

# ENHANCED OIL RECOVERY (EOR)



# NETL

NATIONAL ENERGY TECHNOLOGY LABORATORY

## OVERVIEW

As the United States continues to pursue its energy independence and reducing emissions of greenhouse gases, the topic of carbon dioxide (CO<sub>2</sub>) enhanced oil recovery (EOR) continues to be explored as a method to store CO<sub>2</sub> underground in order to mitigate its greenhouse impacts as an adjunct to recovering incremental oil from conventional fields.



As much as two-thirds of conventional crude oil in domestic fields remains unproduced, left behind due to the physics of fluid flow that results in oil adhering to matrices in underground formations. CO<sub>2</sub> EOR enhances sweep efficiency, or the ability to flush the oil droplets off the formation matrices, thereby enhancing production. The technology is also applicable to hydrocarbons in unconventional rocks or in formations that have unconventional characteristics (such as oil in fractured shales, kerogen in oil shale, or bitumen in tar sands) which constitute a significant potential domestic supply of energy.

The re-injection of natural gas associated with oil production is also being investigated as a mechanism for EOR. The use of associated natural gas as an injectate for EOR not only improves incremental recovery. It also reduces further flaring of natural gas, thus mitigating greenhouse gas emissions. NETL is sponsoring field-based research to accelerate the development and application of technologies for enhancing

the recovery of petroleum from both conventional and unconventional reservoirs in fields across the nation.

Drivers that provide a clear focus for research, development, and demonstration in this area include:

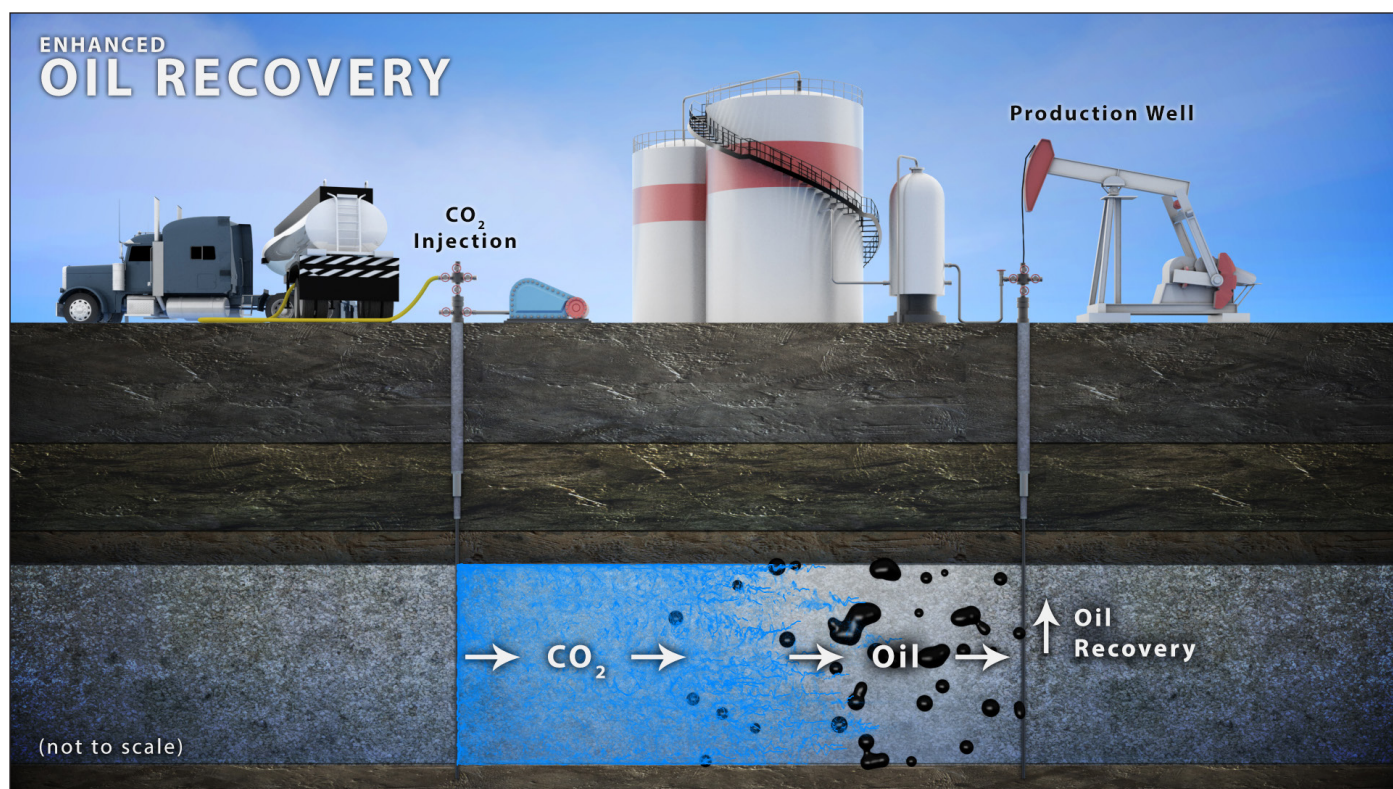
- Next generation CO<sub>2</sub> EOR technologies that can increase recovery from existing CO<sub>2</sub> EOR projects and accelerate application of the process to other mature oil fields around the country.
- Methods to improve performance and lower costs of CO<sub>2</sub> and other gas floods, as well as ways to accelerate their application by independent producers.
- Targeting hydrocarbons locked in unconventional reservoir rocks like the Bakken shale or in reservoirs which have characteristics that make their production difficult (such as heavy oil in arctic reservoirs).

## TECHNOLOGY PARTNERSHIPS

NETL maintains research partnerships with industry and academia for field laboratories to catalyze development and demonstration of emerging technologies and methodologies to facilitate widespread application of EOR.

For more information, see:

<https://netl.doe.gov/oil-gas/oil-recovery>



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