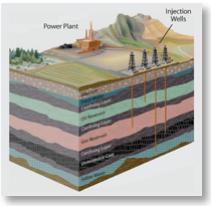
Fossil Energy Historical Timeline*

The 2000s

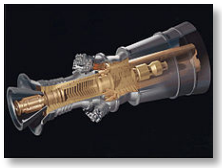


2000

FE's R&D mission becomes increasingly focused on Carbon Capture and Storage (CCS) research.

2000

Methane Hydrate Research and Development Act establishes DOE as the lead U.S. agency for research in this field. Authorized initially with about $3 million in 2000, funding levels increased to $12 million by 2004. The program was reauthorized in the Energy Policy Act of 2005.



2000

General Electric announces that its H System turbines, developed through FE's ATS program, were ready for commercial sale.

2000

CO_2 injection begins at the **Weyburn oil field** in Canada, using carbon dioxide captured from the Great Plains Gasification Plant in Beulah, N.D., for enhanced oil recovery. FE supports this project in cooperation with the governments of Canada, Japan, and the European Union – injection operations extend the field's useful life by an estimated 20 years.

Did You Know?

2001

NETL begins managing full-scale field tests of mercury control technology at nearly 50 U.S. coal-fired power plants. The high performance and reliability of these control systems gives coal-based plant operators the confidence to begin deploying technology.

2001

The **Clean Coal Power Initiative** is launched. Combined with the **Power Plant Improvement Initiative** , begun in 2000, FE/NETL co-sponsor and manage commercial demonstrations of innovative retrofits to existing plants. Twelve demonstration projects were complete or underway by the end of the decade, with DOE's private and local partners covering at least half the costs.

2002

Renovated JEA **Northside Generation Station** is fully operational, incorporating circulating fluidized bed (CFB), advanced NOx controls, and state-of-the-art flue gas desulfurization technology pioneered by FE research. The facility demonstrated that **CFB technology** could be scaled up for very large electric utility applications and made the Jacksonville, Fla., facility one of the cleanest coal-burning power plants ever built.

2003

FE/NETL's **Hydrogen from Coal Program** is in the vanguard of efforts to develop hydrogen gas-separation membranes, a great advance over existing multi-step process for hydrogen production and purification.

** Click on images for more information*

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The 2000s

2003

Inaugural meeting of the **Carbon Sequestration Leadership Forum**; seven **Regional Carbon Sequestration Partnerships** are established. DOE/FE is instrumental in the formation of both groups, which have immense positive effect on advancing CCS technology.

2004

FE's NETL begins management of the first U.S. field test near Dayton, Texas, to gauge the viability of **underground brine formations** as geological storage sites for CO_2.

Did You Know?

2005

FE is credited with helping refine cost-effective horizontal drilling and hydraulic fracturing technologies, protective environmental practices, and developing data on Devonian shales that allows Range Resources to demonstrate effective methods for recovering unconventional natural gas from deep shale formations in Central Appalachia.

FE Research
A Closer Look

2005

A decade-long cooperative agreement between NETL and FuelCell Energy Inc. ended after spurring commercialization of the company's molten carbonate fuel cell technology. Testing this design, the largest coal-based fuel-cell power plant in the country – Wabash River's coal gasification facility in Indiana – transformed synthesis gas into electricity.

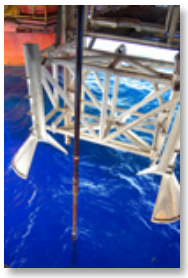
2005

Building off initial research projects started in the 1990s, DOE launches its **Climate Change Technology Program**, giving FE and NETL a leadership role in broadening the range of feasible technological options for controlling CO_2 emissions and limiting their impact on the environment.

US CLIMATE CHANGE TECHNOLOGY PROGRAM
www.climatetechnology.gov

2005

A deepwater drilling program in the Gulf of Mexico successfully addresses industry's desire to establish protocols for safe drilling through the most common gas hydrate-bearing sediments.



2006

NETL and ANH Refractories develop a new chrome-oxide refractory material capable of standing up to the intensely hot and corrosive conditions in slagging gasifiers.

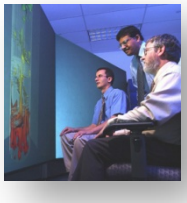
2006

FE scientists serve as science co-chief on a deepwater expedition conducted by the government of India in the Bay of Bengal. FE subsequently collaborates on international programs with Japan, South Korea, Canada, New Zealand, and China.

** Click on images for more information*

Fossil Energy Historical Timeline*

The 2000s



2007

NETL wins prestigious R&D 100 Award for its Multiphase Flow with Interphase Exchange (MFIX) software for modeling gas-solids flow, important for coal gasification research

2007

An FE/industry partnership conducts the successful Mount Elbert gas hydrate program on the Alaska North Slope. The results enable the U.S. Geological Survey to assign 85 tcf of technically recoverable gas in gas hydrate to the region in 2008.

Did You Know?

2008

NETL concludes its primary mercury program after tests at dozens of sites around the U.S. indicate the readiness of activated carbon injection for commercial use in power plant flue-gas.

2009

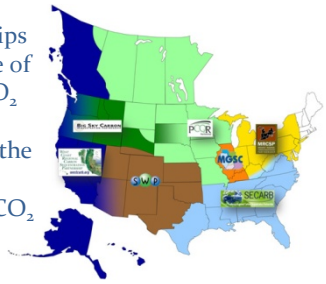
NETL co-sponsors the first coalbed sequestration field test at a site in northern West Virginia.

2007

NETL announces its patented coal fines process can improve energy recovery for consumers, reduce coal preparation plant wastes, and provide profits for operators.

2008

Regional Carbon Sequestration Partnerships begin third 10-year phase of several large volume CO_2 storage tests in North America to demonstrate the long-term, safe underground storage of CO_2 at commercial scale.

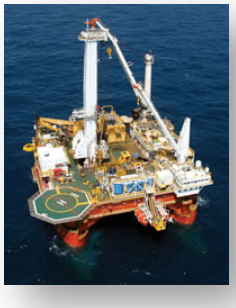


2009

U.S. enhanced oil recovery is 250,000 barrels per day, 10 times greater than in 1986. FE carbon capture and storage budget is $180 million, with additional $3.4 billion provided by Congress in stimulus funding to continue building on program successes.

2009

An FE/industry partnership conducts **landmark gas hydrate Leg II program**. The expedition discovers resource quality gas hydrate at two of three sites drilled and provides initial confirmation to 2008 Department of Interior estimates of more than 6,700 tcf of gas in high concentration deposits in the Gulf of Mexico



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