UNCONVENTIONAL RESOURCES

NETL

NATIONAL ENERGY TECHNOLOGY LABORATORY

The increasing demand for energy and the need to explore, characterize, and produce domestic fossil energy resources requires continued research into ways to enhance recovery and minimize risks associated with domestic oil and gas production. NETL researchers are addressing these needs through work under a series of programs and projects categorized as Unconventional Resources research.

The Unconventional Resources Program is designed to ensure that a reliable, affordable, and secure domestic supply of oil and natural can be developed and produced in a manner that maximizes recovery efficiency while minimizing impacts on the environment

UNCONVENTIONAL RESOURCES

Despite significant growth in the production of unconventional resources during the "shale revolution," the mechanisms controlling recovery efficiency in these reservoirs remains poorly understood. Recovery factors, the ratio of ultimately produced resource to total resource originally in-place, are typically low – approximately 20 percent in gas-rich shale reservoirs and less than 10 percent in liquid-rich plays. Increasing the per-well recovery factor for unconventional plays will reduce the number of wells required to economically exploit the resource and lessen developmental impact on the environment.

Three universally accepted drivers provide a clear focus for research in this area:

- Conventional domestic natural gas production is declining and the primary alternative for replacing it, natural gas from hydraulically fractured shales, involves an increased demand for fresh water and the possibility of induced seismic events related to increased fracturing wastewater disposal.
- Stakeholder interest, concern and attention is increasingly concentrated on solutions that are capable of increasing the percentage of in-place unconventional hydrocarbons recovered and ways to reduce costs associated with reservoir characterization, stimulation, and production.
- Increased use of clean-burning natural gas for power generation remains an essential element of any strategy to help the United States transition to a lower carbon footprint.

NETL'S RESEARCH IS INTENDED TO INVESTIGATE THESE ASPECTS OF UNCONVENTIONAL RESOURCES:

CHARACTERIZING EMERGING PLAYS

To characterize emerging oil and natural gas accumulations at the reservoir level.

IMPROVING RECOVERY EFFICIENCY

To identify and help accelerate the development of economically viable technologies to produce natural gas and oil resources in a more efficient and affordable manner.

MITIGATING IMPACT ON THE ENVIRONMENT

To develop and improve technologies that are focused on reducing the environmental and operational impacts of oil and gas production.

UNCONVENTIONAL RESOURCE TECHNOLOGIES WILL EXTRACT THE FULL ECONOMIC VALUE FROM OUR NATION'S TIGHT OIL AND GAS RESOURCES BY:

- Reducing domestic natural gas and oil supply cost
- Reducing supply risks for regional manufacturing centers that rely on natural gas for fuel or feedstock
- Increasing recovery per well and per well pad, with a concurrent reduction in surface disruption per unit of resource recovered
- Enhancing United States energy security, including reduced oil imports
- Strengthening United States resource export potential, and maximizing value for domestic energy stakeholders

TECHNOLOGY PARTNERSHIPS

NETL maintains research partnerships with industrial, academic, and research entities, in particular for the implementation of field laboratories designed to catalyze development and demonstration of innovative technologies and methodologies for unconventional oil and natural gas development.

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