



# 20 NEW 24 USES FORUM



Agricultural Utilization Research Institute



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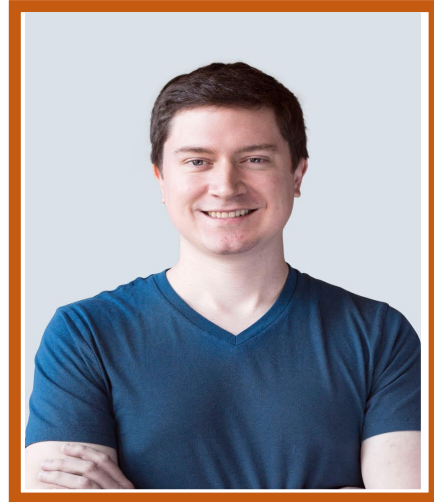
**Have you ever tried to scale up technology transfer before?**

ⓘ Start presenting to display the poll results on this slide.

# Scaling Up for the Future



**Jill Zullo, Ph.D.**  
Founder  
Zullo Advisors, LLC



**Sean Hunt, Ph.D.**  
Chief Technology  
Officer  
Solugen



**Billy Hagstrom**  
Chief Executive Officer  
& Co-Founder  
Bluestem Biosciences, Inc.



**Eric Lee**  
Vice President of  
Engineering  
Spiber

# Panel Discussion



# Audience Questions & Answers



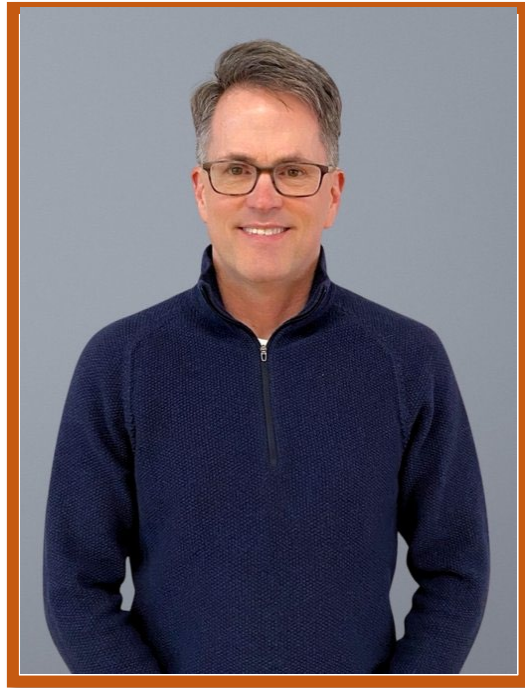
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**What is a key word for something that you took away from this session?**

**i** Start presenting to display the poll results on this slide.

# Keynote Address: The Arrival of BioMADE



**Jack Starr, Ph.D.**

Chief Manufacturing Officer  
BioMADE



# New Uses Forum

- › Jack Starr
- › April 9<sup>th</sup>, 2024





# Agenda

- › About BioMADE and Bioindustrial Manufacturing
- › Infrastructure Vision
- › Join the Movement

# About BioMADE

BioMADE launched in 2021 and is an independent non-profit, public-private partnership sponsored by the U.S. Department of Defense. In partnership with our members, we are securing America's future through biomanufacturing innovation, education, and collaboration by:

- › Propelling new biotechnology products from the laboratory to the commercial market
- › Creating a more robust and resilient supply chain and helping the U.S. become more self-sufficient
- › Ensuring that the workforce of the future is prepared and ready to fill new jobs
- › Bringing together a range of member organizations to bridge the gap between lab-scale research and at-scale manufacturing



# Vision & Mission

## Vision

To build a sustainable, domestic end-to-end bioindustrial manufacturing ecosystem

## Mission

Our mission is to enable bioindustrial manufacturing at all scales, develop technologies to enhance U.S. bioindustrial competitiveness, de-risk investment in relevant infrastructure, and expand the bioindustrial workforce to realize the economic promise of industrial biotechnology

