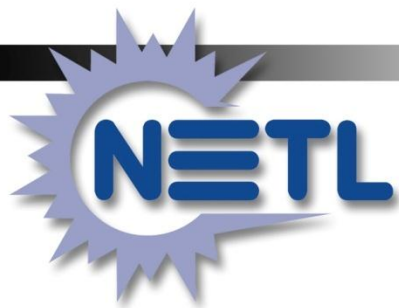


NATIONAL ENERGY TECHNOLOGY LABORATORY



“Partnering with NETL-RUA”

Charles E. Taylor, Director, Chemistry and Surface Science Division

ENERGY

the ENERGY lab



NETL-RUA Snapshot

PRODUCTS		
	FY2011	FY2012
Publications	194	195
Patents	11	12
Licenses	9	4
Students Graduated	20 PhD	23 PhD
	8 MS	19 MS

RESEARCH PERSONNEL



Total = 555

- Graduate Students - 112
- Undergraduate Students - 14
- University Researchers - 200
- URS Researchers - 80
- NETL Researchers - 149

- 13 Cooperative Research and Development Agreements
- 3 Contributed Fund Agreements
- 16 Licenses

- 23 Memorandum of Understandings
- 69 Non-Disclosure Agreements

NETL Core Capabilities

- **Carbon Management**
- **Chemical Reaction Engineering**
- **Combustion Science**
- **Computational Research**
- **Environmental Science**
- **Fuel Cell Research**
- **Geosciences**
- **High Temperature/High Pressure Science**
- **Materials Performance**
- **Methane Hydrates Research**
- **Process Development**
- **Reciprocating Engines Research**
- **Remote Sensing**
- **Sensors and Controls**
- **Separations Science**
- **Surface Science**

NETL Major S&T Initiatives

Computational and Basic Sciences

- **Computational Chemistry**
- **Computational Fluid Dynamics (CFD) and Multiphase Flow**
- **High-performance Computing**
- **Multi-scale Modeling**
- **Development of Advanced Diagnostic Tools**
- **Process Simulation and Optimization**

Key Facilities

- **Simulation Based Engineering Users Center (SBEUC)**
- **AVESTARTM Center**
- **Computer clusters**
- **Visualization**
- **Cold Flow Experiments**

NETL Major S&T Initiatives

Energy System Dynamics

- **Technologies to Capture CO₂ During Energy Generation**
- **Methods to Use Hydrogen Combustion in Turbines and Engines**
- **Performance of DOE-Developed Fuel Cells**
- **Fundamental Research in Combustion Sciences**
- **Sensors and Control Technology for Advanced Energy Systems**
- **Fuel Reforming and Gas Cleanup Technologies**

NETL Major S&T Initiatives

Energy System Dynamics

Key Facilities

- **Advanced Sensors Development Laboratory**
- **Catalyst Screening Unit**
- **Co-gasification Kinetics Facilities**
- **Fuel Cell Test Facility**
- **Fuel Processing Unit**
- **Hybrid Performance (HYPER) Laboratory**
- **Image Processing Laboratory**
- **Multi-cell Array**
- **High-Pressure Combustion Facility**
- **Oxy-fuel Combustion Facility**
- **Post-combustion CO₂ Capture Facilities**
- **Pre-combustion CO₂ Capture Facilities**
- **Small-scale Combustion Laboratory**

NETL Major S&T Initiatives

Geological and Environmental Systems

- **Thermal Science**
- **Gas Separation & Purification**
- **Reactive Flow & Diagnostics**
- **Reactor Design**
- **Dynamics and Control**
- **Multiscale, Multiphase Flow**
- **Strategic Monitoring of Natural-System Behavior**
- **Geomaterials Science (both geophysical and geochemical aspects of earth materials)**
- **Geospatial Data Management and Assessment**
- **Drilling Under Extreme Conditions**

NETL Major S&T Initiatives

Geological and Environmental Systems

Key Facilities

- **Geomechanics and Flow Laboratory**
- **CT Scanner Facilities**
- **Shallow Well Laboratory**
- **Deep Well Laboratory**
- **Advanced Drilling Research Laboratory**
- **Brine Sequestration**
- **High-pressure Water Tunnel Facility**
- **Infrared Spectroscopy Test Facility**
- **Manometric Sorption Test Facility**
- **Separations Laboratory**
- **Mobile Air Monitoring Laboratory**
- **Analysis Instrumentation**
- **Simulation of Geologic Environments Facility**

