Shale gas is natural gas trapped inside formations of shale — fine grained sedimentary rocks that can be rich sources of petroleum and natural gas. Just a few years ago, much of this resource was considered uneconomical to produce. But Office of Fossil Energy (FE) research helped refine cost-effective horizontal drilling and hydraulic fracturing technologies, protective environmental practices and data development, making hundreds of trillions of cubic feet of gas technically recoverable where they once were not.

Consequently, shale resources are contributing to a rejuvenation of domestic natural gas supply in the United States. The U.S. Energy Information Administration (EIA) reports that U.S. shale gas production has increased 12-fold over the last decade and reserves have increased substantially, and now constitute about 19 percent of technically recoverable domestic natural gas. Shale gas (23 percent of the total), coalbed methane and tight gas combined now account for 58 percent of U.S. production. This increased domestic supply has helped reduce the need for imports while enhancing U.S. energy security.

FE’s early investments in shale research in the 1970s matched technology to complex geology for various settings. In 1986, FE collaborated with industry on the first air-drilled, 2,000-foot-long horizontal shale well in the Appalachian Basin.

Through its National Energy Technology Laboratory (NETL), FE pioneered directional wells (drilling at an angle other than vertical), hydraulic fracturing (using pressurized liquids to fracture subsurface rock) and other technologies.
Building on past R&D successes, new technologies are being applied to make certain that the process of drilling for this valuable resource minimizes environmental impacts.

According to EIA, the technically recoverable unproved shale gas resource is **482 trillion cubic feet**. By 2035, shale is projected to account for **49 percent** of U.S. gas production.