# What is Bioindustrial Manufacturing?

Bioindustrial manufacturing uses living organisms such as bacteria, yeast, and algae to make new products or replacements for current products that are more sustainable and environmentally friendly than current processes

By harnessing the power of biology, bioindustrial manufacturing can make myriad products that Americans use every day

Bioindustrial manufacturing is key part of the bioeconomy, which could have an economic impact of up to \$4 trillion annually within the next 10–20 years

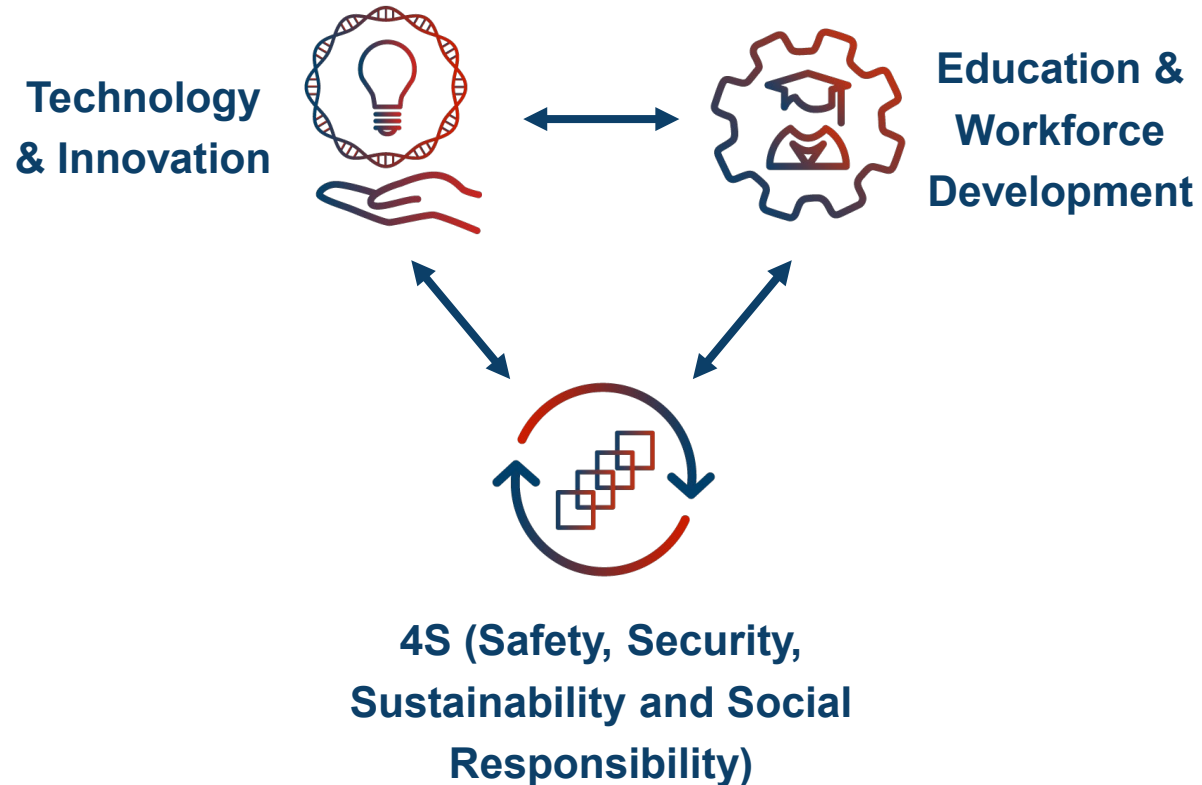
## Applications

- › Novel and performance-driven chemicals, materials, catalysts, sensors, probiotics, and more
- › Compounds that go into footwear, ink, and engine coolant
- › Fibers that become coffee capsules, diapers, cups, and electronics
- › Skincare products
- › Growable concrete and on-site production of fuels, lubricants, and other critical materials

