



Council on Competitiveness Bioeconomy Initiative

Working Session 4 Prep Brief

Build National Capacity: Talent, Infrastructure, and Ecosystem Leadership

Virtual Working Session | Thursday, October 8, 2026 | 2:00–3:00 p.m. ET

Zoom link: <https://compete-org.zoom.us/j/83243528347?pwd=GCP394II7j3aeYkMnfc0IMoJXzMtCf.1>

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PROJECT BACKGROUND

The Council has been building a body of work around the U.S. bioeconomy and its implications for competitiveness, innovation, and national economic security. This effort builds on discussions at the [2025 National Competitiveness Forum](#), the leadership gathering hosted by Jim Stutelberg at [Primient in Lafayette](#), the Council's April 2026 bioeconomy [working session](#), and the Nebraska Competitiveness Conversation hosted by University of Nebraska System President Jeff Gold.

Building on these discussions and the growing national focus on biotechnology and biomanufacturing, the Council is convening six virtual working sessions starting on Thursday, September 17 and concluding on Thursday, October 22, each scheduled for one hour from 2-3 PM Eastern. The virtual working sessions will identify a focused set of high-impact, strategic recommendations to strengthen U.S. competitiveness and leadership in the global bioeconomy.

THE SIX-SESSION PROCESS

The six one-hour sessions will examine three complementary dimensions of the U.S. bioeconomy, with two sessions devoted to each:

- 1. Build Fast, Scale Big.** *Investment, Commercialization, and Biomanufacturing Leadership*
- 2. Win the Market.** *Demand and Global Competitive Advantage*
- 3. Build National Capacity.** *Talent, Infrastructure, and Ecosystem Leadership*

The first session in each focus area will surface emerging trends, critical challenges and chokepoints, opportunities for U.S. leadership, and potential solutions. Following each session, the Council team will circulate a summary of the discussion, highlighting emerging recommendations and areas for further exploration, and invite participants to provide feedback. The second session will build on this input by challenging and refining the recommendations, assessing feasibility and impact, identifying gaps and unintended consequences, and prioritizing the ideas with the potential for transformational impact.

Council staff will synthesize the work across all six sessions into a concise strategic recommendations report for release at the [2026 National Competitiveness Forum](#). For additional background on the initiative, see the [Bioeconomy Initiative Project Plan](#).

SESSION 4 OVERVIEW | BUILD NATIONAL CAPACITY: TALENT, INFRASTRUCTURE, AND ECOSYSTEM LEADERSHIP

This working session will focus on the national capacity, connections, and implementation mechanisms needed to make the U.S. bioeconomy easier to build, finance, manufacture, and compete globally. Discussion will explore four ecosystem capacity challenges:

- **Building the workforce that can discover and manufacture**, including the scientists, engineers, technicians, operators, and other talent needed to move technologies from laboratory to plant floor.
- **Making the regulatory, standards, and procurement environment work for the products coming next**, including modernizing rules, classifications, codes, specifications, and procurement systems to enable adoption of new bio-based products.
- **Building a national bioeconomy intelligence, data, and trust infrastructure**, including the data, metrics, domestic and international standards, global competitiveness intelligence, and trusted information-sharing mechanisms needed to make better decisions and reduce barriers to market entry.
- **Building and connecting the infrastructure and regional ecosystems needed to scale**, including pilot and demonstration facilities, commercial infrastructure, regional manufacturing ecosystems, and stronger connections among companies, universities, national laboratories, and other assets.

SESSION 4 AGENDA

- **5 minutes — Opening and framing:** Purpose, context, and desired outcome.
- **10 minutes — Expert framing:** Two or three kickoff discussants briefly identify the most important capacity/ecosystem gaps and opportunities from their perspectives.
- **40 minutes — Working discussion:** Open discussion, debate, challenge, and recommendation development.
- **5 minutes — Synthesis and next steps:** Identify areas of emerging consensus, unresolved questions, and issues to carry into Session 5.

