

Panel -- carbon dioxide capture, storage still too costly

Guntis Moritis, Oil & Gas Journal, 11-3-11

DENVER -- A dramatic reduction in carbon dioxide capture and sequestration (CCS) costs are needed before society will accept CCS was the main consensus of a panel discussion on the role of the petroleum industry in CCS at the Society of Petroleum Engineers annual technical conference and exhibition on Tuesday.

As noted during the session, anthropogenic CO₂ represents about 92% of the greenhouse gas emissions from energy producing sources. The remainder emissions from these sources are methane, 7%, and nitrous oxides, 1%.

Current US CO₂ emissions from all anthropogenic sources are about 6 billion tons/year or about the same as in 1995. China has had the steepest growth in emissions and now emits about 8 billion tons/year.

Expected world CO₂ emissions may reach 40 billion tons/year by 2030 and 60 billion tons/year by 2050 from the current 27 billion tons/year.

Enhanced oil recovery is one way to mitigate the cost of CCS but, as noted by panelist Christine Ehlig-Economides, a professor at Texas A&M, CO₂ storage in EOR projects as well as in depleted oil and gas fields provides only a small amount of the storage volume needed.

She also said storage in saline aquifers is limited but could be increased with the production of water from the aquifer. In that case, brine disposal would become an issue.

Charles Fox, a vice-president at Kinder Morgan CO₂, presented some economics of CO₂ EOR. He said currently the Permian basin of West Texas and New Mexico produces about 280,000 bo/d with CO₂ EOR. Purchased CO₂ for injection is about 60 million tons/year with another 60-120 million tons/year of CO₂ recycled.

Fox said for an \$85/bbl oil price, the gain from a typical CO₂ EOR project is about \$22/bbl. Costs include \$18/bbl for royalty and production taxes, \$10/bbl for capital expenditures, \$20 for operating expenses, and \$15/bbl for CO₂ cost.

Even though the \$22/bbl looks good, Fox noted that because CO₂ costs are at the start of the project, the project only has a 20% rate of return before taxes. Other oil and gas projects can have much higher rates of return, he said.

He also said a typical CO₂ project will sequester about 92% of the purchased CO₂. His calculation assumes that a production of about 180 million bbl of oil will have direct and indirect CO₂ emissions of 18.5 million tons from the 260 million tons of CO₂ purchased. CO₂ sequestered is then 241.5 million tons.

If one considered the emissions from burning the produced oil, the sequestered amount is about 48% of the CO₂ purchased, he said.