# Benefits of Bioindustrial Manufacturing

- › Creates more robust and resilient domestic supply chains
- › Establishes the U.S. as a self-sufficient and global manufacturing leader
- › Creates more environmentally sustainable products with less reliance on petrochemicals
- › Produces materials with physical and chemical properties not currently available
- › Builds a diverse and globally competitive STEM workforce
- › Supports American farmers and enhances rural development

# Program Areas and Projects



## BioMADE Projects

BioMADE co-invests with its members to advance projects in each of these three interconnected areas. To date, BioMADE has:

- › 76 projects
- › 67 members engaged in projects
- › Project work in 20 states
- › Over \$170M in funded work

# Piloting Infrastructure

Approved for Public Use



# There is a Gap in Existing Domestic Infrastructure

Laboratory

30-100 L



Reasonably Available

Pilot / Intermediate

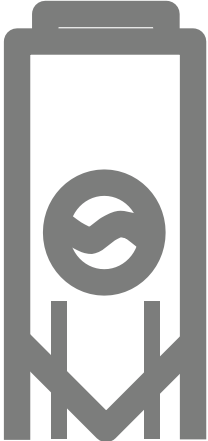
2,500-50,000 L



Sparse

Specific Product Production

200,000 L



Reasonably Available



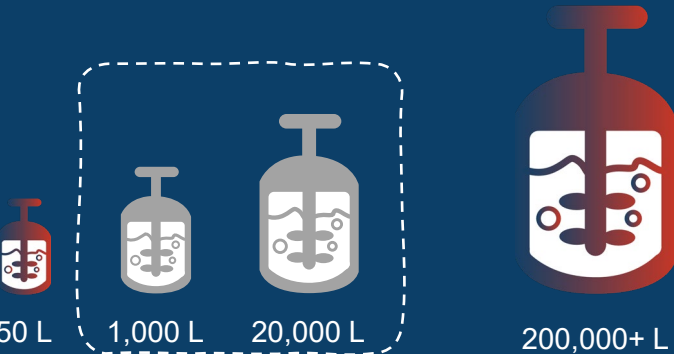
# The Domestic Scale-Up Infrastructure Gap

Gap is filled by going overseas

Lack of domestic scale-up facilities forces U.S. innovators to look elsewhere to scale or manufacture their biotechnology innovations

Asia

Europe



Lab scale Abundant Pilot Scale Scarce Commercial scale Present for current bioproduct



An Existing Network of National Pilot Facilities

Mexico



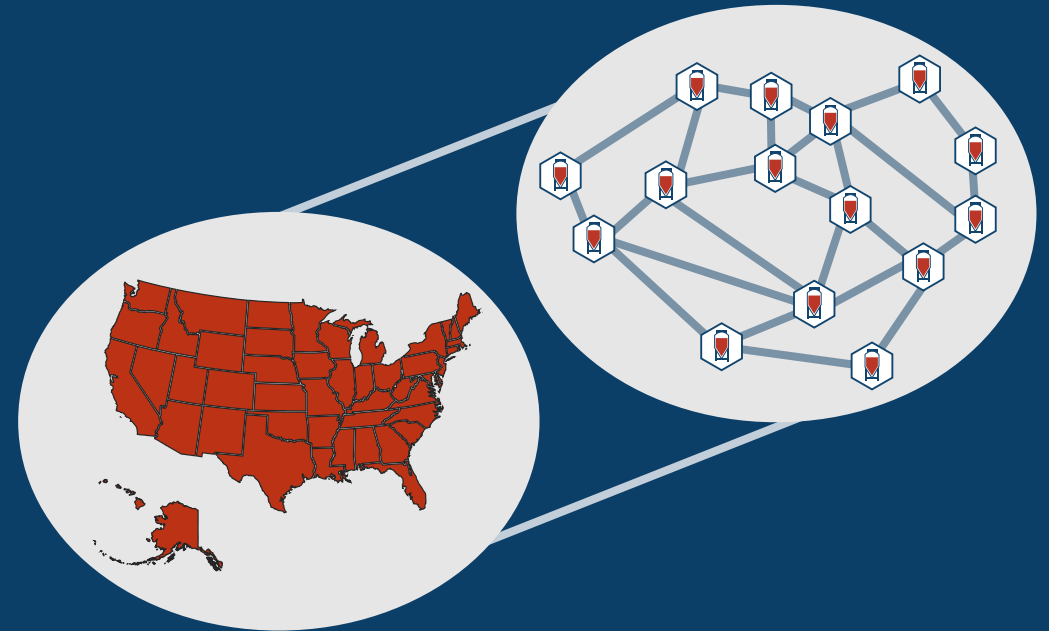
# Diverse and Specialized Infrastructure for a Robust and Resilient Network of Manufacturing Capabilities

