Geophysical Research Abstracts
Vol. 12, EGU2010-14500, 2010
EGU General Assembly 2010

Geoengineering treatment of methane

Andrew Lockley (1) and Alan Gardian (2)
(1) Leeds University, UK (applicant), (2) Leeds University, UK

Methane is a significant GHG, and substantial reservoirs are vulnerable to instability due to AGW. Excursions, from permafrost and clathrates especially, act a positive feedback to AGW. Existing concentrations of well-mixed atmospheric methane substantially exceed pre-industrial levels.
Various geoengineering methods are herein proposed for containment of methane, and/or accelerated oxidation to CO2 (a gas with a lower GWP over all timescales).
A basic qualitative analysis of each technique is undertaken, to direct further study. Consideration is also given to the potential capacity of each technique to treat the total likely excursions of methane expected as a result of AGW.

Proposed techniques:
Section 0
SRM (comparison option)
Section 1 Pre-emptive treatment of methane reservoirs
Soil heating (polytunnels, heat pumps); Soil aeration; Mining of clathrates; Burning of clathrates
Section 2 Remediation of aquatic methane excursions
Lake sealing; Mixing of aquatic strata; Bubble capture; Lake aeration; Biological oxidation in aquatic environments
Section 3 Remediation of concentrated atmospheric methane
Regenerative thermal oxidation; Electrical ignition; Thermal ignition; Using incendiary munitions
Section 4 Remediation of diffuse atmospheric methane
Thermal oxidation by concentrated solar power; Compression ignition; Chemical degradation
Assessment criteria:
Infrastructure/implementation cost; Energy cost; Expected efficacy; Complexity/development path; Environmental impacts; Potential for CCS