Ohio University (OU) Voinovich School of Leadership and Public Service US Department of Energy Office of Environmental Management (DOE EM) Financial Assistance Grant DE-EM0004147

Collaborative Efforts to Inform DOE EM Cleanup, End State Configuration, and Accelerated Property Transfer at the PORTS facility in Piketon, Ohio

Site Repurposing Continuation and Ongoing Technical Assistance, Public Outreach, Education, and Engagement for Property Transfer and Future Use

Budget Period 6 (BP5) October 1, 2021 – September 30, 2022

Combined Activities Report September 30, 2022

Stephanie Howe
Ohio University (OU) Voinovich School of Leadership and Public Service

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PORTSFUTURE
IMAGINING THE OPPORTUNITIES, GATHERING YOUR IDEAS
THE FACILITY AT PIKETON, OHIO

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Purpose and approach

The Site Repurposing Continuation and Ongoing Technical Assistance, Public Outreach, Education, and Engagement for Property Transfer and Future Use activities serve the DOE EM cleanup mission in several ways. These activities expand data utilization with site stakeholders at PORTS and in the region to enhance information-based decision making when determining viable future-use options for the site and site assets, so that cost savings/cost avoidance may be realized by DOE as cleanup efforts continue. These activities contribute to informing the end-state configuration for the site and may expedite property transfer for reindustrialization, thus supporting DOE's efforts to reduce the EM footprint at PORTS. Additionally, grant activities support the site reindustrialization efforts being led by the local DOE-designated community reuse organization, the Southern Ohio Diversification Initiative (SODI).

Ohio University's role in the site repurposing and ongoing outreach activities is to serve the public interest: by acting as an independent, credentialed broker of data and other information; by convening, facilitating, and assisting collaborative partners and interested parties--including government, business, and community entities--with information sharing and partnership building; by brokering relationships with private sector entities who are potential future tenants; and, along with collaborators, by employing data-driven decision processes to ensure efficacious planning for site future-use endeavors. These efforts are responsive to the stated future-use preferences of the public at large in the four-county region near the site as identified during various DOE and Ohio University public engagement efforts.

Site repurposing and ongoing outreach activities were carried out in the form of a collaborative effort among Ohio University (OU), DOE, the local community reuse organization known as the Southern Ohio Diversification Initiative (SODI), site contractors, and national experts. As the activities were carried out, progress updates and/or conversations were held with stakeholders such as: the Site-Specific Advisory Board (SSAB) (when requested); local, state, and federal elected officials; county, regional, and state-level economic development professionals; private sector interests; national experts; community leaders; and/or the public at large.

The work is part of the Ohio University PORTSfuture Program that focuses activities in the areas of public engagement, training, outreach, and Science, Technology, Engineering, and Mathematics (STEM) education; ecology, hydrology, and site environment field work; site readiness, Geographic Information Systems (GIS), and data analysis; economic modeling/economic impact and workforce analysis; industry

discovery; and partnership building. Grant activities create public value and serve the public interest in one or more of the following ways: informing site cleanup and future use planning; providing cost savings/cost avoidance for cleanup; facilitating the transfer of property to reduce the DOE EM footprint; leveraging public assets of the PORTS site and the region to create regional economic stability; and providing regional youth with STEM education opportunities related to the site and/or emerging STEM-related occupations.

Background

The U.S. Department of Energy's former Portsmouth Gaseous Diffusion Plant (PORTS) near Piketon, Ohio has been an important economic player in the Pike, Scioto, Ross, and Jackson County region for many decades. This fact has impacted the region's socio-economic profile. As the decommissioning and decontamination process continues at the PORTS site, it is expected that this transition period will lead to further changes in the region's socio-economic profile including the creation of socio-economic stressors as well as growth opportunities. The extent to which decision-makers can minimize transitional stress and maximize the economic prospects for the region hinges greatly upon the cleanup and transfer of the PORTS site and site assets for other economic use.

Leveraging foundational public engagement activities

Site repurposing continuation and Ongoing Technical Assistance, Public Outreach, Education, and Engagement for Property Transfer and Future Use activities for Budget Period 6, build upon site repurposing and outreach activities conducted with 3161 funding (federal funds focused on benefits to workers) during 2013-2015 and previous work under grant years 1, 2, 3, 4, and 5. These activities also build upon findings from Ohio University's original DOE grant work under the public outreach task completed in 2011. Under the outreach task, Ohio University conducted a 15 month, broad-based, grass roots, public participation process in Pike, Scioto, Ross, and Jackson Counties to identify the community's future-use preferences for PORTS. Community participants in outreach activities included residents, economic development entities, environmental groups, nonprofits, businesses, governmental interests, and many other stakeholders in the four counties near the PORTS reservation.

To inform the design of the outreach project, OU conducted qualitative research that included: interviewing key site stakeholders; conducting four focus groups with the public at large; administering a regional telephone survey to gain information about residents' opinions on major problems facing local communities and residents' awareness/knowledge of the site and cleanup efforts; and gathering residents' preferences for possible site future uses. Results from this qualitative research were used to design Community Visioning Teams that further broadened opportunities for public involvement at a more in-depth and focused level. Future use scenarios were developed by community participants in County Visioning Teams and voted on by the public at large at numerous public events and online. County Visioning Teams were provided summary findings from the qualitative research, data on the site and site assets, cleanup plans, and reports that detailed environmental conditions on the site. Throughout the visioning process, participants reviewed and discussed the data and used this input in creating their future use scenarios. The full outreach report can be found here:
https://www.portsfuture.com/public-outreach-and-public-outreach-report/

Public voting on future use preferences occurred online and in-person at public events throughout the region from July 15, 2011-September 30, 2011. A total of 1,141 people voted on the nine scenarios. Each person could select 1-3 scenarios as preferred options for future use consideration for PORTS. Results of the multiple-choice voting, with the top four scenarios highlighted in red font, are as follows:

Scenario Name	Total Votes
Nuclear power plant	**495**
Green energy production	**475**
Industrial park	**421**
National research and development	**418**
Warehousing, distribution, and transportation hub	179
Training and education facility	160
Metal recovery facility	152
Multi-use southern Ohio education center	143
Greenbelt	131

Scenario preferences obtained through the public voting activities were reported to site stakeholders and the final outreach task report was submitted to the U.S. Department of Energy, Office of Environmental Management, Portsmouth/Paducah Project Office, DOE PORTS site officials, and the PORTS-SSAB for their consideration in informing cleanup and risk reduction decisions. These results served to inform subsequent site repurposing activities.

Site repurposing activities history and evolution

2013-2015

Staff from OU, SODI, DOE, and relevant site contractors met regularly and engaged in activities to achieve the collaborative goals of informing DOE EM cleanup, end-state configuration and accelerated property transfer at PORTS. Efforts focused on identifying viable options for best leveraging the site and site assets and identifying related industrial sectors that could be recruited as future tenants of a reindustrialized PORTS reservation. The energy sector was vetted in-depth and the potential to attract energy-related businesses to locate at the site appears to be extremely favorable. Due to southern Ohio's long-standing ties to energy industries, the ability to develop and strengthen an energy cluster in the region will be enhanced with the site cleanup, transfer, and reuse. During 2014, the President and CEO of the International Economic Development Council (IEDC) met with the collaborative group to discuss strategies for site reindustrialization in the top three identified potential future use sectors that include energy, advanced manufacturing, and transportation/logistics. The IEDC President, in his role as an OU Voinovich School Senior Fellow. continues to provide expert input and guidance to grant activities throughout the year as requested and in-person, usually twice per year.

To gather meaningful input from energy industry leaders and state and regional economic development professionals, a regional energy sector roundtable was held in May of 2014 to further inform site reuse planning in this area. The roundtable discussion focused on identifying opportunities to develop energy sector businesses at the PORTS site in the form of Public-Private Partnerships (P3s). Ohio University designed the roundtable concept in conjunction with IEDC and other national experts and in consultation with several energy industry leaders who were interviewed by telephone. This information resulted in a concept paper that guided the materials developed for the session, the participant recruitment, and the facilitation design for the roundtable.

The roundtable was well-attended and included representation from private industry, economic development, government, national level consultants, PORTS-SSAB, DOE, SODI, and site contractors. The Energy Sector Roundtable revealed key insights regarding the most feasible energy industries to pursue including: bio-chemicals (polymers, plastics, other); waste recycling/waste transformation (waste heat, municipal waste, anaerobic digestion, methane combustion, other); metals recycling; energy generation, energy storage and micro-grids; biofuels/bio-products; and coal alternatives (carbon capture

and use, carbon capture and sequestration, clean coal, coal to liquids, RD&D, other) with an emphasis on employing an 'E3 approach' of harmonizing utilization of environmental resources to develop energy and provide economic benefit to the region.

During the winter of 2014-2015, Mike Zimmer Esq., an attorney, international energy business development expert, and Ohio University Voinovich School and Russ College of Engineering and Technology Executive in Residence, authored an industry profile paper that discussed top energy sector industries viable for siting at PORTS. The paper can be viewed here: https://www.portsfuture.com/wp-content/uploads/2019/03/PORTSfuture-Energy-Sector-PORTS-Campus-White-Paper.pdf

In February of 2016, Dr. Benjamin Cross P.E., Principal of NuSynergy Energy LLC, Ohio University Voinovich School Executive in Residence and formerly Senior Advisor for the Clean Energy Directorate at the Savannah River National Laboratory, authored a white paper on establishing an Appalachian Regional Energy Cluster. This white paper provides an overview of business (industry) clusters and discusses why the establishment of an Appalachian Regional Energy Cluster is considered a prerequisite for enhancing the viability of locating an Integrated Energy System-Closed Loop Manufacturing (IES-CLM) complex at the U.S. Department of Energy PORTS site. The white paper can be viewed here: https://www.ohio.edu/ce3/resources/upload/CE3-Appalachian-Regional-Energy-Cluster-White-Paper-Feb-2016-FINAL.pdf These papers served to guide subsequent grant activities related to site repurposing.

2016-2021

Site repurposing activities were informed by and built upon the previous efforts cited above. At the request of the local community reuse organization, the Southern Ohio Diversification Initiative (SODI), OU site repurposing activities were directed to focus on supporting the development of an Integrated Energy System/Closed Loop, advanced Manufacturing (IES-CLM) complex at PORTS and align with insights garnered throughout previous site repurposing grant work. An IES-CLM complex will attract and expand industries in the region, leverage coal and shale resources in additive manufacturing applications, create jobs, and grow the southern Ohio economy.

This strategy includes employing a multi-disciplinary cluster approach for regional development utilizing the PORTS campus as one element of a regional economic diversification strategy. This approach is employed based on the notion that clusters develop across a geographic area and businesses provide synergy across/among each other, which will enhance cluster growth. This cluster approach was consistent with stated public preferences for site reuse cited above. Additionally, during this time, southern and eastern Ohio had been tagged as potential areas in which to site billion-dollar petrochemical industries that are related to the shale boom in Ohio and western Pennsylvania. The PORTS site has the infrastructure capacity to serve as a major petrochemical (petchem) industry hub.

Another burgeoning industry across the nation and especially in Ohio relates to data centers which consume vast amounts of electricity. Again, the PORTS infrastructure and interconnection to the PJM national grid positions the PORTS site to be an ideal location for a central hub for electricity generation, transmission, and distribution for decades to come. The DOE PORTS site is widely viewed as a major regional asset that can greatly enhance efforts to develop several regional clusters in the areas of energy, advanced manufacturing, transportation/logistics, and power generation, transmission, and distribution and thus the site could be reindustrialized in these areas to enhance the economic viability of the region for many future generations of Ohioans.

Beginning January 2021, under the Biden Presidential Administration, national energy and economic development strategies abruptly shifted to focus on clean energy production and sustainable manufacturing which aligns perfectly with the Integrated Energy System-Closed Loop Manufacturing (IES-CLM) strategy for PORTS. This dramatic shift in national focus was instigated out of necessity to employ an 'all-hands-on-deck' approach to combatting the rapidly worsening climate crises by developing ways to reduce CO_2 emissions in the areas of power generation, manufacturing, and transportation. Our site reindustrialization efforts expanded to include private sector developers to produce decarbonized energy inputs via development of clean hydrogen to power for electricity and blue hydrogen for manufacturing and transportation. We retain our partnership with a regional solar energy developer as well as with private companies who conducted a siting study to determine assets at the site that are aligned with attracting advanced nuclear small modular reactor projects in the future. With these core energy producer partners, we are remaining steadfast to our articulated vision of engaging in an 'all of the above' energy strategy in our IES-CLM development.

2021-present

Collaborative site repurposing efforts between OU and SODI to launch an Integrated Energy System-Closed Loop Manufacturing complex have been branded as the "Ohio Valley Green Energy and Manufacturing (GEM)" initiative. Branding of the site reindustrialization efforts has enabled PORTSfuture and our partners to differentiate the future opportunities of the site for private sector companies from the ongoing federal cleanup mission. Core GEM partners include OU, SODI, organized labor steering committee of labor leaders in Ohio, American Sustainable Business Network, Newpoint Gas LLC, advanced nuclear reactor stakeholders, and the Commercial Aviation Alternative Fuels Initiative (CAAFI). GEM also works closely with other energy producers and manufacturing interests. GEM has established a solid relationship with US DOE headquarters and maintains regular contact with senior advisors to the Secretary of Energy and with the Office of Environmental Management leaders to provide updates on progress and opportunities as appropriate.

GEM efforts continue to be widely socialized throughout the SODI 4-county footprint and throughout the Ohio Appalachia region, as well as at the state and federal levels. GEM continues to enjoy widespread support as we continue to engage with many types of stakeholders. One of the most impactful aspects of GEM is the ongoing involvement of Ohio organized labor leaders who serve as our labor steering committee. The steering committee meets regularly with the GEM team and the committee has been very active in engaging with industry prospects and with identifying labor-friendly private financing for GEM projects. Additionally, this group continues to engage in robust advocacy for GEM with elected leaders at the state and federal levels and with US DOE headquarters. Our joint work with this committee has enabled GEM to establish strong bipartisan support at the federal level for the site reindustrialization vision and federal legislator representatives from both parties regularly attend our meetings and events.

The American Sustainable Business Network (ASBN) is a national coalition-builder among industry, businesses, and the investor community that advocates for just and sustainable economic opportunities to benefit all people throughout our nation while respecting and preserving the planet. ASBN is a vital partner to validate and endorse the GEM vision and provide support with engaging with industry partners and investors that align with the GEM mission.

GEM continues to be very active with the ReImagine Appalachia/Marshall Plan for Middle America (RA/MPMA) group during this budget period. RA/MPMA is a diverse consortium of stakeholders in the Ohio, Pennsylvania, and West Virginia geographic area that joined together to define and advocate for environmentally responsible economic development opportunities to advance economic prosperity for the region. Their blueprint was developed at the grassroots level and their advocacy has great impact at

regional, state, and federal levels. RA/MPMA has designated the GEM initiative as one of their priority projects for which they will advocate.

The GEM initiative's primary industry partner that is ready to roll out a project in the near-term is Newpoint Gas LLC. Newpoint has deemed their project the "h_2 Trillium Energy and Manufacturing (h_2TEAM) Complex". The complex will initially be located on clean or remediated land DOE EM has already deeded to SODI. Additional land needs are currently under discussion with SODI who will in turn submit parcel requests to US Department of Energy Office of Environmental Management Portsmouth/Paducah Project Office. While this Newpoint launch will be privately financed, the reach and impact could be greatly enhanced by leveraging funds from the Bipartisan Infrastructure Law (BIL).

