

## **LMS Submission to the Garnaut Climate Change Review – Emission Trading Scheme Discussion Paper (March 2008)**

### **Introduction**

LMS is an Australian owned company with over twenty five years experience in successful landfill gas to energy projects. LMS is a recognised leader in landfill gas management, renewable energy and carbon credit trading, employing unique processes and technologies developed in Australia.

This submission contains LMS's view of the proposed Emission Trading Scheme with particular emphasis on the Waste Sector as it applies to the landfill gas industry.

It should be noted that the structure of waste industry relating to landfill gas projects is such that a third party landfill gas expert is given the rights to the landfill gas emanating from the site, and thus are engaged to control and utilise the gas produced. This is an important fact in that the expertise specifically relating to landfill gas is generally held outside of the waste industry itself.

It is evident that the waste industry employs experts like LMS to control and manage their landfill gas as well as build, own and operate the related energy facilities. LMS therefore has considerable expertise in gas management and experience with existing carbon and renewable energy schemes such as the Greenhouse Friendly Scheme, NSW GGAS and MRET.

The emissions from this sector have reduced over the last ten years mainly due to the efforts of companies like LMS and emissions from well run landfills are now minimal. The US EPA (1998) calculated that with a 75% collection efficiency and where electricity generation from landfill gas replaces fossil fuels, it is possible to reduce the net greenhouse gas emissions from landfilled municipal waste by as much as 92 per cent.

The information provided in this submission is based on LMS's knowledge, experience and on-going investigations into international trading schemes as it pertains to landfill gas as a component of the waste sector.

### **Section 2.3 Intrinsic Design Features of an ETS**

#### **Page 16 - Inter-temporality: banking and borrowing**

Experience in the Greenhouse Friendly Program has shown that restricting permits in terms of their vintage is not necessary and can cause issues in relation to hoarding and lending.

Initially under the Greenhouse Friendly program permits were identified by a specific project and a vintage, and were subsequently purchased and offset against a liability supposedly occurring in the same vintage period. This was found to be unnecessary and later abandoned.

Restricting the time use of permits will also cause difficulties if borrowing allows parties to use permits from the future to meet current obligations, particularly if the scheme is subject to future intrinsic changes that may invalidate future permits.

### **Section 2.5 Exogenous Factors Affecting the Implementation of an Australian ETS**

#### **Page 19 - Scientific and Technological Uncertainties**

The measurement of emissions produced in the waste sector cannot effectively be "measured and verified at reasonable cost and with reasonable accuracy".

The majority of waste sector emissions (86.5%) (DEH, 2007) come from solid waste disposal on land. The most widely accepted method of estimating total emissions produced at a landfill site comes from a calculation utilising the First Order Decay Model (IPCC Tier 2 FOD Model). Many companies use this model which estimates the likely quantity and quality of gas to be produced at a landfill site over time. However it is fraught with uncertainty and is, at best, a rough guide.

It is impossible to determine exactly the amount of true putrescible waste entering a waste area, and the half-life of the organisms contained within the waste stream. The breakdown of waste is influenced by many external factors such as surrounding strata, rainfall and subsequent absorption, ambient temperature, atmospheric pressure, treatment of waste prior to and post disposal, and many others.

Therefore whilst adoption of the First Order Decay Model is widely accepted within the Landfill Gas Industry internationally, it is the inputs to the model which can widely affect the results. As no landfill site, or waste input can ever be exactly the same, the inputs into these forecast models can never be the exactly the same, thus making it impossible for any measurement of landfill emissions to be considered even remotely accurate.

A paper by Raffaello (et al) entitled *Modeling Landfill Gas Production, (1996)* tables the varying landfill gas yields that can be reported using different modeling techniques. The landfill gas yields reported as m<sup>3</sup>/ton of municipal solid waste vary from as low as 20m<sup>3</sup> through to 500m<sup>3</sup> highlighting the significant uncertainties that can be associated with desk top modeling of gas production.

It is possible to install gas extraction systems into landfills to capture gas being produced at the site. If such a gas extraction system is installed at a landfill site, the quantity and quality of the gas that is captured and extracted from that site can be measured reasonably accurately. But it is the gas that is not captured that is the problem.

