

The Fossil Report

Oak Ridge National Laboratory Fossil Energy Program

Summer 2002

Energy Technology for the Future...and for the World

New Projects Added to ORNL Fossil Energy Program in FY 2002

Several new activities were added to the ORNL Fossil Energy Program in FY 2002 in the Oil and Gas Research and Natural Gas and Carbon Sequestration areas.

Oil and Gas and Natural Gas and Carbon Sequestration are the second and third, respectively, largest areas of the Program [[graphic](#)].

Heavy crude oils contain condensed polyaromatic linkages, composed of polyaromatic hydrocarbons and sulfur and nitrogen heterocycles. The existence of these materials makes the refining of heavy crudes very difficult. With support from the [DOE National Petroleum Technology Office](#), [Abhijeet Borole](#) has undertaken a study of the use of temperature- and oil-tolerant enzyme catalysts to upgrade heavy crude oils. Catalysts with such properties make them ideal as

oil bioprocessing catalysts. Previous work at ORNL revealed that oxidative enzymes are capable of attacking polyaromatic compounds.

[Joanna McFarlane](#), with support from the [DOE National Petroleum Technology Office](#), is working on the development of a computational tool to predict the water-soluble organic content in brines, associated with deep-well oil production. The long-range goal of the work is a tool that can be used for produced water cleanup from production facilities, resulting in cost savings and reduced environmental impacts.

The Petroleum Risk Information Decision Evaluation System (PRIDES) is the vision of a new project, supported by the [DOE National Petroleum Technology Office](#) and lead by [Wilson McGinn](#), to provide risk guidance, information, and tools to the fossil energy community to protect human health and the environment, while, at the same time making cost-effective

Removal of Sulfur from Fuel Gas Objective of New Work

Fossil fuels, still our most abundant natural resource and the mainstay of our country's energy supply, continue to suffer from the persistent problem of sulfur contamination.

Whether the end product is coal gas, liquid fuels, or natural gas, sulfur contamination is a critical hurdle to overcome for the environmentally-acceptable use and application of fossil fuels in a wide variety of emerging energy technologies.

Led by [Tim Armstrong](#) of Oak Ridge National Laboratory's Metals & Ceramics Division, in collaboration with the [DOE National Energy Technology Laboratory](#), a new project is scheduled for FY 2003, which will study an improved sulfur removal technique for fuel gas.

The Selective Catalytic Oxidation of Hydrogen Sulfide (SCOHS) process is a continuous sulfur removal tech-

IN THIS ISSUE

New Projects Added to ORNL Fossil Energy Program in FY 2002
Removal of Sulfur from Fuel Gas Objective of New Work
Status of FY 2003 Appropriations
Congress Working on Budget for FY 2003
National Greenhouse Gas Emissions Inventory Act of 2002
Coal Facts

[See New Projects on page 2](#)



