C2ES CENTER FOR CLIMATE AND ENERGY SOLUTIONS

MANUFACTURING AN ADVANCED ENERGY FUTURE IN KENTUCKY

November 21, 2024

Roundtable Takeaways

Note: *Takeaways represent statements made in the roundtable discussion and do not necessarily reflect the positions or opinions of the Center for Climate and Energy Solutions (C2ES), nor do they represent consensus among participants in the event.*

Overall Takeaways

- Kentuckians have long supplied the resources and power underpinning the American energy economy and are proud of their legacy of hard work and sacrifice that built the state's energy and automotive industries. New energy strategies and investments must honor these efforts and preserve the traditions, culture, and dignity of workers and communities.
- Kentucky already has a large energy workforce, with more than 157,000 workers employed in industries relating to power production (~6,000 workers), fuels (~14,000 workers), transmission, distribution, and storage (~25,000 workers), energy efficiency (~24,000 workers), and motor vehicles (~88,000 workers) across the state.[1]
- New manufacturing facilities for batteries, electric vehicles, and other advanced energy supply chain inputs are bringing tens of thousands of additional jobs to the Commonwealth, and Kentucky has been a top ten state nationally for economic development for the past 14 quarters.[2]
- Intentional and equitable statewide investment in community infrastructure and economic development is central to Kentucky's ability to continue to attract private sector investment, build out new facilities, support a local, highly skilled workforce, attract and retain companies and workers, promote resiliency to extreme weather, and ensure positive health and livelihood outcomes for all Kentuckians.
- Manufacturers can lead by example by promoting the integration of community development into facility construction and operations plans, such as developing training programs in partnership with a local university or offering childcare onsite, but additional support from state and local government is necessary to facilitate development across all communities.
- As new advanced energy industries continue to offer opportunities for Kentucky's communities and workers, workforce development programs must address gaps among the existing workforce and prepare recent entrants to the workforce for the new skills and competencies needed to succeed in the evolving industry.
- Intentional efforts are necessary to raise awareness among regional economic development agencies of the opportunities available to communities to access state and federal funding and workforce training programs. Policymakers and trusted community partners like academic institutions should lead these awareness and information-sharing efforts.

- Companies are driving the development of clean energy generation, as their sustainability and energy procurement targets encourage new and existing facilities to use greater shares of renewable power. States that are best able to affordably accommodate these needs will be the most competitive in attracting and retaining new facilities.
- Power capacity is currently uneven across the state, and some areas are experiencing significant increases in demand for power as new facilities and developments move in. Access to distributed energy resources like solar generation is crucial to enabling the build-out of local power capacity, while additional investments in transmission, distribution, and storage are crucial to deliver electricity from generation to end use.
- In communities that have seen economic or environmental decline in recent decades, new developers must focus on building trust among community members and develop relationships with trusted community leaders. This can facilitate development and accelerate the permitting process, while also setting the stage for workforce development and economic benefits to accrue to communities.
- Site readiness is a key driver of companies' investment decisions. Proactive state and county investment in making brownfield and greenfield sites ready for new facilities, through local infrastructure improvements and even early permitting actions, can help to attract new facilities to Kentucky's communities.
- Recent federal investments, including funding and tax credits through the Inflation Reduction Act of 2022, have had a significant positive impact on the economics of advanced energy projects in Kentucky, especially in energy communities (which include most of Kentucky's counties). Federal incentives may be the tipping point for making a project economically feasible in communities across Kentucky.

Technology-specific opportunities

- There is local demand for sustainable aviation fuel (SAF), including at Cincinnati/Northern Kentucky International Airport, and agricultural resources in Kentucky combined with competencies in chemical engineering, which could make Kentucky a key contributor to the development of a national SAF industry.
- The Appalachian Regional Clean Hydrogen Hub (ARCH2), a collaboration across West Virginia, Ohio, and Pennsylvania will produce hydrogen and build out regional hydrogen fueling stations. This hub, paired with other companies producing and utilizing clean hydrogen in Kentucky, could provide opportunities in the hydrogen economy for Kentucky companies and workers.
- Kentucky sees a major opportunity to supply high-demand inputs for nuclear power generation — beginning with the gaseous diffusion plant in Paducah and extending to other facilities across the state.
- Kentucky's industries and workers have deep experience with minerals processing, a key supply chain need in the advanced energy economy. There is an opportunity to utilize fly ash

from coal plants and other waste streams to produce new mineral products, especially those that will be in the highest demand for an American battery supply chain.

Domestic and global market competitiveness

- Demand for advanced energy technology and production—such as electric vehicles and batteries, solar panels and wind turbines, clean hydrogen, electrolyzers, heat pumps, and other kinds of low-carbon technologies—continues to accelerate rapidly both globally and domestically. If Kentucky-made products and industries are going to be globally competitive, they will need to integrate advanced energy solutions into their operations.
- Many major companies have carbon neutrality and sustainability targets across their global operations, which drive investment decisions to places that can best facilitate access to low-cost renewable power and sustainable production processes.
- Of the $40 billion of manufactured goods produced in Kentucky annually, $11 billion is exported to Europe, which has recently imposed strong limits on the embodied carbon allowed in certain imported goods.[3] To remain competitive as an exporter, Kentucky must enable access to energy and production processes that support the competitiveness of its companies in European markets.
- One of Kentucky's historic competitive advantages is the low cost of electricity, which made energy-intensive facilities more economical and attracted companies to site them in the state. Looking ahead to the future energy economy, energy affordability is key to maintaining this competitiveness.

