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House of Representatives Standing Committee on Science and Innovation  
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### Comments on Inquiry into Geosequestration Technology

Those who advocate the continuation of carbon-based energy production propose that carbon dioxide so produced can be permanently eliminated by effectively burying it in the ground in either exhausted gas fields or other porous rock formations. The following brief comments will attempt to address why this is an unwise idea, indeed one that could lead to a great catastrophe for future generations.

Sequestered carbon dioxide must be stored forever – this carbon should never be released into the environment. This is impossible to guarantee over geological periods, and assuming civilisation survives, its unintended release in the future could have devastating results.

Sequestered carbon dioxide will ALWAYS be potentially harmful. In comparison, nuclear waste eventually becomes harmless in geologically short periods of time. In addition, nuclear waste occupies smaller volumes, by many orders of magnitude, and there are many more suitable sites.

The mere fact that exhausted gas fields have held their contents for long periods of time is no evidence that they will continue to do so in the future. Firstly, it is likely that these fields have lost portions of some or most of their contents by natural processes over eons of time. The gas-containing volume is not truly hermetically sealed as may be supposed. Secondly, as gas is pumped out of fields the rock structure changes as it is no longer supported by internal pressure. It cracks and otherwise degrades. In addition, gas recovery is often enhanced by deliberately inducing cracks in the reservoir. Re-pressurising the field is not likely to repair this damage. Furthermore, there is no proof that once a field is filled with carbon dioxide, the plug can or will remain intact over the rest of time.

Most if not all gas fields contain water. The carbon dioxide will react with this water and create carbonic acid which may weaken the formation.

The potential for destruction by the accidental release of gas is tremendous. Furthermore terrorists are a great risk to this technology. They could easily compromise the seal on sequestered gas, or cause a gas reservoir to be released before it is ultimately sealed. A sudden release of carbon dioxide is extremely

dangerous. In 1986 naturally accumulated carbon dioxide was suddenly released from the bottom of Lake Nyos, West of Cameroon and more than 1700 people were killed along with livestock up to 25 km away. This involved a much smaller volume of gas than may be sequestered from a typical power station.

Given all of the aforementioned problems it is difficult to imagine that there can be any strong case made for carbon-based electricity production with associated carbon sequestration. Further, there are few alternatives. Most “alternative” forms of energy are not of a sufficiently high energy density to ensure economic collection and distribution. Wind farming is environmentally destructive due to bird strikes, infra-sound and visual impact and does not work without subsidies. Solar cannot meet base load production requirements and is also expensive. There are limited hydro resources and these are currently almost fully exploited. Wave and tidal power is of limited application. The reality is that nuclear power is the only technology that can compete on a similar economic basis to carbon-based electricity production and has fewer problems with disposal of its waste products. Short of returning to the Stone Age, if we decide to remain an energy-based civilisation, we must use nuclear energy. The carbon dioxide problem cannot simply be buried in the ground as is advocated.

In summary, carbon dioxide sequestration is poorly conceived, cannot guarantee sequestration of gas forever as is necessary and has potential for great harm due to accidental or deliberate release. It is nothing more than a ploy by those who are not prepared to face reality and recognise the urgent necessity of developing large scale nuclear electricity generation which ultimately has far fewer potential problems than sequestration.

Sincerely,

Dr David Maddison