CENTER FOR FUELS AND CHEMICALS

R&D233, September 2025

NATIONAL ENERGY TECHNOLOGY LABORATORY

OVERVIEW

The chemicals industry is a keystone of the U.S. economy, converting raw materials (oil, natural gas, air, water, metals, minerals) into more than 70,000 different products. Chemicals are the building blocks of many products that meet our fundamental needs for food, shelter and health. Chemical products are vital to computing, telecommunications, biotechnology and other advanced technologies.

cfc Center for Fuels and Chemicals

NETL's Center for Fuels and Chemicals (CFC) is a technology development and support center established to collaborate with the U.S. chemicals industry as it looks to utilize innovative new technologies to meet the needs of its customers

Albany, OR • Morgantown, WV • Pittsburgh, PA • Houston, TX

U.S. DEPARTMENT of ENERGY

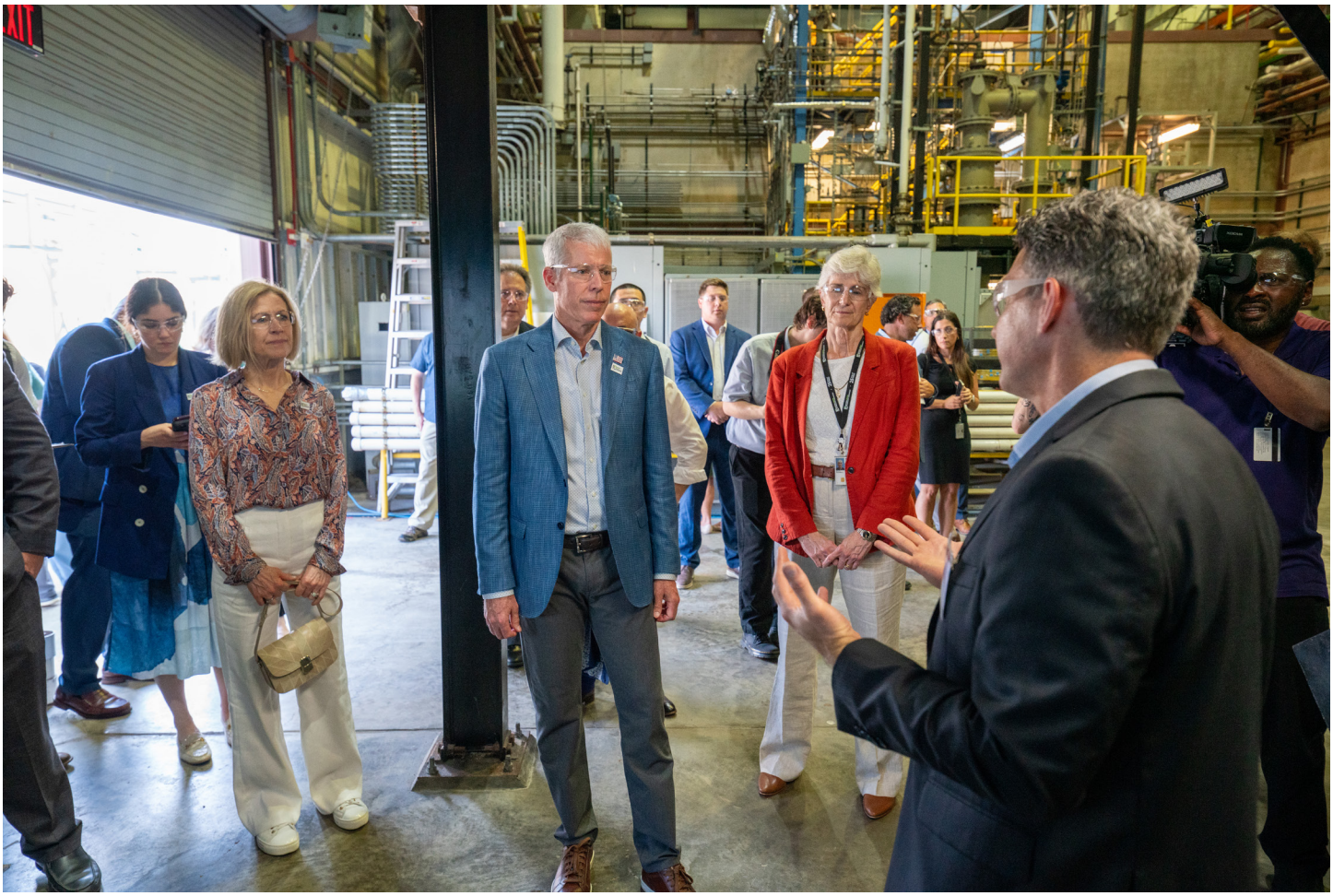
ENABLING TECHNICAL INNOVATION IN FUELS AND CHEMICALS

The CFC focuses on developing technologies that will enable the U.S. chemicals industry to move chemical products to market that are lower in cost, higher in performance, and/or more benign in environmental impact. In many instances, the center examines technologies that remain too risky or far-term for the private sector to develop alone.

The CFC leverages NETL's expertise in computational sciences, including advanced approaches in process optimization and reactor design, to model novel manufacturing technologies and simulate how chemical production can be scaled up faster and at less cost.

Through the CFC, NETL will use its decades of experience with chemical conversion, functional and structural material science, and process systems analysis to accelerate the identification and deployment of strategies within the chemical sector to maximize global competitiveness. This effort includes fuel/feedstock switching, increasing efficacy of conversion and separations, and novel hardware design. These improvements in process design will be coupled to NETL's capabilities in life cycle analysis (LCA) and technoeconomic analysis for research applications to quantify the potential benefits of R&D efforts.

