



FARM FOUNDATION® FORUM

Opportunities For US Agriculture In The Bio-based Materials And Energy Economy

MAY 7, 2026



Today's webinar is made possible by a grant from Farm Credit

#FarmFoundationForum



Farm Foundation Campus

Learn More



More than a venue, it is where **innovation** and **education** come together to drive progress.



Farm
Foundation®
Accelerating people & ideas





TIM BRENNAN

Vice President, Programs and Strategic Impact
Farm Foundation

Who We Are

Independent and nonpartisan — a trusted place where people across food and agriculture come together to build understanding

A think tank and do tank — turning dialogue and insight into practical, real-world solutions

A connector and catalyst — bringing diverse leaders together to strengthen agriculture and move it forward



Farm Foundation
is an **accelerator** of practical
solutions for agriculture

We accelerate **people** and
ideas into **action**

The three levers we use
to accomplish this are **policy,**
innovation, and education.



Our Mission And Vision Guide Our Work

Mission:

To build trust and understanding at the intersections of agriculture and society.

Vision:

To build a future for farmers, our communities and our world.

Farm Foundation Campus

More than a venue, it is where **innovation** and **education** come together to drive progress.



[email:connect@farmfoundation.org](mailto:connect@farmfoundation.org)

Support Our Work

- See the link in chat function
- Donate to Farm Foundation to support our mission
www.farmfoundation.org
- Help us continue to provide valuable content like today's Forum



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Important Notes

- Submit questions by clicking on the **Q&A Button** at the bottom of your screen.
- **Please include your name and company** so questions may be contextually understood.
- Due to time limits, we may not be able to ask all questions submitted.
- This Forum is being recorded and will be posted on our website at **farmfoundation.org** as well as the **Farm Foundation YouTube** channel.
- Please take the **short survey** at the conclusion of the Forum.



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SARAH GLAVEN

Visiting Fellow, Andlinger Center for Energy and the Environment, Princeton University
Founder & Principal, Marathon Bio

Biotechnology: Basic Research and Discovery

Sarah Glaven • Gerhard R. Andlinger Visiting Fellow

+ Farm Foundation Forum: Opportunities for US Agriculture in the Bio-Based Materials and Energy Economy, May 7, 2026

Biotechnology is a solution to many challenging global societal problems

- + Health and Well-being
- + Feeding and Nutrition
- + Climate
- + Chemicals and Materials

biotechnology: technology that applies to and/or is enabled by life sciences innovation or product development

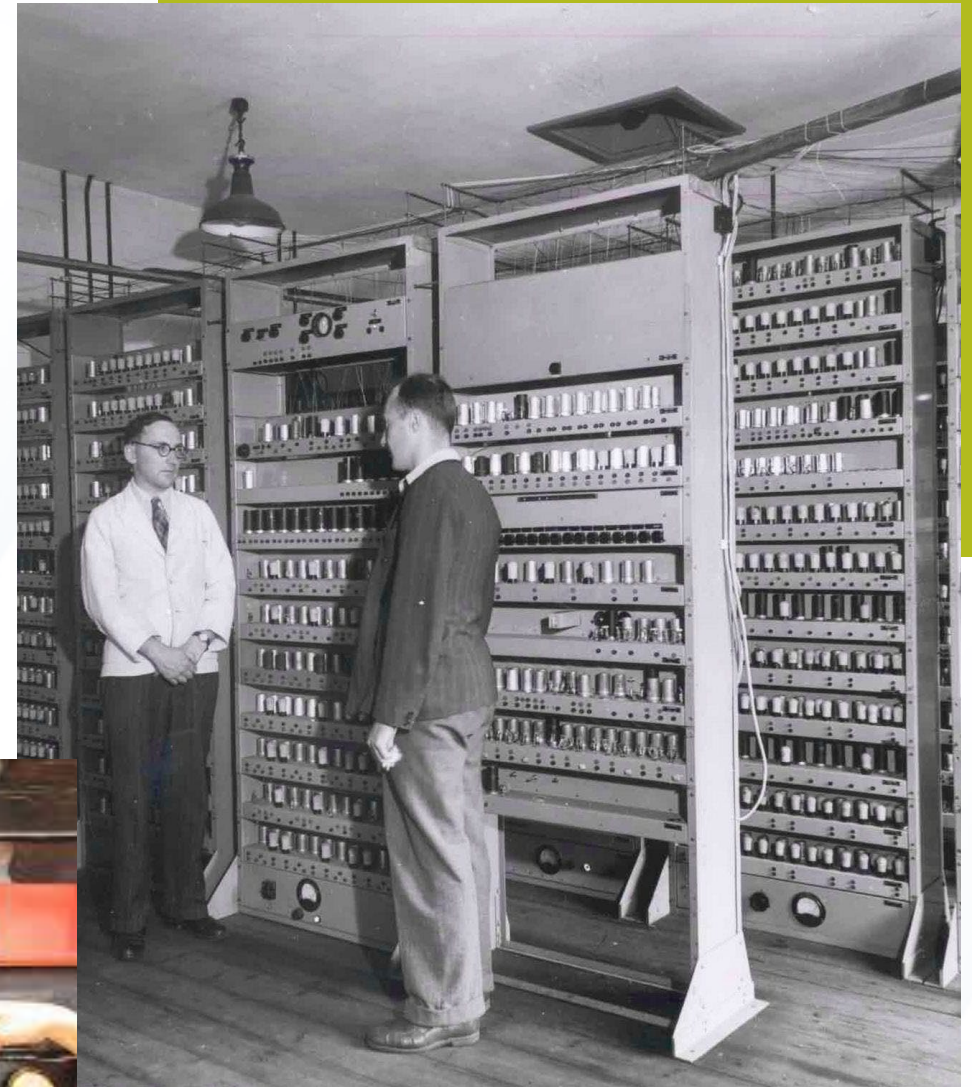
<https://www.nist.gov/bioscience/nist-bioeconomy-lexicon#biotechnology>

Current state / Future state

The first computer...

Biotechnology is still in a very nascent phase

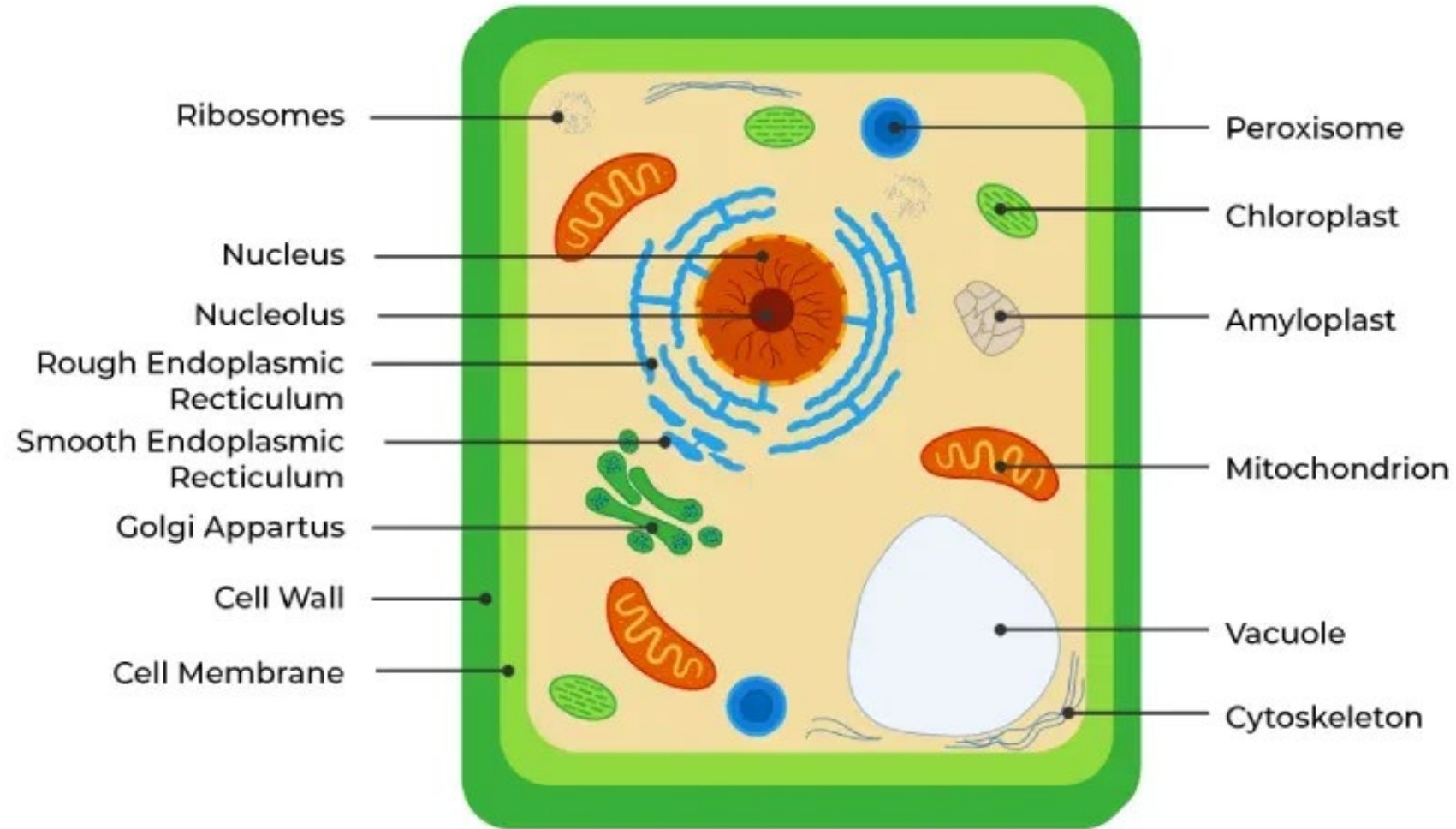
- + Biotechnology tools have rapidly advanced over the last 25 years
 - + DNA sequencing
 - + DNA synthesis
 - + AI/Machine learning
- + There is still much to learn and tools to develop
- + Biotechnology products struggle to find entry into already established markets – the bioeconomy is just the economy