NETL Major S&T Initiatives

Materials Science and Engineering

- **Advanced Combustion**
- **Advanced Gasification**
- **Fuel Cells**
- **CO₂ Utilization**
- **Turbines (base materials and coatings)**
- **Catalysis and Nano-Materials**
- **Batteries**
- **Membranes (H₂, CO₂, O₂ selective)**
- **Carbon-Capture Solvents and Sorbents**
- **Discovery and Design**
- **Synthesis and Processing**
- **Characterization**

NETL Major S&T Initiatives

Materials Science and Engineering

Key Facilities

- **Membrane Synthesis**
- **Membrane Separation Units**
- **Solid Oxide Fuel Cell Test Facility**
- **Catalysis Reaction Units**
- **Materials Processing**
- **Materials Performance Evaluation**
- **Analytical Characterization**
- **High-Temperature, High-Pressure Research Facility**
- **Melting, Casting, and Fabrication Facility**
- **Microstructural Characterization Facility**
- **Nano-Materials and Catalyst Research Laboratory**
- **Refractory-Ceramics Facility**
- **Severe Environment Corrosion Erosion Facility (SECERF)**

Definition of Work for Others (WFO)

- **As one of the Department of Energy's (DOE's) national laboratories, the National Energy Technology Laboratory (NETL) is authorized to perform work for entities outside of DOE's Office of Fossil Energy (FE).**
- **Reimbursable Work may be performed by NETL for DOE customers outside of FE (referred to as Inter-Entity Work) and for customers outside of DOE (referred to as Work for Others)**
- **Work for Others (WFO)**
 - **Other Federal Government Agencies**
 - **State and Local Governments**
 - **Private industry (for profit)**
 - **Academia and other non-profit organizations**

NETL WFO Strategy

- **NETL's work for others (WFO) is 100 percent on a fee-for-service basis.**
- **NETL must have funding authority before work begins; advance funding is required for non-federal work.**
- **Charges reflect only the actual costs; no profit is added.**
- **Work is performed on a best-effort, rather than fixed-price, basis.**

NETL WFO Strategy

Initiating Projects

- **You and your NETL counterpart develop a statement of work that describes the general scope, level of effort, and project deliverables.**
- **NETL works with proposal/agreement coordinator to develop an initial cost estimate for the reimbursable work**
- **NETL Business Development and Outreach team submits initial cost estimate to NETL Finance; NETL Finance reviews the SOW and cost estimate.**

NETL WFO Strategy

To proceed with any WFO opportunity, ORD must comply with NETL Procedure 481.1-1C:

“This procedure establishes processes and requirements for the acceptance and management of reimbursable work by NETL....those soliciting, accepting, and managing reimbursable work at NETL must sufficiently document their compliance with this procedure and the external requirements on which it is based, particularly in seeking management approval to pursue such work.”

Before any WFO agreement can be finalized, or funding accepted, the NETL Director issues final approval to accept the work

NETL WFO Strategy

When may NETL start work?

When (1) the appropriate agreement has been signed by both parties, and (2) funds or funding authority has been received by NETL.

Are funds tied to specific projects?

Yes, a project's funds may only be used for that project to ensure compliance with appropriation law and the intent of Congress.

Can a multi-year project be funded partially or entirely at the outset of the project?

Yes, a customer may fund a multi-year project in segments. If a project is funded in total the customer needs to work with the NETL Financial Management Division to ensure the customer's appropriation limitations will not have an adverse effect on the project.

How does NETL charge customers for work performed?

All customers are charged in the same manner for direct cost incurred for work performed on the project and an equitable share of DOE and NETL indirect cost. There is no profit.

How big can a project be?

There are no arbitrary minimum or maximum size constraints.

NETL WFO Strategy

Are NETL costs competitive?

NETL cost focuses on providing the best value for its customers. NETL is skilled at providing federal and contractor support in a cost-effective manner.

What progress reports can I receive?

Technical progress reporting is negotiated as part of your agreement with NETL. Periodic financial reports can be sent to the point-of-contact identified in the agreement. The NETL project manager may provide additional detailed status reports, as needed.

What happens to unexpended funds on completed projects?

Unexpended funds are returned to the customer.

Can customers terminate project and have funds returned to them?

Yes, NETL will return all unexpended funds (after all project and closeout costs have been recorded).

Does NETL have to comply with federal rules and regulations?