Newpoint is assembling a Memorandum of Understanding to continue to work with OU as a lead partner along with other industry and university partners to respond to the DOE Hydrogen Hub Request for Proposal (RFP) that is part of the BIL. Winning a hub designation would provide resources for Newpoint to launch a multi-state decarbonized hydrogen and sustainable manufacturing effort, with the central node being located on SODI parcels that were formerly part of the PORTS reservation. Newpoint has named the multi-state geographical area and concept "The Appalachian Triangle Hydrogen Hub (ATH_2)". ATH_2 will contribute to identifying and evaluating retired or operating facilities, infrastructure, and resources in the area that could be potentially converted to decarbonized energy generation and sustainable manufacturing facilities. Additional feedstocks for supplementary fuel will also be identified in support of developing a hub and spoke strategy. This hub and spoke approach will significantly multiply regional economic and workforce impacts. This will greatly increase economic security by attracting additional clean energy and manufacturer investment to expand new job creation and promote auxiliary business development in the heart of Appalachia. Another focus of this effort will be to advance research, demonstration, and deployment (RD&D) efforts for emerging technologies in partnership with universities and national laboratories. RD&D will explore the utilization of regionally produced coal, biomass, plastic, organic waste, and other suitable resources for recycling as a value-added feedstock in the production of clean energy and or sustainable manufacturing.

Site repurposing activities-Current Budget Period 6

OU site repurposing activities include collaborating with SODI and other stakeholders in the areas of: master planning, site readiness and property transfer activities; data analysis; GIS; industry discovery, support, and networking; collaborations/partnership building; stakeholder engagement, project resource acquisition for SODI; and developing linkages to applicable Ohio University researchers and tech commercialization entities. Ongoing Technical Assistance, Public Outreach, Education, and Engagement for Property Transfer and Future Use activities include developing property request guidelines (as requested); a property transfer plan; a phased-implementation schedule; providing reindustrialization planning and progress updates, information gathering through meetings and webinars, and STEM educational activities for regional youth in the four-county region.

These activities support the diversification of the regional economy by imagining possibilities beyond the immediate and existing economic realities in southern Ohio to identify what is needed to best prepare the PORTS site to attract 21st century industries with enduring missions. This will provide residents in the region access to new job prospects, enhanced wages, and an overall improved quality of life. Site reindustrialization will spur regional cluster and supply chain-related growth throughout the impacted counties, further advancing economic healing by growing both large and small business opportunities in southern Ohio and beyond. OU Budget Period 6 activities are depicted in Figure 1 below.

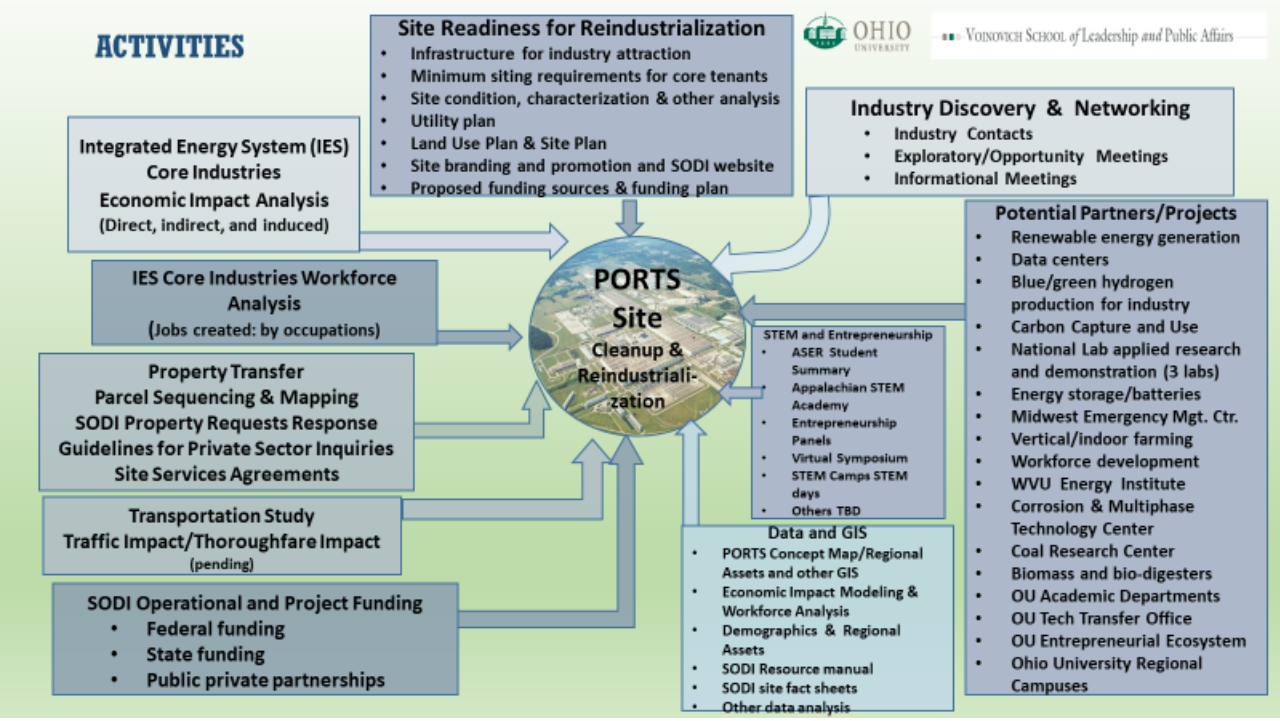


Figure 1-OU Budget Period 6 activities

Integrated Energy System-Closed Loop Manufacturing (IES-CLM) complex

As previously stated, the Southern Ohio Diversification Initiative is pursuing the development of an Integrated Energy System-Closed Loop Manufacturing (IES-CLM) complex at PORTS to leverage the unique infrastructure and other assets of the site to their optimal value for new economic growth opportunities.

The technical definition of an IES is two or more energy resources utilized as inputs to two or more physically coupled subsystems to produce one or more energy commodities as outputs. A simpler definition is multiple energy resources combined to produce one or more energy related products. An IES embodies a synergistic integration of an "all-of-the-above" energy strategy.

The key aspects of an IES-CLM are collocating, combining, interconnecting and/or networking of energy producers and energy users and utilizing waste outputs from one industrial process as an input or feedstock into a different industrial process. In an IES-CLM, the "whole" is worth more than the "sum of the parts", value is the driver, and desired value propositions such as high efficiency, high reliability, low emissions, low/acceptable production costs, and creation of more permanent, higher quality jobs are achieved. An IES-CLM results in industrial symbiosis as depicted in Figure 2 below.

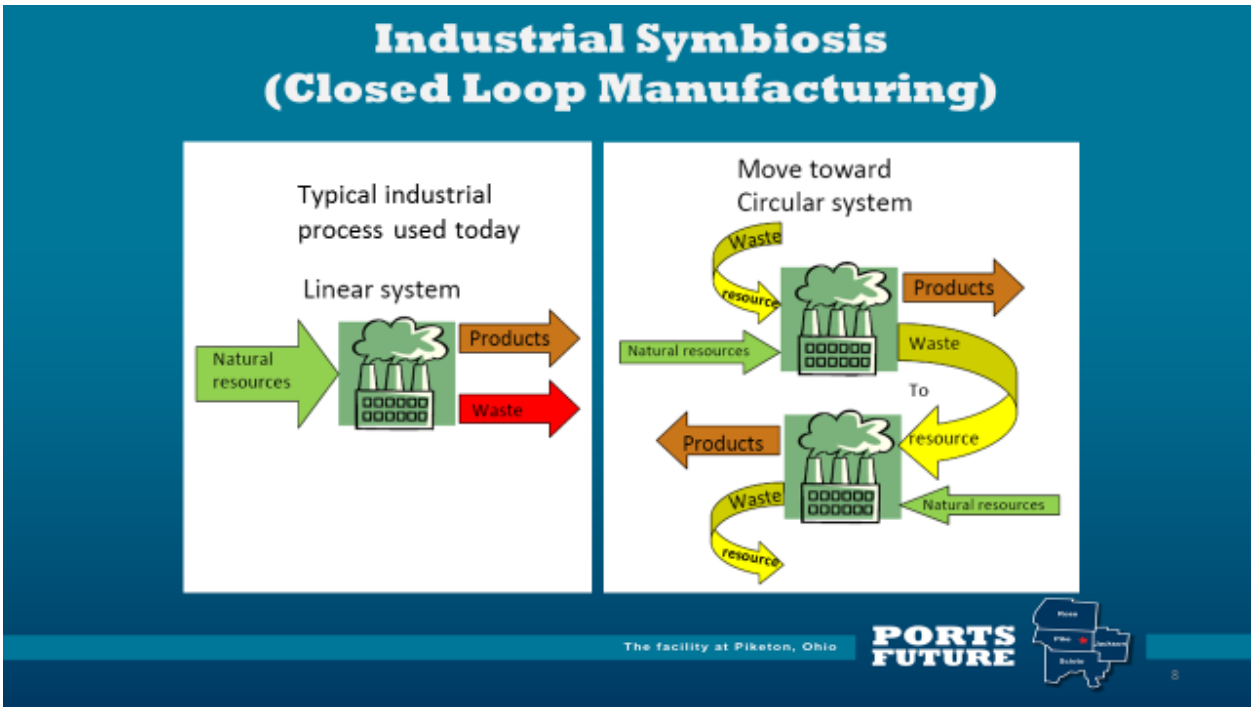


Figure 2-Industrial symbiosis depiction

IES-CLM complexes integrate high temperature heat with industrial technologies to produce electricity for use by manufacturers, data centers, and residential consumers; supply predictable, low-cost energy for industry and for the national grid; power industrial processes such as carbon conversion (e.g., coal to liquids) and chemical production; and produce decarbonized hydrogen for transportation fuels, polymers, plastics, fertilizer, and the hydrogen fuel cell market to name a few. Creating an IES-CLM at the PORTS facility will: serve and expand existing markets; create new markets; establish new applications for value-added manufacturing with the region's coal and natural gas assets; utilize hydrogen across components of the IES-CLM; develop flexible processes to accommodate market shifts; and utilize residual heat to drive low temperature processes such as water purification (e.g., distillation, osmosis) and enzymatic processes (e.g., fermentation, anaerobic digestion).

The Piketon IES-CLM Project is expected to develop in a series of phases:

- Pilot plant and demonstration activities
- Near-term (0 to 5 years): deployment of initial energy sources and process plant needed by industries to meet their market conditions and the regulatory environment
- Mid-term (5 to 15 years); transition and prepare for the potential addition of nuclear and other energy sources and process plants to accommodate changing economic and regulatory environments
- Long-term (15+ years): integration and optimization of energy sources and industrial process plant industries for changing economic and regulatory environments

A graphical depiction of the Integrated Energy System-Closed Loop Manufacturing concept follows in Figure 3 below. To view the IES-CLM complex technical concept diagrams, see Appendix 1.

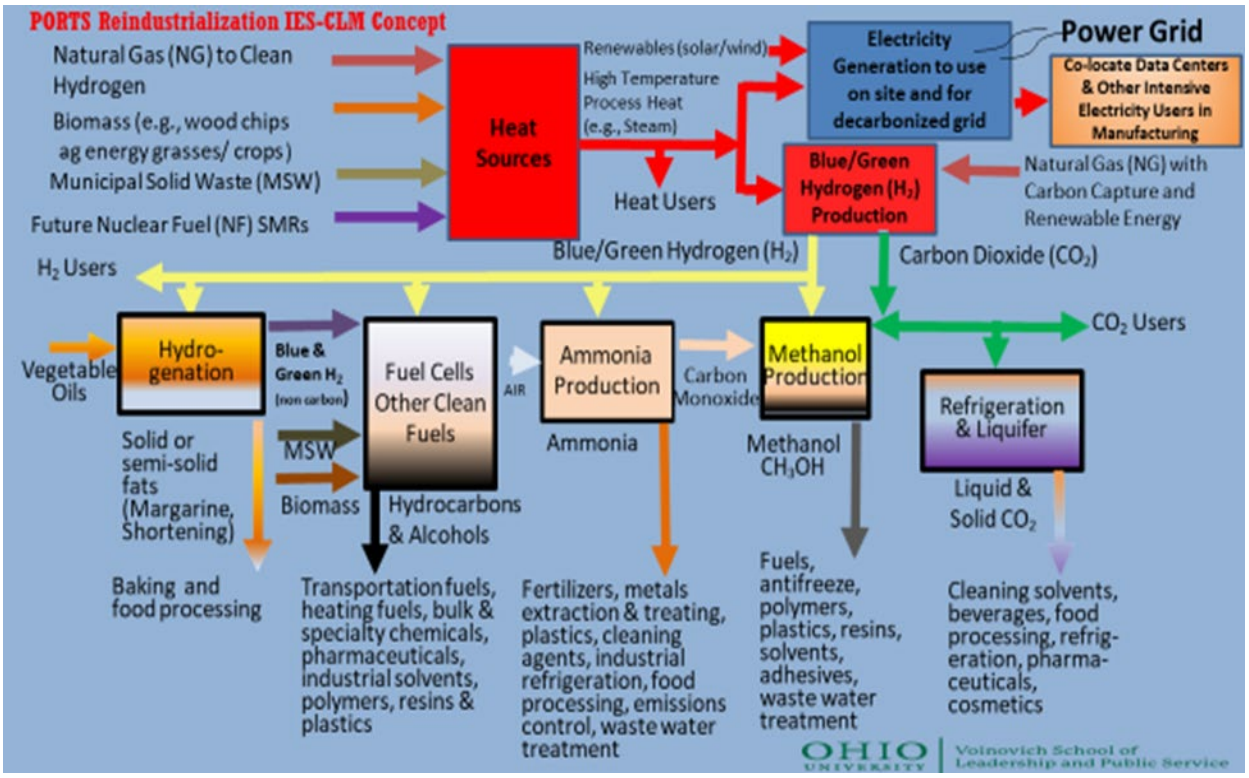


Figure 3-Integrated Energy System-Closed Loop Manufacturing Concept overview graphic

Regional cluster development will occur with the growth of natural spin-offs from the core IES-CLM complex to be located at the former PORTS facility as various industries can realize more effective production costs when collocated within an IES-CLM. Industries that are high hazard, high security, high investment, and/or require extremely high temperature process heat can be located within the secure area of the IES-CLM complex at the PORTS facility. Other industries can tie into the IES-CLM complex to access heat, electricity, hydrogen, and other production outputs via transportation networks (e.g., roads, rail, and pipelines). A depiction of the potential for regional cluster development with an IES-CLM complex follows in Figure 4 below.