...70 years later

9th Grade Textbook Diagram of a Plant Cell – Complex Cell System

100 μm
About the
size of a
human hair



3D Whole Cell Model of a Mycoplasma Bacterium– Simplest Cell...MASSIVE COMPLEXITY

145 nm
1000X
smaller than
a plant cell or
human hair

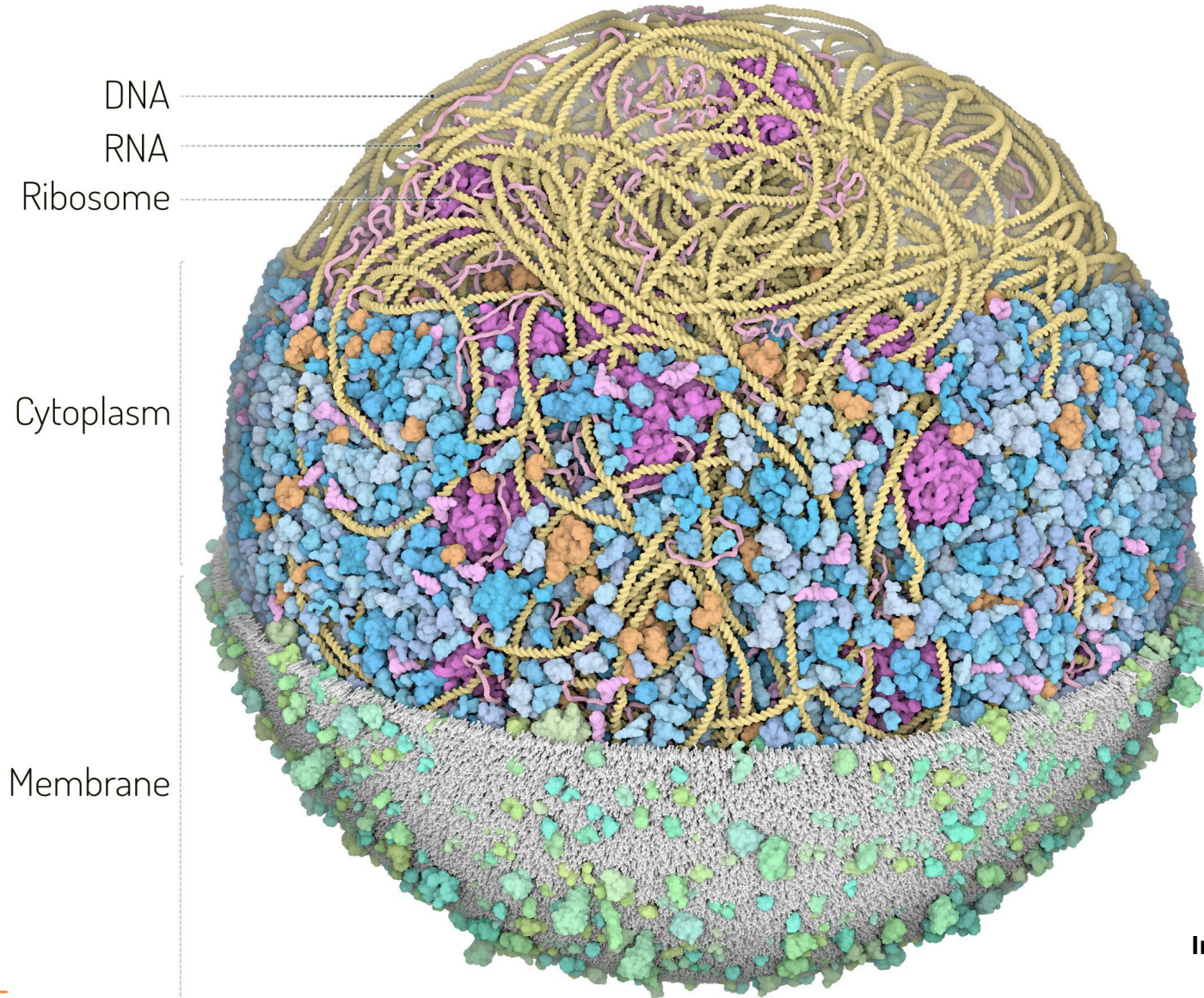
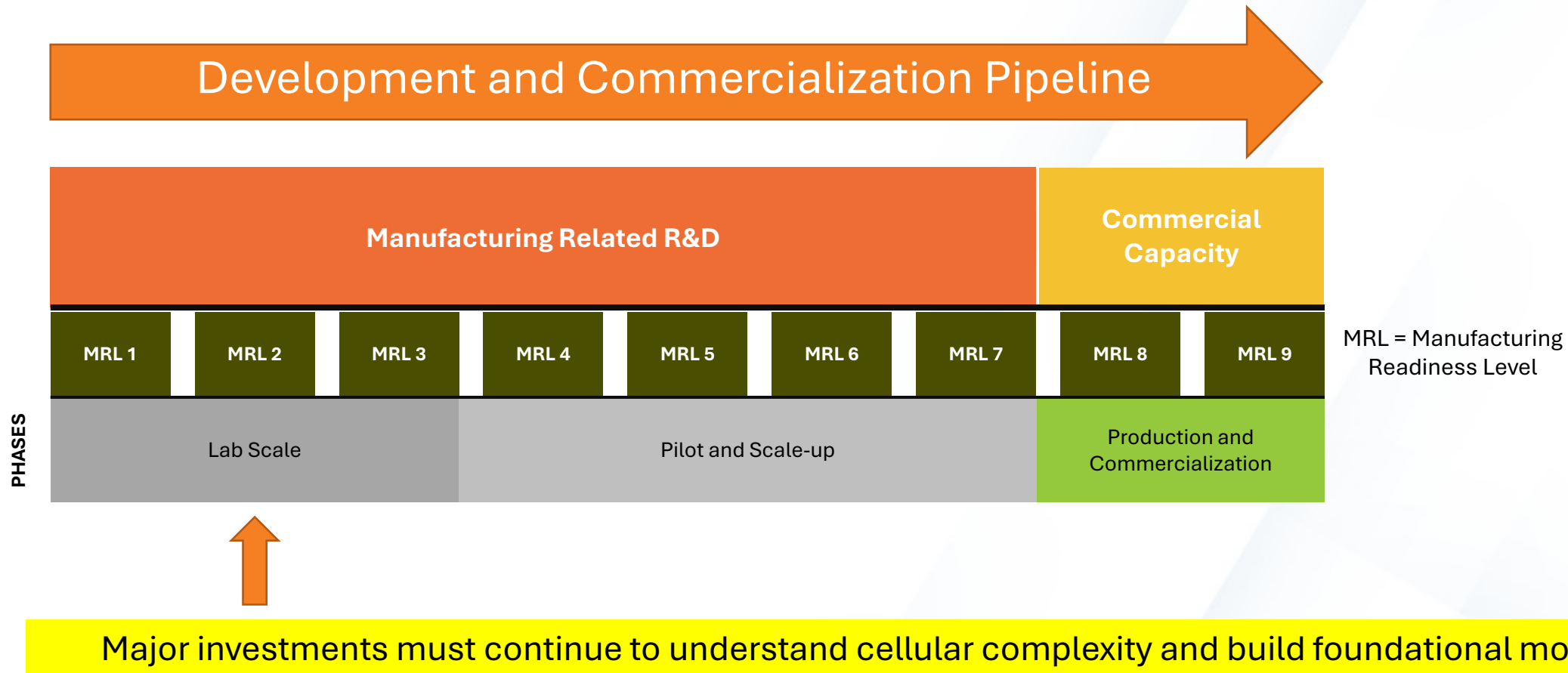


Image by Martina Maritan, Scripps Research

Investment in innovation will accelerate innovation, but it's not enough...Must continue to fund basic research and discovery to harness the true power of cellular complexity



Policy of the Bioeconomy Executive Order

Directed the Executive Branch to prioritize biotechnology and biomanufacturing across 10 areas:

- + R&D
- + Data for the Bioeconomy
- + Biomanufacturing Infrastructure
- + Biobased Products Procurement
- + Workforce
- + Clarify and Streamline Regulation
- + Biosafety and Biosecurity (mostly related to lab practices)
- + Measuring the Bioeconomy (industry codes)
- + Protecting the Bioeconomy
- + International Engagement

All are connected, with R&D as the foundation

National Bioeconomy Board/Biotechnology Coordination Office

THE WHITE HOUSE



MARCH 22, 2024

The White House Advances Biotechnology and Biomanufacturing Leadership with the Launch of the National Bioeconomy Board



