

Greenhouse emissions trading and the Northern Territory beef industry.

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While much uncertainty remains about future projections of climate change and the impact that human activity is having on the climate, governments are now sufficiently convinced of the future risk of adverse human-induced climate changes that they are prepared to take actions to reduce that risk. As some have pointed out, this decision by governments is a bit like the decision by home-owners, who each year religiously pay a fee to insure against the possibility their house might burn down. Most homeowners go through their entire life and never claim against that insurance, but they still pay the fee each year. In a similar fashion, governments are sufficiently convinced of the risk of human-induced climate change that they are prepared to pay an insurance fee to try and prevent the damage it might cause. That 'insurance fee' is the cost associated with implementing policies to reduce the rate of greenhouse emissions generated by human activity.

Australia's annual greenhouse emissions (based on internationally agreed greenhouse accounting methodologies) are amongst the highest in the world on a per person basis, largely because the nation essentially relies on coal to generate electricity. The transport costs associated with a small number of people living on a large landmass are also a big factor in emissions, as is Australian agriculture, as can be.

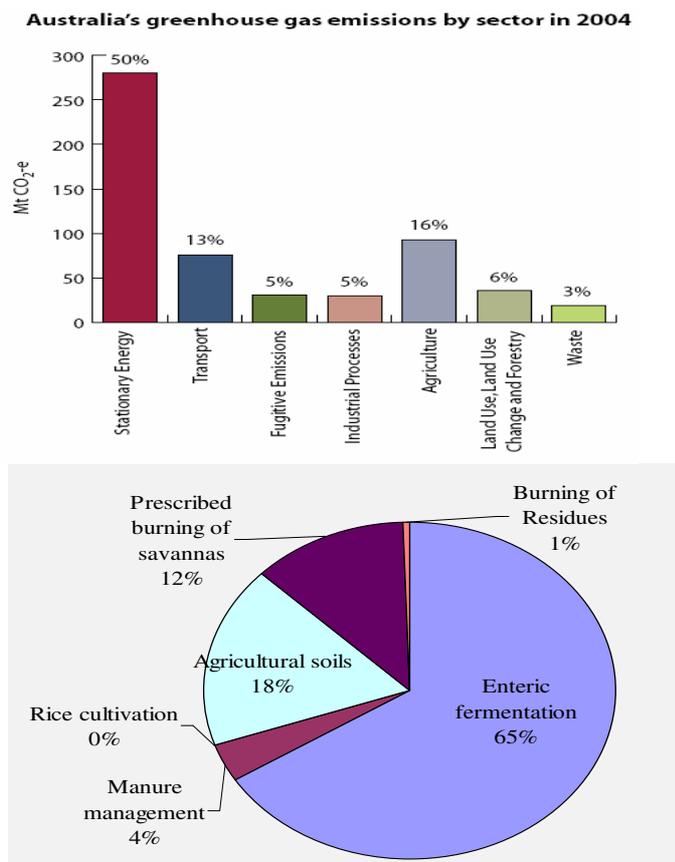


Figure 2. Agricultural greenhouse emissions.

Observed in figure one. Looking more closely at agricultural emissions, approximately two thirds arise from ruminant (sheep and cattle) digestion, with cattle accounting for approximately 50% of agricultural emissions and sheep accounting for another 15%. The nitrous oxide and methane released by burning pastures in northern Australia also accounts for another 10% of agricultural emissions.

Any thinking about reducing Australian emissions inevitably leads policymakers to focus on agriculture. At 3% of GDP and 16% of greenhouse emissions, it is pretty easy to work out that in simple economic terms, each tonne of emissions from agriculture contributes a lot less to national economic welfare than does a tonne of emissions from other sectors of the economy, therefore leads to the assumption that reducing agricultural emissions by a tonne will have less economic impact than reducing emissions in another sector.