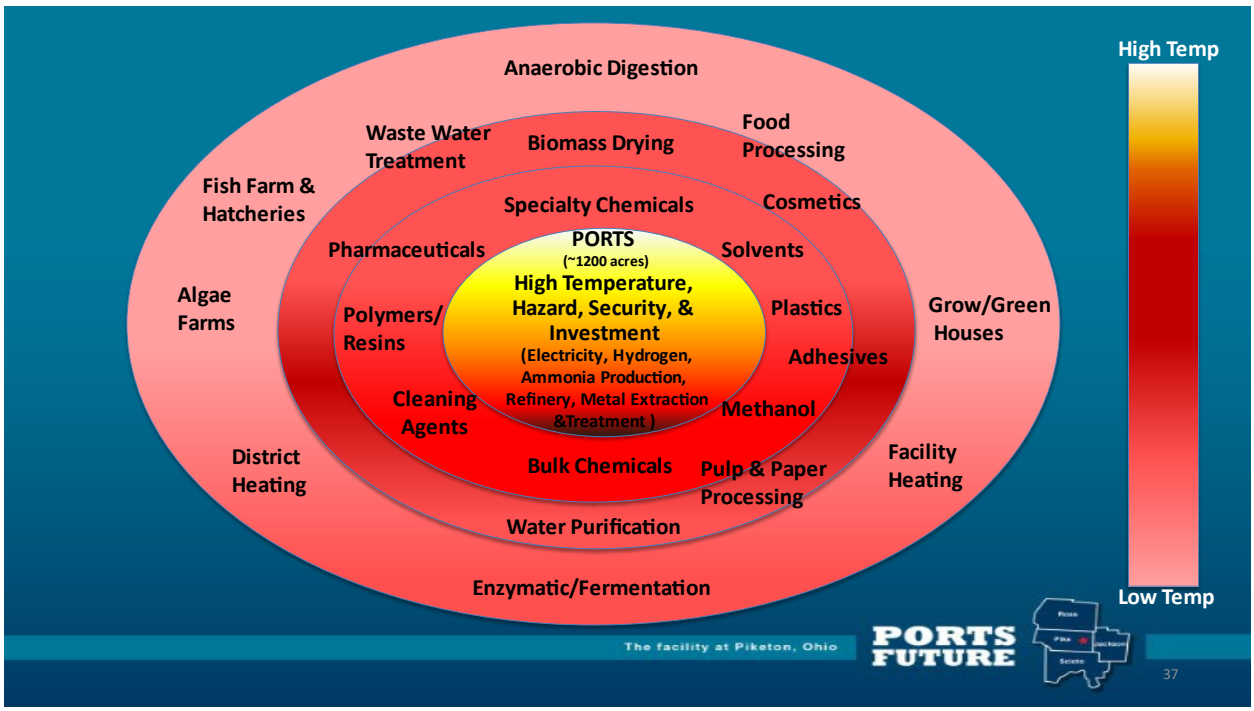


Figure 4-Potential for regional cluster development with an IES-CLM complex

Reindustrialization of the PORTS site into an IES-CLM complex would serve as an excellent example of converting a national liability to a national asset, resulting in much-needed regional economic development. This effort is an extraordinary opportunity to demonstrate what can and should be done with former DOE Defense Nuclear Sites or other brownfield sites. The IES-CLM complex will provide enduring and non-exportable jobs focused on optimizing efficiency of energy production and energy utilization in a sustainable and environmentally responsible manner. Sustainability, recycling and the efficient use of the region's natural attributes/resources and its man-made industrial infrastructure are key drivers. Repurposing of coal assets as a chemical feedstock to make new and innovative products is an excellent opportunity for economic development. Using coal and shale assets in additive manufacturing and diversifying the regional economy will revitalize the region.

Citizens will have access to an increased number of high-quality, higher-than-average paying jobs. Economic impact analyses and workforce analyses of prospective future jobs have been and continue to be conducted by faculty at Ohio University. The region's entire economy will benefit from the site reindustrialization in the form of direct economic impacts (i.e., worker wages), indirect economic impacts (i.e., commerce and business revenue), and induced economic impacts (i.e., purchasing of goods and services that will generate business and job expansion and enhance state and local tax revenue). It is impossible to overstate the impact that site reindustrialization will have on the region's economy as there have been no large-scale industry start-ups or expansions to replace the DOE former plant operations. A multitude of IES-CLM complex benefits are shown below in Figure 5-IES-CLM Impact.

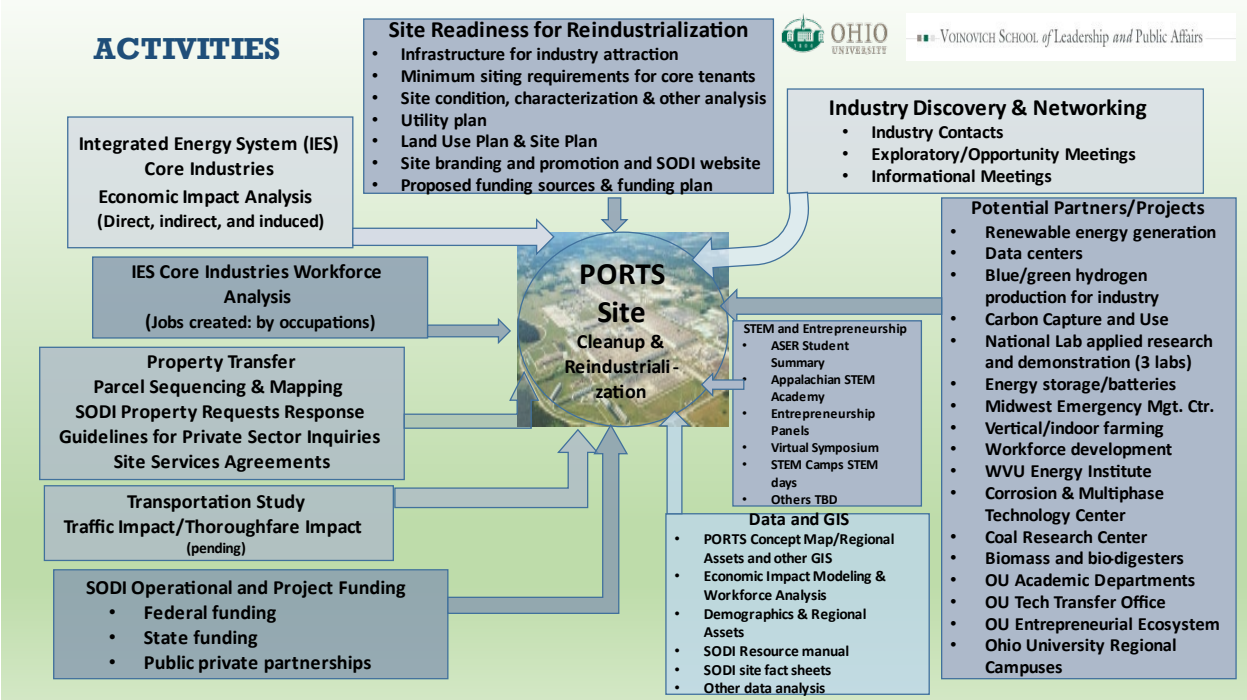
Figure 5-IES-CLM impact

OU grant activities complement SODI's ongoing collaboration with a nuclear industry collaborative seeking to identify and pilot versatile, next generation advanced small modular reactor nuclear power technologies at the PORTS site. The next generation nuclear reactors could serve as the long-term source of high temperature heat to power the IES-CLM complex at PORTS. This new technology would be attractive to energy-intensive heat and power-using industrial end-users who are seeking zero carbon, environmentally friendly energy sources in their production processes. Key concerns that must be addressed include mitigating the immense up-front cost to construct the reactors and resolving regulatory issues associated with the design and federal licensing of this new reactor technology so that it can be constructed and operated as a part of the IES-CLM complex at the PORTS site. SODI and the industry collaborative plan to continue to work closely with the government, the U.S. Department of Energy, and others with the goal of effectively maintaining this partnership.

Summary of Budget Period 6 Activities for Site Repurposing Continuation and Ongoing Technical Assistance, Public Outreach, Education, and Engagement for Property Transfer and Future Use

Some activities from Budget Period 6 will carry into the next grant cycle as ongoing grant activities.

Brief narratives for each activity-area displayed follow the graphic below.



OU Budget Period 6 activities

Site Readiness for Reindustrialization

The Southern Ohio Diversification Initiative (SODI) continues their focus on asset recovery operations by dedicating staff resources to that effort. Asset recovery involves SODI working with DOE and site cleanup contractors to identify, retrieve, recycle and/or sell personal property assets that are located at the PORTS site. By expanding asset recovery efforts, SODI will reduce landfill waste and increase revenue streams for regional economic development. Asset recovery proceeds are used by SODI for economic diversification initiatives in Pike, Ross, Scioto, and Jackson counties. These four counties served as the primary labor market for the PORTS site when it operated as a US DOE gaseous diffusion facility. The asset recovery proceeds are also used to accelerate the PORTS site reindustrialization efforts including working with Ohio University who allocates part of their DOE grant to create and update a viable land use plan, site master plan, and related materials to further prepare SODI to comprehensively respond to prospective investment requests from industries. DOE EM funding appropriated to the site by Congress is dedicated to cleanup activities including funding for the DUF6 facility.

Site readiness activities for site reindustrialization focus on preparing parcels to be made available and undergo approval processes for reindustrialization. This includes: identifying industry types that would be a good fit for the available parcels; ensuring that the site can meet those industries' minimum siting criteria; analyzing the utility infrastructure in relation to industry attraction and determining minimum standards; identifying weaknesses and proposing funding sources to strengthen utility infrastructure; ensuring basic geological, environmental, and other related site characterization studies are completed or identify gaps and studies that need to be completed to prepare the site for redevelopment; designing a framework to ensure the site will meet the minimum validation by an external site selection agent; improving and maintaining the SODI website; and assembling this information so that SODI can respond to and alleviate concerns of prospect companies which will be crucial to attracting industries. SODI formally received the first land parcel transfer at a ceremony held in July of 2018. Future parcel transfers are expected, including an additional 220+ acres before the end of calendar year 2022, thus SODI needs

to accelerate site reindustrialization preparedness to quickly attract industries so that job creation can be realized for the region.

Data and GIS

As stated earlier, the purpose of the two activity areas summarized in this report is to serve the DOE EM cleanup mission. By expanding data utilization with site stakeholders at PORTS and in the region to enhance information-based decision making when determining viable future-use options for the site and site assets, the potential for cost savings/cost avoidance is enhanced as DOE cleanup efforts continue. Data and GIS created under previous grant activities will be maintained and new and/or updated data and GIS products are being developed under the current grant. Data activities are summarized in Figure 6 and described below.

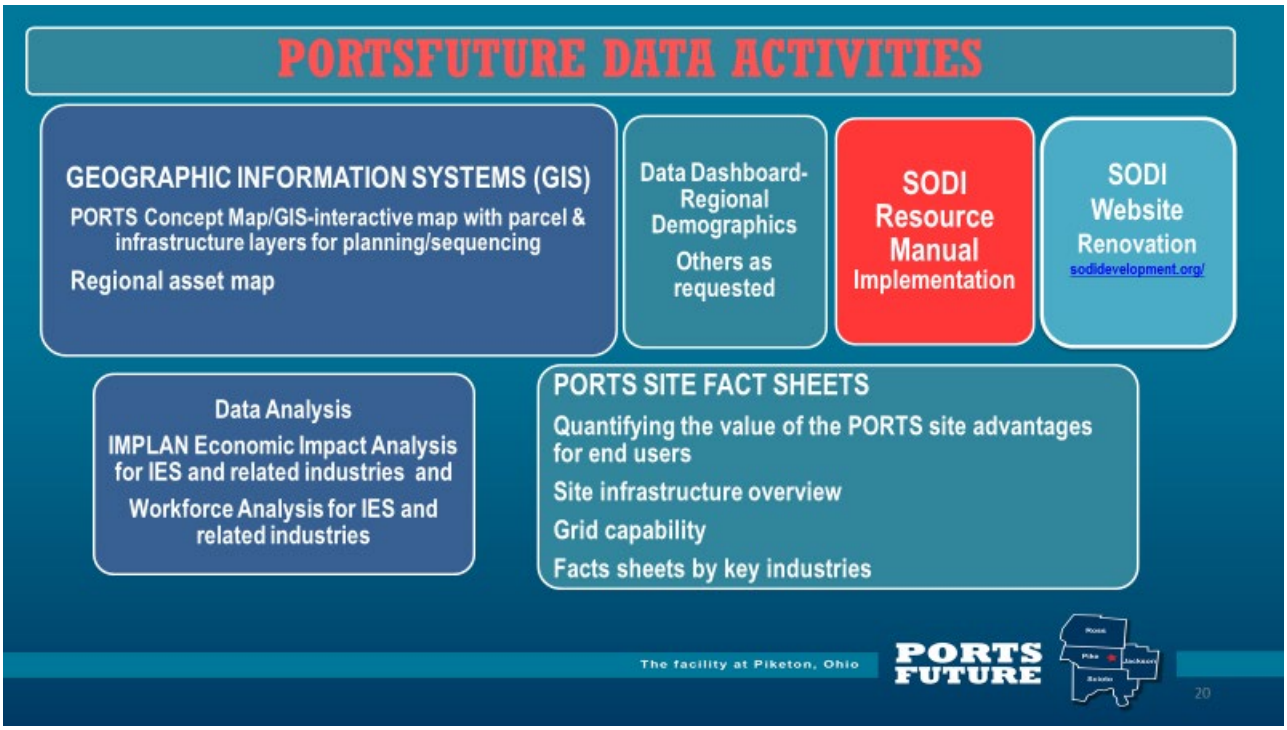


Figure 6-PORTSfuture data activities

Industries IMPLAN Economic Impact Analysis and Workforce Analysis

In previous grant years, Ohio University conducted analyses on the direct, indirect, and induced economic impact and related workforce analysis on the four-county labor market closest to the facility (Pike, Scioto, Jackson, and Ross counties) of potential additive manufacturing industries (tier 2 industries) related to an IES. Grant Year 5 included an analysis of decarbonized hydrogen to power and blue hydrogen production. During Budget Period 6, OU conducted an extensive analysis of the anchor industry's (Newpoint Gas LLC) proposed decarbonized hydrogen and advanced manufacturing project. Additional analyses on other potential site reindustrialization options will be added to findings of previous grant years as appropriate. Budget Period 6 deliverables follow below.

Regional Energy Initiatives Related to Integrated Energy System Closed Loop Manufacturing (IES-CLM) Industries Economic Impact Analysis

OU conducted analysis of the direct, indirect, and induced economic impacts on the regional labor market for our anchor industry partner's, Newpoint Gas LLC, planned decarbonized hydrogen energy production and sustainable manufacturing project.

The economic impact analysis report will inform site reindustrialization, local economic development planning efforts and workforce development strategies. This information can be used to seek support and/or resources from industry, investors, government, and the community in support of the development of this initial project that will launch the IES-CLM complex. Deliverables include a summary document that can stand alone or be compiled as part of a larger summary document. This analysis is available at: https://www.portsfuture.com/wp-content/uploads/2022/07/Decarbonized-Hydrogen-Project-IMPLAN-and-Workforce-Analysis.pdf
Draft electronic version of report in PDF format-June 2022
Final electronic version of report in PDF format-completed July 2022

Advanced Reactor Stakeholders DOE Office of Nuclear Energy (NE) Siting Study
OU is providing data and GIS products and services to the NE Siting Study being carried out by SODI and their advanced reactor partners. This group is developing generic design support for advanced reactor companies in the form of a Site Reuse Deployment Guidance document. The PORTS site is being used as the case study to develop guidance for an early site permit. The project focuses on identifying, characterizing, and licensing sites for near-term deployment of advanced reactor demonstrations and first-commercial units. The Site Reuse Deployment Guidance document will evaluate benefits and potential obstacles of repurposing an existing nuclear facility undergoing decommissioning for siting and construction of an advanced reactor project.

This group is building upon earlier projects and products from the initial U.S. public-private efforts on new plant licensing. The study will also document insights for decontamination and decommissioning technologies in relation to cleanup for intended future use of DOE facilities. The group has stressed that this effort is not intended to supersede nor evade other formal decision processes related to identifying future uses of the PORTS site. The project merely serves to use the PORTS site as an example for explicating the revised requisite advanced reactor permitting and licensing documentation. The study will develop a Plant Parameter Envelope (PPE) for use at the DOE Portsmouth Site for advanced reactors and will also quantify potential savings to DOE's Office of Environmental Management by reusing the PORTS site for an advanced reactor project.
Draft electronic version of report and products in PDF format-June 2022
Final electronic version of report and products in PDF format-will be completed upon NE Siting Study group review and comment.

