

NETL RESEARCH



OUR MISSION

Driving innovation and delivering solutions for an environmentally sustainable and prosperous energy future:

- Ensuring affordable, abundant and reliable energy that drives a robust economy and national security, while
- Developing technologies to manage carbon across the full life cycle, and
- Enabling environmental sustainability for all Americans

NETL

NATIONAL ENERGY TECHNOLOGY LABORATORY

WHO WE ARE

The National Energy Technology Laboratory (NETL) facilitates the responsible and effective use of our nation's extensive fossil resources. NETL is one of 17 partner organizations in the U.S. Department of Energy's National Laboratory System and the only national lab organization dedicated to fossil energy optimization research. For more than a century, NETL and its predecessor labs have been at the forefront of technology development, consistently creating safe and environmentally sound technical solutions that satisfy the world's demand for affordable, abundant energy.

ACCELERATING DEVELOPMENT OF EMERGING TECHNOLOGIES

NETL is committed to utilizing and creating the most current and efficient technology to implement practices and policies that address the energy industry’s most demanding and complex challenges. To this end, NETL is working with our partners to achieve a carbon pollution-free power sector by 2035. We will accomplish this through integration of critical clean energy technologies, to include: battery storage; negative emissions technologies; carbon capture and storage; renewable hydrogen; safe nuclear energy; and extraction of highly efficient methane gas.

CLEAN TECHNOLOGY R&D

NETL has been at the center of technology development for more than a century, consistently leading and partnering to create safe, affordable, and environmentally sound technical solutions that increase efficiency, reduce emissions, and diminish energy costs. Advanced technologies will: synthesize the clean, reliable, and affordable energy needed to increase domestic manufacturing and associated workforce; invest in improving our nation’s energy infrastructure; improve electrical grid reliability and resilience; expand domestic energy production; educate America’s future scientists and engineers; and support U.S. energy and national security goals.

APPLIED R&D SUPPORTING COMMERCIALIZATION

The NETL Carbon Capture Program is creating technological solutions for carbon capture from natural gas or pulverized coal power plants, as well as emerging applications such as: hydrogen production from steam methane reforming; industrial point sources such as cement and steel production; and direct air capture.

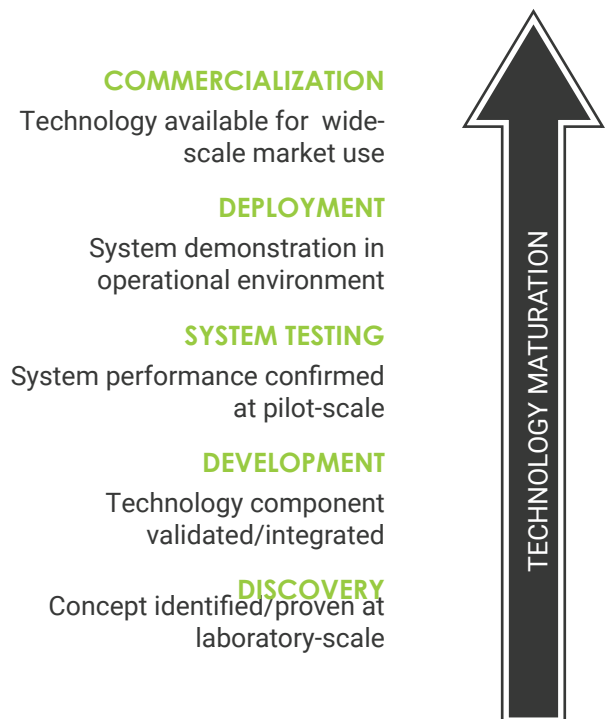
Additionally, NETL research is accelerating the development of efficient, cost-effective fossil fuel conversion systems that meet the short-term goal of capturing 90 percent of the CO₂ produced by a pulverized coal power plant. This effort ranges from the discovery of innovative materials through evaluation in real systems.

In 2016, NETL formed the Institute for Design of Advanced Energy Systems (IDAES) to improve the efficiency and reliability of existing coal-fired power plants and to accelerate development of advanced fossil energy systems.