FRAMING THE NATIONAL ECOSYSTEM CHALLENGE

The United States has many of the assets required to lead the emerging bioeconomy. The challenge is building the capacity, connections, and implementation mechanisms needed to turn those assets into sustained commercial and manufacturing advantage.

A promising technology may encounter a shortage of manufacturing talent or production capacity just as it moves toward commercial scale. A regional innovation hub may have world-

class research capabilities but lack the pilot infrastructure needed to advance technologies toward market. A company may have a viable product but face regulatory uncertainty or multiple, overlapping regulatory regimes. A new bio-based material may offer strong performance but lack the standards, specifications, codes, or procurement classifications needed for customers to adopt it. Valuable process and biological data may be generated across the ecosystem but remain fragmented, difficult to access, or impossible to compare because common standards are lacking.

These challenges often arise at the interfaces between institutions and capabilities. Talent can be developed without sufficient input from the employers who will need it. Research infrastructure can be disconnected from the companies trying to commercialize technologies. Regional strengths can develop independently rather than as part of a connected national network. Regulatory and standards systems can remain oriented toward legacy products and production pathways even as new biological technologies cross traditional agency and industry boundaries. Data is increasingly valuable, but it is not always shared, interoperable, or generated in ways that allow it to be used across the ecosystem.

During this session, we will focus on the national capacity, connections, and implementation mechanisms needed to make the U.S. bioeconomy easier to build, finance, manufacture, and compete globally. The objective is to strengthen the national ecosystem so that U.S. capabilities can operate as a competitive system, repeatedly translating scientific and technological advances into products, manufacturing capacity, companies, jobs, and global market share.

CROSS-CUTTING QUESTIONS

Across the four challenges outlined below, we should consider:

1. Where are the most consequential capacity gaps today, and which bottlenecks are most likely to constrain growth as the bioeconomy scales?
2. Where do we need to:
 - Build additional capacity?
 - Better connect and coordinate existing capabilities?
 - Develop or modernize standards, codes, and specifications?
 - Better align incentives?
 - Improve institutional design or federal coordination?
 - Build entirely new infrastructure or capabilities?
3. Where could stronger connections among existing capabilities create more value?
4. What capabilities need to be developed or coordinated at the national level, and what should remain regional or market-driven?

NATIONAL, REGIONAL, AND MARKET ROLES

A useful lens throughout the discussion is that not every capability needs to be centralized to benefit from national coordination. Some capabilities will depend on local comparative advantages or private investment, while others may require common national frameworks, standards, information, or infrastructure to function effectively.

National capabilities are areas where scale, interoperability, security, or national competitiveness considerations may argue for a coordinated approach. Examples could include:

- Data and interoperability standards
- Global competitiveness intelligence
- Workforce competency models and portable credentials
- Certain research, testing, and characterization infrastructure
- Federal regulatory coordination
- Biosafety and biosecurity frameworks
- National measurement and standards infrastructure

Regional capabilities are areas where local comparative advantages, assets, and market conditions matter most. Examples could include:

- Feedstock-to-product ecosystems
- Manufacturing clusters
- Specialized workforce programs
- Pilot and demonstration facilities
- University-industry partnerships
- Regional infrastructure
- Specialized supply chains

Market capabilities are areas where private investment, customer demand, and competition should primarily determine what gets built and where. Examples could include:

- Commercial manufacturing
- Product development
- Customer relationships
- Proprietary technologies
- Supply-chain investments

BUILDING ON THE NSCEB AGENDA

As we heard last week, the National Security Commission on Emerging Biotechnology (NSCEB) has developed a substantial body of work relevant to these challenges, with [49 recommendations](#) addressing domestic biomanufacturing, workforce development, biological data, standards, federal coordination, regulatory modernization, and other areas. Forty of those recommendations are now moving forward through Congress or implementation efforts.

The Council's work can build on, reinforce, and extend this important agenda. Where there is alignment with NSCEB recommendations, the Council can add additional weight and support to important ideas already gaining momentum. At the same time, the Council's Bioeconomy Initiative brings together a broad cross-section of industry, academia, labor, national laboratories, investors, and regional leaders with direct experience developing, financing, regulating, and commercializing bio-based technologies; this perspective can help identify where complementary actions may be needed.

