REGIONAL ROUNDTABLES

Securing The Battery and Critical Material Supply Chain in Alabama

Roundtable Summary and Takeaways

October 15, 2025

On September 11, 2025, the Center for Climate and Energy Solutions (C2ES) hosted a roundtable event in Tuscaloosa, Alabama, in partnership with the Alabama Mobility and Power Center. This summary condences the conversation from that event, highlighting lessons, challenges, and opportunities to developing a battery and critical material supply chain both in the state and in the broader south eastern region of the United States.

Note: Takeaways represent statements made in the roundtable discussion and do not necessarily reflect C2ES positions or opinions, nor do they represent consensus among participants in the event.

Summarizing the Conversation

Lessons from Other Markets and Industries

- The emerging American battery industry can take many lessons from the more mature markets in China, Korea, and other countries, particularly with respect to launching a highly technical and capital-intensive industry. To develop a battery industry in Alabama, the Southeast, and the United States more broadly, we must build on the following foundational principles:
    - Long-term government support is paramount to developing the battery industry. Unfortunately, significant shifts in the level of government support for the industry with American political cycles foster uncertainty around the near- and long-term outlook of the industry. Consistent federal policies would help provide the policy certainty to unlock private markets for new battery business.
    - Companies have difficulty securing private-equity investments in the battery space, which are challenged by the desire for short return timelines. Investment in the battery and critical materials space requires more patience for return on investment, particularly as it scales up in the United States.
    - We must accelerate the development of existing technology to meet the needs of and address challenges to the battery industry, such as coating, drying, and calendaring, to improve the manufacturing process. Support for research, development, demonstration, and deployment in these areas is paramount to industry growth.
    - In advanced manufacturing, especially for batteries and critical materials, the interface between human and machine is of utmost importance. Improved education and training for operators of advanced manufacturing machinery will be key to the industry's ability to efficiently produce critical materials and convert them into batteries.

Key Challenges to the Industry

- The fundamental challenge to growing the battery market is collaboration among many diverse stakeholders—coordination is necessary among feedstock suppliers, cell fabricators, and final product original equipment manufacturers (OEMs) to demonstrate the viability of the industry. Financiers of new projects need the certainty of a customer base, while customers need to see that a supplier has the financial stability to provide reliable inputs.
- Battery technologies are a new area for many people, including policymakers, communities, and even companies looking to purchase or install batteries. Often, large and small battery companies alike are the primary communicators about their technology, which can foster skepticism among some communities. To be successful, the battery industry needs a strong, coordinated, and well-resourced marketing strategy that educates people about the technology and associated risks and opportunities.
- Raw materials production for the battery industry is globally concentrated in a single country. This creates a reliance on an individual supplier, which raises risks to energy and national security while deterring private sector investment. Geographically concentrated supply is an energy and national security issue because the country that controls those resources can withhold them for geopolitical reasons. Additionally, private sector investors are less likely to provide capital to new facilities when heavy reliance on a concentrated set of suppliers, and lack of alternative options, creates high risk of disruption.
- The United States has historically deployed an economic strategy that focuses on attracting and supporting companies as far downstream in the supply chain as possible, deprioritizing raw material production and manufacturing. Recent developments in global markets, geopolitical tensions, and supply chain disruption events have highlighted the importance of strengthening domestic production throughout supply chains.
- Global markets for battery and end products, such as electric vehicles, have become more competitive as demand rises and new regions enter the market. New European and Middle Eastern companies are looking to compete with Chinese manufacturers and traditional U.S. OEMs who are joining the market. American producers must work efficiently and decisively to scale new technology and secure supply chains to remain competitive.
- The biggest challenge for companies looking to site in Alabama has been securing financing for their projects. Traditional bank loans may not be an option for new entrants to the market, leaving companies to search for investors and private equity partners. Companies are most successful in securing financing when these investors believe in the promise of the new companies and are willing to wait for longer-term returns than other investment options.
- State support is often complimentary to federal policy support; the capital needed for new project development is beyond the capabilities of any one state in the Southeast. This further emphasizes the need for companies to engage with private sources of capital.

Alabama's Competitive Advantages and Strategic Opportunities

- Alabama's access to a deep seaport in Mobile capable of handling large global cargo transport, the state's natural resources such as graphite and lithium in the Smackover formation, and its access to advanced labs and research facilities at the University of Alabama make it attractive to companies across the battery supply chain.
- Deep sea mining offers the opportunity to harvest critical mineral rich geologic nodules off the ocean floor with potentially less ecological impact compared to terrestrial mining. Alabama's

seaport access on the Gulf could place the state in a position to benefit from this industry as it develops.