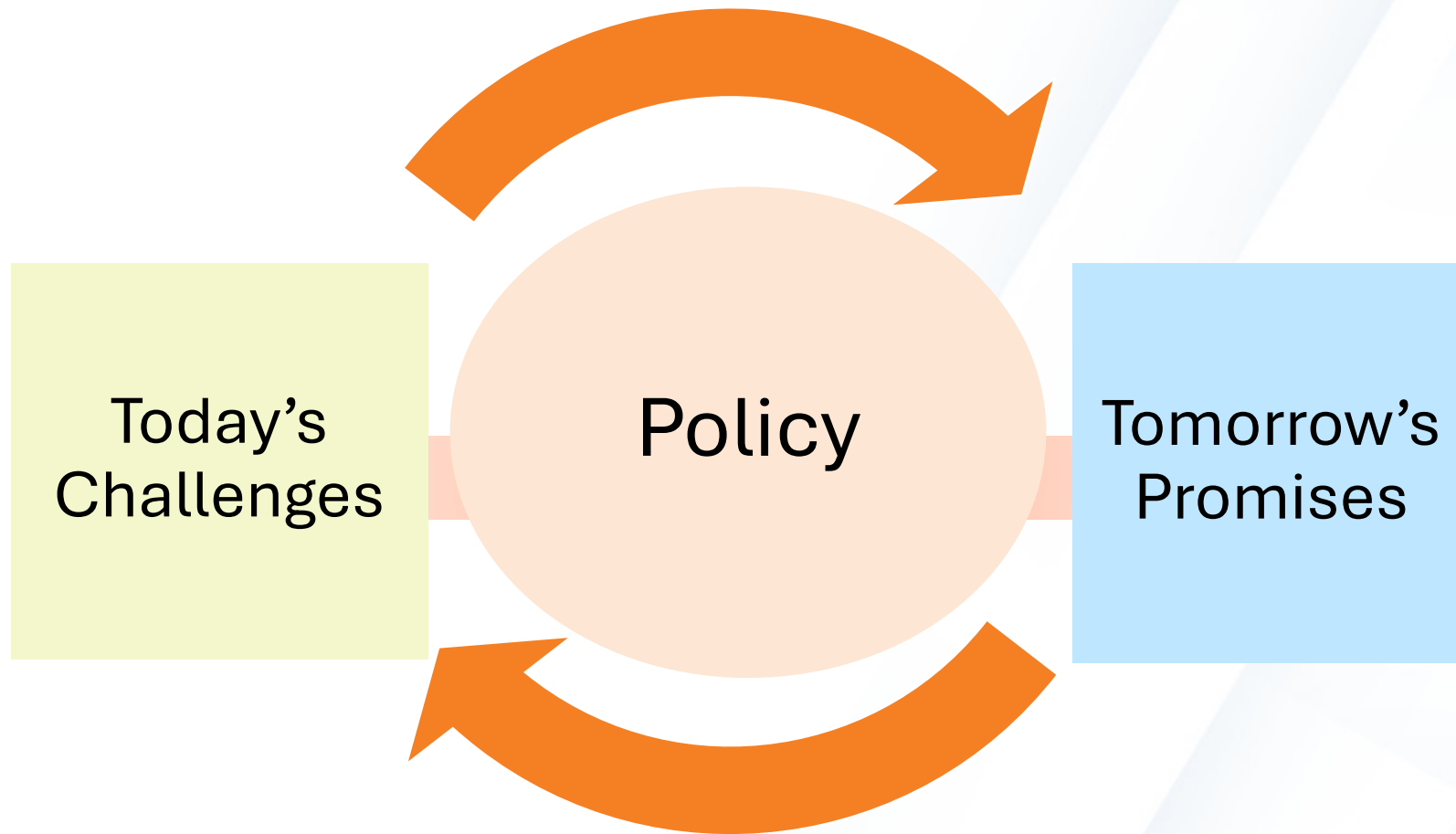
› [OSTP](#)

› [NEWS & UPDATES](#)

› [OSTP BLOG](#)

*By Sarah Glaven, Principal Assistant Director for Biotechnology and
Biomanufacturing, Industrial Innovation, White House Office of Science
and Technology Policy*

...how do we get there from here?







BETH CONERTY

Regional Innovation Officer, iFAB Tech Hub
Associate Director, Business Development, IBRL,
University of Illinois Urbana-Champaign



iFAB

Illinois Fermentation and
Agriculture Biomanufacturing Tech Hub

What is iFAB?

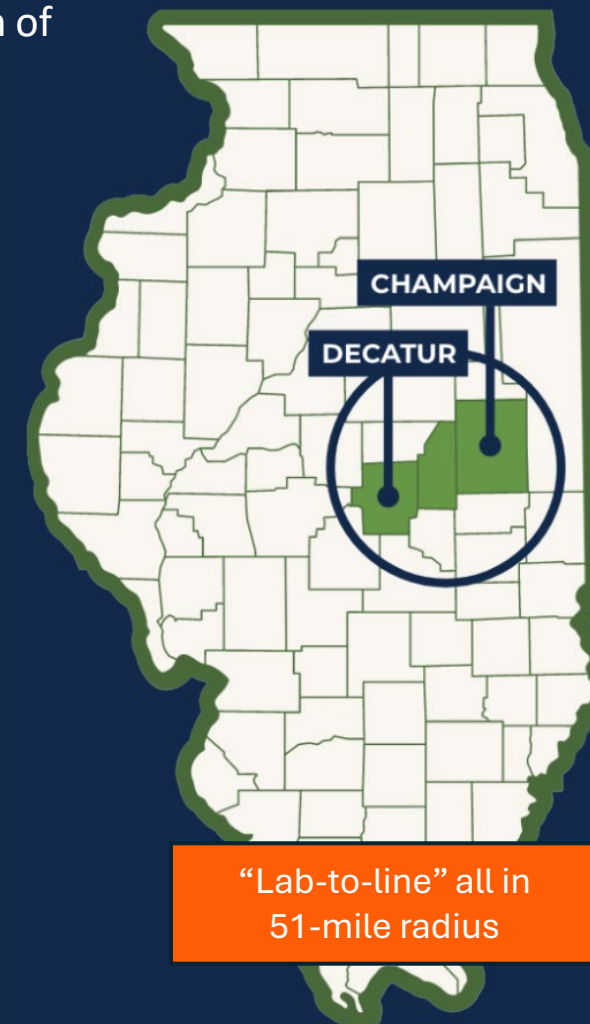
The **Illinois Fermentation and Agriculture Biomanufacturing Tech Hub (iFAB Tech Hub)** is consortium of 36 members (and 30 strategic partners) led by the University of Illinois Urbana-Champaign.

Our mission is to leverage our region's unique assets—an abundance of feedstock, world-class bioprocessing facilities, unparalleled transportation networks, and higher education institutions—to establish Central Illinois as a global leader in precision fermentation and biomanufacturing.

Aligning federal policy and strategic investment with American know-how and innovation will future-proof our supply chains, bolster manufacturing in rural America, drive job growth nationwide, and enhance America's global competitiveness.

FAST FACTS: Why Biomanufacturing & Why Illinois?

- ✓ 30% of U.S. Chemical Demand through biomanufacturing by 2040
- ✓ Total expected market of \$200 billion within 15 years
- ✓ 1 million additional jobs by 2030
- ✓ Opportunity to re-shore manufacturing
- ✓ Illinois is a leading producer of soybeans and corn
- ✓ Home to the world's largest corn wet-milling plants, producing sweeteners like dextrose
- ✓ ADM Intermodal Ramp, 280-acre inland port for processing international cargo

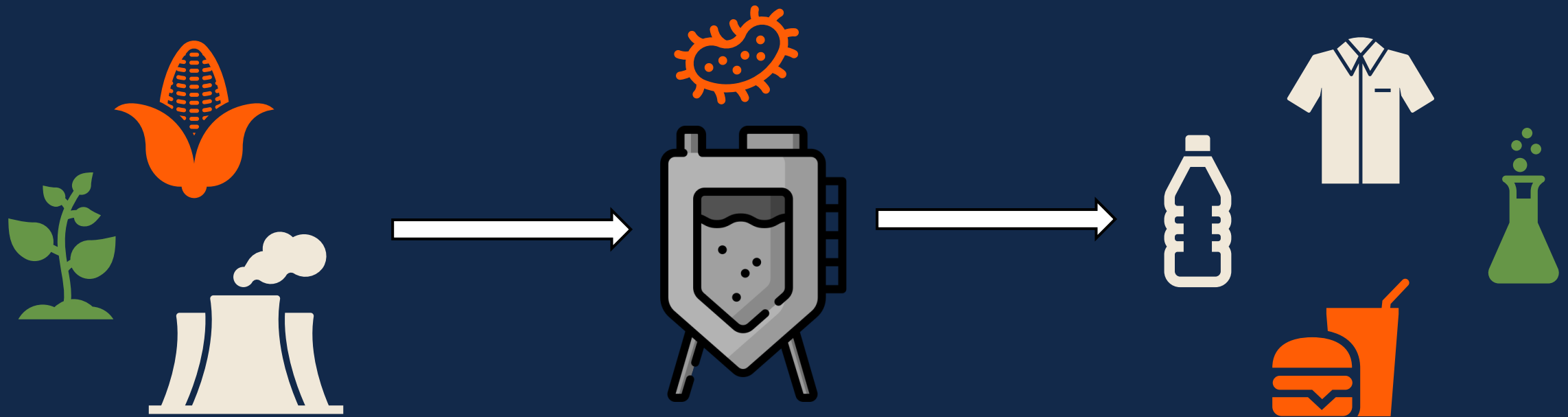


"Lab-to-line" all in 51-mile radius

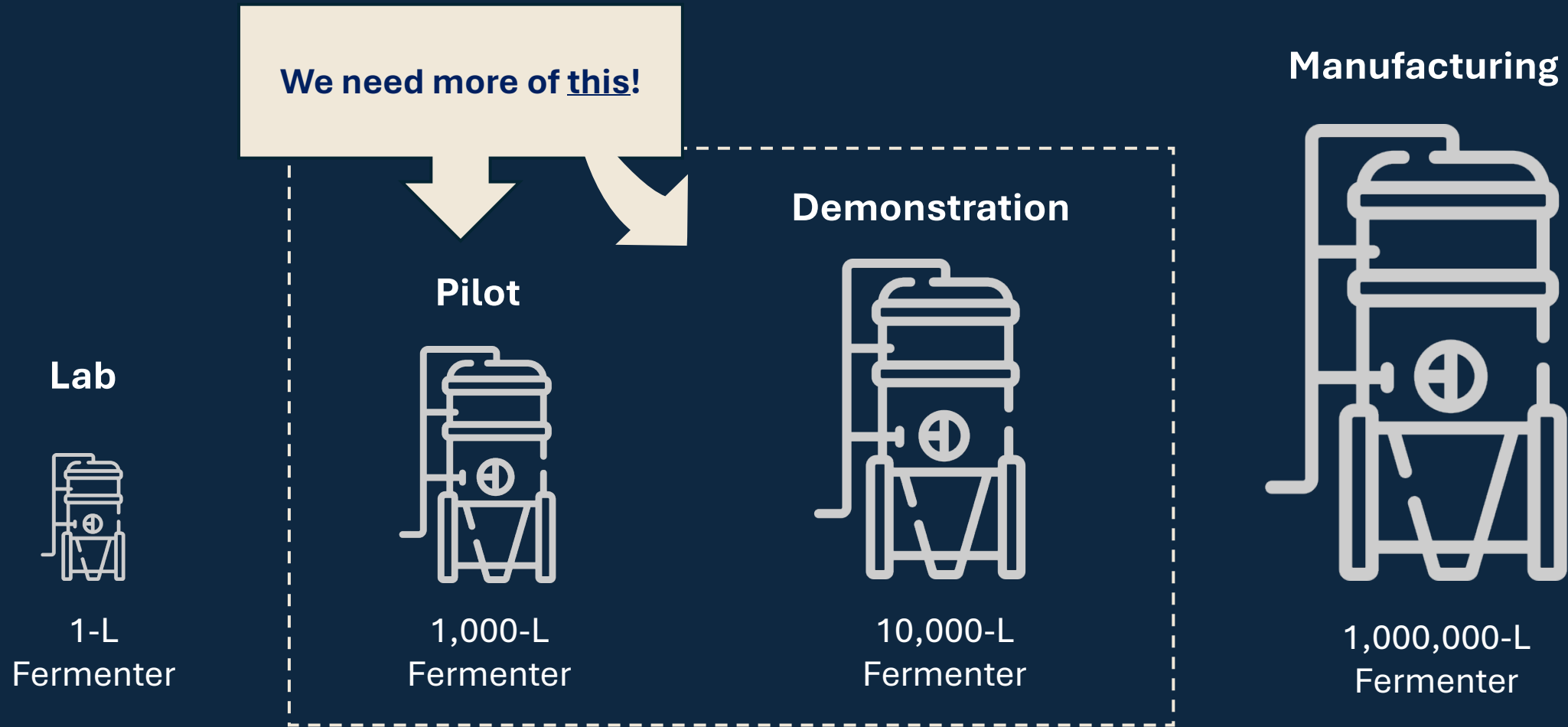
A photograph of a cornfield with a combine harvester in the distance, overlaid with a semi-transparent dark grey box containing white text.

