August 18 2006

Dr Anna Dacre
Committee Secretary
House of Representative Standing Committee on Science and Innovation
PO Box 6021
Parliament House ACT 2600
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Dear Dr Dacre,

Re: House of Representatives Standing Committee on Science and Innovation inquiry into geosequestration technology

Thank you for your invitation to express our views on the matter of geosequestration technology.

The Cooperative Research Centre for Greenhouse Accounting's vision and mission was to provide world-class research outputs for land-based greenhouse emissions accounting at the national and project levels to support Australia meeting the greenhouse challenge on the land. We have just completed our seven-year term and believe we have 'delivered the goods' – a significantly increased understanding of greenhouse gas fluxes in terrestrial ecosystems, a range of and input to greenhouse accounting tools (including the National Carbon Accounting System), and a range of exciting new scientific discoveries of the potential impact of climate change on plants and soils.

We have limited expertise in geological sequestration. However, we have a significant understanding of climate change science and policy, both domestically and internationally.

The challenge of climate change is probably the most significant that civilisation has faced. In the past five years, all remaining credible scientific argument against human-induced climate change has evaporated. In the past year, the climate science community has come to the conclusion that climate change is happening faster and with greater impacts than previously thought. It is clear that we must reduce our emissions and change behaviours. We must employ alternative forms of energy, pay the full costs of the energy we consume, and implement market-based systems to drive changes and innovation. It is essential that nations around the world respond quickly and with all available options at their disposal.

It is in this context that we support the thorough investigation of geological sequestration. It is clearly an option that, if proven technically feasible and environmentally safe, will assist in responding to climate change by reducing emissions of greenhouse gases.

We also believe that the implementation of market instruments (an emissions trading scheme) will hasten the successful development, demonstration and implementation of geological sequestration and other technologies and behaviours to reduce net emissions of greenhouse gases.

We would also like to note that terrestrial ecosystems have a significant role to play as one of many tools to be employed in response to the challenge of climate change.

- Terrestrial ecosystems are currently storing about 2500 billion tones of carbon around the globe.

Carbon is removed from the atmosphere and stored in the biomass (plant material, including roots), litter and soil. Because forests contain relatively large amounts of biomass, they are a significant

store of carbon. Australia has benefited enormously from the carbon stored in forests: we are likely to reach our *Kyoto Protocol* target of average annual emissions in 2008-2012 being no more than 108 per cent of 1990 emissions due to the reduction in the clearing of forests (reducing the emissions caused by land clearing) and the establishment of new forests.

- We estimate that forests in Australia store 10.5 billion tonnes of carbon (excluding soil carbon). The carbon store has been built through the forest plants having removed almost 38.5 billion tonnes of carbon dioxide from the atmosphere, about 70 times Australia's annual net greenhouse gas emissions (565 million tonnes).
- Australian plantations and managed native forests removed a net 43.7 tonnes of carbon dioxide from the atmosphere in 2004.
- Australian plantations alone currently store about 93 million tonnes of carbon.

Various estimates suggest that over the next few decades new forests could remove from the atmosphere and store in the order of 10 to 20 per cent of global emissions from the burning of fossil fuels.

Carbon sequestration in forest 'offset projects' is a 'technology' that is ready to make a valuable contribution. This opportunity is widely recognised around the world and in various emissions trading schemes (eg the *Kyoto Protocol* and the NSW Greenhouse Gas Abatement Scheme).

The carbon offset value of a forest project is determined by the difference in long-term-average carbon stock of the forest compared with the previous non-forest land-use. On average, the carbon stocks of the forest are higher than if the land was used for agriculture. While the forest is maintained, there is always a positive carbon benefit compared with non-forest land use. There are risks to the carbon stock from fire or disease, but these can be managed in the same way that plantations managers manage their commercial risk.

The total pool of carbon removed from the atmosphere by a forest can build over time to be much greater than that actually stored in the forest. After harvesting, much of the carbon in wood goes into long-term storage in wood products. This carbon is more secure than that stored in standing forests, because of reduced risks from fire and usually minimal decay. If the forest is replanted, the carbon in wood products is additional to the carbon stored in the forest.

- The Australian Greenhouse Office estimates that wood products in service in Australia (produced from 1944 onwards) are storing about 95.6 million tonnes of carbon.

At the end of their service life, most wood products in Australia are disposed of in landfills. Research by the Cooperative Research Centre for Greenhouse Accounting has demonstrated that, because of the anaerobic environment in landfills, wood products decay very slowly there. Therefore, much of the carbon taken from the atmosphere by the growing forest remains in storage, even after disposal of wood products.

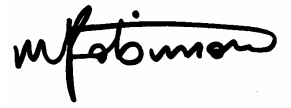
- We estimate that more than 136 million tonnes of carbon is stored in Australia's wood products in landfills.
- Research by the Cooperative Research Centre for Greenhouse Accounting shows that up to 47 per cent of the carbon in a timber production forest can be permanently stored after each rotation of harvesting.

Further greenhouse benefits are obtained from the use of wood products instead of more energy-intensive building materials such as concrete and aluminium. And where sustainably harvested wood and residues are used to generate energy, net greenhouse gas emissions are very small compared with the use of fossil fuels.

Well-planned reforestation projects can provide multiple benefits: besides mitigation of climate change, further environmental benefits of reforestation include mitigation of dryland salinity, enhancement of biodiversity, and improvement in stream water quality through reduction in nutrient runoff and soil erosion. Reforestation projects also offer benefits in regional development and diversification of income for farmers. While geological sequestration of carbon would, if proven technically feasible and environmentally safe, assist in responding to climate change, it offers no such co-benefits.

Biological sequestration, especially through forest offset projects, can contribute to mitigation of climate change, and offer an opportunity to promote sustainable development of Australia's rural landscape. Our terrestrial ecosystems need to be managed to reduce emissions, to offset emissions through sequestration, and to store carbon for the long-term.

Yours sincerely



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