- The close proximity of facilities in Alabama to other battery supply chain producers and customers across the Southeast, and the states relatively affordable energy prices, can serve as an advantage for the state and region in supporting industry development, enabling a more secure and resilient supply chain.
- Alabama has existing industrial clusters in chemical, automotive, and defense sectors, and mature support systems for all of these industries. The state is well-positioned to use learnings from these industries and utilize cross-system collaboration to strengthen the battery and critical material supply chain in the state.
- The emergence of industry-specific consortia, such as the Alabama Mobility and Power Center, helps the integration of academic, public, and private sector networking and partnerships, aligning goals and developing better business models to react to a volatile market.

Developing a Battery Industry Talent Pipeline

- Workforce readiness and site preparedness are paramount to new business development. We need to start workforce development as early as K–12 all the way through college programming. For new industrial sites, projects can be developed most efficiently when the state readies infrastructure as soon as funding is secured.
- Other regions across the country have spent years developing partnerships with community colleges to train workers to start manufacturing at commercial scale immediately. For example, Reno, Nevada, has worked with the Tesla Gigafactory and Redwood Materials to support a robust talent pipeline through the local community college system.
- Innovative new workforce development processes are needed to make sure workers are prepared for the large-scale manufacturing necessary for the cutting-edge battery market.
- Several research hubs exist to develop the battery industry in different regions across the country. More collaboration is necessary to align the work and objectives of each of these hubs. However, this coordination can be challenging and is complicated by the proprietary nature of each research hub's intellectual property.

Innovating and Scaling Cutting-edge Technology

- The key question for launching new battery and material technology in the United States is how to address cost of production and get manufacturing to a scale that meets the needs of a consumer market. To successfully launch a domestic industry, policymakers and industry leaders need to pull several levers and make gains from each one, such as subsidies for new businesses, adoption of foreign technology transfer, and development of industrial clusters and knowledge ecosystems.
- Many early-stage companies underestimate the challenge of industrially scaling their product. A key challenge in the industry is the ability to ramp production from pilot scale (e.g., one ton of product per day) to commercial scale (e.g., thousands of tons per day).
- There must be a pathway for innovation in the battery and materials space that cultivates connection between developers of new technology and business professionals with experience and resources to commercialize new technology.

- Given the capital intensity of the industry, rightsizing the scale of new production facilities is crucial to the economic viability of private companies entering the U.S. industry. Companies must often decide where their technology fits best in the market. For example, the defense industry has more niche applications and a higher tolerance for risk, whereas the consumer EV industry needs proven technology at a large scale with low costs and minimal risk.
- Once a new battery technology is developed and in its early stage of commercialization, the industry needs more communication with the public to provide education and increase confidence in the new technology.

Business Development for Battery Materials Companies

- When establishing a new sector, multiple new entrants to the market can only be successful when demand for end products is high enough. Government incentives are helpful to emerging companies, but not sufficient to get them to market alone. The U.S. electric vehicle sector has made a lot of progress to bring supply chain nodes to the United States, but in the long run, the sector still needs to find growth opportunities to boost demand and ensure the offtake market matches the supply.
- Companies developing cutting edge technologies face a different set of challenges than the companies onshoring mature technologies and supply chains. To onshore existing supply chains, producers must convince offtakers to spend time and money considering a switch in their supply from their long-time, offshore suppliers to new domestic producers. Policymakers must consider what is needed to support the domestic industry looking to compete on a cost basis with existing suppliers abroad in this competitive, price-driven global consumer market.
- In recent years, many companies aiming to source from domestic producers or friendly nations tried to vertically integrate their supply chains. However, when they encountered high capital costs for these new facilities, many companies sought to engage in joint development agreements—this cost sharing helped reduce risks to individual companies developing new facilities.
- Companies in the battery space can make better-informed sourcing decisions that promote financial efficiency if they are able to holistically compare both capital and operational expenditures across their business—however, companies need access to the data to make this comparison, which is more accessible for mature and established companies.

Policy and Strategy Workshop

Following a full day of presentations and full group discussions, participants self-selected topical areas to engage in blue-sky thinking to develop specific recommendations in support of the battery and critical materials industry. These topics were designed to represent the crucial support systems to ensure a conducive social and economic environment in Alabama and the broader Southeast for technology to develop, businesses to locate and grow, and communities to benefit from the battery industry. The topic areas and big ideas the groups developed were as follows included attracting new industries, workforce development, responsible industrial development, and research & development.