The main focus of government efforts to reduce greenhouse emissions is a national greenhouse emissions trading scheme (ETS), which the Rudd government has proposed will be implemented in Australia by July, 2010. Descriptions of how an ETS works can become incredibly complex, but in reality the concept is quite simple. The major greenhouse emitters in the economy are identified, and these organisations are then required to produce an annual greenhouse activity statement, in which they use standard greenhouse accounting methodologies to calculate how many tonnes of greenhouse gases they produce annually. The government then enacts a law making it illegal for these organisations to release greenhouse gases without an equivalent volume of greenhouse emission permits. The government then adds together the total volume of greenhouse emissions produced by these organisations, and decides to cap the allowable level of emissions at some level beneath existing emissions. The government then makes available a volume of emission permits, which these organisations bid for, and can trade amongst themselves.

Those organisations required to participate (called covered organisations or ETS participants) then have a choice of either finding ways to reduce emissions, buying more permits from other organisations that have been able to reduce their emissions, or paying a fine based on the volume of emissions they released which they did not hold permits for. One further option (depending on the rules of the ETS) can be that ETS participants pay non-participants to carry out activities that are recognised as removing greenhouse gases from the atmosphere (such as planting trees).

Once implemented, an ETS will have the effect of making emission-related products more expensive, and for Australia that means electricity and fuel in particular. Given the fundamental role that fuel and electricity have in most economic activities, this inevitably means that many other goods and services will also be more expensive – especially in regional Australia.

Agricultural businesses are not likely to be required to be direct participants in the ETS during its initial stages, because of the uncertainties associated with measuring agricultural emissions, and the administrative difficulties associated with trying to administer annual greenhouse activity statements from 130,000 farm businesses. However, New Zealand has proposed that agricultural businesses there will become direct participants in the ETS from 2013, and Australian policymakers see some benefits in having both Australian and New Zealand farmers operating on a similar basis.

The fact that agricultural businesses will not initially be required to be ETS participants does not mean that agriculture has been ‘let off’, and farmers will not need to respond to the implementation of the ETS. Agricultural businesses will be impacted by higher energy and energy-related costs, and in a few years

also face the prospect of being required to be direct participants in the ETS and to find ways to reduce the greenhouse emissions arising from their businesses.

