Sequestering CO_2 through Enhanced Oil Recovery:

An Insufficient Technique to Mitigate Climate Change

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Introduction

Sequestering Carbon Dioxide (CO_2) through enhanced oil recovery (EOR) is a well established technology being used to mitigate climate change. *This thesis examined the underlying reasons why CO_2 EOR should be abated as a sufficient method to mitigate climate change in terms of economics, the environment, and liabilities.* The discussion highlights the fact that CO_2 EOR does not change the fossil fuel lifestyle Americans have become reliant upon. At best, CO_2 EOR is a bridge technology to find more productive ways of reducing CO_2 emissions.

Climate Change and CO_2 Enhanced Oil Recovery

Carbon Dioxide is one of the most significant greenhouse gases contributing to what some consider worldwide climate change. Reducing atmospheric CO_2 emissions is the goal of many international governments, agencies, and scientists. Carbon sequestration – the long term storage of CO_2 - is a technique being developed to accomplish this goal and mitigate climate change from CO_2.

The most well established form of CO_2 sequestration is into oil reservoirs, specifically through enhanced oil recovery (EOR). Carbon Dioxide is pumped into a near-depleted oil reservoir which mixes with highly viscous oil allowing for the extra recovery of 30-60% oil that would normally be non-recoverable. A moderate amount of the CO_2 used for oil extraction remains sequestered in the oil reservoir rather than the atmosphere.

Enhanced Oil Recovery is a value-added system that allows CO_2 to be sequestered at a low cost due to the revenue of recovered oil. It is no surprise that EOR has become a heavily researched and booming technology. Enhanced oil recovery is viewed as the optimal form of CO_2 sequestration by the oil industry not only because of its cost-effectiveness and elimination of atmospheric CO_2, but also because of its relative ease to employ and successful track record.

Conclusion

The most significant problem with CO_2 EOR is that it does not change the fossil fuel lifestyle Americans have become reliant upon. Furthermore, we do not understand the long-term environmental effects. Thus, despite its aspects of economic and environmental viability, CO_2 EOR can be considered merely a short-term bridge technology to other alternative forms of renewable energy. Relying upon CO_2 EOR as a sufficient technique to mitigate climate change will prove insufficient.

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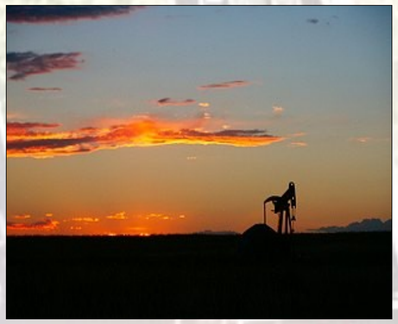

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Economics of CO_2 EOR

Pros

+ Economically viable for oil companies when oil $50 pb or higher
+ 15% - 60% more oil extracted for sale
+ Carbon credit system implementation

Cons

- Carbon capture costs too high at $150/ ton CO_2
- Oil demand will not match supply in the long-run

Environmental Impacts of CO_2 EOR

Pros

+ Minimal problems in 35 year history
+ Sequestered CO_2 life expectancy of 1000 years

Cons

- More research needed for long-term effects
- Leakage into atmosphere?
- Seepage into groundwater?

Regulations and Liabilities of CO_2 EOR

Pros

+ Monitoring must distinguish ‘acceptable’ from ‘unacceptable’ behavior
+ Both economic and environmental benefits to monitoring
+ Extensive models needed for effective monitoring

Cons

- Policy system for regulations and liabilities non-existent
- Policy interpretation by judicial, legislative, and regulatory authorities?
- Time buying mechanism by politicians