer. <sup>(Ref 9)</sup>

Treasury analysis estimates a carbon permit price of \$23/t CO<sub>2</sub>-eq at the commencement of the scheme that will then move to \$35/t CO<sub>2</sub>-eq by 2020, and to \$115/t CO<sub>2</sub>-eq by 2050 when the emissions target will be met. <sup>(Ref 18)</sup>

Businesses in the Scheme will calculate their emissions in the previous year by October of each year and they must surrender one permit for each tonne of CO<sub>2</sub>-eq that they emitted in that last year. <sup>(Ref 9)</sup>

A financial penalty for non-compliance with the Scheme will be set at the average auction price for permits auctioned in the previous financial year, plus 10% for each permit that has not been surrendered. Even after the penalty, the business will still have to buy and surrender the required permits to meet the shortfall. The non-compliance will also be made public. <sup>(Ref 13, p 7-42)</sup>

The start of the CPRS has been deferred until July 1st 2011 and the price of permits has been fixed at \$10 for the first year. <sup>(Ref 7)</sup>

### Transition Arrangements

**Fuel tax Adjustment** - A fuel tax adjustment will be introduced at the beginning of the CPRS whereby there will be a 'cent for cent' reduction in fuel excise to compensate for any rise in fuel price due to the sale of carbon permits. Agriculture will be able to access this fuel tax adjustment for three years from the start of the Scheme. <sup>(Ref 10)</sup>

### Emission Intensive Trade Exposed Activities

Assistance to Emissions Intensive Trade Exposed (EITE) activities will be assessed on a business by business basis and is only for activities that are EITE - this may represent only a portion of the business. An EITE activity must involve a process of chemical or physical change to produce an output. Assistance will be available to existing or new businesses, and is directly linked to production and continuing production in Australia. <sup>(Ref 13, p 12-13)</sup>

Under the Scheme a business will be assessed as trade exposed if more than 10% of their product was traded offshore in any of the years 2004-05 to 2007-08. If the trade share is less than 10% then a business can apply as a special case to demonstrate a lack of capacity to pass through costs so that it can access assistance. <sup>(Ref 13, p 12-29)</sup>

EITE assistance will be reviewed every five years with five years notice given of any changes. EITE assistance will be maintained until equivalent emission reduction schemes are in place in competing marketplaces. <sup>(Ref 13, p 12-82, 85)</sup>

Assistance to emission intensive activities will be at two levels:

- 95 % of free permits for activities with an emission intensity above 2,000 tonnes CO<sub>2</sub>-eq/\$million revenue or 6,000 tonnes CO<sub>2</sub>-eq/\$m of value added;

- 60% of free permits for activities with an emission intensity between 1,000 and 1,999 tonnes CO<sub>2</sub>-eq/\$million revenue or 3,000 – 5,999 tonnes CO<sub>2</sub>-eq/\$million of value added.

Assistance in the form of free permits will be made at the beginning of the year based on the projected emissions of the EITE activity. <sup>(Ref 13, p 12-19, 20)</sup> EITE assistance rates will fall at a rate of 1.3%/year for both the 60% and 95% levels of assistance over the 11 years to 2020-21. <sup>(Ref 13, p 12-55)</sup>

If the CPRS is extended in 2015 to include agricultural emissions the beef, sheep, dairy, pigs and sugar cane sectors that are likely to be eligible for EITE assistance. <sup>(Ref 13, p 12-45)</sup> Dairying is likely to fall into the category for higher level assistance. Agricultural activities assessed as eligible for EITE assistance will receive assistance at the rates that apply at the time of their inclusion in the Scheme - in 2015 the initial 90% assistance level will have fallen to 84.4%. <sup>(Ref 12, p 320)</sup>

### Assistance to small and medium enterprises

The government has established the Climate Change Action Fund to target small and medium sized businesses that are not eligible for other assistance. Funds will be available from 2009-10 to 2013 for:

