

# PROGRAM facts

U.S. DEPARTMENT OF ENERGY  
OFFICE OF FOSSIL ENERGY  
NATIONAL ENERGY TECHNOLOGY LABORATORY

Strategic Center  
for Natural Gas & Oil

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## DRILLING, COMPLETION, AND STIMULATION

As gas production continues to deplete our shallow, conventional easy to get natural gas resources, future natural gas supply will increasingly depend on the domestic industry's ability to safely and economically drill, complete, and stimulate wells that are more complex, deeper, remote and costlier to drill. There are near-term industry needs to more efficiently drill and produce gas from conventional reservoirs to maximize productivity given limited rig, manpower, and service capacities. To address these needs, the DOE sponsors a wide range of research and development of new and improved technologies designed to allow faster, deeper, cheaper, safer, and less damaging drilling in a wide range of environments. New technologies for the improved and more efficient completion and stimulation of wells are also being developed under this area. In addition, more and more gas will need to come from deeper reservoirs. These reservoirs are characterized by higher temperature, higher pressure, more caustic, and harder geologic environments. Therefore, DOE/NETL initiated the Deep Trek Program to develop technologies that would lower the cost and improve the efficiency of drilling and completing wells in the aforementioned environments.



## ADDRESS

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## WEBSITE

[www.netl.doe.gov](http://www.netl.doe.gov)

## STRATEGIC CENTER FOR NATURAL GAS & OIL WEBSITE

[www.netl.doe.gov/scngo](http://www.netl.doe.gov/scngo)

Technologies currently being developed and demonstrated are:

- **Conventional Drilling System Efficiency**

- Advanced mud hammer and hammer engine technologies
- Optimization of mud hammer drilling performance
- Downhole event recognition
- Aphron drilling fluids

- **New Concept Drilling System/Components**

- High-pressure jet assisted drilling system
- New aggressive TSP cutter design
- Hydraulic pulse drilling system
- Downhole seismic source for Pore Pressure Prediction
- Laser drilling and well completion systems
- Composite drill pipe
- High baud two-way telemetry system ("Intellipipe")
- Liner drilling system

- **Advanced Completion and Stimulation Systems**

- Hydraulic fracture mapping system
- Downhole fluid analyzer
- Composite production risers
- Downhole power generation & wireless communication
- Ultra-lightweight cement

- **Deep Trek Program**

- High temperature (>225°C) electronic components
- High temperature/ high pressure MWD
- High temperature/ high pressure supercement
- Downhole vibration monitoring and control system
- Stimulation technology for deep well completions
- Electromagnetic telemetry tool for deep drilling
- Optimization of HT/HP fluids and advanced diamond bits for deep drilling
- High temperature gamma ray detector