IEAGHG Information Paper; 2012-IP4: Direct Air Capture an Update

Background: Paper in PNAS, "Economic and energetic analysis of capturing CO_2 from ambient air" Kurt Zenz House et al.

This paper was brought to my attention by one of the co-authors, Howard Herzog of MIT. Howard felt that the report published by the American Physical Society in late 2010 - Direct Air Capture of CO_2 with Chemicals - underestimated the cost of Direct Air Capture (DAC). The cost quoted in the APS report for DAC was \$600/t CO_2 avoided. The comparative cost quoted in the report for post combustion capture at a pulverised coal fired plant in the USA was \$80/t CO_2 avoided. In discussion with Howard he felt that:

- The cost assumptions used were too simplistic in the APS report, despite the fact that they showed the costs of DAC were significantly higher than PC Capture.
- Also, based on information coming through from the costs network, which shows that costs of siting plant in remote locations, is higher than previously expected. This is because of the equipment, services; skilled labour force will need to be bussed in to these sites and accommodated during their operation.
- Finally he is concerned that proponents of air capture in the USA are not being fully open on the real costs of DAC and thus the technology is beginning to be considered as a mitigation option that has costs that are supposedly comparable to other low carbon mitigation technologies.

Howard and a group of authors have now undertaken their own analysis which is presented in the paper above, a copy of which is appended for your reference. The main conclusions from this analysis are:

- DAC is significantly more expensive than other low carbon mitigation options and thus will not be competitive with CO_2 capture at power plants and other large point sources.
- Costs of DAC are likely to be of the order of \$1000/t of CO_2 avoided.

The conclusions are broadly similar to those of the APS report, the difference is the costs which is some 66% higher in their analysis.

Howard et al are not totally dismissive of DAC they feel it could potentially play a role after 2050 it could play a role in mitigating emissions from distributed systems. Negative emissions with DAC are also feasible in the long term after the electricity and other large point sources have been decarbonised. Both of these situations require an abundant source of low cost zero carbon energy sources.

John Gale 25/06/12