



Creating a Sustainable Future for Domestic Mining: Establishing the Appalachia Clean Mining and Critical Materials Innovation Campus (ACMIC)

Meeting the National and Economic Security Need

The demand for critical materials is rising as we transition our energy system, and as a result, a domestic supply of extracted and processed materials is vital to our economic stability and national security. To address the rising demand, there is a need to develop and deploy technologies and processes that allow for additional extraction and processing, as well as reprocessing of materials with higher efficiency, lower environmental impacts, and expanded economic opportunities.

Accomplishing the goal of expanding the domestic supply of materials will rely on evaluating, scaling up, and deploying innovative technologies, which will require a partnership between the government, academia, and

industry to establish and manage core facilities tailored to technology development and testing. We envision such facilities and related activities being sited in the region comprising Kentucky, Ohio, Pennsylvania, Virginia, and West Virginia and organized as the Appalachia Clean Mining and Critical Materials Innovation Campus (ACMIC) with the mission to foster cutting-edge research and tackle the grand challenges facing mining communities and the global supply chain of minerals. With government funding, the ACMIC could connect the lab-scale innovations that have been conceived and researched by academia with the marketplace that will produce the materials needed.

The ACMIC facilities would be available to industry, with a focus on entrepreneurs and small, start-up companies, under a merit-based system to enable a broad group of innovators to

access its capabilities and offer unique regional and international collaborations. ACMIC would also be able to work with community colleges and other academic institutions, with a focus on disadvantaged populations, to further develop the domestic workforce required to develop, deploy, and operate the “clean mining” technologies.

Providing a Regional and National Resource

Since 1946, Associated Universities Inc. (AUI) has forged effective partnerships with government, industry, and academia to build and manage large-scale, complex, unique facilities to pursue multi-disciplinary research. AUI is a key partner with LEAP Manufacturing and UT Dallas on a comparable campus called the Batteries and Energy to Advance Commercialization and National Security (BEACONS) center, which focuses on testing and small-scale manufacturing of batteries for national security needs. AUI is responsible for the modeling and analysis required to optimize the battery supply chain for a cleaner, more reliable supply of critical materials.

AUI could work with a university in the Appalachia region, and other partners, to establish the ACMIC, and would manage it to ensure the access to the facilities and capabilities is objective and open to all potential users. With their focus on technology development and their deep expertise in advancing discoveries from laboratory to industrial scales, the DOE’s National Energy Technology Laboratory (NETL) would play a central role in ACMIC.

The ACMIC campus would house unique infrastructure to enable this mission: flexible high-bays could be rapidly reconfigured to provide both researchers and startups with agile, versatile environments: validation tools and fabrication facilities for commercial-grade testing of prototypes; mobile labs that can be moved directly to regional worksites as technologies reach higher readiness levels; and a workforce development hub to link engineering and technology training with a changing industrial

landscape.

ACMIC’s Mission will be to:

- Provide unique facilities, capabilities, and services tailored to the scale-up, testing and demonstration of technologies to improve the extraction and processing of critical materials.
- Become a regional technology hub and manage a portfolio of innovative projects that will facilitate and accelerate the transfer of new technologies from the lab to the marketplace, including expanding access to investment capital.
- With the facilities, support creation of cutting-edge R&D, intellectual property, and new entrepreneurial companies, which can lead to new job creation.
- Catalyze the education and training of a technologically skilled workforce by working with academia to provide internships and hands-on training opportunities.
- Plan and coordinate with local government, industry, academia, and additional stakeholders to integrate financial investments from private and public investment institutions and the technology innovation community and integrate the input to determine the market opportunities and needs
- Foster a new generation of entrepreneurs, ready to create and manage successful startups domestically, and help enable expansion to international markets.
- Create sufficient value to reinvest and help make the ACMIC self-sustaining.

Through a public-private partnership, ACMIC would help reduce the risk for private investments and enable capital and entrepreneurs to access a platform of innovation and excellence that they cannot achieve on their own or easily find in the public sphere.