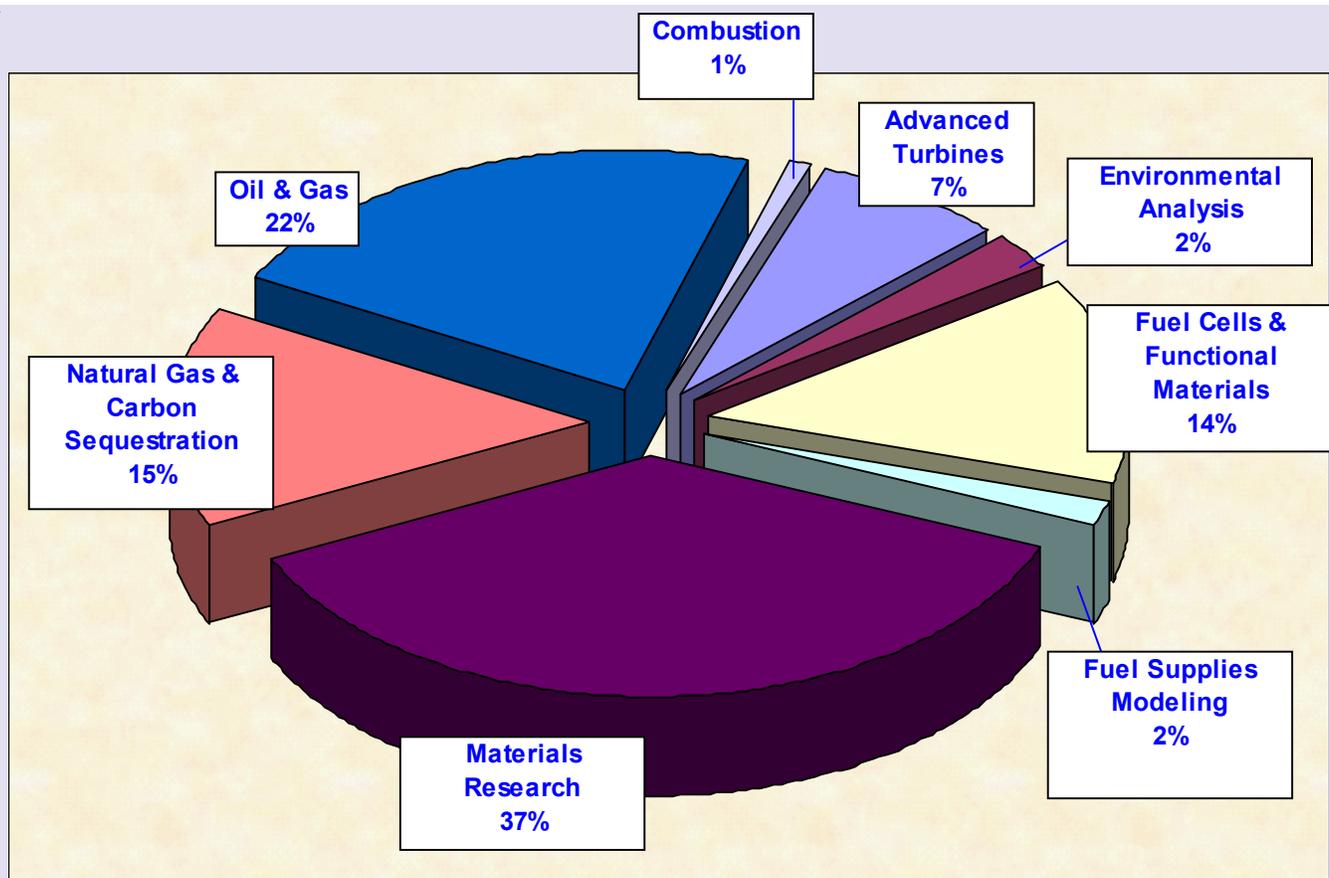
UNITED WE STAND

[See Sulfur Removal on page 4](#)

The Fossil Report is published quarterly.

Send comments to:

[Paul T. Carlson](#)
Editor and Publisher
Oak Ridge National Laboratory
Fossil Energy Program



THE ORNL FOSSIL ENERGY PROGRAM IN FY 2002

New Projects from page 1

decisions.

Tommy Phelps, with support from the DOE National Energy Technology Laboratory, is working on the characterization of the thermodynamics and kinetics of natural gas hydrate formation and dissociation. In

addition, sediments containing methane hydrates will be characterized. The primary focus will be the analysis of samples derived from the Ocean Drilling Program, Leg 204. [See the January-February 2001 issue of The Fossil Report for more on the work of the Ocean Drilling Platform to re-

veal methane hydrate deposits.]

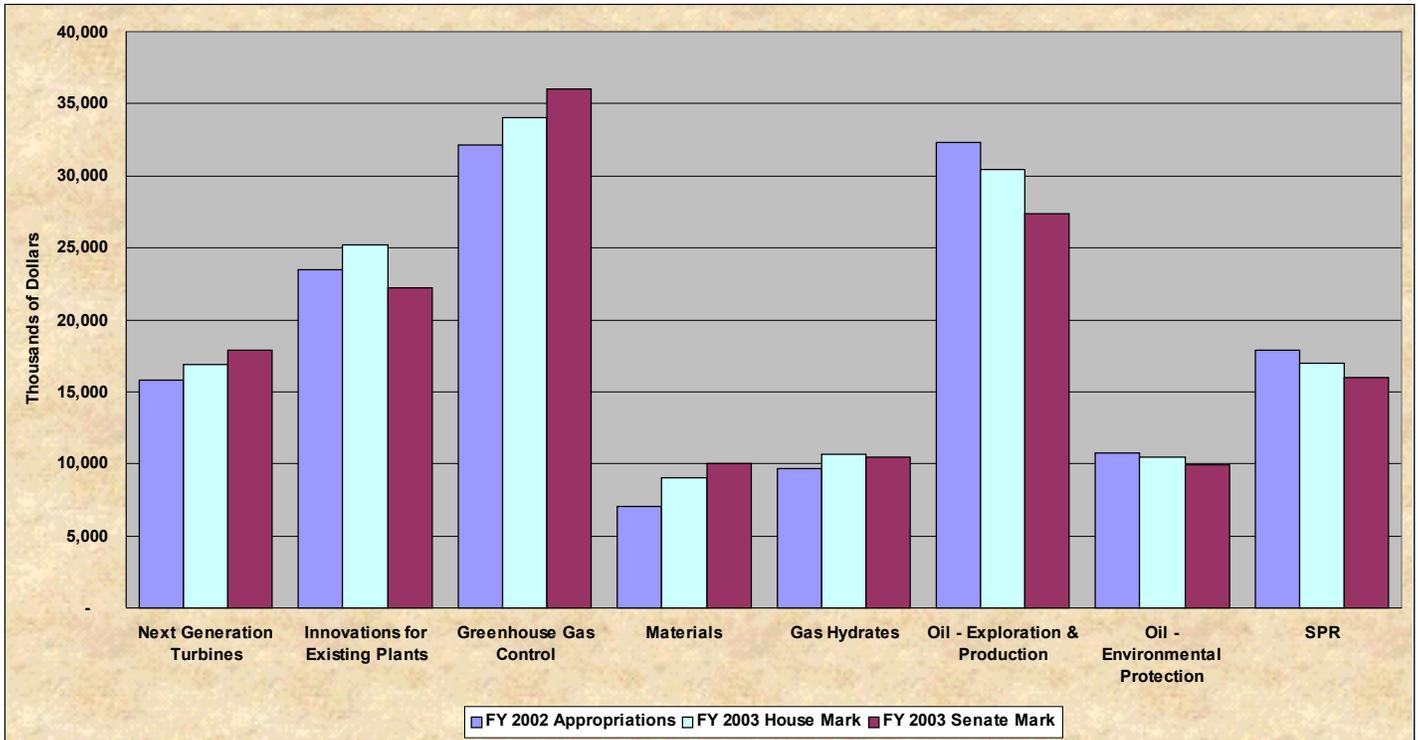
Jim Blencoe, with support from the DOE National Energy Technology Laboratory, began work this year on a study of the effects of temperature and gas mixing on formation pressure, CO₂ sequestration, and methane production in underground coal beds. See the Winter 2001 issue of The Fossil Report for more on this activity.

