



CARBON CAPTURE AND STORAGE IN ALBERTA

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On the heels of the United Nations Climate Summit in Copenhagen - where Canada was portrayed in the media as a climate villain - and the more recent announcements that several major US companies will boycott oil from Alberta's oil sands, many are looking to the Province's Carbon Capture and Storage program ("CCS") to redeem Alberta's environmental reputation.

In July 2008, the Province announced that it was committing \$2 billion in funding for the development of CCS projects. However, this pledge came at the height of the economic boom experienced in Alberta when, arguably, the Province had the money to spend. Despite a recent weak economic climate, however, Alberta's commitment to CCS has been demonstrated by the approval of several large scale experimental projects, and the program's survival in two subsequent budgets in which Alberta has run deficits.

Carbon Capture and Storage is, as its name would suggest, the process of capturing the carbon dioxide produced from the burning of fossil fuels and permanently storing it, such that it is not released into the atmosphere and therefore does not contribute to climate change. The carbon, once captured, is stored in geological formations in the earth, deep underground where conditions are present that, in theory, prevent its subsequent release. This approach is argued by its proponents as a more realistic response to the need to reduce carbon emissions than the blanket reduction in dependence on oil and gas preferred by many environmentalists.

The characterization of Alberta as being a significant greenhouse gas contributor is not without merit – comparable only to the emissions of the much less sparsely populated Saskatchewan, Alberta emits over three times more carbon dioxide per capita than the remaining provinces. In addition to primarily relying on the burning of coal and natural gas for electricity generation (two of the most carbon-intensive methods available), the energy industry and particularly the development of the oil sands produces a significant amount of carbon dioxide. While considerable debate rages, in Alberta and globally, regarding the feasibility, practicality, and socioeconomic impacts of substantial reductions in production of hydrocarbons, or of encouraging a cultural shift away from consumption of those products, CCS is promoted by the Province as a leading and realistic alternative solution to the issue of climate change.

The technology behind CCS, though technically complex, is in fact conceptually straightforward. The carbon dioxide produced by industry is captured before it is released into the atmosphere. It is then transported to an injection site where it is injected deep underground – in most cases either into depleted oil and natural gas reservoirs or the large underground saline reservoirs found throughout Alberta. At the depths that the carbon is



injected, it is anticipated that the pressure will be great enough such that it cannot be re-released into the atmosphere.

An added benefit touted by proponents of CCS is the encouraging success that industry has had with Enhanced Oil Recovery. This process, as it relates to CCS, is the injection of carbon dioxide into an otherwise depleted reservoir to boost the pressure to successfully produce otherwise unobtainable oil. Stimulating a reserve to increase production is not a new concept, however, married with CCS it provides an economic impetus that many believe industry will require to adopt broader CCS practices. This process is already enjoying success and is estimated to increase production by up to 18% in some applications.

Though Enhanced Oil Recovery offers some economic incentive to industry to pursue and apply CCS technology, there is no question that at its present stage CCS remains largely uneconomic. In recognition of this, the \$2 billion earmarked for development of CCS projects was set aside by the Province in 2008 and secured by the *Carbon Capture and Storage Funding Act* to advance the technology necessary to make this practice viable. Fulfilling that mandate, the Government has signed letters of intent with four proponents whose projects account for the full \$2 billion allocation. These projects address a range of issues that currently limit the viability of CCS.

The final report of the Alberta Carbon Capture and Storage Development Council, the arm's-length Government body tasked with guiding the Province's CCS development, has estimated that CCS will be commercially maintainable within 15 – 20 years, until which point government and stakeholder economic support will be necessary to maintain development. The price tag of this support is expected to be in the range of \$1 - \$3 billion per year. Given the current economic climate, uncertainty remains as to where this funding may be found.