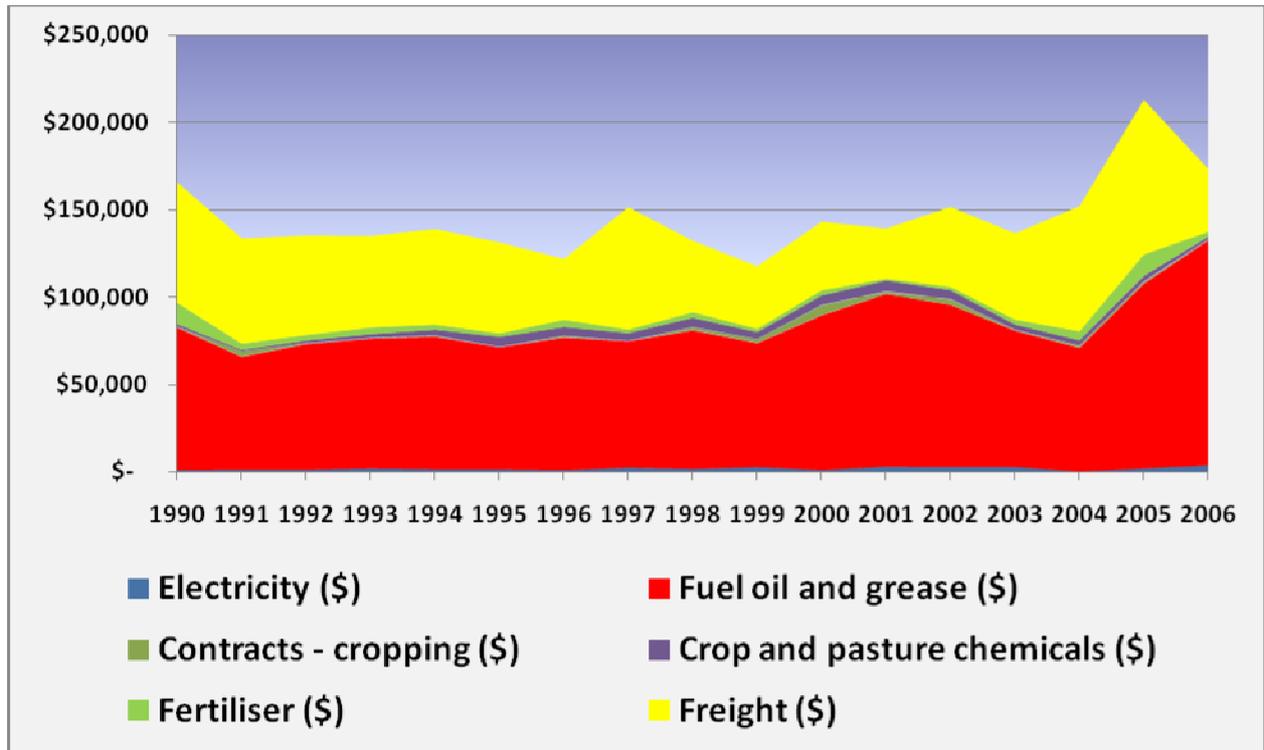


Figure 3. Energy and energy related farm inputs – Northern Territory beef enterprises.

Different sub-sectors of agriculture will be impacted in different ways by the ETS, both before and after agriculture is required to be a direct participant. As figure 3 highlights, ABARE farm surveys show that the average N.T. beef enterprise purchases approximately \$160,000 worth of energy and energy-dependent farm inputs each year, and the cost of all these will be increased as a result of the introduction of the ETS. Together, these inputs are approximately 15% of the average total inputs purchased by N.T. beef producers each year. A 20% increase in energy and energy related input costs would increase average beef N.T. beef total farm input costs by 3%, but would have a much bigger percentage impact on farm business profit, because of beef producers inability to pass on additional costs by demanding higher cattle prices.

While agriculture remains an ‘ETS uncovered sector’, N.T. beef producers are probably in a better situation than average broadacre farmers in the rest of Australia, who on average have 30% of annual farm inputs costs associated with energy or energy-dependant inputs. Crop producers, in particular, have up to 46% of their total input costs associated with energy or energy-dependent inputs, and will face significant increases in their operating costs as a result of the ETS.

If (or once) agriculture becomes an ETS covered sector, a different situation will emerge. Those sub-sectors of agriculture that are responsible for producing a relatively high level of greenhouse emissions will be more impacted by participating in an ETS which requires businesses to produce less and less emissions each year, or to pay for those emissions that are produced. This means that any farm businesses

with a heavy reliance on cattle or sheep production will be more affected by direct participation in the ETS. Figure 4 puts this issue in context, by providing a profile of the greenhouse emissions estimated to be produced by a N.T. beef farm running an average of 15,000 head of cattle on 50,000 hectares, and using diesel for electricity generation.