- Information - to provide advice on the operation of the Scheme and minimise its impact.
- Investment - Capital Allowance for small business and community organisations to adopt energy efficiencies from an eligible product list; Innovation grants for low emission technologies, processes and products.
- Structural adjustment - funds to assist workers, regions and communities.
- Coal Sector Adjustment. <sup>(Ref 13, p 18-11)</sup>

### Agriculture and the CPRS

The Government has not yet decided if agriculture will join the CPRS and has deferred a decision until 2013 for possible commencement from 2015. <sup>(Ref 5)</sup> Both non-agriculture stakeholders and the government support the inclusion of agriculture in the Scheme to broaden its base and so reduce the overall cost and the cost on those sectors that are included. <sup>(Ref 13, p 6-44)</sup>

For the purpose of the CPRS, agricultural emissions are limited to methane and nitrous oxide. Carbon emissions from fuel and electricity are counted against refinery and power generation emissions. <sup>(Ref 4)</sup>

The agriculture sector includes only a handful of farms that exceed 25,000 tonnes CO<sub>2</sub>-eq/yr so at this threshold most

agricultural emissions would not be covered by the Scheme. <sup>(Ref 13, p 6-44)</sup>

A significant implementation issue is yet to be resolved - where to place the point of obligation for emissions. Placing the obligation with the farmer comes with higher audit and compliance costs. Placing the obligation with the processor of product is simpler but provides no incentives for on-farm improvement. <sup>(Ref 15)</sup> If agriculture is included in the Scheme, most agriculture stakeholders had a preference for farm-level measurement to establish permit liabilities and to give maximum incentive to reduce emissions and, therefore, reduce the cost of the Scheme to production. <sup>(Ref 13, p 6-44)</sup> However, the government would prefer that obligations are picked up off-farm by processors to make assessment simple but, at the same time, ensuring that there are incentives in place for farmers to minimise emissions. <sup>(Ref 13, p 6-45)</sup>

The government has committed to continue analysis of the viability of including agriculture in the Scheme and continue negotiations with sector representatives around the impact of Scheme coverage on the sector, analysis to identify the most cost-effective point of obligation, and research to improve the accuracy of emissions estimation and reporting. <sup>(Ref 13, p 6-45, 46)</sup>

If the government decides in 2013 not to include agricultural emissions in the Scheme it will consider alternative ways of reducing agricultural emissions so that the agriculture sector makes a contribution to emission reduction at about the same cost as the other sectors that are included in the Scheme. That is, if the carbon price was \$25/tonne CO<sub>2</sub>-eq then the government may make it compulsory for agricultural businesses to invest in emission reduction technologies or practices to the value of about \$25/tonne CO<sub>2</sub>-eq. <sup>(Ref 13, p 6-45)</sup>

### Impact of the CPRS on the Farm Business

The introduction of the CPRS is likely to produce a one-off rise in CPI of around 1.1% based on a price of \$25/t CO<sub>2</sub>-eq with minimal impact for ongoing inflation. <sup>(Ref 8)</sup>

The introduction of the CPRS in 2011 will see the cost of electricity, farm chemicals and fertiliser rise - this is the Scheme's way of making more efficient use. <sup>(Ref 5)</sup>

ABARE modeling suggests that the CPRS will generate cost increases of 0.2 -0.5% for most farms when it is introduced. <sup>(Ref 5)</sup> The impact of the CPRS on the dairy industry at the commencement of the Scheme (and assuming a carbon price of \$20/t CO<sub>2</sub>-eq) will see a rise in feed costs by 1.5%, fertiliser and farm chemicals by 2% and electricity by 16%.