*Biomanufacturing:
Converting plant materials to
high value products*

Precision Fermentation as a Tool for Biomanufacturing



Lack of Fermentation Infrastructure: Bottlenecking the Industry

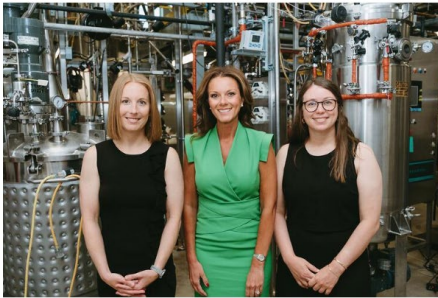


FUNDING

iFAB awarded \$51 million EDA Tech Hubs grant to propel Central Illinois as a biomanufacturing leader

July 2, 2024 | Claire Benjamin

[Awards](#) / [Sustainability](#) / [Technology](#)



Illinois
Department of Commerce
& Economic Opportunity

FEDERAL: \$51M. One of four hubs awarded at the highest funding level through the EDA's Tech Hubs Program in 2024.

STATE: \$31.2M. iFAB continues to receive an enormous amount of state* support. Leaders from higher education, economic development organizations, government, and industry have secured significant commitments in cash match and strategic investments.

* *The Tech Hubs program required a 10% total match rate. The State of Illinois DCEO had a Federal Match Support Funding Opportunity to help cover much of the necessary match funding.*



Funded Projects

iFAB projects will work together to support a globally competitive “lab-to-line” precision fermentation hub in Central Illinois, with support for companies at each stage of scaling.

 **IBRL**
Expansion



University of Illinois
Urbana-Champaign
1500L

EnterpriseWorks
2.0



University of Illinois
Urbana-Champaign

 **Primient**
PROOF



Decatur, IL
13,000L

 **ADM** BioProducts



Decatur, IL
80,000L

iFAB Hub Management

Members of iFAB

Tech Hub



HIGHER EDUCATION

Integrated Bioprocessing Research Laboratory
Parkland College
Richland Community College
University of Illinois Urbana-Champaign

LEAD

ECONOMIC DEVELOPMENT ORGANIZATIONS

Champaign County Economic Development Corporation
Economic Development Corporation of Decatur & Macon County
Illinois Economic Development Corporation

INDUSTRY FIRMS

ADM
Ameren
Boston Bioprocess
Clarkson Grain Company
Kraft Heinz
National Foodworks Services
Primient
Roebbing
Thew Arnott

INDUSTRY GROUPS

Corn Refiners Association
IL Corn
Illinois Manufacturers' Association
Illinois Soybean Association

LABOR ORGANIZATIONS

Decatur Building & Construction Trades, AFL-CIO
East Central Illinois Building & Construction Trades Council
UA Plumbers & Pipefitters Local 149
United Steel Workers

MANUFACTURING EXTENSION ORGANIZATIONS

Illinois Manufacturing Excellence Center

UNITS OF GOVERNMENT

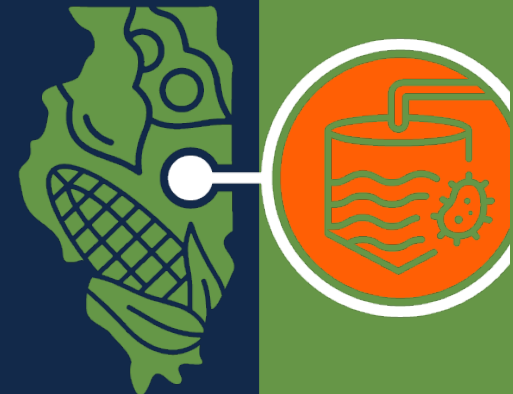
Champaign County
City of Champaign
City of Decatur
Macon County
Piatt County
State of Illinois

VENTURE DEVELOPMENT ORGANIZATIONS

gener8tor
Serra Ventures
University of Illinois Research Park, LLC

WORKFORCE TRAINING ORGANIZATIONS

East Central Illinois Workforce Board - Champaign WIOA
Workforce Investment Solutions - Decatur WIOA



Connect with Us



iFABTechHub.org

ibrl.aces.illinois.edu



@ifabtechhub

@integrated-bioprocessing-
research-laboratory





JAMES GLUECK

Executive Director, Plant Based Products Council
Senior Vice President, Advanced Bioproducts, Corn
Refiners Association



What are biobased products?

Diverse feedstocks



Agricultural residue



Algae



Bamboo



Sugar cane



Hemp



Sugar beet



Wood



Dent corn



Cassava



Rice husk



Palm leaf



Soybeans

Diverse products



Household cleaner



Furniture



Building materials



Personal care products



Food service ware



Textiles



Packaging



Auto parts



Office supplies



Toys



Medical supplies



Footwear



The benefits of biobased products

01.




Supports growth
of the US
bioeconomy

02.



New market
opportunities for
commodity crops

03.



Same or better
functionality

04.



Addresses
numerous
environmental
challenges

05.



Improved
circularity



+20%

Increase in consumer familiarity with biobased products.



Consumer demand

67%

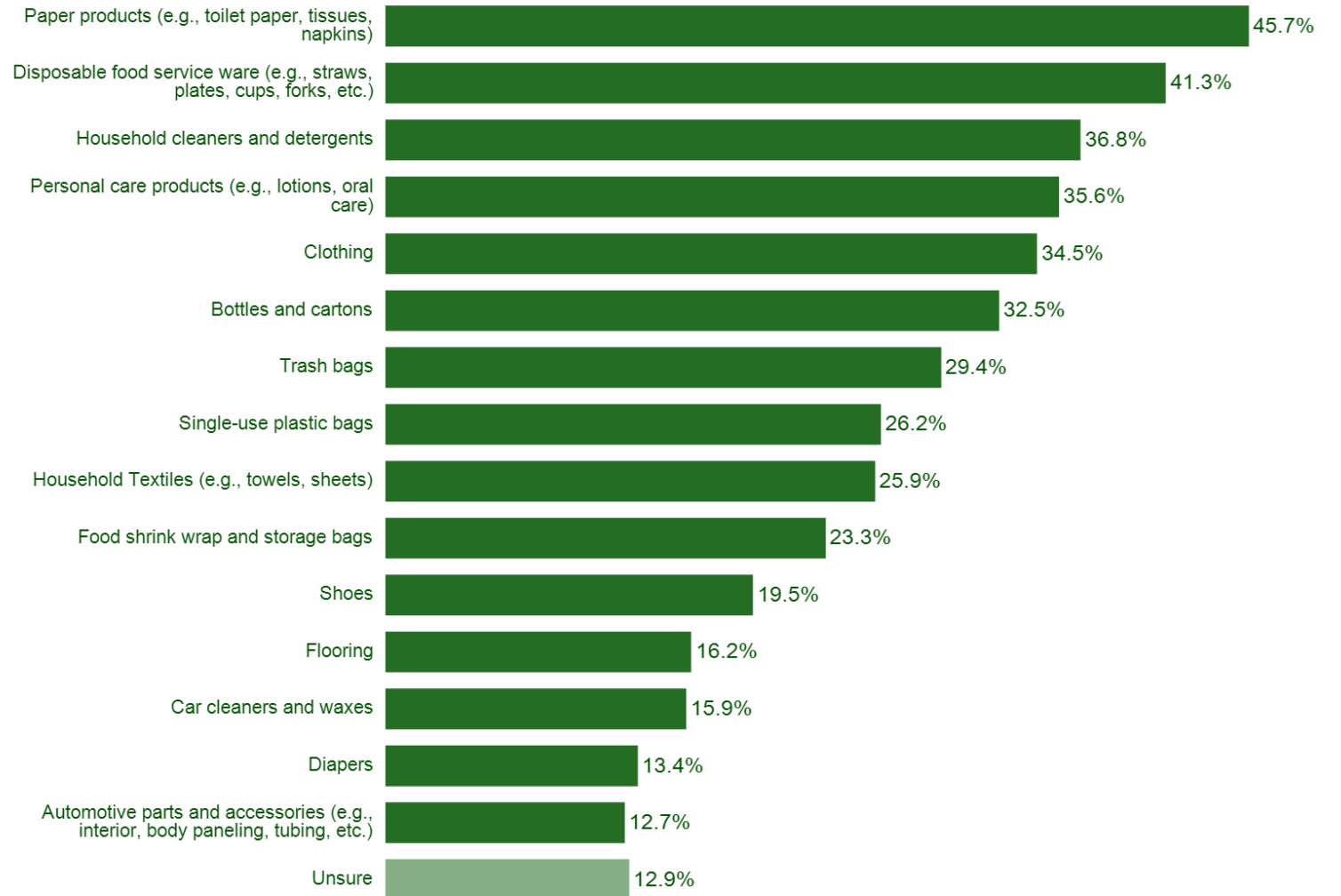
67% of consumers say they use plant-based products at least monthly, with paper products, household cleaners, and personal care products among some of the most popular items.