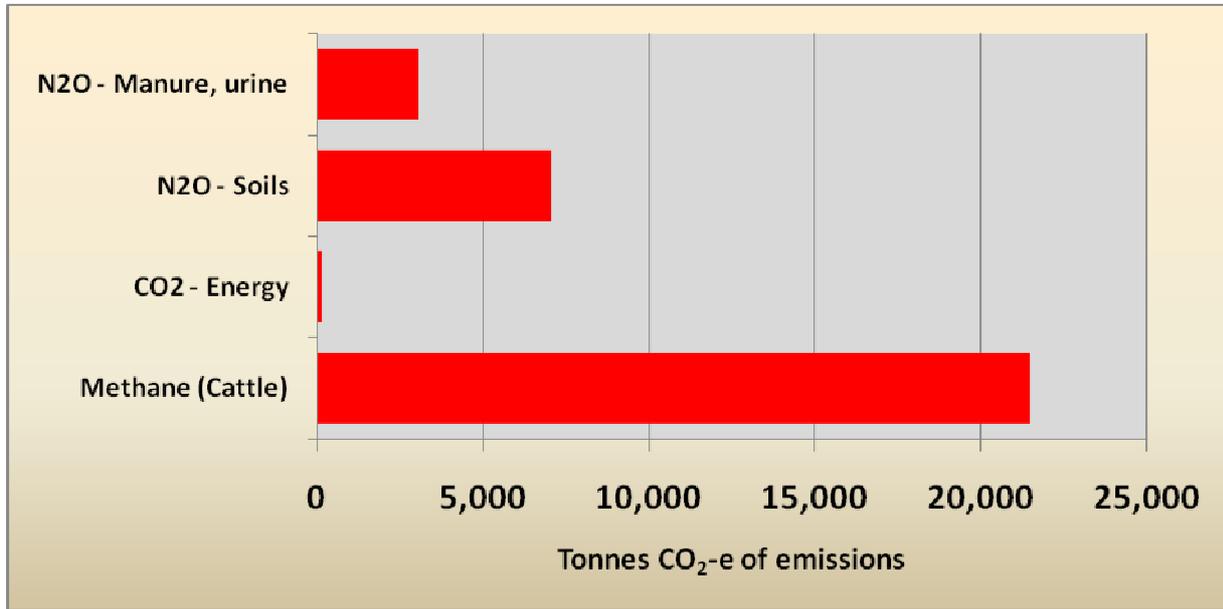
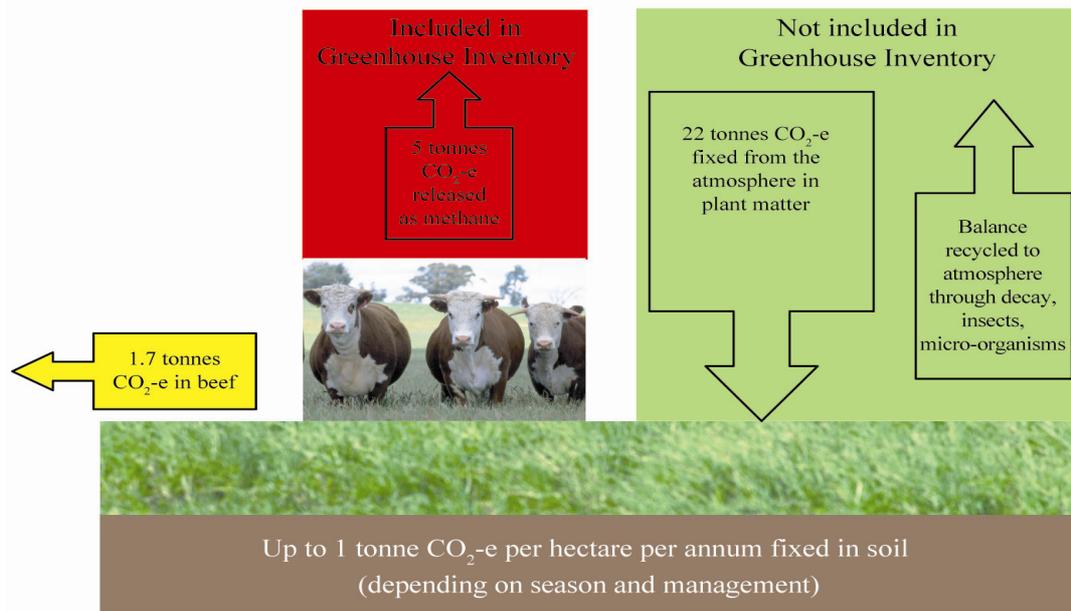


Figure 4. Greenhouse emission profile of an N.T. beef enterprise running 15,000 cattle.

