

Alternative Sources of Natural Gas?

Most methane (natural gas) is found in geological deposits. Sometimes it is found by itself, but often significant quantities are found associated with oil or coal deposits. Oil producers often vent methane into the atmosphere or burn it as flares because of the risk of explosion. Coal beds give off gasses, often containing methane, that are a risk for poisoning, asphyxiation and/or explosion. Technologies exist for capturing methane from both sources, and these constitute one possible “alternative” source of methane. I put the term in quotes because these methods are long known, and the issue has been whether it was economic to recover this methane in a low price environment.ⁱ

Some shale rock also holds methane. However, the recovery is difficult, as the shale gives up the methane slowly. The reserves are estimated to be large, but they will not serve as a significant alternative source unless a technology for extracting the methane is invented.ⁱ

Methane hydrates are essentially natural gas molecules trapped in ice. They look like snowballs, but they burn. They exist only under conditions of low temperature and high pressure: beneath permafrost at the poles, and in deep-sea sediments, including the coastal regions of Japan and the Americas. World reserves are estimated at over 100 times current proven natural gas reserves. While this estimate must be viewed cautiously, it illustrates that methane hydrates are a potentially huge resource. Methane hydrate deposits are a relatively recent discovery. No technology or demonstration projects exist to recover them. As an aside, methane hydrates are one of the chief concerns of climate scientists – if global warming causes the arctic permafrost to thaw, it may release the deposits, venting vast quantities of methane into the atmosphere, where it will have a greenhouse effect many times that of carbon dioxide. Result: global warming the likes of which we have not yet imagined.ⁱ

As organic matter decays, it gives off methane. Thus, landfills produce methane, and when landfills are full, wells have to be installed to vent it. Landfill methane, therefore, is not obtained from ancient deposits, but from current decay that would go into the air if it wasn't captured. Landfill sources of methane are not sufficient to make a significant impact on our overall demand, but they are very desirable. Keane, New Hampshire, for instance, runs their entire recycling facility on methane from the town dump. They save money, don't use additional energy, and protect the environment, all at one time.^{ii iii}

Decaying animal waste, including human sewage, also gives off methane. Trapping and processing the methane solves several problems: it provides energy for the farming operation or sewage plant, it reduces odor, it saves the streams into which the sewage is otherwise dumped, and it lowers atmospheric emissions.^{iv}

Conclusion: methane recovery from oil wells, coal beds, landfills, animal waste, and human sewage are very worthwhile. The benefits are many, the costs relatively few. Every bit helps, but they will not provide sufficient reserves to meet future demands for natural gas. Shale and methane hydrates are potentially huge reserves, but it will be decades before we have the technology to recover them effectively.

ⁱ Nersesian, Roy. (2007) *Energy for the 21st Century*. Armonk, NY: M.E. Sharpe.

ⁱⁱ Landfill Methane Outreach Program, U.S. Environmental Protection Agency. <http://www.epa.gov/lmop>.

ⁱⁱⁱ *Global warming: The signs and the science*. (2005). DVD. South Carolina Educational Television. Available through PBS.

^{iv} Hansen, R.W. *Methane generation from livestock wastes*. Colorado State University Extension – Agriculture. Viewed online 11/10/2007 at <http://www.ext.colostate.edu/pubs/farmmgt/05002.html>.