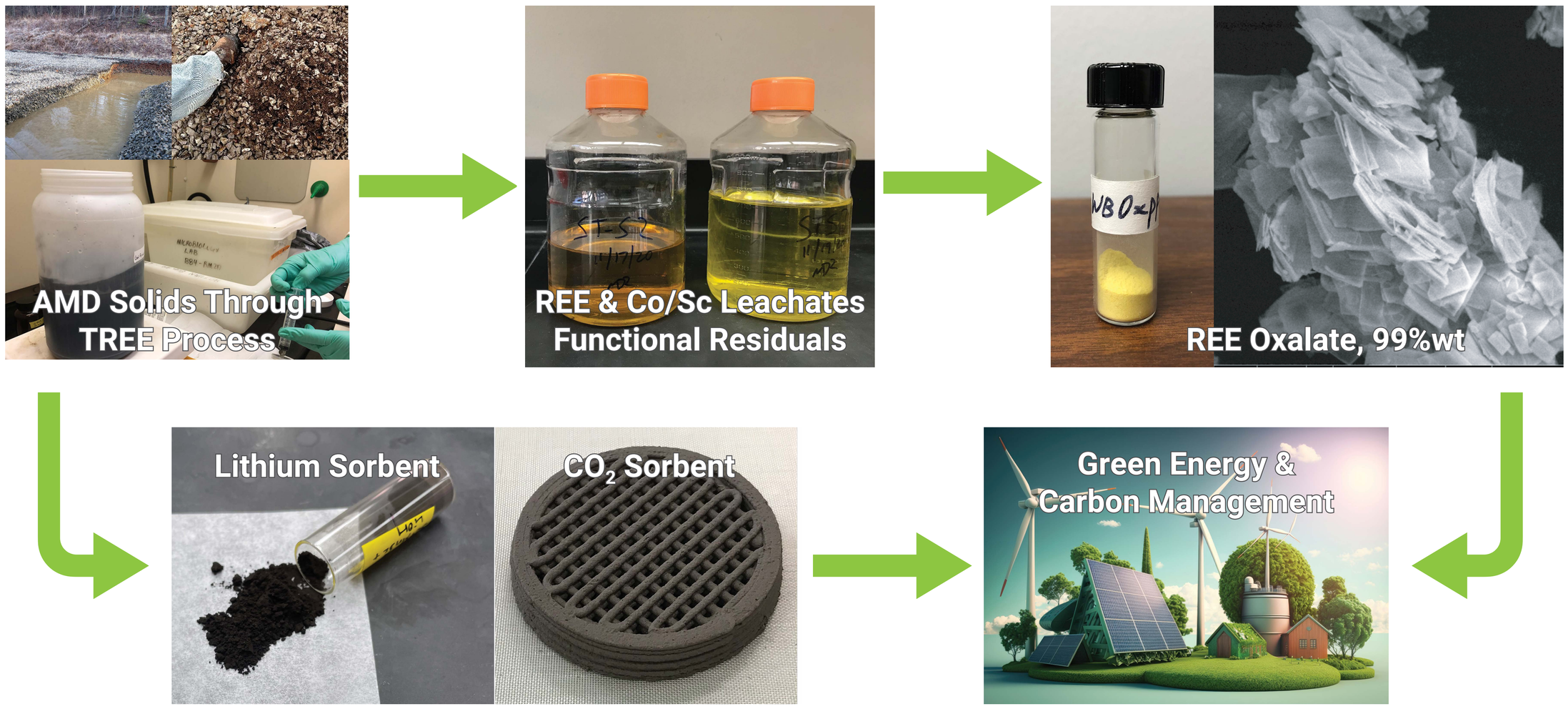
Informed Rare Earth Extraction From Mine Drainage Treatment Waste

NETL and collaborators recover meaningful supplies of rare earth elements (REE), cobalt, and functional residuals for green energy and carbon management while addressing legacy environmental wastes.



Targeted rare earth extraction (TREE) from acid mine drainage (AMD) solids.

As part of the Critical Minerals Characterization Program, NETL scientists characterized critical minerals in 100+ acid mine drainage treatment wastes (AMD solids) in collaboration with students from the University of Pittsburgh and Hedin Environmental, while utilizing synchrotron microprobe analyses at Stanford Synchrotron Radiation Lightsource and geochemical modeling by the U.S. Geological Survey.

Results of this work:

- TREE–a patent-pending step leaching protocol to effectively–to effectively recover multiple critical minerals (REE, cobalt and/or scandium) and functional residuals used for green energy and carbon management from legacy wastes, including Appalachian AMD solid, coal ash, drill cuttings, and mine tailings, across the country.
- Opportunity to transform abundant waste streams into environmental and economic assets–1,102 tons REE/year in Appalachia alone–to meet goals for DOE Offices of FECM and Environmental Management and the U.S. Environmental Protection

DOE PROGRAM

Minerals Sustainability

NETL PARTNERS

HedinEnvironmental

SSRL

SLAC NATIONAL ACCELERATOR LABORATORY

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