Manufacturing infrastructure and logistics

- Kentucky's central location creates an advantage in supplying inputs and finished products to major markets across most of the United States; access to multi-modal transportation corridors including rail, maritime, and highways can help products reach demand centers elsewhere.
- Sites surrounding current and retired coal plants are rich in physical and human capital that can make them attractive to other advanced energy industries, such as a skilled workforce, electric sector infrastructure (i.e., transmission lines and substations), and rail and maritime transport access. By investing in brownfield cleanup, revitalization, and infrastructure development, at a retired coal plant, for example, companies can save money by utilizing existing energy infrastructure while also developing on a site and in a community accustomed to industrial project development.
- In addition to the coal industry, Kentucky has been a hub for the manufacturing of vehicles and parts throughout the automotive supply chain, as well as other heavy industries. These assets are directly applicable to new industries. Kentucky's communities and workers have the expertise, infrastructure, supply chain networks, and other core competencies to help them lead in the manufacture of advanced energy products.

Workforce and skills development

- As new facilities produce thousands of jobs in construction and operations, Kentucky now faces a tight labor market with fewer qualified candidates than job openings. This gap can be filled by recruiting workers from other states, as well as recruiting from groups that may experience higher barriers to entry to the workforce, such as veterans, formerly incarcerated workers, and workers with disabilities.
- Additionally, community leaders, state government, academic institutions, and employers must promote ways to retain workers educated in Kentucky, to ensure Kentuckians feel they can continue to live in their home state and to ensure that enough skilled workers remain in the state.
- Workers need more than wages and skills training—companies and local governments must also facilitate access to jobs by expanding access to wraparound services like childcare, broadband, transportation, opioid abuse prevention and treatment, and housing to develop communities that workers want to move to and stay in.
- Jobs in the advanced energy manufacturing and deployment industries require new, specialized skill sets, especially battery manufacturing and testing, which necessitates specific safety training and competencies in addition to engineering and manufacturing competencies.
- Exposing students to advanced energy technologies early can help them develop an interest in growing high-need sectors while ensuring they start developing necessary skills early.

Community infrastructure

- Appalachian states, including Kentucky, have a regional identity rooted in a deep history of production for the coal and automotive industries. Efforts to promote community development in this region must respectfully acknowledge and build upon this regional identity rather than trying to combat it.
- Community economic development research and planning must utilize participatory action and bring in communities and workers from the very beginning. This can build buy-in among communities and ensure research and planning efforts are reflective of conditions on the ground.
- Due to the geographic distribution of Kentucky's population, and the rural nature of many counties, new facilities may create a significant need for jobs in regions geographically removed from where there are greater concentrations of job seekers. Additional transportation infrastructure, particularly highway and rail infrastructure, is crucial to enabling these job seekers to reach sites with employment opportunities.

Entrepreneurship and Innovation

- Investing in an entrepreneurship and startup-friendly innovation ecosystem across Kentucky could create jobs while helping the state become a key player in the advanced energy economy.
- Regional investment must transcend county boundaries in Kentucky to promote collaboration rather than forcing competition between counties that stretches resources and stifles innovation.

Policy Recommendations

The following are policy recommendations developed directly by participants through an interactive workshop during the roundtable. They were developed among small groups through a guided exercise and do not necessarily indicate unanimous agreement among all participants.

Promoting the global competitiveness of Kentucky-made products

- To support Kentucky's global competitiveness in sustainable product/material manufacturing, the Kentucky General Assembly should dedicate resources to establish an interstate regional coalition across the southeast Ohio River Valley and Appalachia focused on transportation, manufacturing, and energy supply.

Building, expanding, and/or retooling infrastructure to support access to the new energy economy

- To address the need for greater coordination between state, local, and federal government entities on energy infrastructure buildout, Congress should pass legislation to mandate the U.S. Economic Development Administration (EDA) to establish a federal Office of Community Prosperity for Underserved Communities, with offices in all 50 states, as conduits for state, local, federal, and industry. The Kentucky General Assembly should pass enabling legislation to support the development of a corresponding office at the state level.

Promoting workforce development for advanced energy manufacturing in Kentucky

- To increase access to and utilization of workforce development opportunities, the Kentucky General Assembly should fund the creation of a comprehensive online database of workforce development resources and opportunities for area development districts, local governments, and local communities across the state.

Developing the innovation ecosystem for advanced energy in Kentucky

- To equitably and transparently strengthen the innovation ecosystem in Kentucky, and across the country, Congress should establish a public/private partnership supporting a national Innovation & Entrepreneurship program that drives a graduated K-12 experiential learning program.

Accelerating the development of the nuclear energy supply chain in Kentucky

- To demonstrate the opportunity for Kentucky to manufacture parts for the existing U.S. nuclear fleet, the Kentucky General Assembly should fund a study to identify the parts and qualifications necessary to expand production in Kentucky. This should include determining a new line within an existing facility, a certification to enable the production of pumps, pipes and valves, and qualifications.

Endnotes

[1] See U.S. Department of Energy, *Kentucky: U.S. Energy and Employment Report—2023* (Washington, D.C.: Department of Energy, 2023, https://www.energy.gov/sites/default/files/2023-06/USEER23-KY-v2.pdf.
[2] See Chris Hughes, "Kentucky gets top rankings for economic development in national publication," *Spectrum News 1*, July 9, 2024, https://spectrumnews1.com/ky/louisville/news/2024/07/09/business-facilities-economic-development-rankings-kentucky.
[3] Kentucky Export Initiative, "KY Export Facts," accessed November 27, 2024, https://kyexports.com/export-facts/.