Data on Ohio Geology
OU updated and maintained comprehensive data from the Ohio Department of Natural Resources and other sources on geology and related information that will be needed by private developers. A password protected web page was created on the portsfuture.com website so that data can be reviewed as needed by external parties upon request.

PORTS Site Master Plan
OU collaborated with SODI to produce a site master plan that fully explicates SODI's mission, vision, assumptions, guiding principles, goals, values, objectives, challenges, benefits, and strategy for launching the IES-CLM complex at PORTS. This plan was updated during Budget Period 6.
Draft electronic version of report in PDF format-August 2022
Final electronic version of report in PDF format-to be determined by SODI after SODI Board approval

PORTS Land Use Plan

OU collaborated with SODI to produce a site land use plan that describes SODI's site reindustrialization purpose, assumptions, current land use, leases, transfers and other land use actions, future land use plans, land use issues, planning and control for existing missions, and process for future land use changes. This plan was updated during Budget Period 6.
Draft electronic version of report in PDF format-August 2022
Final electronic version of report in PDF format-to be determined by SODI after SODI Board approval

PORTS Concept Map

OU is maintaining, expanding, and modifying as requested the interactive site map that displays various layers including site infrastructure, easements, broadband points of presence, topography, limitations, parcel transfers, and other information to be used in site planning efforts. This is an interactive GIS database creating a land use and site master planning tool that enables the user to display various layers such as site infrastructure assets, wetlands, landfills, and other features in relation to developable parcels. This GIS tool will assist in assessing suitability to industry siting criteria and with other activities related to planning for reindustrialization. During Budget Period 6, OU updated this map in response to SODI requested updates to the concept map related to the advanced nuclear siting study. This interactive GIS database can be viewed at:
https://ohiou.maps.arcgis.com/apps/webappviewer/index.html?id=fe14a57f8ccb48d4875cbfbeb17e0271

Utility Matrix and Permit Inventory

OU developed a utility matrix and permit inventory in Grant Year 4. The utility matrix provides an at-a-glance view of utilities' current capacity, current usage, excess capacity, and other notes of importance for industries looking to site operations at PORTS. OU created an index/matrix of infrastructure requirements for targeted industries (e.g., water, gas, electric, security, other) that could serve to identify assets to preserve rather than demolish, resulting in potential for DOE cost avoidance in this effort. The utility matrix will provide useful data points on investments an industrial tenant might need to consider regarding making use of an asset that might otherwise be disposed.
The utility matrix will continue to be updated based on targeted industry needs and is available upon request and at the discretion of SODI. This matrix is being maintained to support SODI's reindustrialization efforts.

SODI Resource Manual Implementation Follow Up

During calendar year 2017, Ohio University provided ~$50,000 in non-DOE funds toward a collaboration among OU, private sector consultants, and SODI to create a comprehensive site reindustrialization resource manual. The manual is for use by SODI and other regional and state economic development entities working on the reindustrialization of the PORTS site consistent with the IES-CLM concept. Throughout Budget Period 6, OU continued discussing with SODI the implementation of recommendations in the manual. OU will continue to work with SODI as requested on carrying out recommendations in the manual in future grant years. Requests to review the manual can be directed to SODI.

SODI Fact Sheets

Quantifying the value of PORTS site advantages for end users will be vital to attracting industries to the site. Facts sheets have already been developed by OU for site infrastructure, grid capability, combined cycle gas turbine facility, and four types of refineries and can be viewed here
https://www.portsfuture.com/site-reuse/

OU will continue to develop SODI Fact Sheets and will include relevant data and GIS on the specific areas when requested by SODI. These products will assist SODI in responding comprehensively and

expeditiously to private sector and other inquiries about the site and site assets and will thus enhance site reindustrialization efforts.

Data Dashboards

The OU data dashboard link is currently deactivated until the 2020 US Census data become available in total so that OU can make the necessary upgrades to the 2010 Census data. In the interim, we are maintaining previously developed data dashboards. These dashboards are a collection of quantitative and qualitative data to be employed in SODI's site reindustrialization strategy. These data dashboards provide interactive data analysis and visually display relevant regional demographics of workforce-aged residents useful for future site use decision-making. It allows users to quickly access data on the four-county region for various datasets including:

- Population - Total population and percent change in population over time.
- Demographics - The breakdown of total population by age groups and educational attainment.
- Detailed Demographics - The distribution of educational attainment by specific age categories.
- Student Enrollment - Student enrollment by sector and admission area.
- Migration - In-migration, out-migration, and net migration flows for the four-county region.
- Employment by Industry - Total employment by industry sector in the four-county region.
- Employment by Occupation - Total employment by major occupational categories in the four-county region.

The dashboard will be updated to reflect US Census 2020 data and reactivated under the new five-year grant pending availability of funding.

Asset Map

OU is maintaining, expanding, and modifying as requested the existing regional asset map. This map visually displays relevant regional assets useful for future site use decision-making such as highways, hazmat routes, rail, airports, navigable waterways, accredited education institutions, metro centers, population that can be reached within various drive times from the site, and many other data points. During Budget Period 6, the asset map was updated to include new layers that became available and to add layers requested by our anchor private industry partner related to potential end users for the high-volume electricity, decarbonized hydrogen, and CO_2. This map can be viewed at:
http://ohiou.maps.arcgis.com/apps/webappviewer/index.html?id=e5e8bf0c28464fa9b558cd6064afce98

SODI Public Information and Website Redesign Launch

A public information and website launch for the redesigned SODI website is being planned for rollout under the in the new five-year grant. The goal of these activities is to develop a positive and informative narrative about site reindustrialization activities. Ohio University has hired strategic consultants to assist in this effort. Funding for the consultants is coming solely from non-DOE resources at Ohio University. OU finished the redesign of the SODI website in Grant Year 4 in collaboration with SODI and an outside vendor. The goal was to design and build a website for SODI that is easy to navigate and provides useful information to target audiences. Audiences for the website include industry prospects, businesses, nonprofits, economic development professionals, and general inquiries.

Throughout Budget Period 6, OU continues to maintain the SODI website and assist with updates, software licensing and other technical assistance. The website can be viewed at:
http://www.sodidevelopment.org/
SODI Public Information Campaign and website launch dates to be determined by SODI.

SODI Operational and Project Funding

Ohio University has written and submitted the following grant applications to acquire resources for ongoing SODI operations and to support the overall GEM initiative:

- DOE EM1 non-competitive funding request for $15M for SODI operational and site reindustrialization support-October 2021
    - Funding award from DOE EM to SODI is pending SODI identification of collaborative projects at the PORTS site between PPPO and SODI to which this funding can be applied.
- EDA Economic Adjustment Assistance ~$3.5M for various GEM roll out activities-January 2022.
    - This proposal remains under review at EDA.
- Request to US Senator Sherrod Brown for community project earmark $500K for SODI support-June 2021
    - This request was awarded in May 2022 and SODI receipt of funds is pending SODI completing necessary paperwork.
- Second request to US Senator Sherrod Brown for community project earmark $4.29M for SODI support-April 2022.
    - This request remains under review at Senator Brown's office.
- OU will seek funding from the Ohio Governor's Office of Appalachia (GOA) $500M Appalachia Investment Program in calendar year 2022 to support site reindustrialization efforts pending receipt of proposal guidance from Ohio GOA.

DOE Energy Earthshot Hydrogen Hub

During the summer of 2021, DOE announced a Request for Information (RFI) for large-scale hydrogen hub projects. The goal of these hubs is to produce decarbonized hydrogen at scale to expedite the CO_2 reduction goals that are at the heart of the Biden Administration's battle to mitigate the ever-worsening global climate crisis. This RFI exquisitely aligns with the current focus to launch the IES-CLM utilizing decarbonized hydrogen that can be produced by the private sector hydrogen partner mentioned previously in this report.

Ohio University assembled and is leading a team that includes GEM partners and DOE Tri-Labs to pursue a DOE Energy Earthshot Hydrogen Hub to be sited on SODI parcels at the PORTS reservation to support the Integrated Energy System-Closed Loop Manufacturing complex. Integrated energy systems producing zero emissions at-source power along with blue/green hydrogen will serve a vital function in the decarbonization of electricity generation, industrial processes, and transportation. Ideally, the co-location of a CO_2 Sequestration Hub in southern Ohio would further support this hydrogen hub due to the region's favorable geology for CO_2 sequestration.
First round RFI responses were submitted by the team to DOE-July 2021
Second round RFI responses were submitted by the team to DOE-March 2022
Request for Proposals (RFP) release to be determined by DOE during the summer or fall of 2022

Coalition Building for Advancing Site Repurposing Efforts

OU has retained a nationally prominent firm, Remington Road Group, to work with OU, SODI, and GEM partners with coalition building at the regional, state, and national levels to advance site repurposing activities. The PORTSfuture grant covered start-up costs for this effort until other resources were secured. Ohio University has approved the use of their State of Ohio Appalachian New Economy Partnership funds to cover ongoing costs. Coalition building efforts have focused on:

- Meetings with key stakeholders/funders/influencers
- Meetings with federal elected officials
- Meeting with Biden Administration officials including US DOE officials
- Ongoing contact with the Pike County Council of Governments
- Facilitating the labor steering committee to assist with coalition building
- Developing press releases, public information, and messaging materials
- Other efforts to be determined moving forward

Meetings that occurred between October 1, 2021-August 31, 2022, include the following:

White House

- December 15, 2021-Working Group on Coal and Power Plant Communities and Economic Revitalization (IWG) roundtable discussion attended by our partner, Newpoint Gas LLC and follow up discussions

Department of Energy

- February 3-DOE National Energy Technology Laboratory (NETL)
- March 21- DOE Headquarters, Kate Gordon, Senior Advisor to Secretary Granholm, Karen Skelton, Senior Advisor to Secretary Granholm and Hannah Reid, Special Assistant, SODI, OU, and Remington Road Group
- Other meetings held by GEM industry partners on behalf of the Ohio University and SODI efforts also occurred

Congressional

- October 6-US Senator Sherrod Brown's Office, Beth Clodfelter, regional representative
- January 12-Meeting in Pike County with labor leaders from steering committee, representation from Senators Brown and Portman and Congressman Wenstrup offices, and GEM to discuss Newpoint's clean hydrogen project
- November 17-Union leaders labor steering committee meeting with US Senator and Congressional staffers attending
- February 8-Ryan Keating, Deputy Chief of Staff for Congressman Tim Ryan
- March 16-Luke Graeter, Legislative staff for Congressman Brad Wenstrup
- March 17- Union leaders labor steering committee meeting with US Senator and Congressional staffers attending
- April 21-Union leaders labor steering committee meeting with US Senator and Congressional staffers attending
- May 19-Union leaders labor steering committee meeting with US Senator and Congressional staffers attending
- July 19-Site reindustrialization networking event in Pike County
- July 21-John Ryan, State Director, US Senator Sherrod Brown, and other staffers

Labor Leaders

- October 14-Union leaders labor steering committee meeting with Kevin Hoggatt (Senator Portman's State Director) and Alex Scharfetter (Congressman Wenstrup's District Director), Ann Longsworth-Orr (Senator Brown's office)

- October 28-Union leaders labor steering committee meeting with Beth Clodfelter, Regional Rep., Senator Sherrod Brown, John McCracken, Policy Director, Senator Sherrod Brown, John Ryan, State Director, Senator Sherrod Brown, David Zavac, Congressional Assistant, Congresswoman Marcy Kaptur
- November 17-Union leaders labor steering committee meeting with Alex Scharfetter (Congressman Wenstrup's District Director), Beth Clodfelter, Regional Rep., Senator Sherrod Brown, John Ryan, State Director, Senator Sherrod Brown
- November 30- Mike Knisley, Executive Secretary and Treasurer, Ohio State Building and Construction Trades Council
- January 12-Meeting in Pike County with labor leaders from steering committee, representation from Senators Brown and Portman and Congressman Wenstrup offices, and GEM to discuss Newpoint's clean hydrogen project
- March 17- Union leaders labor steering committee meeting with US Senator and Congressional staffers attending
- April 21-Union leaders labor steering committee meeting with US Senator and Congressional staffers attending
- May 19-Union leaders labor steering committee meeting with US Senator and Congressional staffers attending
- July 19-Site reindustrialization networking event in Pike County
- August 18- Union leaders labor steering committee meeting

<u>Site Reindustrialization Overview and Partnership Meetings</u>

- October 1- Reimagine Appalachia Group debriefing on multi-state Marshall Plan for Middle America
- October 4- Dan Blair, Principal with Alternative Clean Energy Foundation, to discuss rare earth mineral extraction and West Virginia research applicable to Piketon reindustrialization
- October 4- Virtual conference with Reimagine Appalachia for follow up planning related to presentation on the Ohio Valley GEM project at Marshall Plan Summit
- October 5- Reimagine Appalachia Group and Marshall Plan for Middle America, presentation wrap-up and conclusions
- October 5-Ginny King, Marathon Petroleum, Sustainability Officer
- October 8 –Amanda Woodrum and Joel Yudken, Reimagine Appalachia, to discuss bioplastics industry study, R&D for Ohio, and region
- October 13- Brookings Institution on carbon removal challenges
- October 13-Presentation to Advanced Reactor Stakeholders Virtual Workshop hosted by SODI's "Site Reuse Deployment Guidance for Advanced Reactors" project team
- October 19- Regional Director US Economic Development Association, Ellen Heinz
- October 19- Steve Csonka, Executive Director, Commercial Aviation Alternative Fuels Initiative (CAAFI), to discuss Reimagine Appalachia, Marshall Plan for Middle America
- October 20-David Wilhelm, Chief Strategy Officer, Hecate Global Energy
- October 22-Jeff Finkle, President and CEO, International Economic Development Council
- October 25-Kevin Lee, Lee Geisse, Blue/Green Alliance, Matt Smith, AFL-CIO Legislative Director, John Haseley, Remington Road Group
- November 2-Jeff Dimick, Alternative Clean Energy (ACE), Wiley Rhodes, Newpoint Gas LLC
- November 19 – Meeting with Counsel to Commercial Aviation Alternative Fuels Initiative (CAAFI) on industrial hydrogen
- December 13-Orano, Southern Company, Electric Power Research Institute (EPRI), Newpoint, SODI
- December 21-John Hemmings, Executive Director of Ohio Valley Regional Development Commission