Yes, NETL is a federal organization adept at meeting the high standards of U.S. Government process integrity with exemplary speed and efficiency.

Types of Partnering with NETL

Cooperative Research and Development Agreements (CRADA) allow for joint research and development performed by NETL and CRADA participant researchers. Background intellectual property (IP) protection is included for both parties, and CRADA developed IP is jointly owned. A CRADA offers participants the right of first refusal to an exclusive license for jointly developed IP. Cost sharing between NETL and the CRADA participant is essential. Small businesses are given preferential consideration for these agreements.

License Agreements transfer NETL-owned intellectual property (IP) from the government to the private sector both exclusively and non-exclusively. NETL looks for licensing partners with a plan for technology development and marketing with a high probability for technology commercialization. Licensing partners should also plan to make the benefits of the licensed IP reasonably accessible to the public.

Contributed Funds in Agreements (CFA) allows NETL to perform work for a nonfederal sponsor. The work must draw on the unique capabilities of NETL and not place NETL in competition with the private sector. The work would be performed on a time schedule that does not interfere with the primary mission related projects. The protection of generated information and the rights to intellectual property is negotiable. The use of CFAs encourages full cost recovery.

Types of Partnering with NETL

Memorandums of Understanding (MOUs) or Memorandums of Agreement (MOAs) are written agreements between NETL and other entities that state of scope of work for a specific project or state the terms of a partnering relationship. Parties to these agreements may include other federal agencies, local, state, international, or other government entities; the private sector; and educational institutions. An MOU or MOA is not considered a binding contract. It cannot be used to obligate or commit funds or be used as the basis for the transfer of funds between or among the parties. Actual implementation of the understandings established by the MOU or MOA must be accomplished through a legally binding instrument such as an interagency agreement, contract or other appropriate agreement between the parties (as applicable).

Non-disclosure Agreements (NDAs) are sometimes referred to as confidentiality agreements and are used when NETL and/or another party wish to exchange information that is either considered potentially patentable by NETL or proprietary by the other party. NETL is bound to maintain information received in the course of business confidential by the Trade Secrets Act (18 USC Sec. 1905). However, NETL will enter into an NDA that reiterates this protection. NDA's may be unilateral or bilateral, depending on the circumstances. NETL only executes its own NDA's.

For Additional Information

The screenshot shows the U.S. Department of Energy website. At the top, there is a navigation bar with links for 'ABOUT DOE', 'ORGANIZATION', 'NEWS', and 'CONTACT US'. Below this is the 'U.S. DEPARTMENT OF ENERGY' logo. A secondary navigation bar lists categories: 'SCIENCE & TECHNOLOGY', 'ENERGY SOURCES', 'ENERGY EFFICIENCY', 'THE ENVIRONMENT', 'PRICES & TRENDS', 'NATIONAL SECURITY', and 'SAFETY & HEALTH'. The main content area is titled 'FOSSIL ENERGY' and features a large image of an industrial facility with the text 'Fossil Energy'. A sidebar on the left contains a 'FOSSIL ENERGY NEWS SPOTLIGHT' section with the headline 'DOE Announces New Research to Advance Safe and Responsible Deepwater Drilling Technologies'. Below this, there are sections for 'OFFICES & FACILITIES', 'STAY CONNECTED', and 'QUICK REFERENCE'.

Office of Fossil Energy
www.fe.doe.gov

The screenshot shows the NETL website. At the top, there is a navigation bar with the 'NETL' logo and the tagline 'the ENERGY lab Where energy challenges converge and energy solutions emerge'. Below this is a secondary navigation bar with links for 'ABOUT NETL', 'KEY ISSUES & MANDATES', 'ON-SITE RESEARCH', 'TECHNOLOGIES', 'ENERGY ANALYSIS', 'NETL R&D', 'TECHNOLOGY TRANSFER', 'SOLICITATIONS & BUSINESS', 'EDUCATION', 'AWARDS & RECOGNITION', 'NEWSROOM', and 'CONTACT NETL'. The main content area is titled 'NATIONAL ENERGY TECHNOLOGY LABORATORY' and features a large image of a stage event with the text '2012 National Science Bowl'. A sidebar on the left contains a 'NEWS' section with the headline '2012 Ig Nobel Science Prize awarded to researchers for...'. Below this, there are sections for 'EVENTS CALENDAR', 'PUBLICATIONS', 'CAREERS & FELLOWSHIPS', and 'PROJECTS IN YOUR STATE'.

NETL
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