Attracting New Industries

In this session, participants discussed: funding for new early commercialization technologies and high capital intensity facilities, bankability and long-term offtake opportunities, the role of state and federal procurement, and how to develop a supportive policy foundation.

As part of the recommendation development process, the group identified key principles that must be part of any policy or program to attract new industries to the state and region:

Principles

- Industry should lead in developing the parameters when attracting new facility development or developing directly.
- Lower barriers are necessary for every step of the process of developing new facilities.
- Cost barriers for infrastructure must be lowered.
- Profitability is central to the success of any new industry.
- Funding and bandwidth support is necessary for various pieces of work and scale up, such as improving timeline for material qualification.

Using these principles, the participants shared aspirational goals for what would push the industry forward, and then developed a specific and actionable recommendation:

Recommendation

- To attract new facilities, Alabama state government, academic partners, and the federal government should all provide funding to expand the offerings of the Alabama Mobility and Power Center and amplify its impact across the entire Southeast region.

Workforce Development

In this session, participants discussed: training for workers entering the upstream battery sector; worker safety in critical battery minerals, materials, and adjacent industries; wrap-around support; and K–12 education and the future workforce.

As part of the recommendation development process, the group identified key principles that must be part of any policy or program to attract new industries to the state and region:

Principles

- Address workforce barriers (e.g., lack of access to healthcare, childcare, transportation) and increase access to training (e.g., mobile training centers).
- Improve education around soft skills (e.g., problem solving, communication) for workers and ensure workers have access to continued training opportunities for upskilling.
- Increase public familiarity with the battery sector and the types of jobs offered to ensure an interested and equipped workforce pipeline

Using these principles, the participants shared aspirational goals for what would push the industry forward, and then developed a specific and actionable recommendations:

Recommendations

- To raise awareness among the K–12 population, the state board of education should integrate battery sector-relevant curriculum into the core curriculum.
- To get organic interest from the next generation, industry should fund marketing & communications efforts that engage influencers & media outlets that have broad youth reach.

Responsible Industrial Development

In this session, participants discussed: natural resource availability, siting and permitting, community engagement, and environmental impact.

As part of the recommendation development process, the group identified key principles that must be part of any policy or program to attract new industries to the state and region:

Principles

- International standards comparable to our own should be accepted by U.S. regulators.
- Industry needs to change the negative image of chemical manufacturing and improve education around the positive end uses.
- Good stories and use cases to share with consumers and policy makers will help existing misconceptions in the public.
- Companies should more actively engage with communities to hear concerns and educate on their process in advance.

Using these principles, the participants shared aspirational goals for what would push the industry forward, and then developed a specific and actionable recommendations:

Recommendations

- Simplify and standardize the U.S. federal regulatory process through digitization, modernization, and updating.
- Empower government to be more flexible, accepting credible data used in other friendly countries to be used to approve EPA chemical related regulations.
- Increase public education around topics related to the battery supply chain and battery use cases through programming at schools and regional outreach.

Research & Development

In this session, participants discussed: next-generation critical materials extraction and refining, design improvements for enhanced safety, performance and efficiency improvements, and design for recyclability.

As part of the recommendation development process, the group identified key principles that must be part of any policy or program to attract new industries to the state and region:

Principles

- Funding is at the center of all R&D and should be directed toward institutions that will make practical use of the outcome—in other words, use-inspired funding focus.
- Collaboration between universities, industry participants, and other key stakeholder groups.
- Prioritize support of technologies with a technology readiness level (TRL) of 4–6.
- New tech development should serve as drop in solution to existing challenges.

- Federal R&D grant programs should mandate industry endorsement/participation of the proposal to ensure the outcomes are aligned with what the industry needs.
- Innovation in existing processes for new material development.
- Scalability of new technologies and demonstration projects.

Using these principles, the participants shared aspirational goals for what would push the industry forward, and then developed a specific and actionable recommendations:

Recommendations

- To support companies through the 'valley of death,' Congress should fully appropriate all funds authorized under the CHIPS & Science Act for the NSF TIP. (priority for energy technologies including storage and design grants for AI) and ARPA-E.
- To develop cutting-edge innovations in battery manufacturing, industry should design, advocate for, and partially fund a Battery Manufacturing USA institute.
- To get companies to open up about their R&D needs (to make public and accessible the most pressing commercial R&D needs so academic institutions can orient their research to be immediately practically applicable), NSF TIP should establish a battery industry advisory council to collect industry R&D needs to set the direction of grant offerings.