

Australian Carbon Tetrachloride Emissions: A Paradigm for a Missing Global CCl₄ Source?

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Australian production of carbon tetrachloride (CCl₄) ceased in the late 1980s and Australian consumption of CCl₄ effectively ceased in the early 1990s, when imports were severely restricted. However the long-term Advanced Global Atmospheric Gases Experiment (AGAGE) CCl₄ record at Cape Grim (1978-2012; Simmonds *et al.*, Krummel *et al.*) shows significant, but relatively small, CCl₄ emissions from Southeastern (SE) Australian urban and industrial centres (Dunse *et al.*).

In Chapter 1 of the *Scientific Assessment of Ozone Depletion: 2010* (Montzka and Reimann, 2011) ‘bottom-up’ estimates of global CCl₄ emissions, based on fugitive emissions from the production, use and destruction of CCl₄, as recorded by United Nations Environment Programme (with some adjustments and additions), fall well short (currently by about 50 Gg/yr) of ‘top-down’ estimates of global emissions derived from AGAGE and NOAA global atmospheric observations.

Australia’s contribution to the fugitive emissions described above is essentially zero, so where do the Australian emissions come from? This paper will report an update of current CCl₄ emissions from the Melbourne/Port Phillip/Latrobe Valley region of SE Australia, based on Cape Grim CCl₄ data, and attempt to identify the location and nature of these sources within the Melbourne/Port Phillip region, using *in situ* measurements of CCl₄ at CSIRO, Aspendale. The possible global significance of these emissions will be discussed.

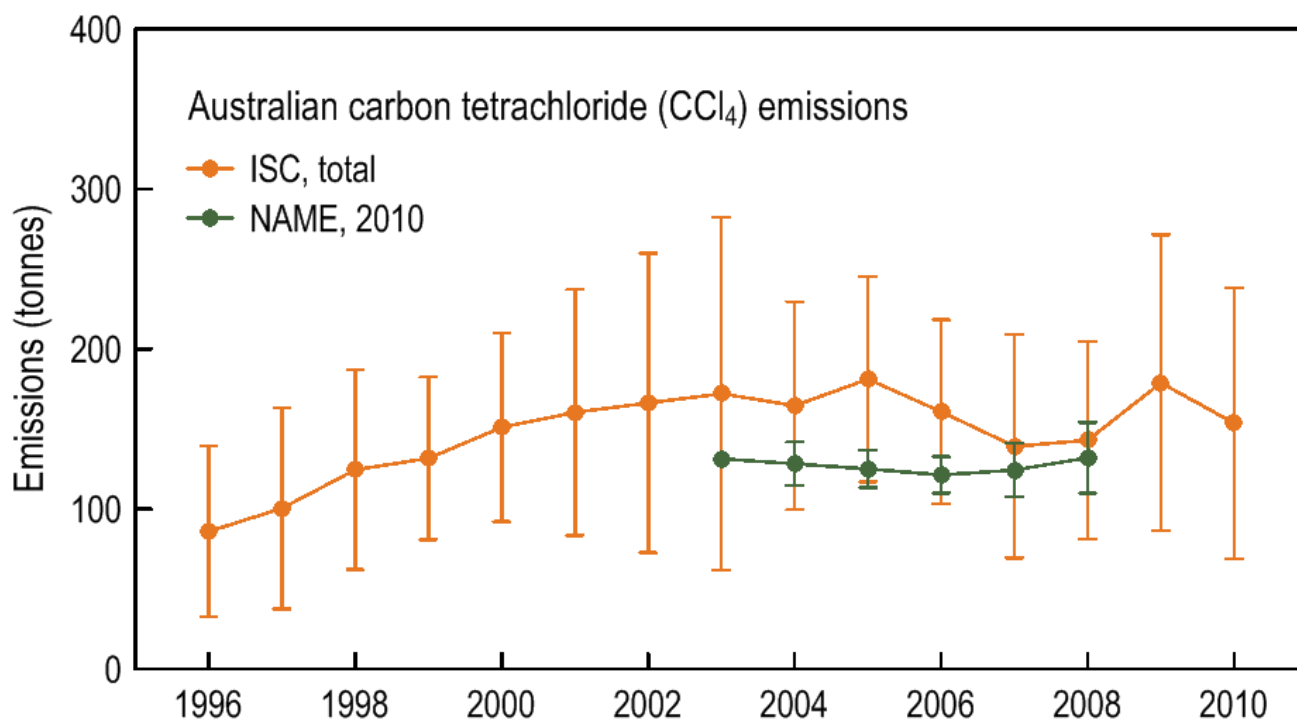


Figure 1. Australian CCl₄ emissions obtained from AGAGE observations at Cape Grim, Tasmania (1995-2011), using interspecies correlation (ISC, Dunse *et al.*, 2005) and inverse modeling via the Lagrangian particle dispersion model NAME (Manning *et al.*, 2011).