

## National Enhanced Oil Recovery Initiative

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**The National Enhanced Oil Recovery Initiative brings (NEORI) together diverse public and private leaders to increase U.S. domestic oil production, energy security, and reduce emissions by capturing carbon dioxide (CO<sub>2</sub>) from power plants and industrial facilities<sup>1</sup> and safely storing it in oil fields.**

Launched in July 2011, the National Enhanced Oil Recovery Initiative's purpose is to develop and advance policy recommendations to increase U.S. domestic oil production from existing oil fields through enhanced oil recovery (EOR) and to store CO<sub>2</sub> captured from power plants and industrial facilities. The private sector, government and NGO leaders participating in this initiative aim to enhance U.S. energy security, promote job and economic growth, and reduce CO<sub>2</sub> emissions.

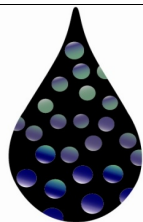
**How does CO<sub>2</sub>-EOR work?** CO<sub>2</sub>-EOR works most commonly by injecting CO<sub>2</sub> into already developed oil fields where it mixes with and "releases" additional oil from the formation, thereby freeing it to move to production wells. CO<sub>2</sub> is separated from the produced oil in above-ground equipment and re-injected in a closed-loop system many times over the life of an EOR operation.

**Does Increasing CO<sub>2</sub>-EOR Create Jobs?** Yes. Workers will be needed across the full CO<sub>2</sub>-EOR value chain: from building and operating CO<sub>2</sub> capture systems at power plants and other industrial facilities, to constructing new pipeline networks to transport CO<sub>2</sub>, to retrofitting and giving new life to existing oil fields. For example:

**Does Increasing CO<sub>2</sub>-EOR Stimulate the Economy?** Yes. CO<sub>2</sub>-EOR will create and preserve high-quality jobs and enable states and local governments to realize additional revenue, inject millions of dollars into local businesses, and reduce oil imports and trade imbalances.

Recent estimates by the U.S. Carbon Sequestration Council<sup>2</sup> show that expanded CO<sub>2</sub>-EOR could provide up to \$12 trillion, equal to about 80 percent of the U.S. national debt, in economic benefits to the U.S. over the next three decades, based on the "multiplier effects" of oil production on economic activities. The multiplier effect is the tendency for newly generated wealth to transfer hands and be spent several times.

A report by the University of Texas Bureau of Economic Geology's (TBEG) Gulf Coast Carbon Center<sup>3</sup> quantifies the total economic activity of oil production for Texas to be 2.9 times the value of the oil produced. In other words, almost two dollars of additional economic activity is created for every dollar of oil produced. Moreover, TBEG estimates 19 jobs for every \$1 million of oil produced annually.



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Advanced Resources International<sup>4</sup> estimates that an increase in oil production from CO<sub>2</sub>-EOR could reduce net crude oil imports by half and provide up to \$210 billion in increased state and federal revenues by 2030. ARI also estimates that a robust EOR policy could reduce the U.S. foreign trade deficit by \$11 to \$15 billion dollars (2007 dollars) in 2020 and \$120 to \$150 billion by 2030.

Cumulatively, this reduction in oil imports would keep \$600 billion here at home, generating additional economic activity, jobs and revenues, rather than flowing out of the U.S. economy to other countries.

### **CO<sub>2</sub>-EOR can deliver long-term economic value.**

CO<sub>2</sub>-EOR projects offer longevity and certainty not always associated with other oil production opportunities. By revitalizing oil production from existing fields and producing incremental oil from proven formations that have been studied thoroughly, CO<sub>2</sub>-EOR can increase a formation's yield by 5 to 15 percent of the original oil in place.

While CO<sub>2</sub>-EOR operators must inject CO<sub>2</sub> for approximately one year before a formation will yield additional oil, the resulting production may continue for up to 30 years, usually peaking for 10 years (between years 5-15). The first two large-scale CO<sub>2</sub>-EOR projects in the United States (SACROC and Crossett in West Texas) began in the 1970s and are still in operation today, producing more than 100 million barrels of oil per year. CO<sub>2</sub>-EOR therefore can provide

relatively stable energy production, employment, and benefits to local economies. In addition, CO<sub>2</sub>-EOR offers rates of return that compare favorably with other oil production projects, provided that CO<sub>2</sub> can be delivered at an affordable price.

### **The potential to pursue – and benefit from – CO<sub>2</sub>-EOR is widespread across the United States.**

Many states have oil fields that are candidates for CO<sub>2</sub>-EOR. As of 2010, 10 states had existing CO<sub>2</sub>-EOR operations, while overall, at least 23 U.S. states have CO<sub>2</sub>-EOR potential. Most existing CO<sub>2</sub>-EOR projects are located in the Permian Basin of West Texas, where there is an extensive CO<sub>2</sub> pipeline network and numerous existing CO<sub>2</sub>-EOR projects.

Over the last decade, new CO<sub>2</sub>-EOR projects have been initiated in the Gulf Coast, Rocky Mountains, Oklahoma, and even Michigan. Expanded or additional CO<sub>2</sub>-EOR projects could be initiated in each of these locations and other states. Oil produced domestically via CO<sub>2</sub>-EOR can displace imports of foreign oil, create local job opportunities, and raise new revenues for federal and state governments.

<sup>1</sup> Examples of industrial facilities include fertilizer production, ethanol production, cement and steel plants.

<sup>2</sup> Carter, L.D., *Enhanced Oil Recovery & CCS*. United States Carbon Sequestration Council. 14 January 2011.

[http://www.uscsc.org/Files/Admin/Educational\\_Papers/Enhanced%20Oil%20Recovery%20and%20CCS-Jan%202011.pdf](http://www.uscsc.org/Files/Admin/Educational_Papers/Enhanced%20Oil%20Recovery%20and%20CCS-Jan%202011.pdf)

<sup>3</sup> CO<sub>2</sub> Enhanced Oil Recovery Resource Potential in Texas – Potential Positive Economic Impacts, TX Bureau of Economic Geology, April 2004.

<sup>4</sup> ARI, *White Paper: U.S. Oil Production Potential from Accelerated Deployment of Carbon Capture and Storage*, 2010