- January 13-Meeting in Pike County with Commercial Aviation Alternative Fuel Initiative, DUF6/USW leader, and GEM to discuss clean hydrogen project to launch the GEM clean energy and sustainable manufacturing complex at the former PORTS site. DOE EM PPPO Manager joined later in the day to discuss DOE EM PPPO supports for this effort
- January 14-Meeting with Orano to discuss synergies between clean hydrogen and advanced small modular nuclear reactor projects as part of the GEM clean energy and sustainable manufacturing complex at the former PORTS site
- January 25-Meeting with GEM and Natural Resources Defense Council to discuss decarbonized hydrogen projects
- February 1-Meeting with Rob Painter, Managing director at Razor's Edge Ventures
- February 2- Steve Csonka, Executive Director, Commercial Aviation Alternative Fuels Initiative (CAAFI), to discuss sustainable aviation fuels as part of Ohio Valley GEM initiative
- February 23- Jim Hamilton, Executive Director of the Nuclear Decommissioning Collaborative, one of the country's leading experts in nuclear decommissioning and has worked with issues at Piketon and Cynthia E. Winland, Director of Community Revitalization, The Nuclear Decommissioning Collaborative, and with the White House Interagency Coal group
- March 7-Meeting with Ryan Augsburger, President Ohio Manufacturers (OMA) on Ohio hydrogen policy
- March 14 -Attended NADO Conference Ohio dinner in Washington DC, for Appalachian Regional Commission (ARC) chair, director, and staff and provided briefing on Ohio Valley GEM project status, cleanup, and land transfers with acceleration
- March 16-Meeting with President of On Grid Solutions LLC regarding ammonia, methanol production project and strategies for site including Sustainable Aviation Fuel (SAF) fuels support
- March 17- Meeting with Co-Director of Reimagine Appalachia and Policy Matter Ohio on advanced manufacturing policies, and Ohio Valley GEM needs for regional support, sustainable sectors, and supply chain
- March 18-IN2Market, Energy Futures Initiative, and Ohio AFL-CIO President
- March 22-Meeting with Jeff Dimick, President Alternative Clean Energy (ACE) Foundation to discuss his progress on funding and status of ammonia plant project for consideration
- March 23-Meeting to discuss offer from Amanda Woodrum, Reimagine Appalachia to serve on study group for regional tool kit on coal plan conversion preproposal development along with Rocky Mountain Institute (RMI)
- March 23-Presented on the PORTSfuture Program and Ohio Valley GEM strategy at the Advanced Reactor Stakeholders conference in Pike County, Ohio
- March 28-Meeting with Steve Csonka, Executive Director, Commercial Aviation Alternative Fuels Initiative (CAAFI)
- March 29-United State Department of Agriculture (USDA) representatives for Ohio
- March 31-Attended Wall Street Green Summit on ammonia production, hydrogen, and carbon credit trading
- April 5-Ohio University Senior Fellow, Rob Painter
- May 2-Mike Jacoby, JobsOhio/OhioSE President
- May 3-Marshall University, Vice President of Research
- May 3-Blue Green Alliance
- May 12- Mark Peters, Executive Vice President for National Laboratory Management and Operation at Battelle, and Ed Wannemacher, Business Development at BWXT
- May 24-Amanda Woodrum, Reimagine Appalachia
- June 2- Appalachia Energy Future Initiative
- June 8-John Carey, Director, Governor's Office of Appalachia, Hugh Sherman, President, Ohio University, Mark Weinberg, Dean Ohio University Voinovich School of Leadership and Public Service

- June 8-Bruce Brown, Marc Singer, Ohio University Institute for Corrosion and Multiphase Technology
- June 9-Jason Trembly, Ohio University Institute for Sustainable Energy and the Environment
- June 9-Ryan Augsburger, President, Ohio Manufacturer's Association (OMA)
- June 28-Matt Cybulski, JobsOhio, Mike Jacoby, Katy Farber, Taylor Stepp, Ohio SE, and Newpoint
- June 30-Amanda Woodrum, Reimagine Appalachia
- July 1- Steve Hellem, President NAVISTA group
- July 19-Site Reindustrialization Networking Event in Pike County, Ohio
- July 27-Bill Paolillo, Vice President Strategic Alliances and Advanced Technologies, J.W. Didado, Quanta Services Company
- July 28-Amanda Woodrum, Reimagine Appalachia
- August 1-Blue Green Alliance, Sierra Club, Natural Resources Defense Council, National Wildlife Federation, Environmental Defense Fund, Ohio AFL-CIO, Utilities Workers Union of America, Newpoint Gas LLC
- August 3-Dan Minkowitz, Minkowitz Holdings
- August 10-Tracy Lesli, Andrew Sowder, Electric Power Research Institute and Newpoint Gas LLC
- August 15-Tom Esselman, Pat Getty, In2Market Hydrogen Hub
- August 17- Dan Minkowitz, Minkowitz Holdings, Mark Denton, Orano Federal Services, Jason Redd, Southern Nuclear, Kevin Shoemaker, Southern Ohio Diversification Initiative
- August 17-Matt Carle, Ohio Clean Hydrogen Hub Coalition
- August 20-Ryan Augsburger, President of Ohio Manufacturers Association
- August 24-Roger Wilkens, The Center for the Creation of Cooperation
- August 25-Amanda Woodrum, Reimagine Appalachia

Energy Communities Alliance

Ohio University remains involved as a non-voting member with the Energy Communities Alliance (ECA) to keep apprised of policy and priorities of this group. ECA serves to inform and advance the needs and requests of host communities and local governments that are adjacent to or affected by US DOE facilities. OU's Budget Period 6 involvement includes:

- October 5, 2021-Participated in the ECA Nuclear Subcommittee Meeting, primarily focused on the small modular reactors that are currently being developed
- October 18, 2021-Participated in the ECA meeting on priorities for EM Strategic Vision, which was to prepare ECA consensus input to EM prior to meeting with Ike White, EM-1 scheduled for October 21, 2021
- November 18, 2021-Participated in Intergovernmental Meeting that was a "Fireside Chat" with Ike White, EM-1. ECA members participated in this Intergovernmental Meeting
- January 5, 2022-Participated in ECA meeting on consent-based siting for used nuclear fuel, which will significantly impact any advanced nuclear development
- January 13, 2022-Participated in the ECA meeting with Senior Advisor Kate Gordon on Place-Based Energy Initiatives
- February 9, 2022-Provided insight to ECA's Nuclear Subcommittee on fusion energy's readiness to meet climate change goals
- April 22, 2022-Participated in DOE EM's Budget Engagement webinar promoted by ECA
  Received numerous and frequent emails from ECA to keep current on ECA and DOE activities.
- Actively participated in ECA Board of Directors meetings as a representative of Ohio University
- Actively participated in ECA Nuclear Subcommittee meetings and responded to emails seeking input from ECA members

Ongoing Technical Assistance, Public Outreach, Education, and Engagement for Property Transfer and Future Use: property transfer, STEM, and entrepreneurship activities

Property Requests Response Guidelines

Initial planning for this activity began in previous grant years and OU and SODI continued to gather information from other former DOE sites on how property transfer and reuse have been effectuated. At the request of SODI, Ohio University, in collaboration with SODI, will develop tools/templates for requests for property when SODI deems appropriate. This includes SODI requests to DOE for property and includes private sector requests to SODI for property.

In the interim, OU continues to assist SODI with: identifying areas on the site that are not good candidates for building (and remove them from consideration in the property transfer proposal process); defining steps for the transfer of property to private industry; identify documentation needed for each involved party; establishing criteria for reviewing proposals that are submitted for consideration; and producing GIS maps for areas that are 'build-able' based on the needs of the requester. Deliverables and due dates will be jointly determined by Ohio University and SODI. SODI has tabled this activity for the time being and we will resume this activity at the request of SODI.

STEM Activities

Science, Technology, Engineering, and Mathematics (STEM) enrichment activities are designed to encourage regional students to learn about and engage in activities in STEM disciplines. The ultimate goal is to encourage students to pursue careers in these in-demand STEM fields that provide well-paying employment opportunities. These activities may help prepare the future workforce in the region to be job-ready when site reindustrialization efforts are realized. PORTSfuture STEM activities are summarized in Figure 7 and described below.

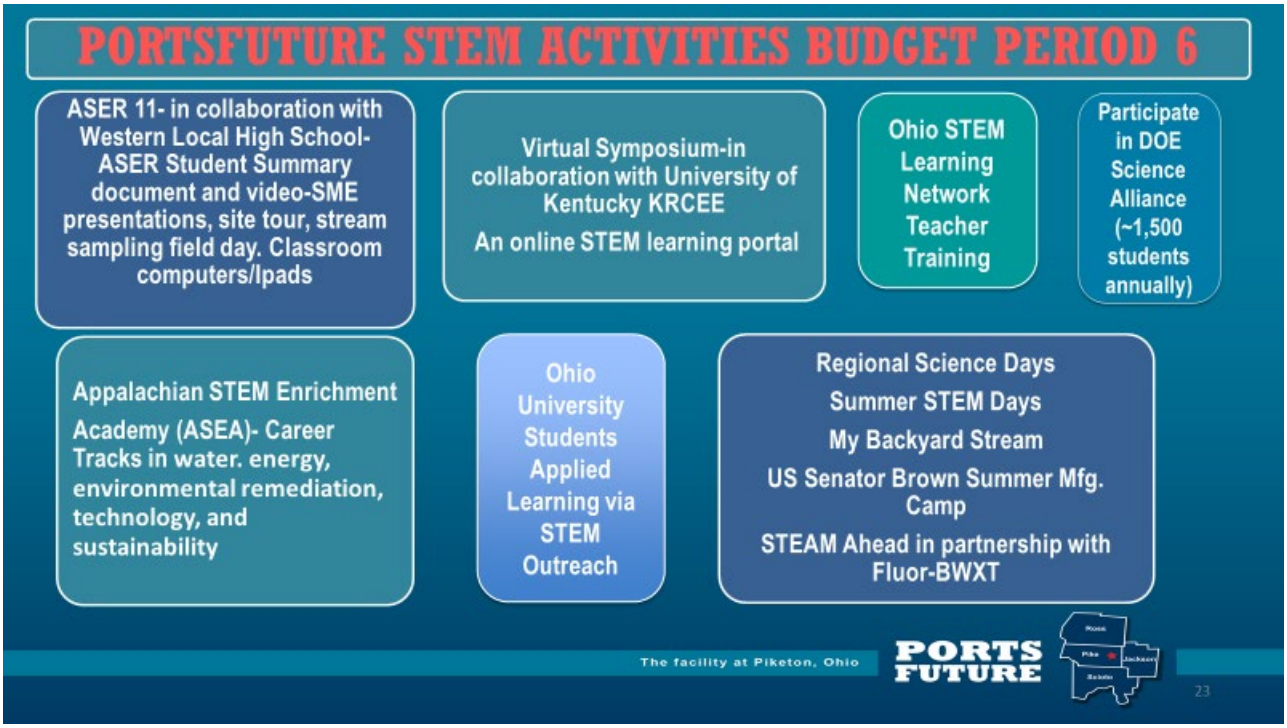


Figure 7-PORTSfuture STEM activities

ASER 11 & ASER 12

ASER 11 (primarily funded under a separate activity within the grant). Ohio University worked with a Western Local High School teacher and 10 students in Pike County to produce the 11th Annual Site Environmental Report Student Summary. This summary provides information to the public regarding the U.S. Department of Energy's progress on cleanup work at PORTS. During the 2021-2022 academic year, students received Subject Matter Expert (SME) seminars on site history, site cleanup and other environmental engineering topics and participated in a classroom presentation from DOE to provide an overview of the site. The group also attended a field day at Lake Hope State Park facilitated by OU staff who provided opportunities for the students to engage in hands-on stream sampling activities. The PORTS site tour did not occur due COVID-19 restrictions.
The final student-generated report and video will be completed by August 31, 2022.

ASER 12 (primarily funded under a separate activity within the grant). Ohio University is working to prepare the ASER 12 project to be conducted in partnership with Waverly High School in Pike County for the coming 2022-2023 academic year under the new five-year grant.

Appalachian STEM Enrichment Academy (ASEA)

OU continued the development of the Appalachian STEM Enrichment Academy (ASEA), a virtual academy that enables STEM offerings to continue online when students are on remote learning. The virtual academy also serves as an online resource for ongoing STEM learning year-round for teachers, students, parents, and caregivers. Thirty-six new lessons were developed and added to the online academy during Budget Period 6.

In Appalachian Ohio, we are connected to the land, communities, history, and spaces around us. At Ohio University, we are proud of our history of encouraging students to be stewards of Appalachia, and of the entire world, by connecting them with skillsets and career pathways for creating a more sustainable future. The Appalachian STEM Enrichment Academy provides virtual hands-on STEM learning opportunities and career track development for K-12 students throughout Appalachia Ohio and beyond.

STEM—or Science, Technology, Engineering, and Math—are vital areas in which we must engage our youth. Students who have a familiarity of STEM topics and an appreciation for how STEM learning creates career opportunities will be better prepared for their future. The Academy platform provides hands-on activities and online lessons and resources and is available 24/7/365. It can be utilized by teachers, after school groups, summer camps, parents/grandparents/caregivers, and students themselves to access unique resources to encourage the next generation of lifelong STEM learners who will be equipped with the knowledge needed to tackle emerging challenges in our world. Our lessons follow a "5E instructional model" which facilitates topical connections through engagement, exploration, explanation, elaboration, and evaluation (see more at https://bscs.org/bscs-5e-instructional-model/).

Our online platform delivers these programs remotely, while fostering an appreciation for the beautiful Appalachian region and introduces ways students can experience STEM every day. The Academy is carried out by a team of faculty and professional staff and students at the Voinovich School, along with contributions from external partners and subject matter experts. It provides career tracks in specific substantive areas including water. energy, environmental remediation, technology, and sustainability. Learning modalities include a blending of: seminars and interactive online sessions; hands-on learning activities, many of which can be carried out with items found at home; career videos; and student sharing via their online postings, videos, and social media interaction. In-person classroom presentations can be provided as well upon request and dependent on available resources.

The virtual academy addresses the resource limitations in Ohio Appalachia and is a collaboration across several programs at Ohio University with joint funding and/or resource support from the DOE PORTSfuture Program, American Electric Power (AEP) Ohio Fund of the Columbus Foundation, Ohio STEM Learning Network, OHIO Museum Complex, Constellation, and Ohio University's Voinovich School of Leadership and Public Service. This collaborative approach enables funding contributors to leverage funds across regional STEM efforts. Cross-promoting STEM offerings expands reach and impact by increasing the volume of student participants and improving long-term access to STEM career pathways information for regional students. The virtual academy reaches wider audiences than if each STEM effort were to develop virtual learning opportunities separately. The online nature of this effort enhances the value of the investments across programs as the content is created once and can serve thousands of regional students. Marketing efforts are ongoing through OU platforms and events and by our partnering entities. See ASEA homepage in Figure 8 below. The Academy is free and open to the public for use from any internet-abled device at home or on the go. To explore the ASEA, please visit**:** https://www.appalachianstemacademy.org/