86%

86% of consumers say they are likely to include plant-based products in their shopping cart in the next three months

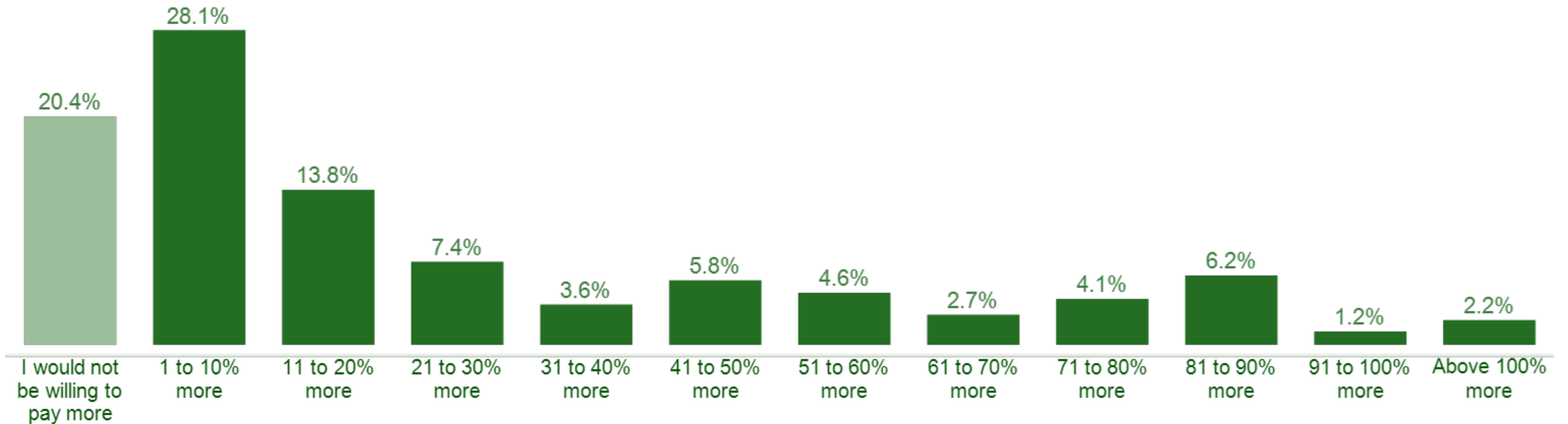


Products purchased





Consumers expect to pay more for plant-based products.





Consumer perception

81%

81% of consumers are more likely to support companies that produce or use plant-based products.

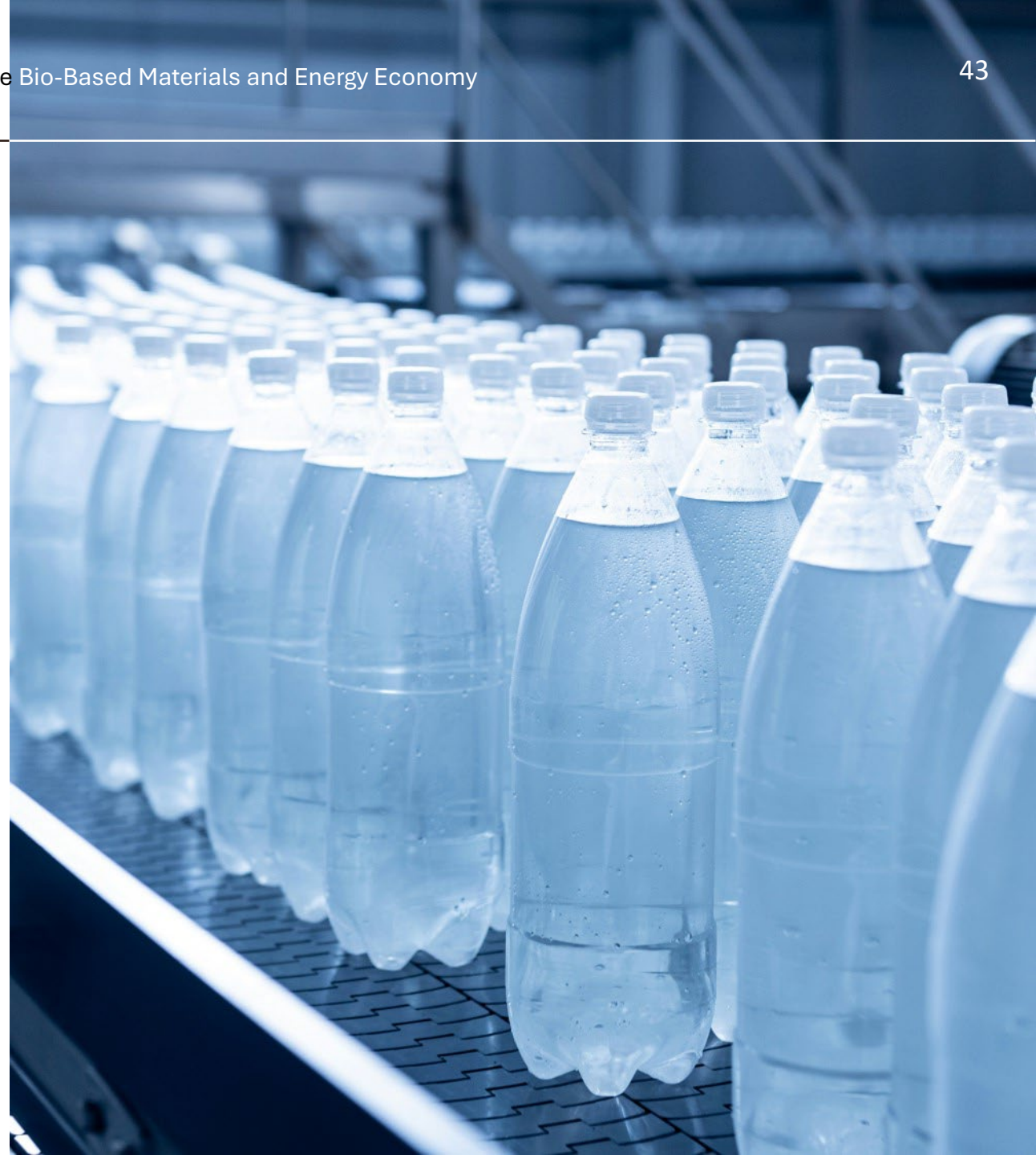
63%

63% feel more favorable about farmers and the agriculture industry knowing they make it possible to produce quality products and materials from plants.



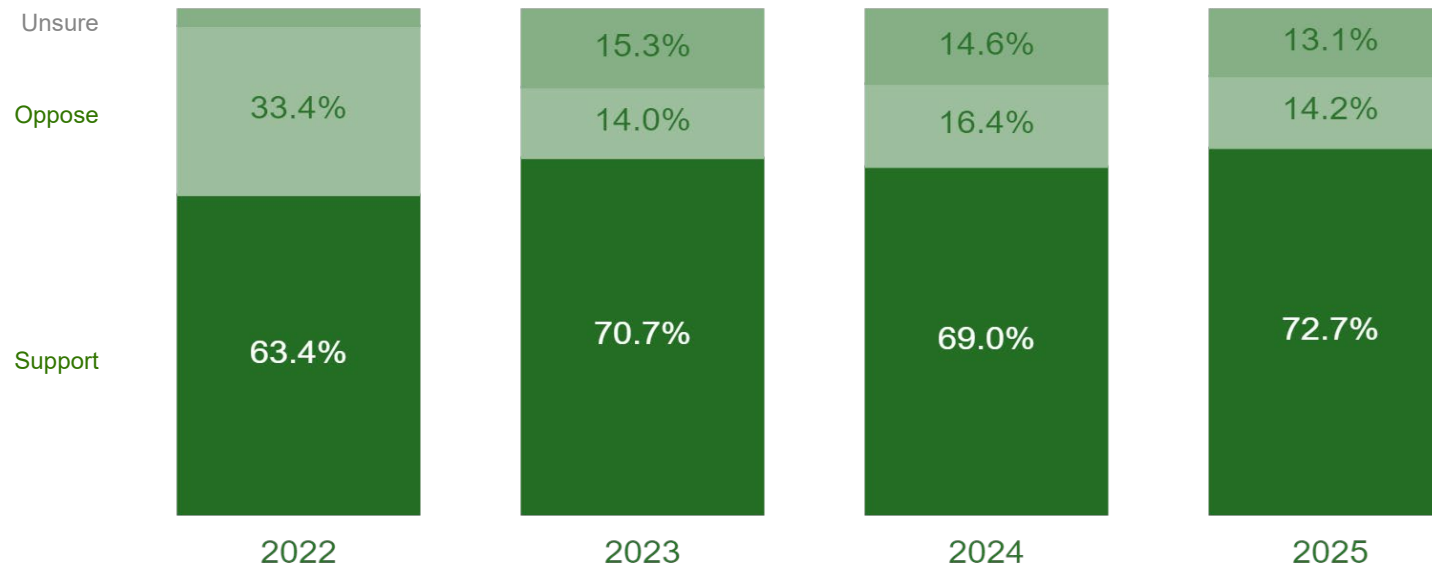
Challenges to growth

- Scalability
- Production costs
- Consistency and transparency across value chain
- Regulatory hurdles
- Waste management and end-of-life infrastructure





Federal Policy – laws and/or tax breaks







GREG JAFFE

President, Jaffe Policy Consulting
Former Senior Advisor, USDA

Federal Programs and Policies Supporting the Bioeconomy

Gregory Jaffe

President, Jaffe Policy Consulting LLC

May 7, 2026



Mission: To help entities utilize biotechnology and biomanufacturing to turn above ground sustainable biomass into biobased products that are successful in the marketplace and to help US agriculture become economically and environmentally sustainable.