Leverage regional strengths and partnerships

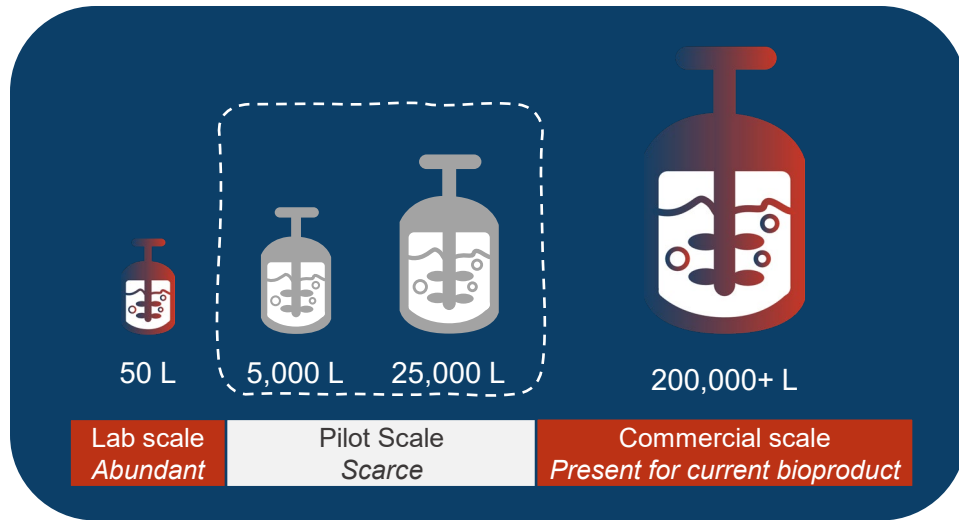
Couple with regional supply chains and manufacturing needs

