

## **Coal to Carbon**

**Creating New Jobs, Products, and Markets** 

# WHAT ARE COAL-BASED **CARBON PRODUCTS?**

High-performance, high-value carbon materials used to manufacture or improve products integral to our society and everyday life.



## **ADVANTAGES OF COAL**

- Coal's unique properties and high-carbon density offer significant advantages over other carbonbased feedstocks.
- Coal is abundant, domestic and enables lowcost, high-volume production of carbon materials and products.

## **R&D ACTIVITIES**

**NETL's Advanced Coal Processing Program works** with national laboratories, universities, and community and industry partners to develop new materials and manufacturing processes that utilize domestic coal to produce advanced carbon products.

#### CARBON FIBERS Isotropic-Pitch-Based Carbon Fibers Anisotropic Mesophase-

**Pitch-Based Carbon Fibers** 

### **FOAMS**

- Carbon Foams
- Silicon Carbide Foams

### STRUCTURAL & **BUILDING MATERIALS**

- Structural Cements
- Structural Plastics





### 3D PRINTING **MATERIALS**

- Fluids
- **Conductive Inks**
- Plastics/Composites
- Devices

#### **ENERGY STORAGE MATERIALS**

- Supercapacitors
- Li-ion Batteries

### **CARBON NANOMATERIALS**

- Graphene Oxide
- Carbon Quantum Dots Carbon Nanotubes

### **CHALLENGES**

- Taking advantage of the natural variations in domestic coals while minimizing the impacts of coal impurities
- Controlling, optimizing, and tailoring endproduct performance

## RESULTS AND ACCOMPLISHMENTS

Coal-based nanomaterials improve:

- Energy consumption
- Processing speeds
- Durability
- Manufacturing costs of computer memory device



R&D projects enable new coal-derived building material technologies and products:

- Roofing tiles
- Decking boards
- Composites
- Other building products









