NETL'S NATIONAL IMPACT

The National Energy Technology Laboratory (NETL) is a U.S. Department of Energy (DOE) national laboratory that produces technological solutions for America's energy challenges. From developing creative innovations and efficient energy systems that make coal more competitive to advancing technologies that enhance oil and natural gas extraction and transmission processes, NETL research is strengthening national energy security and contributing to an America that leads the world with affordable, reliable and secure energy to fuel human prosperity. NETL operates as DOE's only government-owned, government-operated laboratory, managing a highly skilled federal and site-support contractor workforce across three sites in Albany, Oregon; Morgantown, West Virginia; and Pittsburgh, Pennsylvania.

In addition to research and development (R&D), NETL plays a pivotal role in DOE program execution, ensuring integration between scientific advancements and project execution. With project partners in all 50 states, NETL's impact spans the entire United States. Through its research, NETL strives to innovate and accelerate the nation's energy solutions in hydrocarbon, geothermal energy and critical minerals production.

NATIONAL ENERGY TECHNOLOGY LABORATORY

National Economic Impact

In 2024, NETL conducted an economic analysis of the Laboratory's impact nationwide, highlighting its contributions to job creation and overall economic growth across the country. The analysis revealed that NETL injected $1.4 billion directly into the nation's economy in 2024 through grants, R&D awards, contracts, cooperative agreements and purchase orders.

NETL's true impact on the U.S. economy is greater than the Laboratory's total direct spending because money from NETL is spent again by the recipient employees and businesses. This economic "ripple effect" is captured through a series of multipliers that calculate estimates of the impact of each dollar of direct spending that cycles through the national economy in the form of additional (indirect and induced) spending, personal income and employment. The analysis concluded that, in 2024, NETL made a total estimated impact of $3.6 billion on the U.S. economy.

Economy

$1.4B
Total Economic Impact (direct, indirect and induced)

$178M
Total Expenditures

Jobs

19,027
Jobs (direct, indirect and induced full-time equivalent jobs)

1,708
Federal Employment and Site-Support Contractor (full-time equivalent jobs)

DOE Program Execution

NETL uniquely functions as a DOE field office supporting DOE offices in all aspects of program execution. In 2024, NETL supported 3,054 research activities nationwide.

$7.3B
DOE Share (Cost Plan)

$3.2B
Performer Share (Cost Plan)

$10.5B
Total Award Value (Cost Plan)

Awards and Recognition

Since becoming a DOE national lab in 1999, NETL has garnered recognition for research excellence, technology transfer and successful partnerships. For more than 20 years, NETL's scientists have achieved national recognition, earning 63 R&D 100 Awards and 49 regional and national awards from the Federal Laboratory Consortium. Additionally, NETL's technology transfer office recorded more than 700 reports of invention and more than 250 patents.

These accolades further demonstrate the commitment of NETL's technical, scientific and program staff to advancing the nation's energy future by conducting world-class research that creates innovative solutions to strengthen the security, affordability and reliability of energy systems and natural resources.

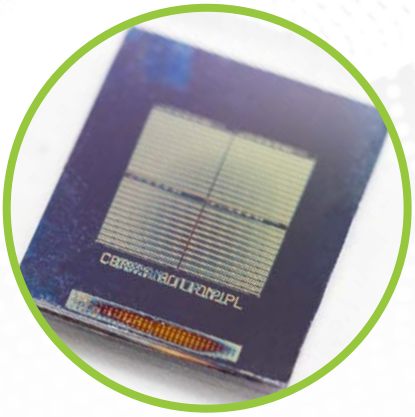
Research Breakthroughs

Enabling Critical Energy Technology Modeling on AI Computer System

To tackle tough artificial intelligence (AI) problems, NETL developed the Wafer-Scale Engine Field Equation Application Programming Interface with Cerebras revolutionary Wafer-Scale Engine. NETL researchers can now perform complex simulations several hundred times faster, speeding up critical energy technology innovations.

Reducing Ammonia Production Costs by More Than 25%

Through microwave research capabilities, NETL has revolutionized ammonia production. This innovative approach operates at low pressure and low temperature, consuming less energy than conventional methods and reducing costs by more than 25%.