Status of FY 2003 Appropriations

July 18, 2002: H.R. 5093 Placed on Senate Legislative Calendar.

July 11, 2002: House Committee on Appropriations Report 107-564 ordered to be printed.

June 28, 2002: Senate Committee on Appropriations Report 107-201 ordered to be printed.



Congress Working on Budget for FY 2003

As Summer draws to a close, the House and Senate are working on the appropriations bill for the coming year.

Each body has issued a report containing recommendations for funding levels for Fossil Energy Program activities in FY 2003.

The above graphic shows the results of the House and Senate reports, compared with FY 2002 levels.

The final conference report is expected sometime in the Fall, but a general sense of the outcome can be seen by the positions taken to date by each of the legislative bodies.

Both the House and Senate voted increases in the Next Generation Turbines Program, over the FY 2002 level, even though the overall funding for

FY 2002 appropriations are compared with House and Senate committee reports for FY 2003 funding.

the Turbines area decreased.

Both the House and Senate support appreciable increases to Greenhouse Gas Control.

Innovations for Existing Plants, with the recommendation that the work should focus on understanding mercury emissions for different types of coal-fired power plants.

In addition, the House has recommended that research on the control of mercury for, specifically, the burning of lignite be expanded and that studies be initiated to understand the role of mercury in

Funding for Gas Hydrates is increased in both the House and Senate reports.

Only the House has recommended an increase of \$1.7M for

coal power plant by-products.

Both the House and Senate support appreciable increases to Greenhouse Gas Control. However, the House has added a recommendation that the carbon sequestration program focus more on carbon capture.

Recommendations for the Materials Program in FY 2003 are for funding levels of \$9M and \$10M under the House and Senate reports, respectively.

Funding for Gas Hydrates is increased in both the House and Senate reports.

Recommendations in both reports are for a decrease in Gas Infrastruc-

See New Year on page 4

National Greenhouse Gas Emissions Inventory Act of 2002

H.R.4611

Introduced: April 25, 2002

Latest Action: May 6, 2002: referred to the House Subcommittee of Energy and Air Quality

The National Greenhouse Gas Emissions Inventory Act of 2002 requires that the Environmental Protection Agency establish and administer a national greenhouse gas emissions information system. The function of the system is to compile lists, on an annual basis and by emitter, of greenhouse gas emissions.

In addition, a national greenhouse gas registry would be established to collect voluntarily-reported information on emissions reductions. An annual national greenhouse gas emissions inventory would be published by the EPA.

In addition to the EPA, the Secretaries of Commerce, Agriculture, and Energy would also participate in the development of methods to quantify, verify, and report emissions information.

New Year from page 3

ture funding and for virtually level funding for Gas Environmental Protection.

In the Petroleum area, recommendations are for decreased funding for Exploration and Production and for Environmental Protection.

The House has specifically recommended that pressure-pulse technology for enhanced oil recovery be pursued.

Although DOE has proposed that all remaining balances of the Clean Coal Technology Demonstration Program be transferred to the Fossil Energy Research & Development account, both the House and Senate have de-

clined to grant this request.

Support for Management of the Strategic Petroleum Reserve is decreased from the FY 2002 level in both the House and Senate reports.

Coal Facts

In a recent report, [Jeff Goodell](#) writes that "...Coal generates more than 50 percent of the United States' electricity...We burn about a billion tons of it a year—besides keeping our lights on, it powers the \$218-billion electric utility industry, the third largest in the country (behind petrochemical and auto). We also have the biggest reserves of coal in the world—an estimated 275 billion tons still in the ground."

Sulfur Removal from page 1

nology, which is envisioned to be a more compact, lower cost, and lower-maintenance method for the removal of sulfur.

The SCOHS process also has the capability to remove sulfur in the parts-per-billion level below 250C, and, at the same time, produce a sulfur by-product.

For more information on this new activity, contact [Tim Armstrong](#), Oak Ridge National Laboratory.

This work is supported by the [DOE Office of Fossil Energy, National Energy Technology Laboratory](#).