NETL has ongoing efforts in a broad set of technologies that improve process performance using enhanced materials, conversions and separations or, in some cases, new processes, such as microwave-enhanced intensification, methane pyrolysis and chemical looping.



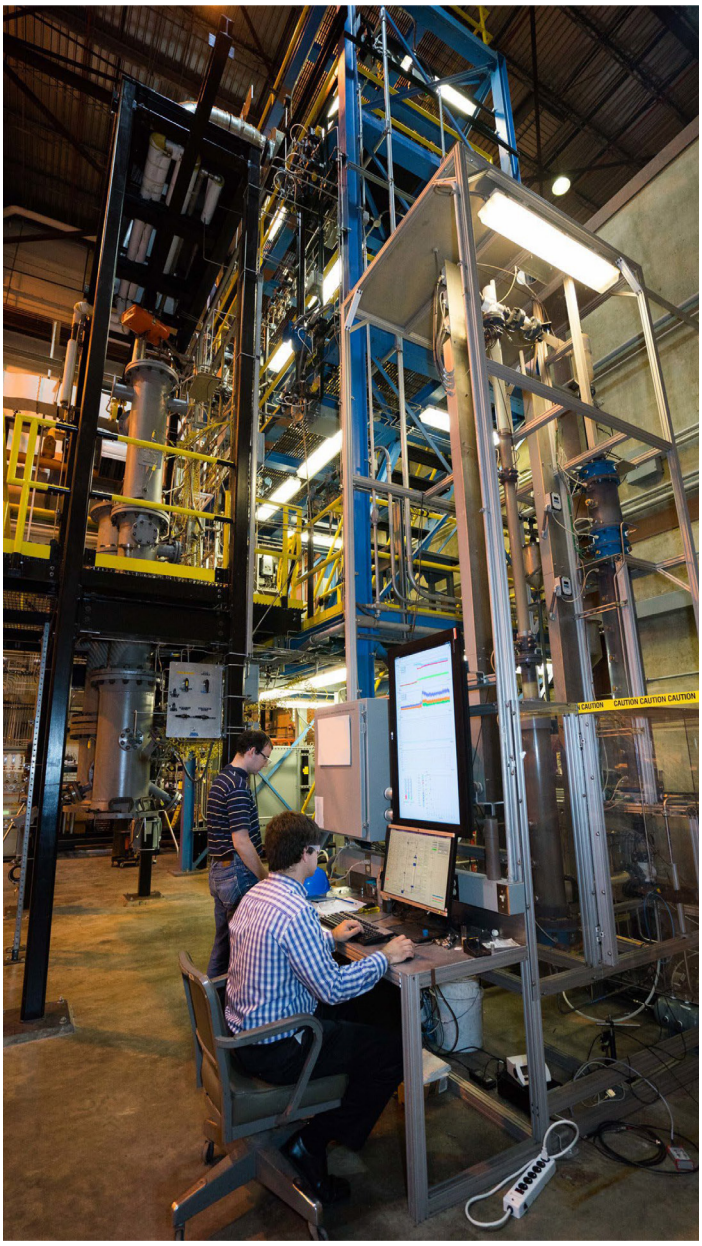
Secretary of Energy Chris Wright participates in a tour of the NETL Morgantown lab in West Virginia Jun. 25, 2025.

WHY PARTNER WITH NETL?

Since 2020, the CFC has operated as an NETL-led technology incubation center for collaborative partnerships to unlock the potential of novel technologies in the process industries. The CFC is working with industry to mature technologies that are too risky or far-term for only private-sector investment using NETL's unique capabilities and equipment. The effort is focused on scale-up, innovation, technoeconomic analysis, LCA and systems analysis and optimization.

NETL is well positioned to develop and advance the CFC using these resources and programs:

- **FACILITIES AND EQUIPMENT —** The CFC is composed of several facilities and advanced equipment that is best-in-class for research and development for energy conversion, process optimization and intensification, chemical recycling, hydrogen production, and carbon management.
- **PARTNERSHIPS —** This NETL-led technology incubation center seeks to assist technology development partners in leveraging the national lab's capabilities to unlock the potential of novel technologies in the process industries. Companies can leverage decades of capability development within the Lab to accelerate solution development.
- **EXPERIENCE —** NETL's comprehensive process innovation capabilities include highly skilled scientists and engineers to collaborate with and provide technical literacy. These NETL researchers are proven experts in their fields and have achieved technical breakthroughs in materials, membranes, gas separation and other discoveries.
- **FUNDING OPPORTUNITIES —** The CFC continuously monitors DOE solicitations for funding opportunity announcements that are aligned with the chemical sector and connects these opportunities to organizations within the CFC pipeline to collaborate on funding responses.



Researchers at work in the chemical looping reactor at the NETL site in Morgantown.

PARTNERSHIP OPPORTUNITIES WITH NETL

NATIONAL ENERGY TECHNOLOGY LABORATORY

NETL is a DOE national laboratory dedicated to advancing the nation's energy future by creating innovative solutions that strengthen the security, affordability and reliability of energy systems and natural resources. With laboratories and computational capabilities at research facilities in Albany, Oregon; Morgantown, West Virginia; and Pittsburgh, Pennsylvania, NETL addresses energy challenges through implementing DOE programs across the nation and advancing energy technologies related to fossil fuels. By fostering collaborations and conducting world-class research, NETL strives to strengthen national energy security through energy technology development.

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