Non-CO_2 Greenhouse Gases: Methane

Source/Sectors: Abandoned Underground Coal Mines

Technology: Options in general (A.1.5)

Description of the Technology:
Active underground coal mines contribute a large share of methane emissions in the United States. As mines mature and coal seams are mined through, mines will be closed and abandoned. Many abandoned mines were sealed and some were flooded through groundwater intrusion or by surface water. Some abandoned coal mines are vented to the atmosphere to prevent the buildup of methane gas. After an initial decline, abandoned coal mines can liberate methane gas at a steady-state rate for a long period of time (USEPA, 2006a).

Although there are no active coal mines in California, there were coal-mining activities in the past. Methane emissions from abandoned coal mines were not included in the most recent inventory report by CEC (CEC, 2006). Flaring of the collected off-gases is a viable option to reduce methane emissions from abandoned underground coal mines.

Effectiveness: Not applicable

Implementability: Not applicable

Reliability: Not applicable

Maturity: Not applicable

Environmental Benefits: It reduces methane emissions.

Cost Effectiveness: Not applicable

Industry Acceptance Level: Not applicable

Limitations: Not applicable

Sources of Information:

1. California Energy Commission (2005) "Emission Reduction Opportunities for Non-CO_2 Greenhouse Gases in California", a report prepared by ICF Consulting for California Energy Commissions, CEC-500-2005-121, July 2005.
2. California Energy Commission (2006) "Inventory of California Greenhouse Gas Emissions and Sinks: 1990 to 2004", final staff report, December 22, 2006.
3. Delhotal, K.G.; de la Chesnaye, F.C.; Gardinar, A.; Bates, J.; Sankovski, A. (2006) "Mitigation of Methane and Nitrous Oxide Emissions from Waste, Energy and Industry" *The Energy Journal*, Multi-Greenhouse Gas Mitigation and Climate Policy Special Issue, pp. 45-62.
4. European Commission (2001) "Economic Evaluation of Sectoral Emission Reduction Objectives for Climate Change", Brussels. (Document can be found at http://ec.europa.eu/environment/enveco/climate_change/sectoral_objectives.htm)

5. International Energy Agency (2003) “Building the Cost Curves for the Industrial Sources of Non-CO_2 Greenhouse Gases”, Report Number PH4/25, IEA Greenhouse Gas R&D Programme, Cheltenham, United Kingdom, October 2003.
6. Lucas, P.L.; van Vuuren, D.P.; Jos Oliver, G.J.; den Elzen, M.G.J. (2006) “Long-term Reduction Potential of Non-CO_2 Greenhouse Gases”, Netherlands Environment Assessment Agency (MNP), published on line November 28, 2006.
7. U.S. Climate Technology Program (2005) “Technology Options for the Near and Long Term”, U.S. Department of Energy, http://www.climatetechnology.gov/index.htm, August 2005.
8. U.S. Environmental Protection Agency (1999) “Report on U.S. Methane Emissions 1990-2020: Inventories, Projections, and Opportunities for Reductions”, United States Environmental Protection Agency, EPA 430-R-99-013, September 1999.
9. U.S. Environmental Protection Agency (2003) “International Analysis of Methane and Nitrous Oxide Abatement Opportunities: Report to Energy Modeling Forum, Working Group 21”, a report prepared by ICF Consulting for the United States Environmental Protection Agency.
10. U.S. Environmental Protection Agency (2004) “International Methane and Nitrous Oxide Emissions and Mitigation Data”, United States Environmental Protection Agency. Available online at www.epa.gov/methane/appendices.html (in Excel file).
11. U.S. Environmental Protection Agency (2006a) “Inventory of U.S. Greenhouse Gas Emissions and Sinks: 1990 to 2004”, Office of Atmospheric Programs, United States Environmental Protection Agency, EPA-430-R-06-002, June 2006.
12. U.S. Environmental Protection Agency (2006b) “Global Mitigation of Non-CO_2 Greenhouse Gases”, Office of Atmospheric Programs, United States Environmental Protection Agency, EPA-430-R-06-005, June 2006.