Trump Administration Executive Orders that Supports Bioeconomy

11539

Federal Register

Presidential Documents

Vol. 90, No. 43

Thursday, March 6, 2025

Title 3—

Executive Order 14223 of March 1, 2025

The President

Addressing the Threat to National Security from
Timber, Lumber, and Their Derivative Products

Presidential Documents

Executive Order 14154 of January 20, 2025

Unleashing American Energy

8433

Federal Register

Presidential Documents

Vol. 90, No. 18

Wednesday, January 29, 2025

Title 3—

Executive Order 14156 of January 20, 2025

The President

Declaring a National Energy Emergency

Research and Development of Feedstocks into Biobased Products

September 2025 letter from the Directors of the Office of Management and Budget (OMB) and Office of Science and Technology Policy (OSTP) on FY27 R&D Priorities:

*“The United States holds the resources to lead the world in producing next-generation bio-manufactured products. Feedstocks from America’s heartland and novel biological processes can be used to **secure our supply chains, create jobs, and build scalable and universal manufacturing capacity.** Agencies should support innovation in **modular and scalable biological platforms** and ensure that promising technologies have clear lab-to-market pathways by leveraging lab and biofoundry infrastructure.”*



Secretary Brooke L. Rollins

UNITED STATES DEPARTMENT OF AGRICULTURE
OFFICE OF THE SECRETARY
WASHINGTON, D.C. 20250

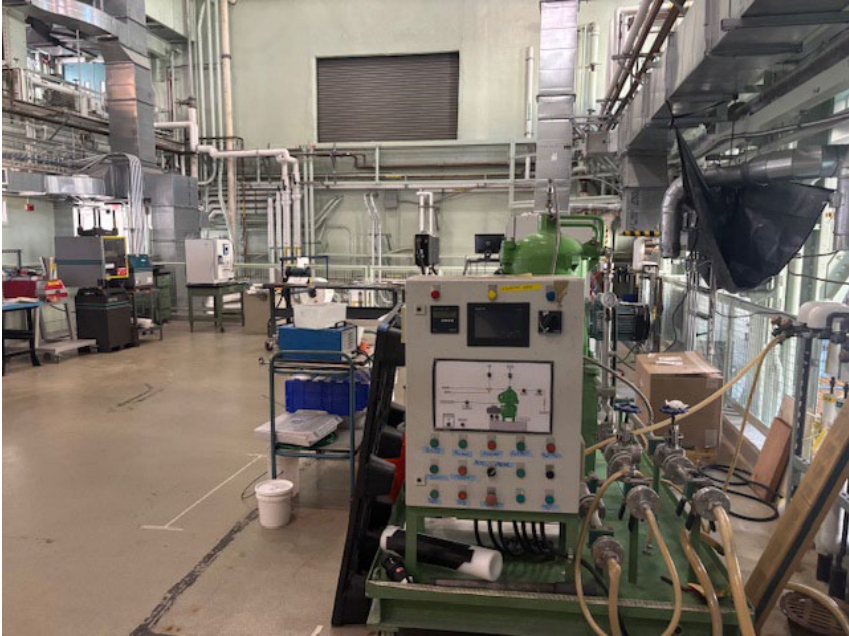
SECRETARY'S MEMORANDUM 1078-020

December 30, 2025

DIRECTIVE ON DEPARTMENTAL RESEARCH AND DEVELOPMENT PRIORITIES

2. Expanding Markets and Creating New Uses of U.S. Agricultural Products: With many producers experiencing record yields this growing season, it is more important than ever to ensure USDA is expanding markets and creating new uses for these American grown commodities. Research and development that seeks to open new markets- such as generating science and data to resolve longstanding sanitary and phytosanitary trade barriers-or expand the utilization of these commodities in novel biobased products and bioenergy (including biofuels) will result in increased demand.

USDA ARS Facility in Albany, CA



Biobased Infrastructure for Stronger Rural Economies at USDA

Leverage funding programs in Rural Development Mission Area for production and marketing of biobased products:

Biorefinery, Renewable Chemical, and Biobased Product Manufacturing Assistance Program

- Rural Energy for America Program (REAP)
- Advanced Biofuel Payment Program (ABPP)
- Higher Blends Infrastructure Incentive Program (HBIIP)
- Business and Industry Guaranteed Loan Program (B&I)
- Rural Economic Development Loan Program (REDL)
- BDAP – Biobased Market Access and Development Grants

Forest Service Programs

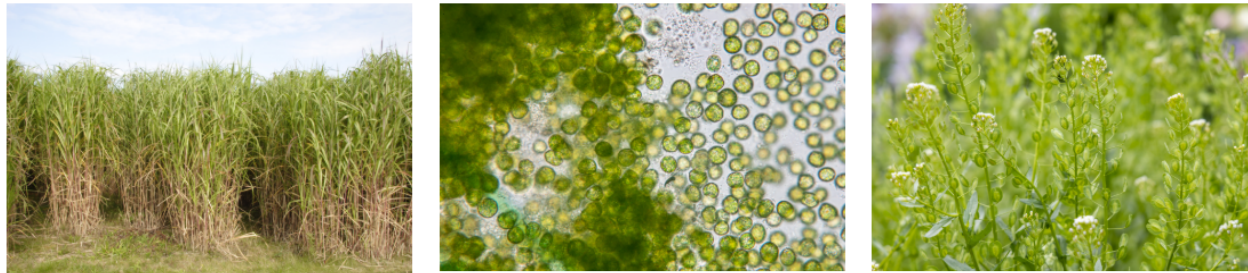
- Community Wood Grants Program funding of community wood energy systems and innovative product facilities
- Wood Innovation Grants to stimulate and expand markets for low-value wood
- Wood Products Infrastructure Assistance Grants to assist facilities that buy or process byproducts from ecosystems restoration projects



U.S. DEPARTMENT OF ENERGY Regional Biomass Resource Hub Initiative

LED BY IDAHO NATIONAL LABORATORY

The [Regional Biomass Resource Hub Initiative](#) (RBRH) is a new initiative from the U.S. Department of Energy (DOE) designed to accelerate the mobilization of purpose-grown energy crops to create alternative fuels and products. The RBRH's mission is to identify and validate market-driven regional strategies that help mobilize low carbon-intensity, purpose-grown energy crops across varied agronomic landscapes. RBRH does this by generating modeling tools, data, and guidelines that support feedstock supply chain development.



Funded by DOE's Bioenergy Technologies Office, RBRH is led by researchers at [Idaho National Laboratory](#) (INL) with expertise in feedstock production, integrated landscape management, carbon intensity measurement and supply chain logistics. INL will coordinate collaboration amongst RBRH groups to share experimental plans, report data, and collectively achieve the funding objectives. RBRH group members will be grouped (by Subtopic Area and by logical geographic regions) to coordinate feedstock data standards and procedures,

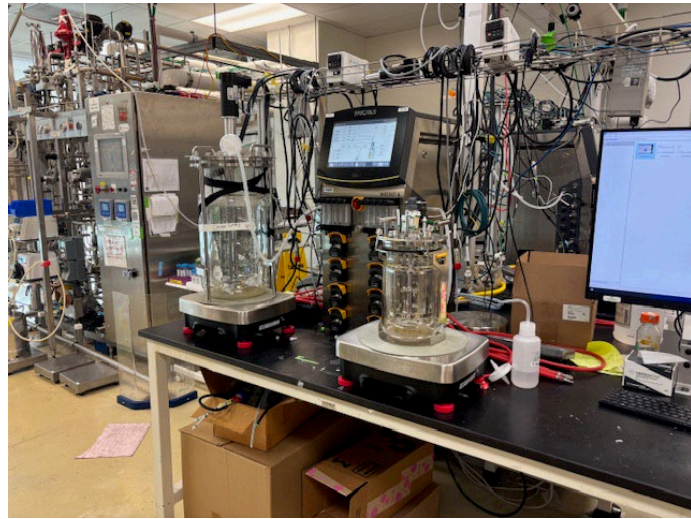
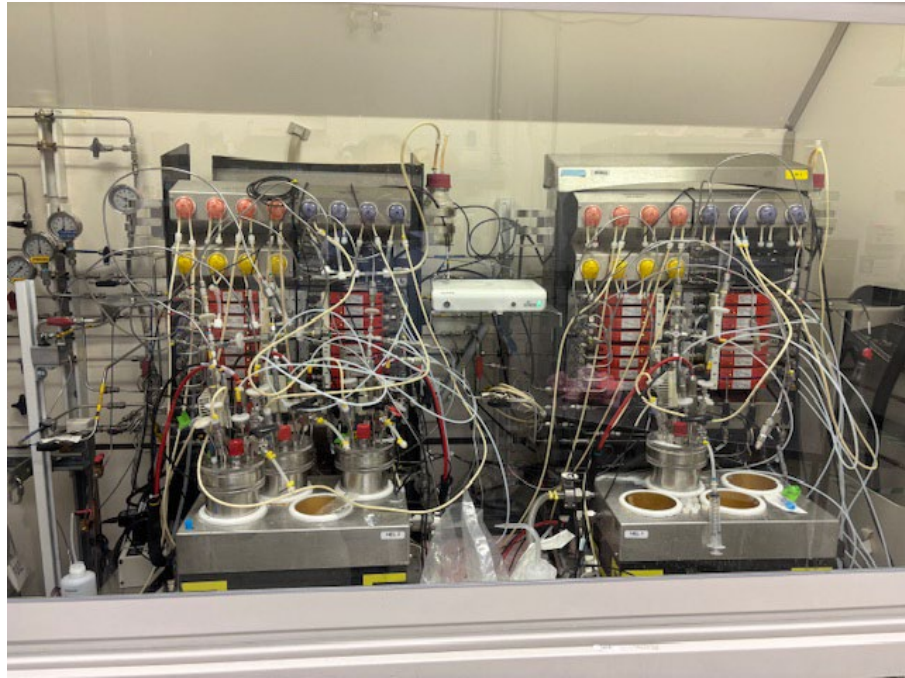
Funding Selections: Regional Resource Hubs for Purpose-Grown Energy Crops



- Office: [Bioenergy Technologies Office](#)
- FOA number: DE-FOA-0003209
- FOA amount: \$52 million

The U.S. Department of Energy (DOE) Bioenergy Technologies Office (BETO) [announced \\$52 million in funding for six university and industry projects](#) to advance the production of low carbon intensity, purpose-grown energy crops critical to accelerating a renewable energy bioeconomy. The projects will expand a domestic supply chain of alternative carbon sources essential to biofuels and bioproducts production that can lower net emissions in the transportation and industrial sectors, as well as innovate and grow the U.S. agricultural industry.

