

17 April 2008  
Project No. 02187417

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

Attention: Submissions

Dear Sir/Madam,

**Subject: Comments on the ETS report concerning landfill emissions**

We are writing about inclusion of the waste management industry in the forthcoming emissions trading scheme (ETS). URS is one of the largest environmental consultancies in the world and has a very large waste management practice. The Australian practice is based in Melbourne and comprises a team of more than 50 technical staff, many of whom are recognised professionally internationally and practice widely around the world. We are strong supporters of both the ETS and the inclusion of waste management in the scheme. In fact, we support the management of resource systems very strongly, in general, and an iterative approach to improvements as levels of knowledge increase.

While we are keen to see the waste management industry included in the ETS, we are concerned that the application method should be based on rigorous and relatively accurate measurement, at least for the first few years. The systems that are currently available and in use for measuring or determining landfill gas emissions from landfills, etc, are crude at best. Because of this, they do not offer any basis for improvement and so cannot provide the drive that is the whole purpose of the ETS. If ETS policy is to drive improvements, we need a modelling system to help.

We believe, therefore, that the waste management industry should be phased into the scheme rather than being pushed into it directly in 2010. If the scheme is to work properly in driving the industry forward to higher goals and better levels of achievement, there is an urgent need to develop an Australian model to suit the variable conditions – different waste mixes and proportions, etc, as well as meteorological variations – found across the country. It is unwise to try to use international rules of thumb in our diverse and rather different circumstances here.

Current landfill gas emission models are unsatisfactory. Some seem to be better than others in the specific conditions for which they were designed and against which they were first calibrated. None, however, offer satisfactory, universal coverage, despite the

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claims of their proponents. In fact, most seem to show quite significant variations between site predictions even well within the boundaries of the areas for which they were developed. This includes the current IPCC model, which is being touted as a good potential base for all others.

The cause of the problem outlined above is that understanding of the factors affecting gross gas yield, and long-term variations in gas generation and emission rates is limited. It is well known that a large number of factors affect yield rates, gas composition, etc, but the mechanisms are often not clear. Recent work in Holland provides a good example of current problems. A study was carried out at a site where actual landfill gas emissions could be measured to an accuracy of about 10 per cent. This showed that the results from a set of seven mathematical models varied very significantly from the true emission rates. The models used were supplied as standard issue by regulators from a number of countries including Britain, France, Holland and the USA, and the IPCC model was also included in the trial. The results from the models varied by a factor of more than 20 X, from about 40 to more than 800 per cent of the (annualised) measured emission rate.

The work was extended from the initial site and the same models were used to estimate annual emissions from two others, for which good input data were available. The results were compared again between the models in the set but no field data were available in this case for even basic calibration. Comparison of the modelling outcomes showed that the distribution of results was random. In other words, the models appeared in a different order for each site when they were listed in order of the size of the annual emissions estimates that they produced. The variation range for the additional sites was smaller than that in the set calibrated against field data, but was still in the order of 1000% with the most probable value – determined from field measurements – lying significantly below the mean and median estimates. None of the models appeared to produce high, moderate or low results with any consistency.

The sites to which the tests applied were all real landfills in Holland, operated according to the regulations applying there. It must be concluded, therefore, that the models available are not suitable for determining landfill gas emission rates, in their current forms. The results that they produce are too inconsistent to be of any value and it is clear that they could not be used validly as the basis of an emissions trading scheme.

It is not clear why the models produced such different results, especially as several suppliers claimed that their models were based on the IPCC model. It is possible that each model had been adjusted to suit local conditions – climate, waste composition, regulatory requirements, etc. It is thought unlikely, however, that that is the only reason why the results were so different. It is very clear that there is a great need for further research that will lead to development of a reasonably accurate system for measurement and modelling of landfill gas emissions.

We recommend very strongly, in the light of the above, that the entry of the Australian waste management industry to the forthcoming emissions trading scheme is delayed for five years from scheme start up. We believe, though, that the delay should be contingent

on the development of landfill gas emission monitoring and modelling schemes suited to Australian conditions. The development process should comprise three main stages –

<b>Stage</b>	<b>Proposed R&amp;D programme</b>	<b>Possible timescale (months)</b>
<b>1</b>	Assessment of gas monitoring techniques, including field trials	6 to 12
<b>2</b>	Development and calibration of a suitable emissions model using field measurements obtained under known conditions at Australian landfill sites	
<b>3</b>	Operation and recalibration of the model to improve its performance, using new field data from new sites as well as the original ones	about 48

In conclusion, we agree very strongly with the view expressed in the report – final paragraph on page 27 – that “... there must be a reliable and accurate way to monitor, measure or estimate, and verify emissions from that sector ...”. We disagree equally strongly, on the other hand, with the statement at the top of page 29 that “Emissions from ... waste processes ... can be accurately measured or estimated at reasonable cost ...”. We do not believe this to be true in any way in relation to emissions from landfills, etc.

URS will be very happy to provide any help or assistance that might be useful with respect to development of the ETS. You might like to know, in that context, that the company has been appointed to the DCC emissions trading scheme panel.

Yours faithfully,  
**URS AUSTRALIA PTY LTD**

Professor J B Joseph  
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