This enterprise would be estimated to be producing around 34,000 tonnes of greenhouse emissions each year, with greenhouse emissions measures as tonnes of Carbon dioxide equivalents (CO₂-e). As can be observed, by far the biggest source of emissions is in the form of methane from cattle (cattle burps), with the number as high as it is due to the fact that a tonne of methane is regarded as resulting in 21 more times the amount of warming as a tonnes of carbon dioxide in the atmosphere. When the current price of a permit to release a tonne CO₂-e of greenhouse emissions is around \$A 40 in the european ETS, some idea is obtained of the potential cost should Australian beef producers be required to purchase emission permits for even a small proportion of their annual emissions.

The whole question of farm sector greenhouse emissions is made all the more complex because of the way international greenhouse accounting rules specify farm-sector emissions should be counted. This is best explained by reference to Box 1, which provides a somewhat simplistic picture of the annual cycling of carbon in a one hectare area of highly productive irrigated pasture in southern Australia. The figure shows the flows of carbon from the atmosphere to the pasture and soils, and through cattle grazing on that pasture. However, international greenhouse accounting rules dictate that only the methane and nitrous oxide produced by the cattle are counted, and none of the carbon dioxide or nitrogen fixed from the atmosphere each year in annual pasture growth is netted of the cattle emissions. As a result, the greenhouse account of a beef operation is essentially a gross emission rather than a net emission figure. Efforts are currently being made in international forums to have these accounting systems changed, but there is not a great deal of optimism that change can be achieved in the near future.

Box 1: The carbon cycle for one hectare of high rainfall pasture.



Annual yield of 10 tonnes of dry matter and 5 tonnes of roots per hectare, consisting of 40% elemental carbon. Stocked at 2.5 cows per hectare, with 70% pasture utilisation by cattle. Cattle weight gain of 1 kg per day, with beef estimated to contain 50% elemental carbon. Data is approximate.

A further point to consider in thinking about ways in which agriculture might respond to the introduction of the ETS is that agriculture is the only sector of the economy that is regarded as having reduced annual greenhouse emissions since 1990, as Table 1 shows. Were it not for a reduction of almost 40% in net agricultural emissions since 1990 (as a consequence of reduced sheep numbers and bans on land clearing by the NSW and Queensland governments) Australian emissions would be significantly above the national Kyoto Protocol target of limiting annual emissions to 108% of 1990 emission levels during the period 2008-2012. Unfortunately, agriculture appears unlikely to gain any credit for this emission reduction when the ETS commences, or in the future if agriculture becomes an ETS-covered sector.

TABLE 1: Australia's Direct Greenhouse Gas Emissions by economic sector 1990, 2006^(a)

	Emissions Mt CO ₂ -e		Change in emissions (%)
	1990	2006	1990 – 06
All Sectors	552.6	576.0	4.2%
Primary Industries	258.9	188.3	-27.3%
Agriculture, Forestry and Fishing	226.8	136.2	-39.9%
Mining	32.1	52.1	62.5%
Manufacturing	65.1	69.3	6.5%
Electricity, Gas and Water	136.3	204.5	50.0%
Services, Construction and Transport	48.9	59.5	21.5%
Residential	43.5	54.5	25.2%

While the introduction of an ETS will present many challenges for Australian agriculture, it may also present some opportunities. In situations where ETS-covered businesses cannot easily reduce emissions, they can opt to pay non-participating businesses to carry out actions that 'offset' emissions by removing greenhouse gases permanently from the atmosphere. Tree plantations are the prime example of this. The potential exists that those farm businesses that have the potential to establish tree plantations of areas of land may be able to generate revenue from these. A high yielding plantation may sequester upwards of 20 tonnes CO₂-e of greenhouse gases per annum, and at rates of \$20 - \$40 per tonne, this could provide an important source of farm income, or at least neutralize some of the added new costs.

In conclusion, the introduction of an ETS in Australia will herald major changes, and present considerable challenges and some opportunities for Australian farmers. Being fully informed of developments and actively considering what those developments might mean for individual farm businesses seem the best way to be prepared for these developments, and to minimise the risks they pose for farm businesses.