DOE – Berkeley National Laboratory



Energy Department Announces 26 Genesis Mission Science and Technology Challenges to Accelerate AI-Enabled American Innovation and Leadership

The U.S. Department of Energy today announced 26 science and technology challenges of national importance to advance the Genesis Mission and accelerate innovation and discovery through artificial intelligence (AI).

[Office of the Under Secretary for Science](#)

February 12, 2026

 Estimated Read Time 4 min

WASHINGTON—The U.S. Department of Energy (DOE) today announced 26 science and technology challenges of national importance to advance the Genesis Mission and accelerate innovation and discovery through artificial intelligence (AI).

Building on President Trump’s Executive Orders [Launching The Genesis Mission](#) and [Removing Barriers to American Leadership In Artificial Intelligence](#), the challenges span DOE’s discovery science, energy, and national security missions. Each was selected for its potential to deliver measurable benefits for the American people and to accelerate advancements through the Genesis Mission’s AI platforms, world-class facilities, and public-private partnerships.

Contents

- Reenvisioning Advanced Manufacturing and Industrial Productivity..... 1
- Reimagining Construction and Operation of Buildings2
- Scaling the Biotechnology Revolution.....3
- Securing America’s Critical Minerals Supply..... 4
- Delivering Nuclear Energy that is Faster, Safer, Cheaper 5

Senior Officials Announced for the War Department's Six Critical Technology Areas





BioMADE to Establish Bioindustrial Manufacturing Infrastructure in Minnesota

Following bipartisan support from Governor Walz and the Minnesota Legislature, the Minnesota site will be the first start in a national network of bioindustrial manufacturing facilities

MINNEAPOLIS-ST. PAUL, MN – June 13, 2023 – BioMADE will be investing in state-of-the-art bioindustrial manufacturing infrastructure in Minnesota, following support of up to \$100 million from Governor Tim Walz and the Minnesota Legislature in the 2023 legislative session. The forthcoming biomanufacturing infrastructure investments in Minnesota will be the first start in a national network of critically needed pilot-scale biomanufacturing innovation facilities that will transform American manufacturing for the 21st century.

BioMADE Expands Biomanufacturing Pilot Plant Network with New \$40M Biomanufacturing Facility in Iowa

The Iowa plant is BioMADE's third in the national network and underscores a joint commitment between the State of Iowa and BioMADE to increase U.S. biomanufacturing capacity.

MINNEAPOLIS-ST. PAUL, MN/EMERYVILLE, CA, August 15, 2025 – Today, BioMADE announced its plans to establish and operate a new pilot-scale bioindustrial manufacturing facility near Ames, Iowa. This is the third facility in BioMADE's Pilot Plant Network, following announcements of major investments in [Minnesota](#) and [California](#). The network of bioindustrial manufacturing facilities will establish the U.S. as a leader in the global bioeconomy, secure domestic supply chains for needed products with defense and commercial applications, and boost rural economic development.

The 15,000 sq. ft. multi-user facility will include up to 10,000-liter industrial fermenters, dry and wet lab space, and downstream processing capabilities centered around the development of agricultural bioproducts, chemicals, food and more. At a total project value of \$40 million, BioMADE has committed at least \$20 million, which will be matched by up to \$10 million in cost-share contributions from ISU and \$10 million in funding from IEDA's Strategic Infrastructure Program.

The bioindustrial manufacturing industry in the U.S. currently faces a scale-up challenge due to a critical lack of pilot- to demonstration-scale infrastructure. As a result, American companies often have to seek relevant facilities overseas, taking American innovation with them and risking IP loss. To address this gap, BioMADE worked with partners at the U.S. Department of Defense, the Iowa Economic Development Authority, Iowa State University and the Iowa State University Research Park to establish this facility and continue the growth of its national Pilot Plant Network.

BioMADE's facility will complement other Iowa-based facilities, like ISU's Center for Crops Utilization Research, to increase the speed at which companies can move through technological development and scale-up processes, bringing innovative biotechnologies from the laboratory bench to commercial production.

BioMADE Announces \$21.4 Million Invested in 14 Projects to Develop the U.S. Bioindustrial Manufacturing Industry and Advance National Security Priorities

With funding from the U.S. Department of War and the U.S. National Science Foundation, these projects will support the production of critically needed goods and materials, strengthen the domestic supply chain, and build a 21st century workforce.

MINNEAPOLIS-ST. PAUL, MN/EMERYVILLE, CA, April 29, 2026 – Today, BioMADE announced 14 cutting-edge new projects that will support the growth and development of the U.S. bioindustrial manufacturing industry. These projects will support the manufacture of innovative bio-based products like a lithium biosorbent for biomining; plastics for 3D printing; proteins for wound healing and chemical defense; biosensors for disease detection; and more. They will leverage state-of-the-art methodologies like machine learning, AI, and advanced new sensors and purification systems. Projects will also support the development of the needed biomanufacturing workforce through projects that are easing the transition for veterans into civilian careers, launching community college programs, and developing hands-on apprenticeship

RELEASE
IMMEDIATE RELEASE

DOD Releases Final Nine Awards for Distributed Bioindustrial Manufacturing Program

Nov. 14, 2024 | [f](#) [X](#) [↻](#)

The Department of Defense today announced the remaining nine awards to bioindustrial firms under the Distributed Bioindustrial Manufacturing Program (DBIMP). This announcement completes the first phase of DBIMP investment at 34 total awards worth over \$60 million.

Final Renewable Fuel Standards for 2026 and 2027

On this page:

- [Rule Summary](#)
- [Additional Resources](#)

Rule Summary

On March 27, 2026, EPA announces a final rule to establish required Renewable Fuel Standard volumes and percentage standards for 2026 and 2027, which include 70 percent reallocation of small refinery exemptions granted for 2023–2025. This rule also partially waives the 2025 cellulosic biofuel volume requirement and revises the associated percentage standard due to a shortfall in cellulosic biofuel production. The final volume requirements, SRE reallocation volumes, and total applicable volumes are listed below.

[standards](#)

RFS Standard	Volume Requirement			SRE Reallocation Volume		Total Applicable Volume	
	2025	2026	2027	2026	2027	2026	2027
Cellulosic biofuel	1.21	1.36	1.43	0	0	1.36	1.43
Biomass-based diesel	n/a	8.86	8.95	0.21	0.25	9.07	9.20
Advanced biofuel	n/a	10.82	10.98	0.28	0.34	11.10	11.32
Renewable fuel	n/a	25.82	25.98	0.99	1.04	26.81	27.02

DEPARTMENT OF THE TREASURY**Internal Revenue Service****26 CFR Parts 1 and 48**

[REG–121244–23]

RIN 1545–BR30

Section 45Z Clean Fuel Production Credit**AGENCY:** Internal Revenue Service (IRS), Treasury.**ACTION:** Notice of proposed rulemaking and public hearing.

SUMMARY: This document contains proposed regulations regarding the clean fuel production credit enacted by the Inflation Reduction Act of 2022 and amended by the One, Big, Beautiful Bill Act (OBBBA). These proposed regulations would provide rules for determining clean fuel production credits, including credit eligibility rules, emissions rates, and certification and registration requirements. In addition, the proposed regulations would amend three sets of final regulations: the elective payment election regulations and the credit transfer election regulations, to clarify language relating to ownership of clean fuel production facilities, and the Federal excise tax

cannot be edited or withdrawn. The Department of the Treasury (Treasury Department) and the IRS will publish for public availability any comments submitted to the IRS's public docket. Send paper submissions to: CC:PA:01:PR (REG–121244–23), Room 5503, Internal Revenue Service, P.O. Box 7604, Ben Franklin Station, Washington, DC 20044. A plain language summary of the proposed regulations will be made available at <https://www.regulations.gov>.

FOR FURTHER INFORMATION CONTACT: Concerning the proposed regulations, Jennifer Golden or Danielle Mayfield of the Office of Associate Chief Counsel (Energy, Credits, and Excise Tax) at (202) 317–6855 (not a toll-free number); concerning submissions of comments or the public hearing, Publications and Regulations Section at (202) 317–6901 (not a toll-free number) or by email at publichearings@irs.gov (preferred).

SUPPLEMENTARY INFORMATION:**Authority**

This document contains proposed amendments to the Income Tax Regulations (26 CFR part 1) regarding sections 45Z, 1361, 4101, 6417, and 6418 of the Internal Revenue Code (26 U.S.C. 45Z, 1361, 4101, 6417, and 6418).

Section 45Z(f)(3) authorizes the Secretary to prescribe additional related person rules for other entities similar to the rule described for corporations that are members of an affiliated group of corporations filing a consolidated return. This includes the authority to prescribe rules for related persons with respect to which the taxpayer has reason to believe will sell fuel to an unrelated person in a manner described in section 45Z(a)(4).

Section 45Z(d)(5)(C) directs the Secretary to issue regulations or other guidance as the Secretary determines necessary to carry out the purposes of section 45Z(d)(5)(A)(iv), which excludes from the definition of “transportation fuel” any fuel produced from a fuel for which a credit under section 45Z is allowable.