Manufacturing High-Value Products from Coal Waste

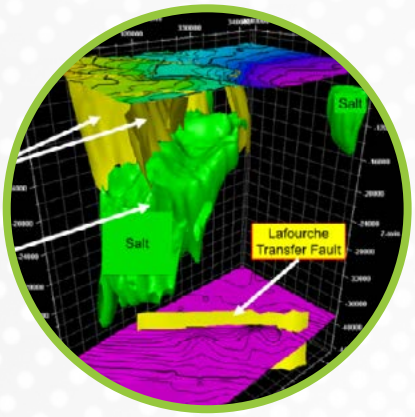
In response to an increasingly technology- and data-driven economy, researchers at NETL and partner institutions have developed methods to use coal as a manufacturing feedstock for high-tech products, like computer microelectronics. This process creates business, economic and societal benefits for the United States.

Increasing Strength of Nickel Alloy by 256%

NETL has developed a high-temperature, oxidation/corrosion-resistant, nickel-based superalloy with superior creep properties. Compared to the baseline commercial alloy of its class, the creep life was improved by up to 256% by tailoring the titanium/aluminum ratio along with the niobium and tantalum content.

Extracting Rare Earth Elements from Waste Streams

NETL's Targeted Rare Earth Extraction (TREE) process is a cost-effective technology to extract rare earth elements and critical minerals and materials from a wide array of coal and coal-processing materials and waste streams.



Offshore Risk Modeling

NETL researchers developed the Offshore Risk Modeling (ORM) suite — a set of eight innovative, science- and data-driven computational tools and models that span the full offshore system. The suite is designed to improve the prediction and evaluation of offshore systems. In 2019, the ORM suite won an R&D 100 award in the software/services category.

R&D Initiatives

Advanced Alloys Signature Center (AASC)

NETL's Advanced Alloys Signature Center (AASC) is a complete alloy development facility capable of prototyping alloys at scales that advance commercialization. The AASC allows prototyping of diverse and specialty alloys at masses up to 500 pounds, a scale that is currently absent from the domestic alloy R&D ecosystem.

Center for Fuels and Chemicals (CFC)

NETL's Center for Fuels and Chemicals (CFC) is a technology incubation center that develops technical solutions for the U.S. chemicals industry to retool its products and operations with the goal of increasing American manufacturing efficiency and unleashing technology innovation. The CFC will move products to market faster, at lower costs and with less environmental impact, while creating a more agile chemicals supply chain.

Center for Microwave Chemistry (CMC)

NETL's microwave research holds the promise of disruptive innovation. It enables opportunities for substantial energy savings through reduced energy requirements, minimal direct emissions and increased process selectivity. Microwave application to chemical processes may transform the way chemical reactions occur, with NETL focusing on ammonia synthesis, polymer and plastic conversion, and synthetic fuels conversion.

Science-Based Artificial Intelligence and Machine Learning Institute (SAMI)

The Science-based Artificial Intelligence and Machine Learning Institute (SAMI) leverages science-based models, AI and machine learning methods, data analytics and high-performance computing to accelerate applied technology development for efficient and affordable energy production and use. These advances empower NETL to push the frontiers of AI technology and create next-generation architecture, tools and approaches; expand partnerships to advance the development and adoption of AI; and foster AI workforce development.

R&D Collaborations

NETL's R&D initiatives align the Laboratory's strongest competencies with areas where NETL can make the greatest national impact on today's energy environment. NETL has been working to implement a dedicated R&D growth plan for each of these areas, focused on transformative science and technology solutions:

- Work with NETL on R&D projects.
- Access NETL's facilities, equipment and research services.
- Establish agreements that define collaboration terms and maximize research impact.
- Secure and license NETL's intellectual property.

ThermoFisher SCIENTIFIC
Ansys
ALPHA METALLURGICAL RESOURCES
EPRI ELECTRIC POWER RESEARCH INSTITUTE
GTI ENERGY
ALASKA ENERGY AUTHORITY
United States Steel
ATI
GENERAC
NW Natural
Southern Company
Hope Gas

NETL is a U.S. Department of Energy (DOE) national laboratory dedicated to innovating and accelerating the nation's energy solutions in hydrocarbon, geothermal energy and critical minerals production. With research sites in Albany, Oregon; Morgantown, West Virginia; and Pittsburgh, Pennsylvania, NETL operates as one laboratory to create advanced energy technologies that support DOE's mission and enable affordable, reliable and secure energy to fuel human prosperity.

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www.NETL.doe.gov

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