Proximity locations to members and educational institutes

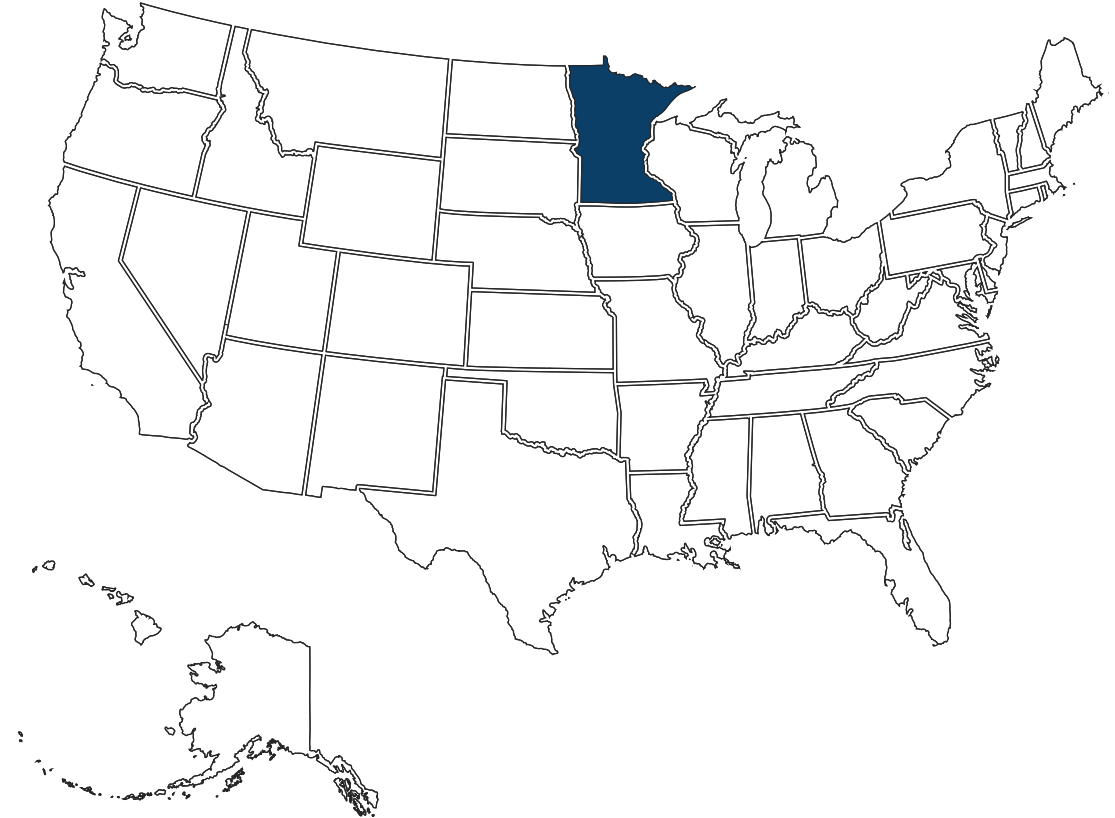
Federal appropriation in FY23 for \$300MM as down payment for network