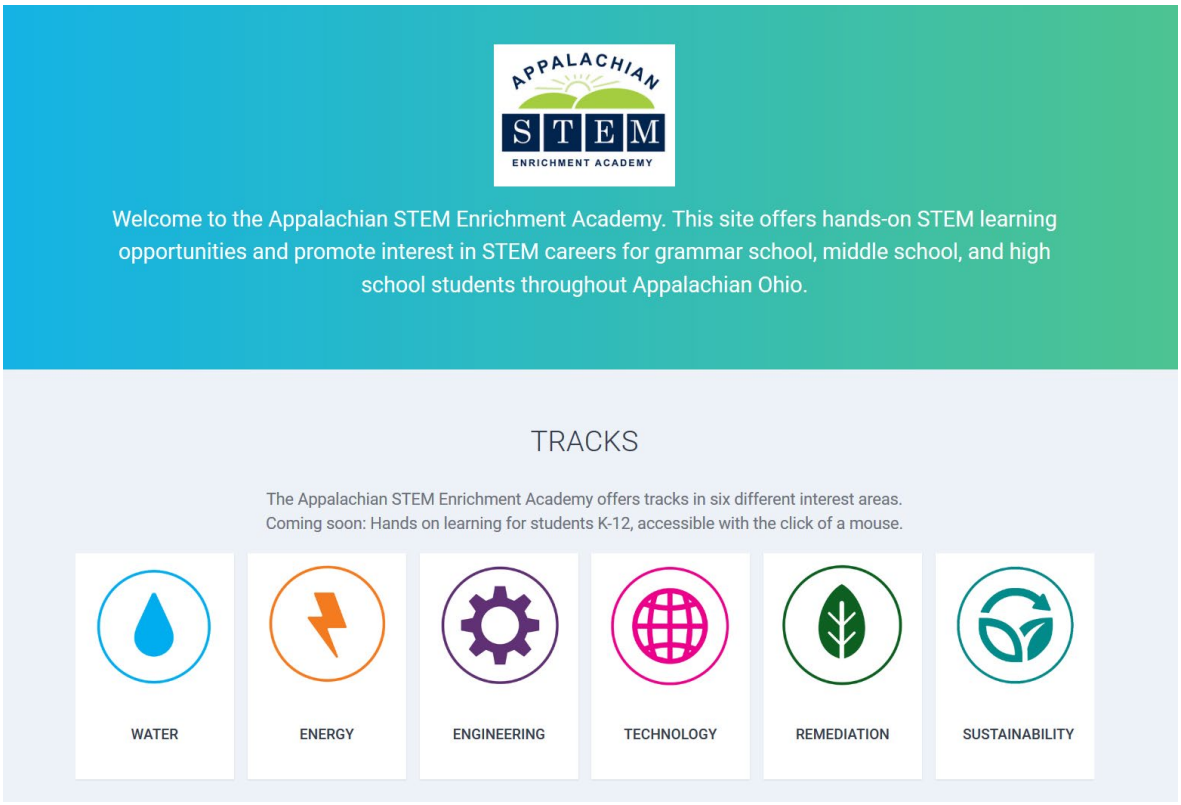


Figure 8-ASEA homepage

Regional Science Days 2022

Regional Science Days serve students from most of southern and southeastern Ohio, including Ross and Jackson Counties in District 12 and Pike and Scioto Counties in District 14. Students in grades 5-12 can compete by presenting their original projects following either standard scientific method or engineering design principles. Through inquiry-based project learning, students gain skills in posing a research question, creating a hypothesis, method development, data collection, data analysis, and written and oral communication. The Ohio Academy of Sciences has developed standards linkage for science fairs across grades 5-12. Students earning a superior at their school fair qualify to compete at their District Fairs and those earning superiors at District Fairs qualify to compete at State Science Day held at The Ohio State

University in Columbus each May. High school students in both districts have the additional opportunity to qualify for the Buckeye Science and Engineering Fair which allows them to compete for a spot at the International Science and Engineering Fair and high school students in District 12 can compete for a spot at the International Fair straight from their district. The potential for learning, exposure to a community of engaged young scientists, and competition for scholarships and awards for students from southern Ohio is unparalleled.

PORTSfuture funding has: increased participation for students and schools in the four-county region; supported teachers with connecting students with scientists at Ohio University; provided OU staff to coordinate with and support schools in the four-county region; supported district fair operations; and connected students from the four-county region with Ohio University resources. Teachers who participated this past academic year received a $500 stipend from the PORTSfuture Program. This included two teachers at Zane Trace Middle School and one teacher at each of the following schools: Unioto Elementary School; Jackson Middle School; and Chillicothe Intermediate School. The overall Regional Science Fair for academic year 2021-2022 included participation from 86 students with 34 of those students mentored by PORTSfuture staff.

Summer STEM Days

Ohio University staff and students engaged regional youth in Pike, Jackson, Ross, and Scioto counties in hands-on activities to learn about water quality and residential storm water pollution mitigation at county fairs during July and August.

The PORTSfuture Program sponsored these activities for one day at each of the county fairs as part of the program's Summer STEM Days outreach efforts. Ohio University led fair goers in activities that included interacting with a storm water display which shows residential storm water pollution accumulation for mitigated and non-mitigated scenarios by activating rain simulations. These simulations illustrated to what extent storm water collects residential pollutants for each scenario. Youth were educated on simple mitigation techniques that can be taken at home to reduce residential storm water pollution such as using rain barrels, washing cars on pavement rather than grass, and cleaning up leaves, yard waste, and pet waste from lawns.

The youngsters also played "pH Bingo" by using pH strips to test a variety of common substances. The youth tested for a range of pH levels from acidity to alkalinity and marked the corresponding pH levels on their 'bingo cards'. Substances they tested included acidic liquids such as orange juice, lemon juice, coffee, tea, soda, vinegar, hot sauce, body wash, and dish soap; neutral substances such as tap water; and alkaline substances such as egg whites, antacids, baking soda, and everyday household spray cleaner. Youth were educated about the pH scale and the differences between substances. See picture of Jackson County fairgoers in Figure 9 below.

Figure 9-Jackon County fairgoers explore PORTSfuture water quality activities in July 2022

These Summer STEM Days events provided an engaging opportunity for participants to explore science techniques through hands-on activities. PORTSfuture outreach efforts strive to inspire regional youth interest in STEM careers for the future. The Appalachian STEM Enrichment Academy was also promoted to youth and parents at these events.

Ohio STEM Learning Network (OSLN) Southeast Ohio Hub

Ohio University hosts the OSLN southeast Ohio regional hub, and this effort is led by Dr. Nancy Stevens a Distinguished Professor in Biomedical Sciences at Ohio University. The Ohio STEM Learning Network has seven OSLN hubs across Ohio that commit to: design, launch and sustain a STEM platform school; capture, amplify and accelerate related STEM research and development; and advance a coherent STEM education and economic development strategy. See https://osln.org/hubs/.

PORTSfuture partners with the Ohio University OSLN Southeast Ohio Hub to assist when applicable in activities such as:

- STEM teacher training sessions: PORTSfuture co-sponsored three sessions during Budget Period 6 with 59 educators attending. See flyer in Appendix 2.
    - Sessions included:
        - Hosting local science fairs-November 2021
        - Simulating science experiments for classrooms-December 2021
        - Appalachian STEM Enrichment Academy overview-January 2022
- Utilizing our Appalachian STEM Enrichment Academy (ASEA) materials to assist with summer school student learning

- Additional OSLN collaborations for the coming academic year are being discussed including seeking out collaborative and crossover opportunities with Science Fair, school outreach activities, Believe in Ohio, and other pitch programs, Fluor-BWXT's STEAM Ahead program, and more.

Virtual Symposium

Budget Period 6 included maintenance of the Virtual Symposium, which is a collaboration between the Voinovich School of Leadership and Public Service at Ohio University (OU) and the Kentucky Research Consortium for Energy and the Environment at the University of Kentucky (UK). These activities are funded by grants administered by DOE's Office of Environmental Management Portsmouth/Paducah Project Office. Primarily funded under a separate task, the Virtual Symposium provides ongoing access to scientific and technical presentations for STEM education interests. The video presentations, PowerPoint presentations, and project reports can serve as useful Science, Technology, Engineering, and Math (STEM) education tools for area schools, colleges, and universities. The Virtual Symposium also provides valuable information to the public at large about projects related to OU activities conducted at the DOE Portsmouth Gaseous Diffusion Plant (PORTS) site near Piketon, Ohio and UK activities conducted at the DOE Paducah Gaseous Diffusion Plant **(**PGDP) site near Paducah, Kentucky. Several videos were added this year related to the Appalachian STEM Enrichment Academy. The Virtual Symposium can be viewed at: https://www.portsfuture.com/virtual-symposium-2/

Science Alliance

Due to the global pandemic, the DOE Science Alliance for October 2021 was cancelled. In previous years, PORTSfuture was delighted to participate in the DOE PORTS annual Science Alliance event held in October that provides over 1,500 high school students access to a variety of interactive kiosks to learn about careers in environmental and engineering fields. The Voinovich School's Raccoon Creek/Watershed team and AmeriCorps volunteers have in the past provided a display that included a live stream table with live fish and macroinvertebrates for the students to explore and learn about stream health and stream cleanup methods. We look forward to Science Alliance resuming in the years to come under the new five-year grant.

New STEM Learning Opportunities for Budget Period 6

My Backyard Stream

My Backyard Stream is a program hosted by Ohio University's Voinovich School that focuses on citizen scientists collecting and sharing water quality data online throughout the State of Ohio. My Backyard Stream allows users to visit their local waterways, collect water quality data, and upload to the My Backyard Stream online platform. The data submission and photos can be viewed through a geolocated data map. The data can be as simple as a photo observation, which is appropriate for younger ages, or as complex as biological and chemical water testing. The platform offers lesson plans to regional educators to conduct this project at a middle and high school level, with step-by-step explanation on what and how to test. The DOE PORTSfuture Program, the AEP Ohio Fund of the Columbus Foundation, and the Ohio Environmental Protection Agency (OEPA) are supporting My Backyard Stream kits that that will help regional educators instruct students and other user groups on the biological, physical, and chemical characteristics of water quality. Trainings in partnership with the OHIO Science Museum Complex and other regional partners augment this train-the-trainer approach.
During Budget Period 6, nine training sessions were held with 125 people trained.

Fluor-BWXT Steam Ahead Collaboration

The PORTSfuture Program is pleased to participate in a new collaborative STEM education program hosted by Fluor-BWXT Portsmouth LLC, a DOE contractor conducting cleanup activities at the PORTS site. Fluor's STEAM Ahead program engages elementary students at Western Local and Eastern Local

elementary schools in Pike County. OU began engaging in 2022 in education days by sharing water quality education and hands-on activities with the students, such as "pH Bingo," which allows students to use pH strips to test the pH levels of various liquids, including milk and orange juice in a bingo format. OU is planning additional collaborative activities with Fluor-BWXT and Western Local Schools in the coming academic year.
During Budget Period 6, PORTSfuture collaborated with four schools to hold one session per school and 100 students were engaged.

US Senator Sherrod Brown Summer Manufacturing Camp-Jackson Ohio

This is not an OU event; however, OU attends each year at the invitation of the organizer. In 2022, the Jackson County Department of Job and Family Services held this event in June. PORTSfuture collaborated with Fluor-BWXT, the DOE site contractors, to provide hands-on STEM activities and to discuss STEM careers. Ohio University staff and IT students used drones and m-bots to familiarize the students with block programming with a tie into larger concepts of robotics and coding in everyday life. After a drone demonstration, students participated in hands-on activities where they were able to code m-bots to achieve their goals and see how the code can be used in conjunction with different sensors to achieve the desired outcomes. The students were sent home with an 'Otto' robot to assemble and code themselves, following directions loaded to Appalachian STEM Enrichment Academy. Ohio University provided a platinum sponsorship fee paid by other non-DOE funds to enable students to attend the camp at no cost.
During Budget Period 6, PORTSfuture engaged 33 students and PORTSfuture provided 33 robot kits for students to take home to continue their hands-on learning

Additional classroom STEM offerings

STEM activities previously developed by OU can be offered onsite in classrooms across the four-county area in southern Ohio dependent upon available funding. We have created a body of work around: renewable energy, the Internet of Things/smart technology; water quality; physical features of lakes and streams; acid mine drainage; analyzing chemical and biological data; and collecting water quality data as a citizen scientist that translates across ages and grades. Working with local teachers, we can customize single class period sessions to their curriculum needs and interests. Hands-on activities augment these programs when possible. Career pathway discussions are integrated into programs for middle and high school students.

Exploring Opportunities for Onsite Academic Initiatives

During Grant Year 4, DOE PORTS inquired about exploring opportunities for utilizing the PORTS site for academic research and teaching initiatives for Ohio University faculty and students in the region. DOE PORTS offered to provide access to the site, data, and Subject Matter Experts (SMEs). Various faculty have expressed interest and will attempt to capitalize on DOE's generous offer if/when they are able to do so. The pandemic limitations during the 2021-2022 academic year precluded the ability to explore onsite academic initiatives however, Ohio University will keep this offer in mind when health restrictions related are lifted.

Interest expressed from OU faculty and researchers at the Ohio University Athens campus includes the following and may be pursued during future academic years:

- Voinovich School faculty hydrologist expressed interest in utilizing the site for class field trips for a multidisciplinary course in Watershed Management. This would include: a site tour and discussion of storm water management on site; viewing a pump and treat system; viewing a site slurry wall on the south boundary; viewing sediment ponds near the switchyards and the disposal cell; and wetland and headwaters mitigation from the disposal cell.

Student research ideas utilizing the site/site data/site SMEs might focus on the water impacts of climate induced extreme weather events including exploring the rainfall runoff characteristics of the previously industrialized area of the site and developing predictions for how that would vary with extreme weather events. The outputs of this modeling could be used to: model different infiltration scenarios and plume migration in a changing climate; examine storm water infrastructure resiliency in a changing climate; establish and monitor geomorphological, flow, and sediment transport characteristics of streams on site; and model future conditions.

- Voinovich School faculty ecologist focused on bioenergy and biomass products, expressed interest in utilizing the site for class fieldtrips to demonstrate remediation and legacy infrastructure, and is interested in the site's phytoremediation projects for research/student research.

- Associate Dean for Industry Partnerships at the OU Russ College of Engineering and Technology (RCE&T) will discuss with the Dean and the RCE&T Center and Institute Directors and extend DOE's offer to provide access to the PORTS site, Subject Matter Experts (SMEs), and data for faculty interested in pursuing academic endeavors. He will also speak with engineering student clubs, as they may be interested in site tours or access to data and SMEs.

Transportation Study/Traffic Impact/Thoroughfare Impact Study (pending)

At the request of SODI, OU began exploring the planning of a transportation study and traffic impact and thoroughfare impact study. At the request of SODI, this activity is currently tabled until SODI's site reindustrialization initiatives are more fully formed.

SODI Operational and Project Funding, SODI Financial Plan

An on-going activity in Budget Period 6 in partnership with SODI was exploring a financial plan for SODI operations. The financial plan will be employed in collaboration with SODI to increase SODI's capacity to obtain the resources necessary to transform PORTS into an Integrated Energy Systems-Closed Loop Manufacturing (IES-CLM) Complex and to pursue complementary missions and facilities.

In the near-term, economic development funding is needed to establish a project development team with a full-time person to lead and coordinate the rollout of a Master Plan and subsequent Execution and Implementation Plans, including a Financial Plan. These plans must strive to be in harmony with State of Ohio and regional economic development strategies and efforts to the maximum extent possible. Additionally, funding is needed for site readiness activities and analyses, identifying potential project opportunities, and other activities to prepare PORTS for transformation. In summary, the initial economic development funds are to be used for:

- Expansion of asset recovery efforts
- Compensation for a project development team, project manager, and professional support staff
- Execution of a Master Plan for transforming PORTS
- Execution of implementation plans

After the initial planning is complete, funding will be needed to execute and implement plans for rebranding and promoting PORTS transformation to an IES-CLM complex in a phased approach that is sequentially compatible with DOE's cleanup efforts. Funding will be needed to identify and engage industries on specific projects for inclusion in the IES-CLM complex. Long-term funding should be project-based, and funding will be needed to ensure that projects are synergistically integrated within the present and future aspects of the IES-CLM complex.

