



ReACT

REACTION ANALYSIS
& CHEMICAL TRANSFORMATION

FACILITY

A robust fossil-based economy supports a high quality of life for millions of Americans, sustains its manufacturing and high-tech industries, and fosters economic growth. Using abundant fossil energy resources with sustainable environmental stewardship is critical. NETL's ReACT facility capabilities are advancing innovative research, leading to efficiencies that increase power production, reduce overall power generation costs, and reduce targeted emissions.



U.S. DEPARTMENT OF
ENERGY

NETL IS PUSHING THE BOUNDARIES

of yet-to-be explored research in reaction science with its ReACT facility. With this new facility, researchers are **advancing the science needed to optimize energy conversion** and transforming how we think about and approach chemical reactions.

The ReACT facility supports NETL's energy conversion engineering competency, which includes **increasing power cycle efficiency and enabling more power generation for less fuel and fewer emissions**. Energy conversion is the process of changing one form of energy

to another, like changing the chemical energy in coal to thermal and mechanical energy that can turn a power plant's turbine.

The ReACT facility's capabilities enable researchers to work toward optimizing chemical reactor designs for specific chemical transformations. This includes investigating novel approaches, such as microwaves, to selectively energize chemical reactions. **No other known facility in the world has this capability.**



NETL technician John Johnson operates a state-of-the-art variable frequency microwave reactor (VFMWR) in the newly commissioned ReACT facility in Morgantown, West Virginia.

NETL'S ReACT FACILITY:

- Is "fuel flexible" and able to experiment with gaseous hydrocarbon fuels, coal, liquid hydrocarbon fuels, biomass, coal and biomass mixtures, and syngas (a mixture of carbon monoxide, carbon dioxide and hydrogen) under a range of pressures.
- Features high-speed imaging, thermal imaging and online gas analysis capabilities.
- Builds upon NETL successes in developing a wide range of transformational energy technologies like chemical looping combustion, direct power extraction, and pressure gain combustion.
- Maintains advanced research capabilities important for developing efficient energy systems.

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