For more information, please visit: <https://idaes.org/>

DISCOVERY-COMMERCIALIZATION

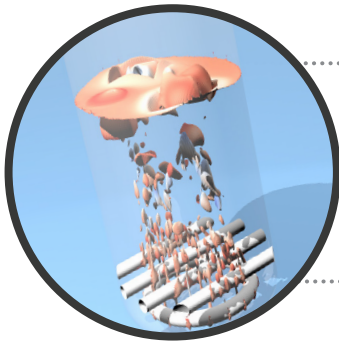
NETL’s integrated science, engineering and technology competencies address today’s energy challenges while aggressively planning and seeking solutions for the challenges of tomorrow. NETL pursues its technology development mission by engaging partners in federal agencies and laboratories, in the private sector, and at some of the Nation’s most prestigious research universities. NETL is committed to a strong science and technology enterprise enabling a fully integrated energy research portfolio that spans the discovery-development-deployment continuum to meet the Nation’s economic, environmental and energy security challenges of the 21st Century.



CORE COMPETENCIES

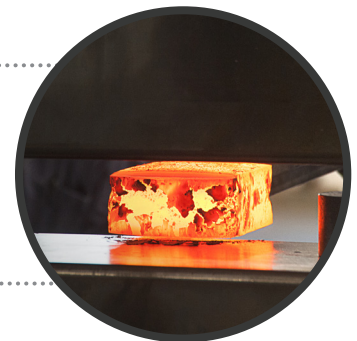
Executing an energy research portfolio of national importance that discovers, matures, and deploys innovative technologies requires NETL to maintain cutting edge and enduring core competencies. NETL's integrated science, engineering and technology competencies address today's energy challenges while aggressively planning and seeking solutions for tomorrow. Furthermore, maintaining these core competencies is critical to ensuring the Laboratory can continue to provide technology options to meet the Nation's needs in times of crisis.

NETL continues to place critical value upon the people that ultimately own the success. Consequently, significant effort is devoted to cultivating a well-trained, dynamic workforce capable of accelerating the technology advancements that attain the energy, economic and environmental goals pursued by the Laboratory.



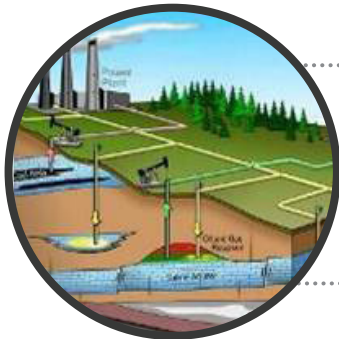
COMPUTATIONAL SCIENCE & ENGINEERING

High Performance Computing
Data Analytics



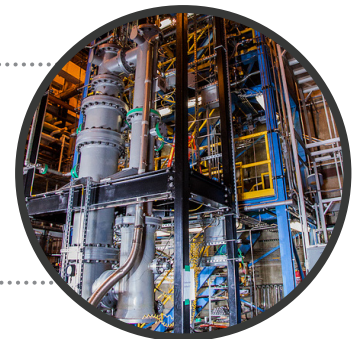
MATERIALS ENGINEERING & MANUFACTURING

Structural & Functional Materials
Design, Synthesis, Manufacturing & Performance



GEOLOGICAL & ENVIRONMENTAL SYSTEMS

Air, Water & Geology
Understanding & Mitigation



ENERGY CONVERSION ENGINEERING

Component & Device
Design & Validation



STRATEGIC SYSTEMS ANALYSIS & ENGINEERING

Process & System
Optimization, Validation & Economics

KEY LABORATORY INITIATIVES

In 2020, NETL executed an extensive competency assessment to identify paths for growth of the Lab's capabilities, which culminated in the establishment of four Key Lab Initiatives (KLIs). The KLIs were crafted to align with the strategic goals of DOE, Fossil Energy (FE) and NETL. They are intended to meet these strategic goals while exercising and enhancing NETL's technical capabilities.



ADVANCED ALLOYS SIGNATURE CENTER

Create a Signature Center for U.S. industry, DOE labs, other government agencies, and academia to prototype alloy solutions, bridging the "valley of death" and accelerating commercialization.



SCIENCE-BASED ARTIFICIAL INTELLIGENCE/MACHINE LEARNING INSTITUTE (SAMI)

Leverage science-based models, AI/ML methods, data analytics and high-performance computing to accelerate applied technology development for clean, efficient, and affordable energy production and utilization.



MICROWAVE (MWAVE) TECHNOLOGY

Significantly improve the energy efficiency of industrial processes, increasing selectivity, and enabling scalable and distributed low carbon applications.



CENTER FOR SUSTAINABLE CHEMICALS AND FUELS

Scale technologies to maturation that are too risky or far-term for solely private-sector investment. Create an NETL-led technology incubation center and consortia of collaborative partnerships to help transform the downstream chemicals sector with decarbonization strategies and new innovations.

Contacts

Customer Service
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