Pursuing additional funding resources:
Accomplishments in Budget Period 6 were cited previously in this report on page 18. Additionally:

- PORTSfuture tracks and summarizes available sources of new state and federal initiatives related to infrastructure improvements, industrial park improvements, and other related programs for which SODI may qualify. PORTSfuture will assist SODI as requested in pursuing these opportunities
- PORTSfuture continues to advise SODI on public-private partnerships aligned with SODI's work. Ohio University offers to support SODI in pursuing such partnerships if SODI chooses to do so as part of the previously mentioned SODI financial plan
- PORTSfuture tracks Congressional legislative updates on proposed Congressional bills that can impact PORTS reindustrialization efforts and the surrounding Appalachian region and periodically reviews these with SODI

PORTSfuture Leveraged Funds for Budget Period 6

As stated previously, our work is carried out through collaborative partnerships which enhances our effectiveness, value creation, and longevity. Whenever possible, PORTSfuture seeks to leverage additional dollars to expand the impact of our work. In Budget Period 6, PORTSfuture leveraged approximately $161,108 of other funding to support PORTSfuture efforts and procured a $500K federal earmark for SODI for a total leveraged funding value of $661,108. This includes securing:

- State of Ohio award to the Voinovich School known as the Appalachian New Economy Partnership-$100,185
- American Electric Power Fund of the Columbus Foundation-$13,220
- Ohio STEM Learning Network-$2,015
- Ohio Environmental Protection Agency Ohio Environmental Education Fund-$22,259
- Constellation-$6,561
- Sugar Bush Foundation-$9,290
- National Science Foundation-$4,328
- District Science Fair-$3,250 sponsorship from other units on campus
- OU secured community project funds for SODI via US Senator Brown earmark- $500K

OU PORTSfuture data reports from previous grant years supporting site repurposing efforts:

Habitat Mapping of the Land and Vicinity of the United State Department of Energy (DOE) Portsmouth Gaseous Diffusion Plant (PORTS) Pike County, Ohio. Under this 2-year task, OU: compiled a fully georeferenced database from DOE, State of Ohio, and public sources; completed a data gap analysis of the georeferenced data; and created a detailed land cover map of the PORTS site, including a 1-mile buffer around the site. Report and land cover map available at: https://www.portsfuture.com/habitat-and-land-use-plan/

Wetland and Primary Headwater Streams Mitigation Conceptual Design Plan. The task resulted in the preparation of a mitigation conceptual design plan, including a wetland mitigation bank proposal, which could be used by PORTS to compensate for potential unavoidable losses to waters of the United States (Clean Water Act Section 404 jurisdictional wetlands and headwater streams as regulated by Ohio EPA). This task applied to only the approximately 3,000 acres of federally owned lands outside of the central high security zone and to such other proximate lands that may be identified as potential locations for headwater stream mitigation. Wetland mitigation analysis and planning was limited to federal lands outside the central high security area. Report available at:

https://www.portsfuture.com/habitat-and-land-use-plan/

Stakeholder Outreach, Partnerships and Networking Support

Many entities continue to express interest in supporting and/or assisting SODI's reindustrialization efforts, with activities determined as appropriate. PORTSfuture also collaborates with SODI in regional outreach, partnership building, and networking support activities to: inform site stakeholders and citizens of site reuse activities; engage economic development professionals and elected officials; identify private sector interests aligned with site reindustrialization goals; broaden contacts with potential collaborators; develop partnerships; elicit regional support; and share information to support SODI's site reuse mission. These activities are summarized in Figure 10-PORTSfuture stakeholder outreach activities.

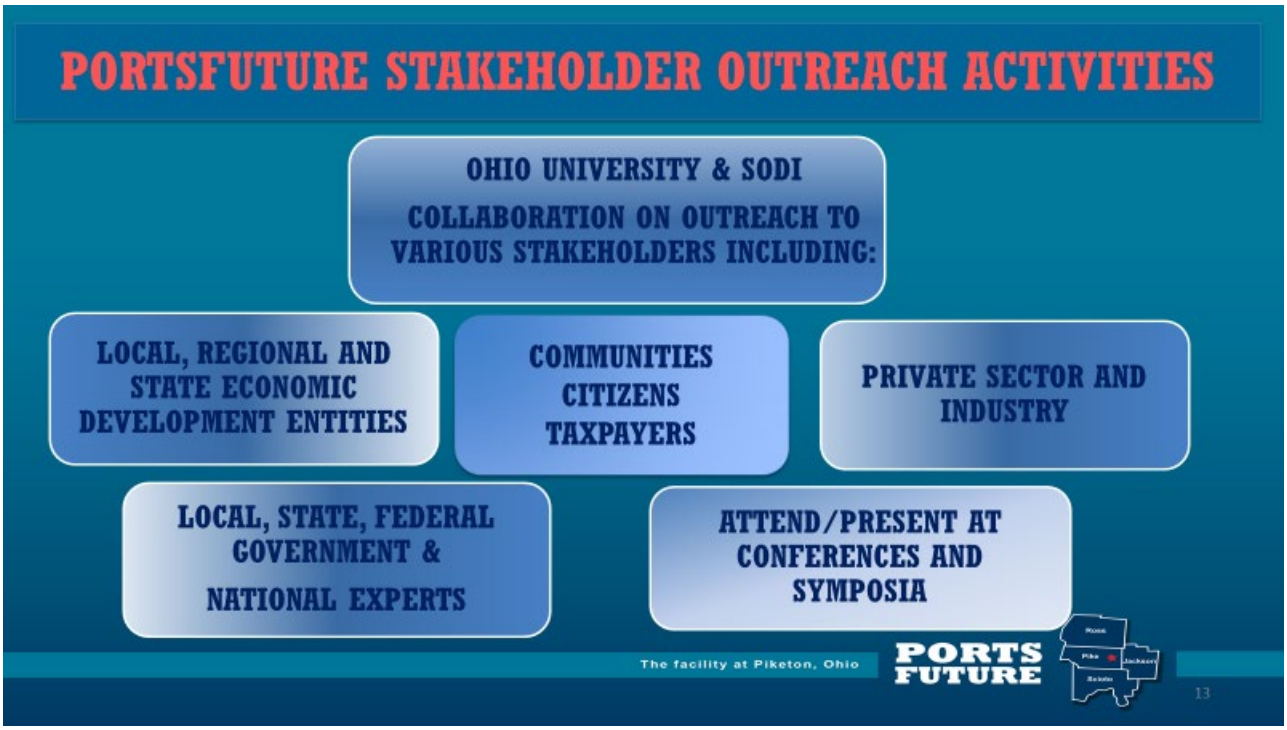


Figure 10-PORTSfuture stakeholder outreach activities

Dissemination of Program Activities

Project website, www.portsfuture.com is used widely to disseminate information, resources, reports, videos, and other deliverables.

Press releases are developed for specific events and activities when applicable, especially related to STEM and other outreach events.

Presentations are provided to stakeholders such as economic development entities, elected officials, federal offices, labor leaders, private companies, investors, community groups, Site Specific Advisory Board along with frequent contact with other regional site stakeholders and other related regional initiatives.

DOE Public Open Houses, 2022

Each year DOE typically holds public open houses. DOE EM PPPO and DOE PORTS lead the coordination and roll out of two series of Community Open Houses typically in the fall and spring of each year in the four-county area near the PORTS site. The purpose of the Open Houses is to inform the public about site cleanup and site reindustrialization efforts. Kiosks have included the Site-Specific Advisory Board (SSAB), the community reuse organization (SODI), OU's PORTSfuture Program, and site cleanup contractors featuring asset recovery, onsite waste disposal facility, and workforce information. PORTSfuture attends the events and displays work products including the interactive PORTS site concept planning and regional assets maps, economic impact and workforce analysis data, and general site reindustrialization materials.
Open houses were not held during Budget Period 6 due to the global pandemic.

Various Meetings and Presentations Highlighting PORTSfuture Program to Elevate Site Cleanup and Site Reindustrialization Efforts Held During Budget Period 6 were cited on pages 19-22 above.

Collaborations

DOE-Related Entities such as US DOE National Laboratories and Community Reuse Organizations

The PORTSfuture Program connects with various experts at DOE National Laboratories and community reuse organizations around the country to seek information to inform our program activities and to discuss PORTSfuture Program activities in support of DOE EM cleanup and preferred community future use.

This past budget period, we continued our engagements with the National Energy Technology Laboratory (NETL), Idaho National Laboratory (INL), and the National Renewable Energy Laboratory (NREL) for the purpose of jointly pursuing funding to launch the Ohio Valley GEM IES-CLM initiative and to specifically secure a DOE Energy Earthshot Hydrogen Hub project to be sited on SODI parcels at PORTS.

Energy Communities Alliance (ECA)

ECA is a non-profit, membership organization of local governments for communities that host, are near to, or are impacted by U.S. Department of Energy activities. ECA convenes meetings and workshops for these entities to share information, discuss and establish policy positions, and promote community interests related to environmental, regulatory, and economic development needs/concerns and the specific impacts at the local level. As an institution of higher education, Ohio University/PORTSfuture is a non-voting member of the Energy Communities Alliance. PORTSfuture participates in conferences and national meetings held by ECA, has an OU Executive in Residence who serves on their nuclear working committee, and we utilize materials disseminated by ECA to inform our grant activities.
ECA involvement during Budget Period 6 was cited in detail on page 22 above.

PJM Interconnection, LLC

PJM is a regional electricity transmission organization (RTO) and PORTSfuture maintains contact with PJM on grid capacity and potential grid and load needs to help better identify PORTS viability as an electricity transmission and distribution hub. During Grant Year 5 PORTSfuture secured the PJM database of coal fired power plants designated to be deactivated in their service area. Our hydrogen industry partner is using this database to evaluate the possibility of converting some of the deactivated plants to produce electricity using decarbonized hydrogen. These regional plants could serve as 'spokes' to the hydrogen hub being pursued through the DOE Energy Earthshot Hydrogen Hub initiative.

Institute for Sustainable Energy and Environment (ISEE)

A key consideration in site reuse is remaining connected to the OU Russ College of Engineering and Technology (RCET) ISEE which houses a coal research center that is touted as one of the nation's leading academic energy research organizations. ISEE is developing innovative and responsible engineering solutions to issues surrounding domestic energy sources and alternative uses of coal in additive manufacturing. These efforts can play a key role in the development and operation of an IES-CLM complex and contacts with RCET are ongoing.

Institute for Corrosion and Multi-Phase Technology (ICMPT)

A key consideration in site reuse is remaining connected to ICMPT at the OU Russ College of Engineering and Technology (RCET). ICMPT conducts research for new ways to address the corrosion of pipelines in partnership with a global gas and oil industry alliance. Pipelines will be a key infrastructure component for an IES-CLM complex.

Biomass, bio-digesters, bio products, and co-production systems

The PORTSfuture program collaborates with faculty researchers at Ohio University who are exploring opportunities for developing biomass, bioenergy and bio products coproduction systems that will simultaneously enhance ecosystem services. Biomass, bioenergy, and bio products could play a key role in the development and operation of an IES-CLM complex.

Related OU academic departments

The PORTSfuture program continues to engage with faculty and researchers from economics, engineering, chemistry, public administration/public policy, and other disciplines when applicable to advance grant activities.

Office of Research and Sponsored Programs

The Vice President (VP) for Research and Creative Activity and Dean of the Graduate College at Ohio University has engaged with SODI and DOE through the PORTSfuture grant to learn more about the site reindustrialization effort. The OU VP of Research remains committed to providing support to the effort, when possible, specifically with linking OU researchers to site reindustrialization efforts and assisting with developing industry partnerships.

OU Entrepreneurial Ecosystem

Ohio University's Small Business Development Center (SBDC), Procurement Technical Assistance Center (PTAC), TechGROWTH Ohio entrepreneurship program, Innovation Center, LIGHTS Regional Innovation Network, Social Enterprise Ecosystem (SEE), and OU Tech Transfer Office are excellent resources for the PORTSfuture Program. They provide expert entrepreneurial education, business assistance, and capital resources in support of small business development, procuring government contracts, and venture development in Appalachian Ohio. These groups provide specific services/events in partnership with the PORTSfuture grant to the DOE four-county area around the site as requested.

OHIO for Ohio

Ohio University is committed to educating students, improving communities, and impacting the local, regional, and statewide economies through six OU campuses and two OU regional centers around the State. OU has recognized the PORTS site reindustrialization initiative as an important priority for regional economic development in southern Ohio and numerous OU officials are providing input and offering insights to the activities of the OU DOE grant.

Workforce Development

OU continues to explore opportunities to support regional workforce strategies for southeast Ohio and relevant adjacent counties. A regional approach is more market-based and creates scalable benefits and funding attraction to support better solutions. These efforts are led by Mike Zimmer, Esq., who is an Executive in Residence at Ohio University.

Research conducted and presented at OU/DOE grant quarterly meetings by Mike Zimmer shows that this approach frames an Ohio River Valley workforce that strategically positions the region to attract large-scale economic development initiatives that are not limited by state boundaries. Research also shows 20%-40% of workers may commute across state lines based on project or industry sector. The goal is to partner with workforce pilots with lifecycle outcomes to measure worker skills to jobs, gaps, existing training and new training resources, and post-performance goal evaluations by worker in key locations such as the Piketon area.

Initial focus of interest to PORTSfuture is on: energy jobs; skills required; career paths; retention practices for blue collar, green collar, and white-collar positions; and workforce needs in region. Jobs of the future include skills development for demands in: advanced and additive manufacturing; construction management; transportation and driving; warehousing/ logistics; algorithms, automation, and coding; building operations and maintenance (O&M); customer service and experience; environmental technologies and waste management; healthcare, fitness, and wellness; and professional services, accounting, and financial support. Additionally, PORTSfuture continues to collaborate with the Ohio Manufacturers Association Workforce group focused on discussing how industry partnerships can assist with economic and workforce development.

National experts and thought leaders

Ohio University's PORTSfuture grant leverages and incorporates University resources and relationships by engaging well-respected national experts and thought leaders in our grant activities. These august individuals provide valuable guidance and feedback to our work and raise the visibility of efforts to repurpose the facility. The following serve in an ongoing and/or in-depth consultative capacity to our site repurposing and ongoing technical assistance, public outreach, education, and engagement for property transfer and future use grant activities:

- Mike Zimmer, Esq.: Attorney and international energy business development expert who serves as an Ohio University Voinovich School Executive in Residence
- Dr. Benjamin Cross, P.E.: Founder and CEO of NuSynergy Energy LLC, formerly with Savannah River National Laboratory who serves as an Ohio University Voinovich School Executive in Residence
- Jeff Finkle: President and CEO of the International Economic Development Council (IEDC) and Ohio University Voinovich School Appalachian New Economy Partnership Fellow
- Dr. Mark Weinberg: Dean of the Voinovich School of Leadership and Public Affairs at Ohio University
- Rob Painter: OU alum with a storied career in the field of GIS/Data/Cybersecurity and venture capital including working for the government, CIA, Google, and other endeavors. He advises on grant efforts based on his connections in federal, defense, data, and technologies

spaces with a specific interest in exploring using the site as part of a national energy security strategy and as a possible site for a government data center, Midwest operations center, or other private sector data centers. Rob serves as a Senior Executive in Residence at the Voinovich School

- Dr. Greg Browning: President of Capital Partners. Former Ohio University Board Trustee. Former Director of the State of Ohio Office of Budget and Management and former Senior Policy Advisor to Governor George V. Voinovich. Greg serves as Co-Chair of the Voinovich School of Leadership and Public Service

- David Wilhelm: Chief Strategy Officer for Hecate Energy, Former Chair National Democratic Committee, and former campaign manager to President Bill Clinton. David serves as Co-Chair of the Voinovich School of Leadership and Public Service

Industry Discovery and Networking

Ohio University participates in (at times with SODI and DOE) exploratory meetings, opportunity meetings, and informational meetings on an ongoing basis to identify entities and resources that could contribute to moving the IES-CLM complex and PORTS site reindustrialization initiative forward.

JobsOhio and Appalachian Partnership for Economic Growth-Recently Rebranded to Ohio SE

Through JobsOhio, the State of Ohio has six network partners throughout the state focused on economic development efforts for their assigned geographic region. Ohio SE is the southern and eastern Ohio state economic development JobsOhio partner that serves 25 rural counties. These JobsOhio network partners serve as a visible point of entry for site selectors and industries interested in locating operations in Ohio. JobsOhio and Ohio SE strive to attract new companies to the region and expand existing companies to grow jobs and create wealth in southern and eastern Ohio. PORTSfuture and SODI continue to maintain a productive working relationship to elevate awareness of the PORTS site and site assets to the state level to advance site reindustrialization goals.