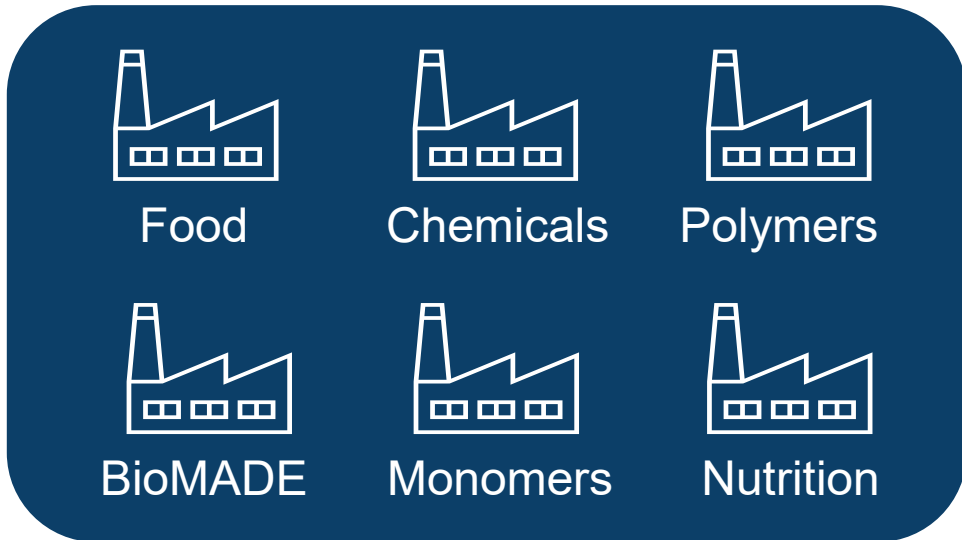
# BioMADE Pilot Plant National Network



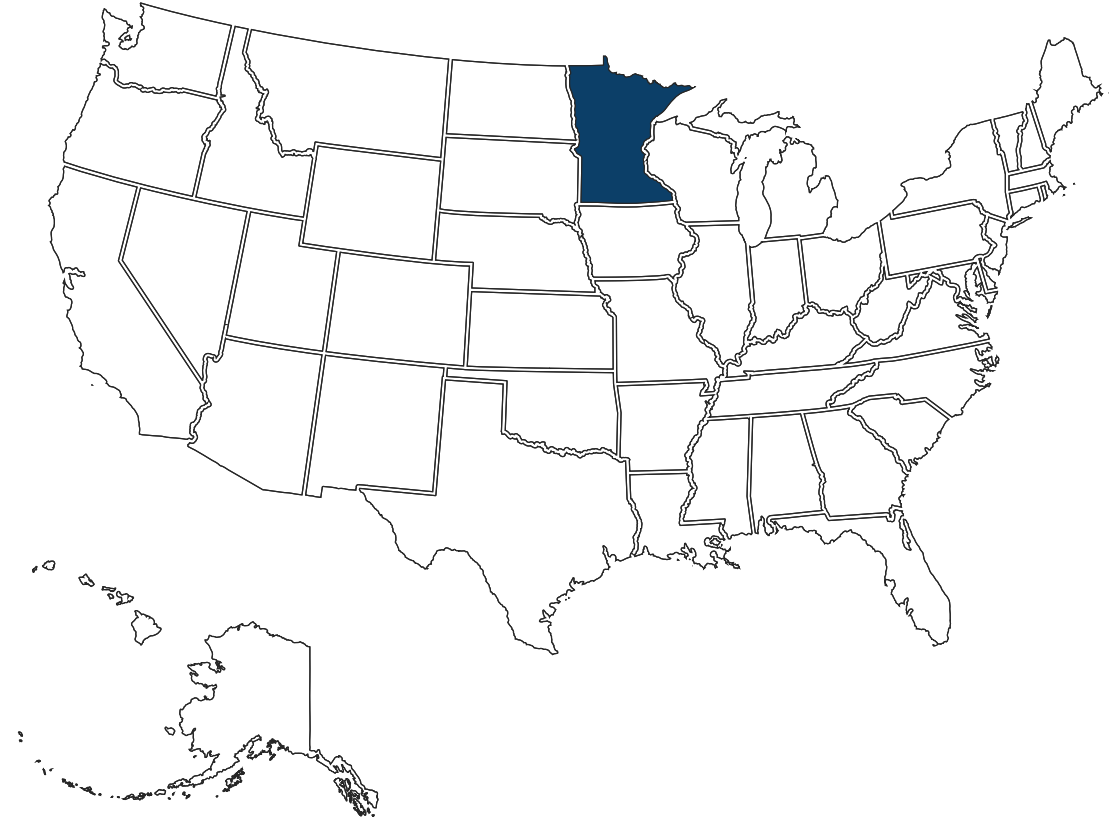
- › Minnesota was announced as a BioMADE biocampus site with up to \$100M of financial support
- › Partnership across Congress, Governor's Office, MN Legislature, and Dept. of Defense