A landfill is effectively a living organism that produces different amounts of gas on different days, no one can be sure exactly how much gas is being produced and therefore no one can be sure exactly what percentage is being captured. Gas escapes through the surrounding strata, the capping material and open areas on the site making it impossible to accurately measure the emissions generated at the source.

The only way to estimate the fugitive emissions from a site with a gas extraction system is to compare the captured gas to the theoretical production from a FOD model which, in light of the above, could not be considered measuring and verifying with a reasonable accuracy.

### **Section 3.4 To Whom Will the ETS Apply?**

#### **Page 27 - Coverage**

As noted above, it is not possible to accurately measure emissions from landfills. This has been attempted previously in situations where commercial decisions have been made regarding investment in power generation facilities to utilise gas from landfill sites purely based on these desk top models with disastrous outcomes. This is fraught with danger and history has shown that these models cannot be relied upon for commercial decision-making and therefore, one would assume, emissions projections under an ETS.

The calculation of emissions from waste is anything but an exact science. This difficulty in measurement is why waste has not been included in other emissions trading schemes around the world. It is not included in the EU ETS and is not slated to be included in the post 2012 commitments. The EC report into the *Inclusion of Additional Activities and Gases into the EU-Emissions Trading Scheme (2006)* states regarding landfills "Monitorability is low, mainly due to the high uncertainty in emission determination". It was also recommended that further assessment and consultation be undertaken before inclusion by the Prime Ministers Task Group on Emissions Trading Report (2007) and the National Emissions Trading Taskforce (2008).

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There are many naturally occurring events that can affect both the production of landfill gas and the ability to recover the maximum amount generated. As a covered sector, the party at the point of obligation would be at the mercy of these naturally occurring conditions with fluctuating generation and recovery rates an expected part of the process. If waste was not a covered sector, these sites could create offsets calculated on actual methane destruction which can be reasonably accurately measured.

The inclusion of waste as a covered sector will also remove the commercial incentive to generate electricity from the gas that can be captured and measured. An increase in electricity prices of the value of one permit would not compensate for the loss of multiple offsets currently gained for the destruction of methane, especially when the extremely high operational costs of this type of equipment are taken into consideration. The NSW GGAS has driven development of power generation facilities at small landfill sites and this will now be lost without NGAC or offset incentive and a valuable resource wasted.

If waste is included as a covered sector and landfills must estimate their emissions, safety concerns may arise as over extraction of landfill gas at some sites in an effort to meet inaccurately estimated gas production rates can be extremely dangerous, with the potential for oxygen to be drawn into the landfill, creating explosive and exothermic conditions. Conversely, inaccurately estimated production rates could cause a site to under extract areas allowing the gas to escape which is not only a greenhouse issue but a serious health and safety issue.

Most of the emissions from solid waste disposal in Australia that are not captured come from small un-engineered landfills without gas extraction infrastructure. These small sites are mostly in regions with small populations and therefore are likely to emit less than the 25,000 tonne reporting threshold. Therefore by including waste in the ETS these emissions will not be captured and there will be no incentive through the creation of offsets to drive their capture by the private sector. Even at sites that are above this threshold, most of which are owned by Councils, without a commercial incentive from offsets the burden of gas capture and disposal, will transfer to rate payers rather than private enterprise.

A paper published by the European Federation of Waste Management and Environmental Services (*undated*), discusses specifically, the incentives for the EU-ETS to include waste management, and conversely whether there is any incentive for waste management to be included in the EU-ETS. The paper references the LETS Update Report (*Environment Agency, 2006*) which provides a shortlist of criteria for assessing whether a sector should be included or not in the EU-ETS.

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These were:

1. The sector is regulated under other regimes
2. The Sector contributes significantly to CO2 emissions reductions (more than 5%)
3. The sector does not allow an exact monitoring of emissions. (Uncertainty of more than 12.5%)
4. Technologies to reduce emissions are available.

These criteria are discussed below in relation to the waste sector being included in the Australian ETS.