Cielo-Trash to Fuel

PORTSfuture connected with Cielo several years ago to learn more about their operations. Cielo is based in Canada and focused on expanding in Canada and USA by developing 40 partnerships and facilities in the next decade. Their model is superbly aligned with the PORTS IES-CLM concept, and they are aligned with our approach related to closed-loop/integrated systems. Cielo is planning their expansion and they are very interested in keeping in contact with us on perhaps utilizing the PORTS site for one of their projects.

Hecate Energy

Hecate Energy serves as an anchor renewable energy power generation partner in the Ohio Valley GEM IES-CLM complex with their focus on sustainable energy production. Hecate Energy is currently siting large solar farms in southern Ohio and possibly a solar panel manufacturing initiative that could be sited in the Pike/Scioto/Lawrence Counties region. Synergies exist with their efforts and frequent discussions and partnering is ongoing.

Newpoint Gas

Newpoint Gas LLC is a privately held multi-fuels processing, conversion, and purification company. A design and build firm with over two decades innovating zero emissions oil and gas production and processing plant sites. Newpoint serves as anchor power generation partner in the Ohio Valley GEM IES-CLM complex. Newpoint's process incorporates methane reforming with hydrogen purification to

separate the hydrogen and carbon dioxide pre-combustion. The carbon is sequestered underground, and the pure hydrogen is used as fuel to produce steam-driven dispatchable power generation. Newpoint Gas also converts retired coal-fired power plants (CFPPs) to use blue/green hydrogen as fuel with three precedent-setting results. In upcycling the retired generation station, Newpoint achieves (1) net zero carbon dispatchable power, (2) provides employment opportunities in cutting edge hydrogen energy technology to the CFPP's displaced workforce and, (3) includes the ability to supply commercial scale clean-fresh water, which is produced during hydrogen combustion in power generation.

American Electric Power (AEP) Ohio

PORTSfuture has had continuous contact with AEP Ohio's economic development office to keep them informed of site reindustrialization efforts and to explore synergies and collaborations as the buildout of the IES-CLM Complex continues.

Ohio Manufacturers' Association (OMA)

The Ohio Manufacturers' Association is a member-organization comprised of a vast array of Ohio industries. OMA focuses on protecting and growing Ohio manufacturing endeavors throughout the State of Ohio. Ohio University was invited to present an overview of the DOE grant project to the Ohio Manufacturers' Association Energy Committee and to discuss the IES-CLM complex's closed-loop manufacturing concept in 2017. Members were very supportive of the IES-CLM complex concept because closed-loop manufacturing would greatly help industries in driving down the costs of manufacturing as well as ensuring a reliable and affordable source of energy for their production processes. Synergies exist and contact with OMA is ongoing. During Budget Period 6, OMA continues to discuss their efforts in expanding their membership from southeast Ohio industries as well as providing updates on OMA workforce efforts.

Summary and next steps

Ohio University is honored to remain a part of, and to continue to add value to, DOE, SODI, and site contractor collaborative efforts on informing end-state configuration to support viable site repurposing, ultimately resulting in cost savings/cost avoidance and reducing the EM footprint at PORTS. The activities executed during Budget Period 6 under the Site Repurposing Continuation and Ongoing Technical Assistance, Public Outreach, Education, and Engagement for Property Transfer and Future Use activities created public value and served the public interest. These activities informed site cleanup and future use planning, while being mindful of leveraging the existing public assets of the PORTS site and the region to create regional economic stability.

The activities and information cited in this report serve to advance SODI's goal to develop an Integrated Energy System-Closed Loop Manufacturing (IES-CLM) complex at the site. It is important to restate and emphasize that these activities were carried out in a manner that was responsive to the stated future use preferences of the public in the four-county region near the site. These preferences were identified during various DOE and Ohio University public engagement efforts and with the involvement of numerous site stakeholders including: SODI; Site-Specific Advisory Board (SSAB); community-at-large; local, state, and federal elected officials; county, regional, and state level economic development officials; private sector interests; and national experts. These preferences continue to be sustained through ongoing contact with the same stakeholders.

Ohio University remains committed to building on the momentum gained to continue the vital activities reported on in this document. DOE, SODI and OU have identified the following areas in which Ohio University can continue to add value. Additional details for some of these activities will be presented in future grant work plans. Proposed future activities include under the pending new five-year grant:

- Continuing to carry out work depicted in the OU Current Grant Activities graphic shown earlier in this report in Figure 1.

- Continue to identify IES-CLM complex industries and related industry needs to support expansion in the region and/or at the PORTS site. Conduct targeted industry site infrastructure analysis to inform sequencing for cleanup, including conducting a comparison of current site conditions versus conditions needed to support commercial use in specific targeted industry sectors to inform DOE decisions on property transfer.

- Viable clusters for future development that have been identified include energy, advanced manufacturing, and transportation/logistics. We will convene roundtables when requested by SODI to focus on developing Public Private Partnerships for Advanced Manufacturing and Transportation/Logistics Sectors.

- Identify siting requirements such as utilities and other assets to be left in place resulting in cost avoidance for DOE. Utilize GIS to display information when appropriate.

- Upon request and with the approval of DOE, update the utility matrix and permit inventory. The utility matrix provides an at-a-glance view of utilities' current capacity, current usage, excess capacity, and other notes of importance for industries looking to site operations at PORTS. This could serve to identify assets to preserve rather than demolish, resulting in the potential for DOE cost avoidance in this effort. Incorporate the management of site ecological assets/natural capital assets management as appropriate. The use of this matrix is subject to DOE discretion.

- Develop and assist with the execution of a site repurposing implementation plan and SODI Resource Manual as requested/as appropriate and incorporate federal programs as appropriate.

- Work with DOE PORTS and site contractors to develop site services agreements to facilitate and streamline new businesses' ability to access needed site services when locating on parcels transferred to SODI for site reindustrialization.

- Collaborate with SODI to promote the website and available transferred parcels through a public information campaign to audiences that include industry prospects, businesses, nonprofits, economic development professionals, and general inquiries.

- In collaboration with SODI, develop tools/templates for requests for property. This includes SODI requests to DOE for property and includes private sector request to SODI for property.

- Produce data and GIS needed to support these efforts (e.g., this may include maintaining existing data dashboards, GIS products, creating profiles of regional economies, and/or other data to be determined).

- Conduct economic impact analysis, workforce analysis, and other types of data analysis for IES-CLM related industries.

- Assist SODI in developing and executing a financial plan to increase SODI's capacity to obtain the resources necessary to transform PORTS into an Integrated Energy Systems-Closed Loop Manufacturing (IES-CLM) complex and to pursue complementary missions and facilities.

- Continue to identify and engage external and/or private sector resources that could be interested in utilizing site assets for future business development and job creation in the region.

- Develop a public information initiative utilizing regional and national influencers and thought leaders to articulate the value of the PORTS site for economic development and elevate the visibility of the site reindustrialization efforts.

- Continue and/or expand Science, Technology, Engineering, and Mathematics (STEM) enrichment activities designed to encourage regional students to learn about and engage in activities in STEM disciplines with the goal of encouraging students to pursue careers in these in-demand fields that provide well-paying employment opportunities.

- Continue to expand existing partnerships and develop new partnerships to advance site reindustrialization efforts.

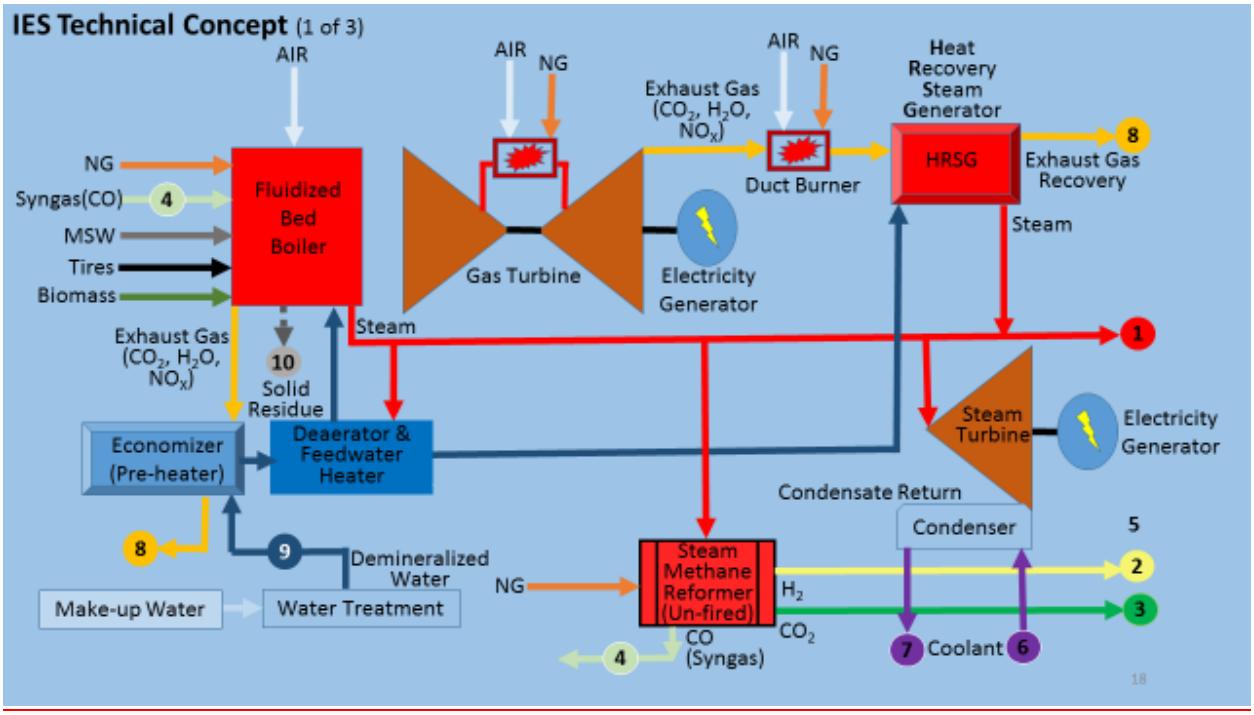
- Continue to disseminate program information through websites, presentations, news releases and/or conferences as appropriate.

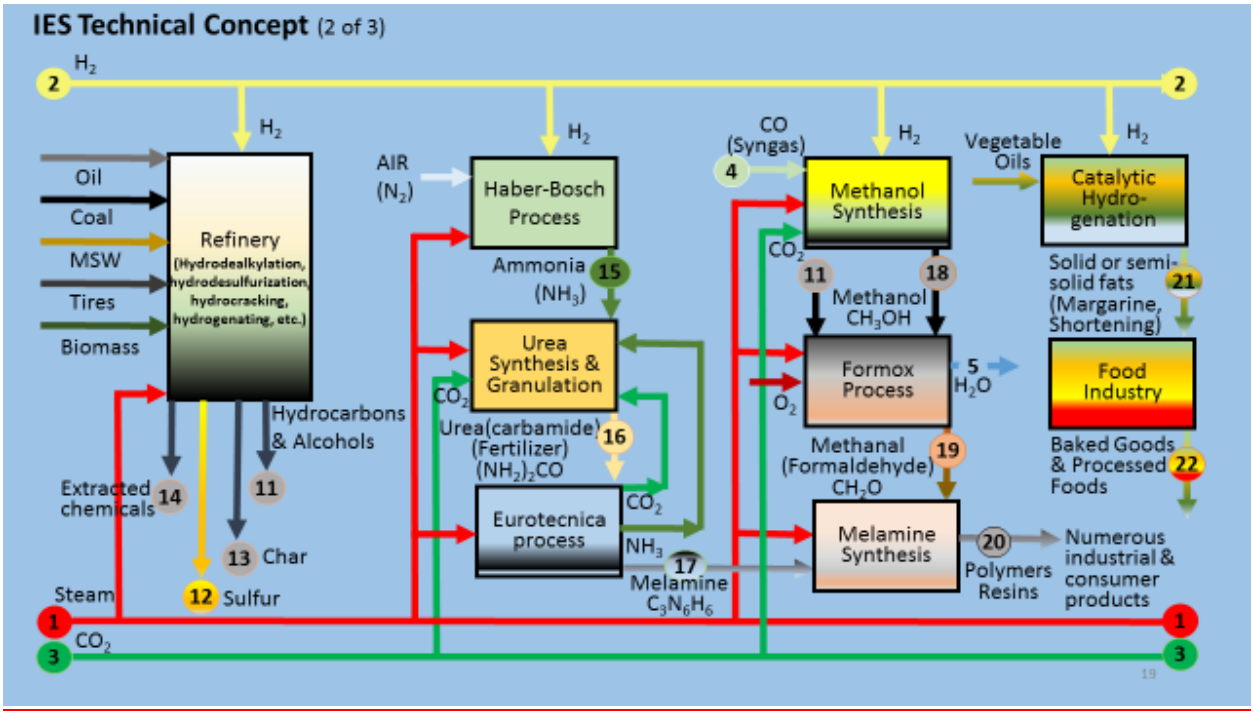
- Continue to inform and update key regional and political stakeholders on activities and progress.

- Leverage other funding opportunities where possible and especially pursue opportunities to bring private sector dollars and/or public private sector partnerships to the PORTS site. This includes building upon current initiatives with entities such as:
    - Commercial partners interested in exploring opportunities at the site
    - University partners interested in conducting research, development, and deployment activities in advanced energy/renewable energy endeavors at the site
    - Technology commercialization experts, private sector venture capitalists and pre-seed fund resources interested in investing in southern Ohio companies.

- Other activities will be defined in collaboration with program partners.

Appendix 1 Integrated Energy System (IES) Technical Concept





Appendix 2 Ohio STEM Learning Network Professional Development Opportunities flyer

Ohio University is the host of the Southeast Hub of the Ohio STEM Learning Network (OSLN). Our goal is to share STEM resources and opportunities for developing partnerships between K-12, higher education, community, and businesses to connect and spread STEM efforts throughout the southeast region of the state.

We are excited to announce the following online STEM professional development opportunities for K-12 teachers.

1-hour webinars are being offered via Zoom

FREE with certificates of attendance

REGISTER HERE:
https://us06web.zoom.us/webinar/register/WN_fACM90hVTWuPuhCczbauzg

For more information:
Jacob White, jacob.white@ohio.edu (740) 597-1281

Facilitator Jacob J. White, Ph.D.
Senior Executive in Residence
Ohio University Voinovich School
of Leadership and Public Service

Wednesday, November 17, 2021 | 3:30-4:30 PM
Hosting Local Science Fairs
This session will provide an overview of the *"whys"* and *"hows"* of hosting local science fairs. Particular focus will be given to learning benefits to students and logistical considerations for teachers. Information will also be shared for aligning local events with district and state fair guidelines.

Wednesday, December 15, 2021 | 3:30-4:30 PM
Simulating Science Experiments for the Classroom
This session will provide considerations for simulating experiments for the science classroom, including an example of a simulated experiment that is safe, hands-on, and engaging. Teachers can easily apply this approach to a variety of grade levels and science topics.

Wednesday, January 19, 2022 | 3:30-4:30 PM
Appalachian STEM Enrichment Academy
This session will overview the Appalachian STEM Enrichment Academy, which provides hands-on STEM learning opportunities and career track development for K-12 students throughout Appalachia Ohio and beyond.

Ohio STEM Learning Network · OHIO Museum Complex · OHIO UNIVERSITY Voinovich School of Leadership and Public Service · PORTSFUTURE · AMERICAN ELECTRIC POWER FOUNDATION · U.S. DEPARTMENT OF ENERGY

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