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COMMENT

Comments on the article "Geological, Ocean and Mineral CO_2 Sequestration Options: A Technical Review, by D.A. Voormeij and G.J. Simandl

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The article by Voormeij and Simandl provides an excellent overview of the technical issues surrounding CO_2 sequestration. I would like to add a comment on how government policies can affect the level of atmospheric carbon dioxide when oil reservoirs are used to store CO_2.

At present, CO_2 is routinely injected into many oil reservoirs in order to increase oil recovery. This injected CO_2 is returned to the atmosphere with the oil. If CO_2 injection is combined with sequestration, the carbon dioxide released at the wellhead is captured and re-injected into the reservoir.

Financial incentives such as subsidies or tax credits for sequestration should target projects that reduce the net amount of atmospheric carbon dioxide. Otherwise such policies may result in the development of sequestration projects that create higher levels of atmospheric CO_2.

To determine which sequestration projects are most effective, we need to calculate the net amount of CO_2 that will be removed from the atmosphere. The carbon dioxide to be removed can be obtained directly from the atmosphere. More typically it is the by-product of an industrial application that would otherwise release the CO_2 to the atmosphere. The net amount of CO_2 removed from the atmosphere is equal to the original amount of CO_2 removed minus the amount of CO_2 released to the atmosphere as a result of the sequestration process. The sequestration process can create CO_2 during the collection, transport, compression, separation, drying and injection of carbon dioxide. Plans to sequester CO_2 in oil reservoirs should include a life-cycle CO_2 audit for the reservoir to determine what the net effect will be on atmospheric CO_2 levels.

For some oil reservoirs, it may not be cost effective for producers to use CO_2 injection as an enhanced oil recovery method. In such cases, subsidies or tax credits for sequestration may make it profitable for an oil company to carry out CO_2 injection with sequestration. The CO_2 injected will result in extra oil being produced. Most of this extra oil will be burned, creating additional atmospheric CO_2. The net CO_2 removed from the atmosphere will be equal to the amount of atmospheric CO_2 sequestered less the amount of CO_2 released to the atmosphere as a by-product of the sequestration process and less the amount of CO_2 released from the reservoir in the form of additional crude oil that is produced. This latter amount may be larger than the CO_2 removed from the atmosphere, leading to a net increase in atmospheric CO_2.

Subsidies should target projects where a life-cycle CO_2 audit has shown the greatest reduction in the amount of atmospheric CO_2. In some cases subsidies could also be given to sequestration projects where increased oil production leads to a greater amount of greenhouse gas production. This should only be done where the additional oil from a sequestration project is replacing another energy source that produces even greater amounts of greenhouse gases.