1. The Australian waste sector is regulated under state based Environment Protection Agencies. The Productivity Commission (2006) notes "*Over the past few decades, landfill regulation has tightened considerably.*"
2. The waste sector already contributes significantly to greenhouse emission reductions, and is one of only two sectors which experienced a reduction in emissions in the 2005 National Greenhouse Inventory (DEH, 2007). Net 2005 emissions from the waste sector have reduced by approximately 6.9% since 1990. Waste contributes less than 2.7 % of total greenhouse gas emissions (DEH, 2006).
3. Whilst emissions from waste can be roughly estimated at a reasonable cost, the resultant data is highly variable. Measurement of captured gas is generally only within 5% due to instrument inaccuracies therefore it is highly unlikely that modeling estimates would be anywhere near 12.5%.
4. Technologies to reduce emissions are readily available and are already employed at major sites therefore the potential for significant greenhouse reduction in the waste sector is questionable. The DEH (2005) estimated that up to 75% of all landfills servicing major urban areas and capital cities already use gas capture technologies.

The general conclusion therefore is that inclusion of the waste sector in the ETS would not significantly strengthen reduction of greenhouse gases.

The eligibility dates as briefly discussed in box 3-2 should have consideration of existing schemes such as Department of Climate Change, Greenhouse Friendly and NSW GGAS. Projects eligible under these schemes should not be penalised under the ETS because of early action to abate greenhouse gas emissions and the lack of action by the previous federal government.

LMS have always openly advocated the reduction of greenhouse gas emissions in the development of our projects prior to the invention or implementation of any of the trading schemes in Australia or internationally. We therefore do not believe that as a company, our projects should be treated any differently to new projects with regard to eligibility dates.

### **Page 31 - Point of Obligation**

The Paper suggests that if emissions from waste are covered at source, then it may be appropriate to apply a threshold. As noted previously there is no way to accurately measure the total emissions from a landfill. Therefore, how does a site accurately determine if they are over the threshold. Emissions that are captured can be measured but the only way to capture and measure is with a high cost installation of gas collection systems in landfill sites, and it would be fair to say that these would not be installed purely for the collection of data in relation to emissions.

### **Section 3.6 International Links**

LMS feel that it is imperative to link an Australian ETS with international schemes to ensure the lowest cost option and a variety in reduction options is available. However consideration should also be given to Australia imposing a cap on the purchase of international offsets so that the market is not at risk of flooding from cheaper international credits, driving Australian prices down.

In order to link with international schemes the Australian scheme must be compatible and based on similar assumptions. Waste is not included in the EU ETS and is not scheduled to be included in the post 2012 commitment period it is also not included in the US Regional Greenhouse Gas Initiative, therefore inclusion in the Australian ETS would create inconsistencies between schemes and complexities in linkages.

### **Section 3.9 Governance**

#### **Page 40 – Institutional Arrangements**

With our past experience in various Australian schemes such as Greenhouse Friendly, GGAS, MRET and Green Power as well as the electricity industry NEMMCO. We strongly agree that an independent authority be set up to administer the scheme, such has been the case with the Office of the Renewable Energy Regulator.

### **Section 5.2 The Case of Stationary Energy**

#### **Page 50 - Interaction with the Mandatory Renewable Energy Target (MRET)**

MRET has been essential to the development of renewable energy in Australia and the related industry which would not exist without it. Stationary energy is the biggest polluting sector and long term energy solutions are required. Without the incentive provided by MRET it is likely stationary generators would purchase cheaper offsets (or permits) rather than invest in relatively expensive renewable energy sources. This may reduce emissions elsewhere at a short term lower cost but it does not provide a long term solution to our energy needs.

By the time the financial incentive provided by the ETS is large enough to drive investment in renewable technologies it is likely that it will be too late to develop them and that the renewable industry in Australia will be decimated, leaving Australia lagging the world.

The Renewable Obligation Scheme in the UK seems to coexist with the EU ETS therefore there should be no reason the MRET scheme can not co exist with an Australian ETS.

### **Section 5.5 Compensation for changes in income distribution**

#### **Page 54 – Compensation to Non-Traded Sectors**

We feel that there would be a strong case for compensation for companies in an industry such as ours if under a new ETS returns were significantly affected, through a loss of income from existing schemes such as Greenhouse Friendly and GGAS. Small companies that have invested heavily and built assets based on existing schemes, that require a long term payback, should not be financially disadvantaged by any new scheme.

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