Fossil Energy Historical Timeline*

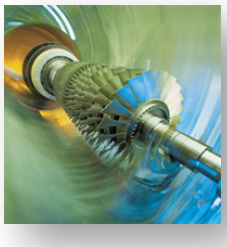
The 1990s

Did You Know?

1990

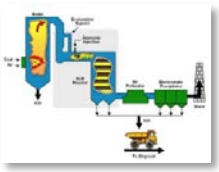
The National Resources Council estimates that two-stage liquefaction, a centerpiece of **synthetic liquids fuels research** at FE facilities, and other process innovations had cut the cost of a barrel of synthetic oil made from coal by half over the preceding decade.

1992



FE's **Advanced Turbine Systems (ATS) Program**, a cooperative effort with industry and academia, begins new round of work on ultra-efficient turbines. Knowledge base amassed enables performance enhancement and establishes the U.S. as world leader in gas turbine technology.

1993



SCR schematic (click for larger view)

The first **Selective Catalytic Reduction** (SCR) technology, encouraged by FE research, is installed in the United States. Today, SCR and selective non-catalytic reduction systems are installed on about 50 percent of the U.S. coal fleet, helping greatly reduce NOX emissions.

Did You Know?

1995

U.S. Geological Survey estimates **hydrate deposits** contain more methane than all the country's other forms of natural gas combined, attracting great attention to developing this resource. FE program are already pioneering R&D in this area.

1990s

A proactive technology transfer program led by NETL helps spread CO_2 development concepts widely throughout the oil industry, promoting enhanced oil recovery to independent operators.

1992

FE adds Coal Preparation Process Research Facility to its Coal Prep Laboratory. Scientists and engineers use these facilities to study alternative methods for the **physical cleaning of coal** before burning it. Cleaning reduces pollutants and impurities in coal before it is used at power plants and industrial facilities.

1992

FE investment in Devonian shale research, 1977-92, matching technology to complex geology, totals $92 million.

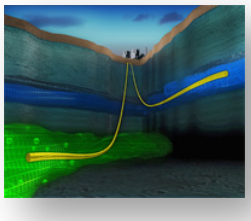
Mid-1990s

Under FE's **Innovations for Existing Plants** program, NETL begins a comprehensive **mercury emissions control R&D** effort for coal-based power generation facilities. Working collaboratively with partners in government, industry, academia, research and state and local agencies, the program eventually significantly improves the cost and performance of mercury control technology.

** Click on images for more information*

Fossil Energy Historical Timeline*

The 1990s



1997

FE/NETL begin **carbon sequestration research program**, the predecessor to current-day carbon capture and storage (CCS) research.

1998

FE's carbon sequestration research budget is $1 million – it would grow 150 percent by 2010, funding activities that put DOE in the forefront of global CCS R&D efforts and innovations.

1998

The **Combustion Byproducts Recycling Consortium** (CBRC), funded by NETL with its National Center at West Virginia University's Water Research Institute, is established to develop and demonstrate technologies to help recycle solid waste materials resulting from coal combustion.

1999

The Gas Information System (GASIS) project, completed at FE's Morgantown research facility, gives natural gas producers unprecedented access to information they could use to guide exploration and drilling decisions. DOE/FE natural gas program funds studies of membrane-based technologies to separate unwanted contaminants from sub-quality gas.

1999

FE's **National Energy Technology Laboratory** is created by elevating the Federal Energy Technology Center to the rank of a national laboratory.

1999

NETL and the Pacific Northwest National Laboratory initiate the Solid-State Energy Conversion Alliance (SECA) to develop modular, fuel-flexible solid oxide fuel cells (SOFCs) with the objective of realizing a 10X decrease in cost by 2010. With the cost target achieved on schedule, SOFC developers are starting to reach early commercialization in the portable power and distributed generation markets.

** Click on images for more information*