

## **CARBON SEQUESTRATION- IS IT A NEW LEASE OF LIFE FOR COAL FIRED ELECTRICAL POWER PLANTS?**

*Over the next 25 years the demand for electrical power worldwide is estimated to increase by a value of US\$20 trillion. In light of this increase, a new lease of life has been discovered for coal fired power stations, which along with motor cars contribute greatly to the Greenhouse Effect.*

New technology has been discovered to "catch" the carbon dioxide (CO<sub>2</sub>) before it enters the environment, thus helping reduce Greenhouse Gas emissions. A power plant in Tampa, Florida U.S.A, has been established using this concept.

During the power producing process the CO<sub>2</sub> gas is driven under heat and pressure. The CO<sub>2</sub> is piped and then stored underground by drilling a bore into porous rock, such as sandstone. The hole is then capped by clay. This process is known as "**Terrestrial Carbon sequestration**".

### **Carbon Sequestration**

The U.S Department of Energy defines "**Carbon sequestration**" as: "**a family of methods for capturing and permanently isolating gases that otherwise could contribute to global climate change**".

Affordable and environmentally safe sequestration approaches could offer a way to stabilise atmospheric levels of CO<sub>2</sub> without requiring the countries to make large-scale and potentially costly changes to their energy infrastructures.

### **Terrestrial Carbon Sequestration**

Terrestrial carbon sequestration is defined as: "either the net removal of CO<sub>2</sub> from the atmosphere or the prevention of CO<sub>2</sub> net emissions from the terrestrial ecosystems into the atmosphere". [Source: U.S Department of Energy]

### **Problems with Terrestrial Carbon Sequestration**

The problem with this concept is finding the right location to be able to drill into. A project is also planned in West Virginia as it has the suitable porous rock to drill into.

Australia has also been looking into carbon sequestration research as a way of tackling Greenhouse Gas emission problems, with projects underway in South Australia along the "Great Australian Bight".

New coal-fired plants with this CO<sub>2</sub> "catching" process are far more expensive than the traditional coal fired power stations, so there has been no rush to establish new plants at this stage unless politicians induce firms, to take on this technology. So far there is no indication that this will occur, so at this stage traditional polluting coal fired power stations are here to stay.

### **Alternative forms of Terrestrial Carbon Sequestration**

Enhancing the natural processes that remove CO<sub>2</sub> from the atmosphere is thought to be one of the most cost-effective means of reducing atmospheric levels of CO<sub>2</sub>, and forestation and deforestation abatement efforts are already under way.

R&D in this program area seeks to increase this rate while properly considering all the ecological, social, and economic implications. There are two fundamental approaches to sequestering carbon in terrestrial ecosystems:

1. Protection of ecosystems that store carbon so that carbon stores can be maintained or increased; and;
2. Manipulation of ecosystems to increase carbon sequestration beyond current conditions.

This program area is focused on integrating measures for improving the full life-cycle carbon uptake of terrestrial ecosystems, including farmland and forests, with fossil fuel production and use. The following ecosystems offer significant opportunity for carbon sequestration:

**Forest lands.** The focus includes below-ground carbon and long-term management and utilisation of standing stocks, under-story, ground cover, and litter.

**Agricultural lands.** The focus includes crop lands, grasslands, and range lands, with emphasis on increasing long-lived soil carbon.

**Biomass croplands.** As a complement to ongoing efforts related to biofuels, the focus is on long-term increases in soil carbon and value-added organic products.

**Deserts and degraded lands.** Restoration of degraded lands offers significant benefits and carbon sequestration potential in both below-and above-ground systems.

**Boreal wetlands and peat-lands.** The focus includes management of soil carbon pools and perhaps limited conversion to forest or grassland vegetation where ecologically acceptable.

*[Source: SBS News Service: 29<sup>th</sup> May 2005 & US Department of Energy [www.fe.doe.gov/programs/sequestration/](http://www.fe.doe.gov/programs/sequestration/)]*