FOUR ECOSYSTEM CAPACITY CHALLENGES

1. BUILD THE WORKFORCE THAT CAN DISCOVER AND MANUFACTURE

The United States needs people who can move technologies from laboratory to plant floor. As biomanufacturing expands, companies need people who understand fermentation and downstream processing, process engineering, quality control, automation, equipment maintenance, and the operation of increasingly complex biological production systems.

The National Security Commission on Emerging Biotechnology (NSCEB) has already called for expanding federal biomanufacturing workforce programs, coordinating training across programs and regions, improving accreditation, and developing nationally recognized competency models. It has also identified the need for microcredentials and skills-based training that employers can recognize across the industry.

Key question. What would it take to build a workforce system capable of supporting a major expansion of U.S. biomanufacturing capacity?

Additional thought starter questions.

- Where are the most consequential workforce gaps today: scientists, engineers, technicians, operators, maintenance, quality, automation, construction, or management?
- How can community colleges, technical schools, universities, national laboratories, and industry better connect education and training to actual bioindustrial jobs?

- Could national competency standards, portable credentials, employer-defined skills, regional training networks, and apprenticeships make it easier to develop and deploy talent across companies and regions?
- How should workforce development anticipate the convergence of biotechnology, AI, automation, advanced manufacturing, and process engineering?

2. MAKE THE REGULATORY, STANDARDS, AND PROCUREMENT ENVIRONMENT WORK FOR THE PRODUCTS COMING NEXT

For the industrial bioeconomy, companies encounter questions about how products are defined, classified, tested, specified, certified, procured, and incorporated into existing industrial systems.

A bio-based product may perform as well as or better than an incumbent product but still face barriers because standards, specifications, building codes, product classifications, procurement systems, or testing protocols were designed around the incumbent. These challenges could become more significant as the bioeconomy expands further into materials, fuels, agricultural products, construction products, consumer goods, and other industrial inputs.

This raises an important distinction between regulating how a product is made and evaluating what the product can do. Where appropriate, could standards, codes, and procurement systems place greater emphasis on the performance and characteristics of the end product rather than prescribing the feedstock or production pathway used to make it?

For a richer discussion on the regulatory landscape of bio-based products, we point you to the Council's Policy [Landscape Brief](#) (see Page 15, Federal Regulation and Standards of the Bioeconomy).

NSCEB has developed substantial work on regulatory modernization, including more predictable pathways for novel products, clearer data expectations, harmonized terminology, and improvements to manufacturing regulation. Its broader standards agenda also calls for NIST to serve as a hub for biotechnology, biometrology, biological-data, and industrial biomanufacturing standards.

Key question. How can the United States make the regulatory, standards, and procurement system more capable of recognizing, qualifying, and adopting the bio-based products coming next?

Additional thought starter questions.

- Where do existing product classifications, standards, codes, specifications, or testing protocols prevent bio-based products from competing on a level playing field?

- How can federal procurement specifications and classification systems be modernized so agencies can purchase innovative bio-based products based on performance?
- Which standards should be developed domestically, and where should the United States pursue international alignment?
- How can regulation remain risk-proportionate while providing enough predictability for companies making large manufacturing investments?
- Where does fragmented jurisdiction across federal agencies create unnecessary uncertainty, duplication, or delay?

3. BUILD A NATIONAL BIOECONOMY INTELLIGENCE, DATA, AND TRUST INFRASTRUCTURE

The U.S. bioeconomy is distributed across businesses, industries, agencies, universities, national laboratories, investors, regions, and states. No single institution sees the entire system, creating both a **coordination and information problem**.

The United States needs a much better understanding of its own bioeconomy capabilities and how they compare with those of global competitors. This includes where critical bioeconomy capabilities and manufacturing capacity exist; comparative costs of production and access to feedstocks, energy, and other inputs; workforce and infrastructure availability; technology readiness and investment flows; regulatory, standards, and procurement environments; supply-chain dependencies and vulnerabilities; etc.

