CSIRO Submission 11/411

Inquiry into Carbon Credits (Carbon Farming Initiative) Bill 2011; Carbon Credits (Consequential Amendments) Bill 2011 and Australian National Registry of Emissions Units Bill 2011

Senate Standing Legislation Committee on Environment and Communications

April 2011

CSIRO science activity relevant to the Carbon Farming Initiative (CFI)

CSIRO has had no formal role in the preparation of the Carbon Farming Initiative 2011 Bill before the Australian Parliament. CSIRO has however an active portfolio of scientific investigations relevant to the CFI. Partnerships with other institutions such as Universities, State Government Departments or non-government organisations feature prominently in this portfolio of research.

These activities include investigations designed to assess the potential for reducing greenhouse emissions from agricultural activities (including livestock farming, crop production and savanna management) and/or enhancing the storage of carbon in soils and vegetation (including soil carbon, biochar and carbon in forests or biodiversity plantings). Some investigations focus on efforts to improve the measurement and modelling approaches to estimation of greenhouse gas abatement. Other investigations look at potential for interactions to arise between carbon farming efforts and other natural processes such as water flows or biodiversity impacts.

In many instances, there is partial funding for such investigations coming to CSIRO from Australian Government agencies, state Governments and the private sector, to supplement CSIRO's core appropriations from the Australian Government.

While this body of research is on-going, CSIRO has sought to continuously communicate the results of its scientific investigations to both the relevant policy departments (Department of Climate Change and Energy Efficiency (DCCEE) and Department of Agriculture, Fisheries and Forestry (DAFF)) and to the wider community (Eady *et al.* 2009; Crossman *et al.* 2010; Sanderman *et al.* 2010; and web pages: http://www.csiro.au/science/Carbon-Australian-agriculture.html; http://www.csiro.au/org/Carbon-Land-use-Theme.html)

Broader science-based reflections on the CFI

It is not CSIRO's role to comment on the merits or otherwise of legislative policy instruments *per se*, but there are some broader science based reflections that can be made about the intent and approaches inherent in the CFI.

CFI addresses important sources of greenhouse gas abatement

Emissions of greenhouse gases from the agriculture and the broader land sector represent a significant on-going load on global atmosphere. Currently 15% of Australia's national greenhouse gas account arises from agricultural emissions (including savanna burning) and a further 9% from deforestation (NGGI, 2008). The deforestation source is partly offset by afforestation and reforestation and net land use change amounted to 4% on the national greenhouse accounts in 2008 (NGGI, 2008). The equivalent numbers on a global scale are 14% for agricultural emissions and 17% for land use change related emissions (IPCC, 2007).

Biosequestration is an important opportunity but overall the abatement achieved is likely to be modest

The theoretical potential for biosequestration in vegetation and soils is large (Eady *et al.* 2009). The technical, economic and social constraints to achieving a fraction of that potential are also very large and these have been detailed in CSIRO reports (Eady et. al. 2009, Crossman *et al.* 2010, Sanderman *et al.* 2010) and are the subject of current research investigations. Given these practical constraints, the greenhouse gas abatement stimulated by the CFI is likely to be modest at least initially. Despite this, engagement of the agricultural and land-use sector with the greenhouse gas abatement challenge remains important given the scale of the emissions from this sector.

Environment integrity is at the core of any successful carbon marketplace

The CFI places a central focus on achieving carbon offsets that have high standards of environmental integrity. In other words, the criteria used to assess and endorse carbon offset methodologies under the CFI are all focused on ensuring the offsets do indeed take a greenhouse gas load off the global atmosphere. This strong focus on environmental integrity is essential for any successful carbon marketplace. In particular, CSIRO strongly supports the criterion that peer reviewed science inform the methodologies approved under the CFI. CSIRO also welcomes the proposed role of the Domestic Offsets Integrity Committee (DOIC) in advising the Minister of the appropriateness of methodologies submitted under the CFI. Public disclosure of this advice also adds to the overall integrity of the CFI.

The science is complex and still evolving

A strength CSIRO sees in the design of the CFI is that it does not prescribe all the technical innovations or all the supporting science at the outset. Instead, the design that involves continuous opportunity for methodology submission via the DOIC for consideration by the Minister allows the abatement approaches to evolve as the science evolves and as new technical opportunities are generated. This approach is likely to stimulate innovation and continuous improvement in abatement methodologies.

Innovation will happen in different places and in different way

The design of the CFI allows for methodologies for greenhouse gas abatement to be proposed from any source. There has been a tendency for government agencies and the formal scientific community to be the strongest voice in such matters in the past. However, industry and community individuals and groups as well as the private sector have much to offer in terms of innovative ideas on greenhouse gas abatement. Provided the rigorous standards of environmental integrity are met, a good idea from any source can be recognised under the CFI design. CSIRO sees this as a strength that can only help to stimulate the agricultural and land-use sectors engagement with the greenhouse gas challenge.

The need to be alert to both additional co-benefits and unintended consequences

CSIRO recognises that some carbon abatement activity could have either additional positive environmental or social benefits and there may be opportunities to recognise these co-benefits as the CFI develops. CSIRO also recognises the potential for unintended consequences and notes attention in the legislation that seeks to avoid negative impacts on water availability, biodiversity conservation and food production. The links to local communities via regional natural resource management plans are also positive in this regard.

The need for continuing to invest in the science that supports the aspirations of the CFI

CSIRO recognises a large and only partially met demand for science that can help the land sector meet the aspirations inherent in the CFI legislation. CSIRO launched the Sustainable Agriculture National Research Flagship in 2010 and this Flagship effort is focusing our research effort on sustainable agriculture with a reduced carbon footprint. Other institutions in Australia's innovation system are directing research efforts towards these goals. These efforts need to grow and strengthen their linkages to relevant industries and communities if the aspirations implicit in the CFI are to be fully met.

CSIRO would be happy to provide further input to the Inquiry on any aspect of science or research activity that is relevant to the CFI.

References

Crossman, N.D. Summers, D.M. and Bryan, B. (2010) Opportunities and Threats for South Australia's Agricultural Landscapes from Reforestation under a Carbon Market, CSIRO, 2010. 57pp.

Eady, S., Grundy, M., Battaglia, M. and Keating, B. (2009) Analysis of greenhouse gas mitigation and carbon biosequestration opportunities from rural land use. Prepared for the Queensland Premier's Climate Change Council, CSIRO 168 pp.

NGGI(2008) Australian National Greenhouse Gas Accounts: National Greenhouse Gas Inventory May 2010. Deptartment of Climate Change and Energy Efficiency.

IPCC (2007) Working Group III report: Mitigation of Climate Change. IPCC Fourth Assessment Report. http://www.ipcc.ch/publications_and_data/ar4/wg3/en/figure-1-3.html

Sanderman J., Farquharson R. and Baldock J. A. 2010 Soil carbon sequestration potential: a review for Australian agriculture CSIRO Land & Water Report www.csiro.au/resources/ Soil-Carbon-Sequestration-Potential-Report.html

CSIRO Web pages:
Greenhouse gases in Australian agriculture: understanding the role of soils, forests and livestock methane: http://www.csiro.au/science/Carbon-Australian-agriculture.html

Greenhouse Gas Abatement and Carbon Storage in Land Use Systems: http://www.csiro.au/org/Carbon-Land-use-Theme.html