Writing plain English science into legislation; or Compost Eats Methane

By Dr Su Wild-River, blog post from 2014, while Visiting Fellow, ANU Centre for the Public Awareness of Science.

Both legislators and scientists can struggle to communicate our work effectively in plain English. How much harder is it when we try to encapsulate science in a law? I'm facing this challenge at the moment, drafting a Carbon Farming Initiative methodology which if accepted, will form a regulation under the *Carbon Credits (Carbon Farming Initiative) Act 2011*.

The Carbon Farming Initiative (CFI) was introduced by Australia's previous Labor Government, and is one element of Australia's climate change mitigation framework that is supported by the current Coalition government. The program allows farmers and land managers to earn carbon credits for reducing or avoiding greenhouse gas emissions. CFI methodologies establish the rules for calculating credits confirming that they are genuine, permanent and additional to business as usual. To achieve this, the methodologies must be clear, unambiguous, complete and precise.

The methodology I'm working on is called *Passive Landfill Gas Drainage and Biofiltration*. In plain English, this means putting compost on landfills, because compost eats methane.

This methodology is in part a eulogy to much-loved environmental professional Mark Ricketts who died suddenly in 2011. Shortly before his death, Mark was advising me and my students on a project to estimate the carbon emissions and reductions from landfills when he told me to consider compost, and then earned giggles with stories of the insatiable hunger of compost greeblies and the yumminess of smelly gas.

I had previously worked alongside Mark while he was drafting the Queensland Environmental Protection Act 1994. I watched his optimistic daily trips to the parliamentary draftsman and his exasperated return to our office as he tirelessly negotiated for each sentence to be as simple and readable as possible. The result of his work is a plain English law that encapsulates the precautionary principle, ecologically sustainable development and other complex concepts based in science.

Drawing inspiration from Mark, my team's CFI proposal was to design a simple, practical method which used robust science, while being easily understood by the hundreds of operators of small local landfills across Australia. Many of these good folk lack the time and capacity to read complicated laws, engineering equations or to establish scientific procedures for their monitoring and evaluation. But they can pick a winner and follow procedures.

Our methodology needs to be consistent with all related national and international methods, so I have read and reviewed hundreds of scientific papers on compost and landfills and the calculation of carbon emission reductions. Most emission reduction methodologies explain themselves through symbols and equations with the most relevant one having five solid pages of such equations, interspersed by just a few sentences for those of us without maths as a first language (pp2-6). Here's an example:

$$E_{CH4,bottom} = \frac{16}{12} * 365 * 10^{-6} * \sum_{i} F_{CH4,bottom,i} * A_i \quad \textbf{(3)}$$

Where:

$E_{CH4,bottom}$	Calculated total methane emissions of the SWDS under the MOL (before oxidation) as annual emission value based on one sampling campaign (tCH_4/a)
$F_{CH4,bottom,i}$	Calculated methane emission flux of the SWDS under the MOL (before oxidation) in zone i ($g\ C.m^{-2}.d^{-1}$)
A_i	Area of zone i (m^2)
i	Number of SWDS zones which are covered with MOL

In contrast, our equations look like this:

Net greenhouse gas abatement = quantity of methane that is oxidised by the biofilter – baseline emissions – project emissions.

Other strategies for keeping it simple include minimising the number of measurements and using simple, cheap and readily available equipment.

So far progress is good, and our focus on practicality and clarity is well received by the government and stakeholders alike. It was hugely satisfying when the non-technical member of our Technical Working Group smiled saying he found our draft methodology very readable.

Assuming the methodology gets approved, the next step will be to find project proponents. Unfortunately, this step is less likely to succeed. Australia's initial carbon credit value of $23 per tonne meant that projects could have pay-backs in under seven years, and reap annual profits thereafter. A direct action approach delivering a carbon price of – say $8 would take over 50 years to pay back. The most likely outlook is an elegant methodology that will fail to feed any compost.

Am I the only one disappointed?