# BioMADE Pilot Plant National Network

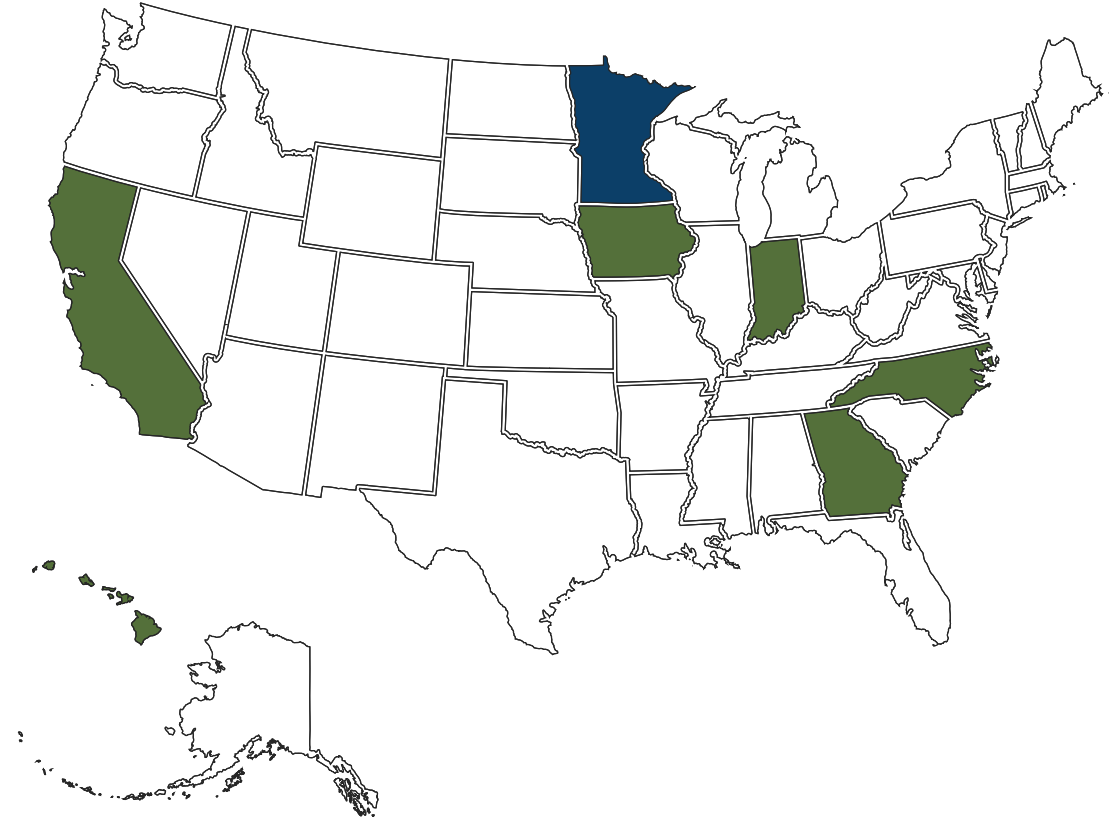


- › Minnesota site is a biocampus with land for companies to co-locate near the piloting facility
- › Benefits of a biocampus to companies include reducing the time to production by addressing zoning, utilities, and community support.



# BioMADE Pilot Plant National Network

- › Nearly 50 Statements of Interest from members and non-members were received
  - › Identified six states under consideration as sites in the next phase of creating a national network of piloting facilities
- |                  |              |
|------------------|--------------|
| › North Carolina | › Iowa       |
| › Georgia        | › California |
| › Indiana        | › Hawaii     |



# BioMADE Membership

Get your seat at the table

# BioMADE Membership

Join a diverse team of industry, academic, nonprofit, and U.S. government members dedicated to innovation in bioindustrial manufacturing

Members collaborate to drive priorities and share successes

Find details and apply at [biomade.org/membership](https://biomade.org/membership)

Be part of the bioindustrial revolution!

Lead and participate on projects

Apply for members-only project funding

Generate and access intellectual property

Provide leadership on committees that shape BioMADE

INDUSTRY

**BioMADE**  
Members

UNIVERSITIES

**COMMUNITY & TECHNICAL COLLEGES**

**NONPROFITS AND K12 SCHOOLS**



# Contact Us

Visit [biomade.org](https://biomade.org) for more information and to sign up for our newsletter

General Questions:  
[hello@biomade.org](mailto:hello@biomade.org)

Membership Questions:  
[membership@biomade.org](mailto:membership@biomade.org)



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**BUILDING A  
SUSTAINABLE,  
DOMESTIC END-TO-END  
BIOINDUSTRIAL  
MANUFACTURING  
ECOSYSTEM**

# Audience Questions & Answers



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**What did you find most inspiring from this morning's keynote address?**

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# Lunch (12:00 – 1:00 CT)

Ag Innovator of the Year Announcement at 12:20!

