SEVENTEENTH SPE IMPROVED OIL RECOVERY SYMPOSIUM

IOR 2010 A GLOBAL PERSPECTIVE — TODAY'S TECHNOLOGIES FOR TOMORROW'S ENERGY

24-28 APRIL 2010
RENAISSANCE HOTEL
TULSA, OKLAHOMA

PRESS BACKGROUNDER

CO_2 EOR: Win-Win Solution for U.S. Energy, Environment

TULSA, April 16, 2009 – Technology advances in enhanced oil recovery (EOR) enable producers to sustain the productive life of declining reservoirs for many years beyond their initial stage of primary recovery, usually increasing the volume of ultimately recoverable reserves.

Typically, primary recovery allows a producer about 10 percent of an oil reservoir's original volume of oil in place (OOIP), using the natural pressure of the reservoir or gravity to drive oil into a producing wellbore. Secondary recovery extends a reservoir's productive life by injecting associated natural gas or water to displace oil and drive it to the wellbore, boosting recovery to 20–40 percent. With much of the easy-to-produce crude already produced—most notably in the U.S.—some producers have turned to tertiary recovery, or EOR, with the prospect of ultimately producing 30–60 percent, or more, of OOIP. EOR can entail the injection of chemicals; thermal energy, such as steam; or gases, such as carbon dioxide (CO_2) to reduce the viscosity of oil and render it more mobile to move it to the wellbore.

The ultimate target of this remaining OOIP is massive. In the U.S. alone, the Department of Energy's National Energy Technology Laboratory (NETL) has estimated that more than 218 billion barrels of discovered oil that is technically recoverable lies unproduced in shallow—less than 5,000 feet subsurface—reservoirs (Figure 1).

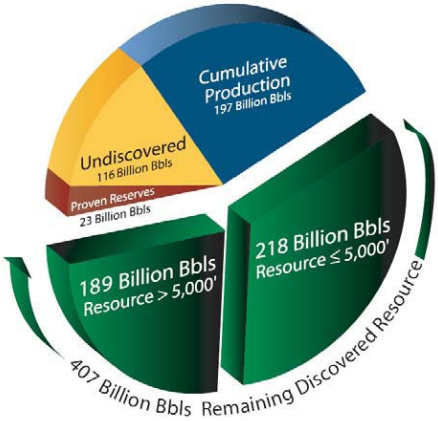

Figure 1. America's target for EOR, IOR
Source: National Energy Technology Laboratory

Tapping just a tenth of that unproduced oil would double America's oil reserves and yield enough production to offset more than 10 years of OPEC oil imports. The widely expected return to higher oil prices will give producers greater incentive to implement EOR projects.

EOR also offers an opportunity for oil producers to help tackle the challenge of postulated catastrophic climate change. NETL studies have shown that many of America's aging oil reservoirs are amenable to the highly successful and fastest-growing EOR technique known as CO_2 flooding (Figure 2). CO_2 EOR would be more readily applied nationwide if an economic source of CO_2 were widely available without having to build massive, costly pipeline networks to deliver the CO_2 from natural sources to oil fields. Injecting the CO_2 into the oil reservoir also presents an opportunity to permanently store the gas, the dominant greenhouse gas implicated in climate change. This solution is known as sequestration.

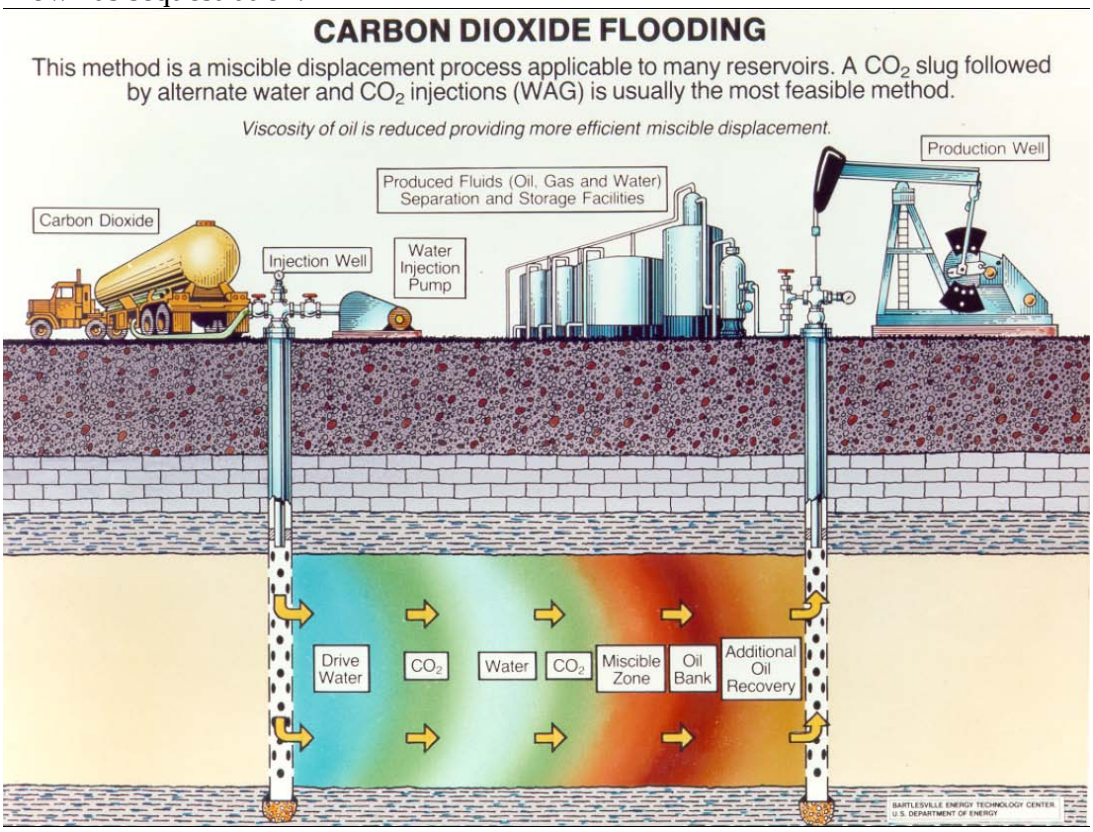

Figure 2. Schematic of CO_2 flood
Source: National Energy Technology Laboratory

Capturing emissions of waste CO_2 from power plants, oil refineries, and other industrial facilities is an extremely costly endeavor. If those industrial emitters of CO_2 could sell the waste gas to oil producers for use in CO_2 floods, that would make CO_2 capture more cost-effective while providing an economic supply of CO_2 for EOR. Implementing a broad program of CO_2 floods with waste CO_2 from coal-fired power plants and other industrial facilities thus would help boost the nation's oil reserves and production while reducing its emissions of CO_2.