The cost of permits in the first year has been fixed at \$10/t CO<sub>2</sub>-eq. <sup>(Ref 14)</sup> The potential impact on farm gate prices is likely to be small with costs passed from processor to farmer as a price cut. The impact of this will be reduced by assistance provided in the Scheme for EITE activities. <sup>(Ref 5)</sup>

Some farm costs will increase in dairying when the Scheme is introduced - 0.5% for electricity; 1.1% increase for electricity, freight and fuel in 2015 if agriculture is not included in the Scheme, or 2.5% with EITE assistance if agriculture is included in the Scheme. This assumes that farms make no attempt to reduce emissions. <sup>(Ref 2, p16)</sup> This extends to increases in total farm production costs in 2020 of -1.2% and 6.7% in 2030 when compared to the 2004-07 average costs. The fall in costs in 2020 is because of anticipated reduced emissions intensity under EITE assistance and improved production efficiency. All agricultural industries are projected to grow between 2005 and 2030. <sup>(Ref 2, p23)</sup>

Dairy farm profits are predicted to drop by 11.6% by 2030 if agriculture participates in the Scheme but by only 0.7% if it doesn't participate. This assumes that agriculture receives no EITE assistance in 2030, pays \$92.60/tonne CO<sub>2</sub>-eq; makes no effort to reduce emissions; and farm gate prices increase by 2.7% while the net price of milk falls by 7.4% after the purchase of permits. <sup>(Ref 3, p19)</sup>

### SUMMARY

Whether you believe in global warming or not is no longer relevant. The Government has made a decision to implement the CPRS so good business management means that the impact of the scheme must be assessed on a business by business basis and measures put in place, at the right time, to minimise the impact of the Scheme on business viability. The structure of the Scheme makes it very clear that the best way to reduce the impact is to reduce carbon emissions. By adapting to climate change the economic impact for livestock industries can be halved when compared to doing nothing. <sup>(Ref 1)</sup>

#### Interesting Websites

[www.abareconomics.com.au](http://www.abareconomics.com.au)  
[www.climatechange.gov.au](http://www.climatechange.gov.au)  
[www.dairyingfortomorrow.com](http://www.dairyingfortomorrow.com)  
[www.dpi.vic.gov.au](http://www.dpi.vic.gov.au)  
[www.dse.vic.gov.au](http://www.dse.vic.gov.au)  
[www.farminstitute.org.au](http://www.farminstitute.org.au)

#### Ref.

#### No. Reference

- 1 ABARE, *Australian Commodities* (Sept 07)
- 2 ABARE, *Issues Insights Agriculture & the CPRS: Economic issues and implications* (Mar 09)
- 3 Australian Farm Institute, *Some Impacts on Agriculture of an Emissions Trading Scheme* (Feb 09)
- 4 Dept of Climate Change, Fact Sheet *Agriculture Emissions* (May 09)
- 5 Dept of Climate Change, Fact Sheet *Agriculture and the CPRS* (May 09)
- 6 Dept of Climate Change, Fact Sheet *Agriculture & the Voluntary Carbon Market* (May 09)
- 7 Dept of Climate Change, Fact Sheet *Deferral of Carbon Pollution Reduction Scheme* (May 09)
- 8 Dept of Climate Change, Fact Sheet *Economic Impacts of Tackling Climate Change* (Dec 08)
- 9 Dept of Climate Change, Fact Sheet *Emissions Trading - How it Works* (Dec 08)
- 10 Dept of Climate Change, Fact Sheet *Fuel Tax Adjustments* (Dec 08)
- 11 Dept of Climate Change, Fact Sheet *Reforestation on Farms* (May 09)
- 12 Dept of Climate Change, Green Paper *Carbon Pollution Reduction Scheme: Australia's Low Pollution Future* (July 08)
- 13 Dept of Climate Change, White Paper *Carbon Pollution Reduction Scheme: Australia's Low Pollution Future* (Dec 08)
- 14 Dept of Primary Industries (Vic), Issues Brief *Impact of Emissions Trading on Farm Costs* (Mar 09)
- 15 Dept of Primary Industries (Vic), Issue Brief 1 *Towards a Carbon Pollution Reduction Scheme* (Mar 09)
- 16 Dept of Primary Industries, Presentation by David Griffin (April 09)
- 17 Dept of Sustainability & Environment, *Climate Change in Victoria: 2008 Summary*
- 18 Dept of Treasury, *Australia's Low Pollution Future: The Economics of Climate Change Mitigation* (2008)

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