To whom it may concern, please accept this submission as a comment on the proposed Clean Energy Bill 2011.

The Clean Energy Bill 2011, in *Part 3 Division 2 Section 31* specifically *excludes*, from the operation of a facility: hydrofluorocarbons; sulfur hexafluoride; perfluorocarbons - the last one only applying if attributable to aluminium production. These emissions have global warming potentials (GWP), relative to atmospheric CO2 (their CO2-equivalent 'greenhouse' effect), as follows, respectively: 140 to 14,800, depending on the type of hydrofluorocarbon; 23,900 for sulfur hexafluoride; a range of 6,500 to 9,000 for the various perfluorocarbons.

It has been estimated that by the year 2050 hydrofluorocarbons (HFCs) could account for approximately 10% to 20% of greenhouse gas heating, a result of increasing demand for air conditioning and refrigeration. For instance, HFC 23, used in domestic air conditioners, is a very powerful greenhouse gas with a GWP 14,800 times more potent than CO2. (*Reference: Velders, G., Netherlands Environmental Assessment Agency*).

About 30% of HFC coolants leak from air conditioners and refrigeration units each year meaning that HFC production keeps on rising to replace loses from existing units and in the manufacture of new units. In 2005 production of HFCs was approximately 280,000 tons (GWP equivalent to 500 million tons of CO2); it is estimated to rise to 672,000 tons in 2015 (GWP equivalent to 1,200 million tons of CO2). (*Reference: http://www.timesonline.co.uk/tol/news/environment/article6544745.ece*)

The combined potential effect of HFCs (combined with nitrogen trifluoride (NF3) used in the production of computer chips, flat-screened (plasma) liquid crystal displays, etc) is equivalent to *approximately one-fifth* of the combined anthropogenic CO2 from all sources *in terms of their GWP*. This is a problematic situation for unlike anthropogenic CO2 HFCs and NF3 are *not absorbed into natural systems* or 'sinks' but remain in the atmosphere until they break down, realising their GWP all the while. HFCs (and NF3) were not included in the climate models prior to the release of the IPCC's 4th Assessment Report. (Reference: Prather, M.J.; Hsu, J. (2008). "NF3, the greenhouse gas missing from Kyoto". Geophys. Res. Lett. 35. doi:10.1029/2008GL034542).

The GWP of these 'industrial gases' would imply that any measurable increase in global temperature anomalies, attributed to anthropogenic CO2 is in fact due, in part, to the greenhouse gas heating effect of these gases, thus *reducing the relative heating impact of anthropogenic atmospheric CO2*.

Rather than relating these anthropogenic non-CO2 greenhouse gases in terms of their GWP relative to CO2, and expressing their emissions as CO2 equivalents, these gases needed to be modelled individually with *their resultant global temperature anomaly outcomes differentiated* from the increased global temperature anomalies resulting purely *from anthropogenic CO2 output*.

Doing so would mean that the observed and modelled increased temperature anomalies of the global annual mean surface air temperature (GAMSAT) could be broken down as fractions, expressed as temperature, of *the likely heating impact of each anthropogenic gas*. This would tell scientists and policymakers the likely effect of each gas on GAMSAT and where the emphasis should be on mitigation, and what the appropriate legal mechanism should be. Failure to do so implies a *deficiency in scientific rigour* for base political purposes, and a *lack of due diligence* on the part of government-funded scientists, policymakers and politicians.

Without due consideration of the GWP of these non-CO2 industrial gases and their individual impact on GAMSAT the Clean Energy Bill 2011 will likely just impose a cost on local producers of these gases or encourage the transference of these gases to off-shore facilities, with the (proposed ETS) market deciding whether or not there is to be a *real reduction* in the mitigation of these gases.

Yours etc

Ian Read, Nowra, NSW

Author and researcher