At the same time, the United States needs better underlying data and measurement systems to assess the performance and competitiveness of bio-based products and processes. Companies, customers, investors, and policymakers need reliable ways to measure and compare product performance, biobased content, process performance, feedstock characteristics, supply-chain provenance, safety, quality, and consistency.

Today, data can be fragmented, difficult to access or compare, or generated without common standards. Inconsistent measurement and verification requirements can impose significant costs on emerging companies and make it more difficult for customers to evaluate new products. These challenges become particularly important as bio-based products enter markets where buyers, regulators, and investors need credible evidence that products meet performance, environmental, safety, and other requirements.

NSCEB has proposed a National Biotechnology Coordination Office and an Office of Global Competition Analysis, as well as senior biotechnology officials across relevant federal agencies. It has also proposed a Web of Biological Data and national standards for AI-ready biological data, and recommended a stronger NIST role in biotechnology, biometrology, biological data, and biomanufacturing standards.

Key question. How can the United States build the data, metrics, measurement and verification standards, KPIs, intelligence, and trusted and secure information-sharing mechanisms needed to understand where it stands globally, identify emerging competitive gaps, and make it easier to develop, verify, finance, manufacture, and buy bio-based products?

Additional thought starter questions.

- What information and metrics would companies, investors, policymakers, and regions need to make better decisions about where to develop or locate bio-based production?
- Should the United States establish a continuously updated global bioeconomy competitiveness benchmark covering factors such as manufacturing capacity, production costs, feedstocks, energy, infrastructure, talent, investment, regulation, and market access? What value would this provide?
- What measurements and standards need to be common across the bioeconomy to allow products and processes to be compared?
- How can federal agencies, states, universities, national laboratories, industry, and investors share information without creating another bureaucratic reporting requirement?
- How can the United States protect sensitive biological, commercial, and national-security information while enabling greater data interoperability and collaboration?
- How can trusted U.S. measurement and verification systems become a competitive advantage for U.S. bio-based products in global markets?

4. BUILD AND CONNECT THE INFRASTRUCTURE AND REGIONAL ECOSYSTEMS NEEDED TO SCALE

The United States has substantial biotechnology and manufacturing infrastructure, but it remains fragmented across companies, universities, national laboratories, and regions. Previous Council discussions have highlighted the shortage of pilot- and demonstration-scale infrastructure, as well as the challenges companies face when they need access to fermentation, downstream processing, testing, analytical capabilities, engineering expertise, specialized equipment, and other assets needed to move from laboratory development toward commercial production. The gap does not end at demonstration scale: as technologies mature, companies must also secure the capital, sites, utilities, workforce, supply chains, and other infrastructure required for full-scale commercial facilities.

Shared infrastructure can help address some of these challenges, particularly for startups and emerging technologies that cannot justify building specialized facilities before commercial demand is established. The emerging BioMADE Pilot Plant Network is one important response, but how can these assets be connected across the commercialization journey, and how can regions build on their strengths.

Regional ecosystems are especially important because the economics of the bioeconomy depend on local combinations of feedstocks, energy, water, transportation, manufacturing, research institutions, workforce, capital, and customers. The opportunity may therefore be to connect specialized regional capabilities into a stronger national system.

Key question. How can the United States build and connect the physical infrastructure and regional ecosystems needed to move technologies from laboratory development through commercial-scale production?

Additional thought starter questions.

- What physical infrastructure is most lacking today: pilot plants, demonstration facilities, downstream processing, testing and analytical capabilities, specialized equipment, utilities, or full-scale manufacturing capacity?
- Which infrastructure should be shared nationally or regionally rather than built independently by individual companies?
- How can existing facilities become more accessible to startups, universities, and smaller companies?
- What financing and operating models can make shared infrastructure economically sustainable?
- Where should government help build capacity, and where should private investment follow demonstrated market demand?