Green house gas reduction through injecting CO_2 in the subsurface

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The evidence presented by the scientific community through the intergovernmental panel on climate change (IPCC) process has created a consensus among a majority of scientists and world leaders that there is a need to reduce green house gas emissions, and now the discussion is in what shape such a response should take. As a nation, as well as within the state of Missouri, we must develop processes to substantially reduce the amount of carbon dioxide from our energy generating activities.

Injecting CO_2 into the subsurface for pure storage, or as a mean for increasing oil and gas production, is currently being considered as one of the most likely near term option for significantly reducing industrial greenhouse gas emissions to the atmosphere. Large, stationary CO_2 emitters, such as coal or gas fired power generation plants, are the most likely sources for CO_2 injection in geological formations.

Several topics of CO_2 injection for long term storage are being pursued by the GSE department; these include storage capacity and sequestration mechanisms, long term well integrity, cap rock leakage and enhanced oil recovery.

The majority of research on sequestration focuses on depleted oil reservoirs and disposal within a few large, deep geological basins, such as the Williston Basin and the Illinois Basin. These structures are clearly ideal repositories for carbon, but they are located great distances from many of the electric generating plants in the Midwest and Missouri. Hence, one research project at Missouri S&T investigates the feasibility of sequestering carbon dioxide in shallower geological formations beneath individual power plant sites in Missouri. Long term well integrity is another concern which is studied in a project in Alberta since wells are the most likely leakage mechanism from storage of CO_2. About 4% oil production in the US is from CO_2 oil enhanced oil recovery and there is a great potential to enhance gas recovery for gas reservoirs while safely sequestrating CO_2.