

Geosequestration and Climate Change

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Climate change caused by human pollution is widely recognised as one of the greatest threats to our society and environment. Human pollution of greenhouse gases is largely responsible for a 0.6°C rise in the global average temperature since the 1880s. This temperature increase is already causing impacts in Australia such as the increased severity of recent drought and bushfires and damage to our coral reefs. To avoid the worst impacts of climate change, industrialised countries need to reduce greenhouse emissions by at least 60% by 2050, with further reductions in global emissions by 2100.

Governments in Australia and overseas have been discussing “geosequestration” – the controversial plan to capture and dispose of greenhouse pollution underground. Ministers and government officials from around the world are meeting in Melbourne at the Carbon Sequestration Leadership Forum (13-15 September, www.cslforum.org) to try and establish some global regulatory principles to manage geosequestration projects.

What is geosequestration and is it a solution to climate change?

Fossil fuel industries and some governments have been advocating the application of geosequestration as a response to climate change.

When we burn oil, coal and gas to produce energy, a large amount of greenhouse pollution in the form of carbon dioxide is released into the atmosphere. In Australia, for example, around 170 million tonnes of greenhouse pollution was released from the burning of coal to produce electricity in 2002. This is the equivalent to the annual emissions from about 40 million cars, four times Australia’s actual car fleet.

Geosequestration basically involves capturing greenhouse pollution through a number of different processes, compressing it, transporting it to the disposal site and attempting to dispose of it underground.

The large-scale application of geosequestration technology is unproven and it remains to be seen whether geosequestration can permanently reduce greenhouse pollution. Geosequestration may also be dangerous to the environment, wildlife and human health.

What are the key social and environment concerns about geosequestration?

Geosequestration is an end of pipe response to climate change that shifts the responsibility of managing our waste to our children and our children’s children. It is far better to respond to climate change by not creating greenhouse emissions in the first place. Renewable energy, energy efficiency and reducing demand allows us to do this and allows us to do it now.

Geosequestration of coal-fired power station emissions is also not expected to be widely available for use before 2015. If we are to prevent dangerous levels of climate change, significant emission reductions are required to happen before this date. Critically, it has not yet been shown that

greenhouse pollution injected into geological reservoirs will remain there for the thousands of years required if it is not going to lead to further climate change. Clearly, if the sequestered greenhouse emissions leak back into the atmosphere, then geosequestration will have failed as a technology to reduce greenhouse pollution. In addition, if the leakage is rapid it can asphyxiate humans and animal life in the vicinity.

Additionally, fossil fuel projects normally have lifetimes of 30-40 years. Yet to effectively reduce greenhouse emissions, the sequestered emissions from these projects would have to remain underground for thousands of years. This raises the significant issue of who is liable for the sequestered greenhouse emissions, particularly once the project, which originally emitted the greenhouse pollution, is no longer operational. The Australian people are already footing a large part of the bill on geosequestration research through government research programs. Long-term responsibility for damage caused by any leakage must remain with industry; otherwise the Australian people would also have to pay for any long-term damage that geosequestration causes to our environment or our health.

It also appears that geosequestration will have limited application. Large areas of Australia, including some major centres for energy generation, do not have geological formations suited to geosequestration. Existing major electricity generators in the states of NSW and South Australia are in regions currently considered economically and technically unsuitable for geosequestration. According to the CO₂ CRC at best geosequestration could reduce Australia's emissions by a quarter – if it works.

Geosequestration also takes investment away from renewable energy and energy efficiency. These technologies are sustainable, create more jobs than fossil fuels, and are proven and mature. Finally, research shows that electricity generated from coal with geosequestration may be more expensive than other less polluting sources, such as gas and wind power.

What should the Australian Government be doing?

The Federal Government must ratify the Kyoto Protocol, set strong targets for clean renewable energy, such as wind and solar, and energy efficiency and commit to reducing greenhouse pollution by at least 60% by 2050. It is also time for political parties to make polluters pay through an emissions trading scheme and/or carbon levy.

No commercial geosequestration projects should be approved at this stage given the range of risks and uncertainties, not least that it remains to be proven whether geosequestration can permanently reduce greenhouse emissions. No R&D geosequestration projects should go ahead until stringent and unambiguous regulatory principles are in place that has involved full public consultation.

Governments must also establish a stringent legal framework for regulating geosequestration facilities that ensures that the proponents of geosequestration assume complete legal liability for the full economic, environmental and social costs of leakage over the lifetime of the storage. This framework must ensure that future corporate insolvency or restructuring should not diminish the effectiveness of the liability regime.

Overall, the implementation of policies to rapidly accelerate the uptake of renewable energy and energy efficiency whilst reducing energy demand must be the absolute priority for governments.

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