Section 45Z(b)(1)(B)(ii) authorizes the Secretary to determine, in the case of any transportation fuel that is not a sustainable aviation fuel (SAF), whether a model is a successor model to the Greenhouse gases, Regulated Emissions, and Energy use in Transportation model developed by the Argonne National Laboratory (ANL). Additionally, section 45Z(b)(1)(B)(i) directs the Secretary, subject to section 45Z(b)(1)(B)(ii) through (v), to annually publish a table setting forth the emissions rate for

of emissions.⁶ Similarly, the EPA found that the 45ZCF–GREET model includes the categories of emissions it previously identified as missing from the R&D GREET model, the lack of which made R&D GREET insufficient for calculating lifecycle GHG emissions for purposes of section 211(o)(1)(H) of the CAA–2022.⁷

The 45ZCF–GREET model contains certain necessary components of a lifecycle GHG analysis consistent with section 211(o)(1)(H) of the CAA–2022 as applied for purposes of the section 45Z regulations.⁸ The 45ZCF–GREET model is consistent with the requirements of section 45Z(b)(1)(B)(iii). Therefore, emissions rates for SAF transportation fuels calculated using the 45ZCF–GREET model would also be consistent with those requirements as applied for purposes of the section 45Z regulations. See section 45Z(b)(1)(B)(i).

e. Other Aspects of 45ZCF–GREET Model

In the 45ZCF–GREET model, for purposes of accounting for emissions associated with hydrogen (as a production input), natural gas alternatives (as a production input or as the transportation fuel produced), electricity, and carbon capture and sequestration, rules similar to the rules under section 45V would apply unless otherwise specified by the 45ZCF–GREET model with respect to technical modeling issues or other technical differences. The proposed regulations would also clarify the similar rule for incrementality with respect to the use of energy attribute certificates in the 45ZCF–GREET model. See also § 1.45V–4(d).

In January 2025, the United States Department of Agriculture (USDA) published a beta version of the USDA Feedstock Carbon Intensity Calculator

(USDA FD–CIC). The beta version of the USDA FD–CIC is undergoing testing, peer review, and public comment in preparation for the publication of a final version of USDA FD–CIC. Following publication of the final version of USDA FD–CIC, the Treasury Department and the IRS anticipate that a section 45Z-specific version of the Feedstock Carbon Intensity Calculator (FD–CIC) module will be included as an input to the DOE's 45ZCF–GREET model (45ZCF FD–CIC) used for calculating carbon intensity adjustments under section 45Z for feedstocks that are produced using certain agricultural practices. Such practices may include no till, reduced till, cover crops, and nutrient management. 45ZCF FD–CIC may undergo periodic updates, including incorporation of new data and methodologies from other FD–CIC versions (for example, USDA FD–CIC, R&D GREET FD–CIC (R&D FD–CIC)), to incorporate more recent data or new data sources, types of practices, feedstock types, or changes to geographic specificity. The results of the 45ZCF FD–CIC are expected to inform the emissions rates calculated under the 45ZCF–GREET model. The Treasury Department and the IRS anticipate that 45ZCF FD–CIC may be used for fuel produced and sold in 2025 even though 45ZCF FD–CIC likely will be published in 2026.

The Treasury Department and the IRS anticipate that adoption of 45ZCF FD–CIC would entail additional requirements particular to its use, such as agricultural practice implementation, recordkeeping, and verification, which may include rules similar to those provided in the USDA's technical guidelines for crops used as biofuel feedstocks in 7 CFR 2100, subparts D, E, and F. The Treasury Department and the IRS anticipate publishing additional guidance on these requirements in coordination with the publication of 45ZCF FD–CIC.

⁶ See Letter from Joseph Goffman, Principal Deputy Assistant Administrator for the Office of Air and Radiation, U.S. Environmental Protection Agency, to Lily Batchelder, Assistant Secretary for Policy, U.S. Department of Agriculture (December 11, 2025).

USDA Climate Smart Agriculture Interim Rule

Billing Code: 3410-GL

DEPARTMENT OF AGRICULTURE

7 CFR Part 2100

RIN 0503-AA82

[Docket No. USDA-2024-0003]

Technical Guidelines for Climate-Smart Agriculture Crops Used as Biofuel

Feedstocks

AGENCY: Office of the Chief Economist (OCE), U.S. Department of Agriculture (USDA).

ACTION: Interim rule.

SUMMARY: This interim rule with request for comment establishes technical

Provides guidance on:

“Biofuel feedstock crops and entities in the biofuel supply chain;

Quantification of farm-level crop-specific carbon intensity;

Chain of custody standards for entities in the biofuel supply chain, including traceability and recordkeeping standards;

Auditing and verification requirements; and

Climate-smart agriculture practice standards for the biofuel feedstock crops included under the rule.”

USDA Feedstock Carbon Intensity Calculator

ACCESS THE USDA FD-CIC TOOL (BETA VERSION): [USDA FD-CIC](#) (ZIP, 30.0 MB)

ACCESS THE USDA FD-CIC USER GUIDE: [USDA FD-CIC USER MANUAL](#) (PDF, 484 KB)

The USDA Feedstock Carbon Intensity Calculator (USDA FD-CIC) (beta version) quantifies carbon intensities (CI), in greenhouse gas emissions per bushel, for three domestic feedstock crops: field corn, soybeans, and sorghum. The USDA FD-CIC (beta version) feedstock CIs reflect the impact of specified climate-smart agriculture practices used during crop production. The USDA FD-CIC tool (beta version) allows producers to evaluate the following practices (as single or stacked practices):

- No till
- Reduced till
- Cover crops
- Nitrification inhibitors
- Fertilizer timing: Split in-season application
- Fertilizer timing: Spring only application

- Possible additional areas in Final rule (or future rules/guidance):
 - Spring and winter canola
 - Intermediate oilseed crops
 - Conservation crop rotation
 - Enhanced efficiency fertilizer products
 - Plant biostimulants
 - Reduced nitrogen application rate

Ensuring Safety of Products Produced with Biotechnology and Biomanufacturing

- FDA GRAS for food ingredients, including plant based and fermentation proteins
- USDA oversight of genetically engineered organisms
- USDA and FDA oversight of cell cultivated meats
- USDA oversight of the growing of Hemp

BioPreferred® Program

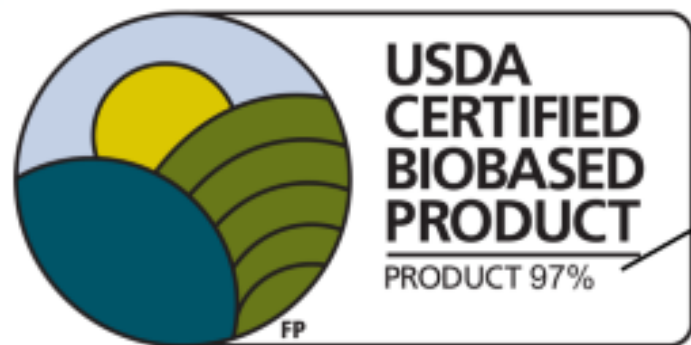
- Identifies and seeks new markets for biobased products
- Spurs economic development, creates new jobs, increases the use of renewable agricultural resources, etc.
- Two major program elements:
 - Voluntary Labeling Program
 - A Federal Procurement Preference



<https://www.biopreferred.gov/>

USDA Certified Biobased Product Label

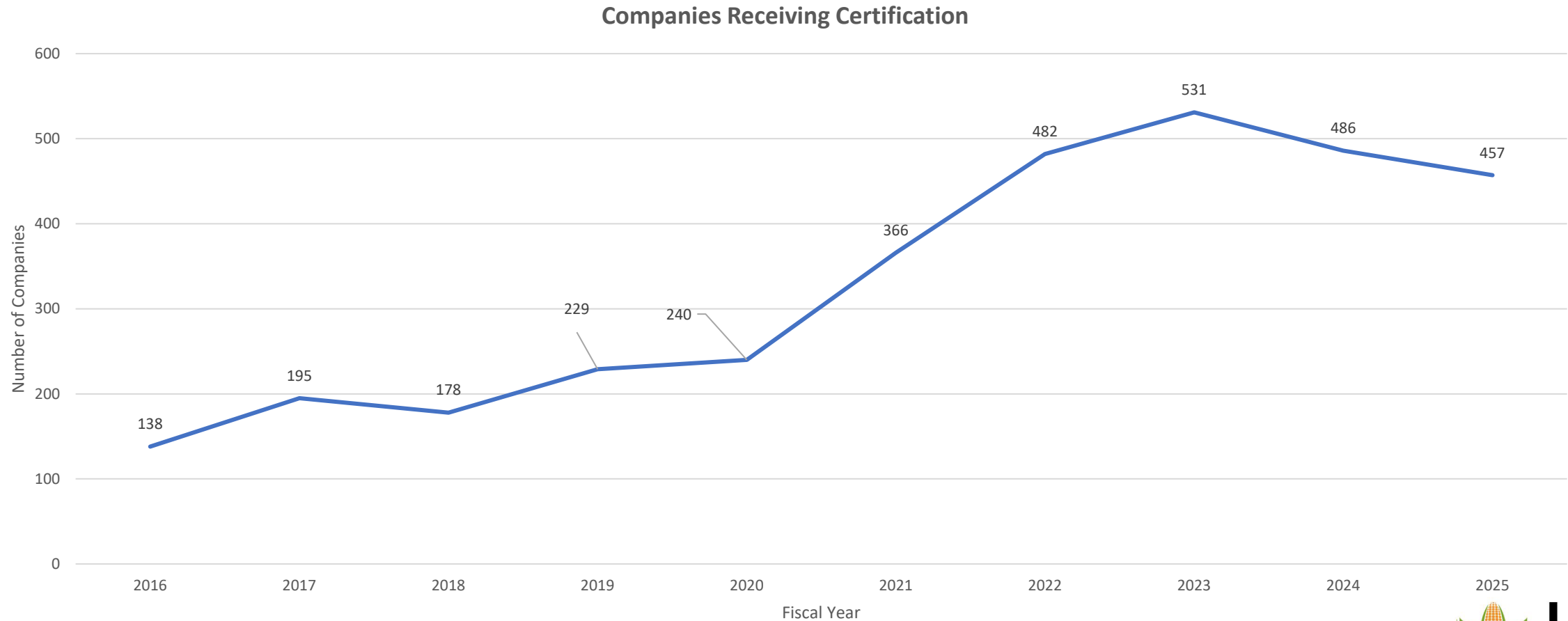
- To make it easier to locate biobased products, companies can apply to have their product tested and “certified.”



Indicates that this product is 97% biobased

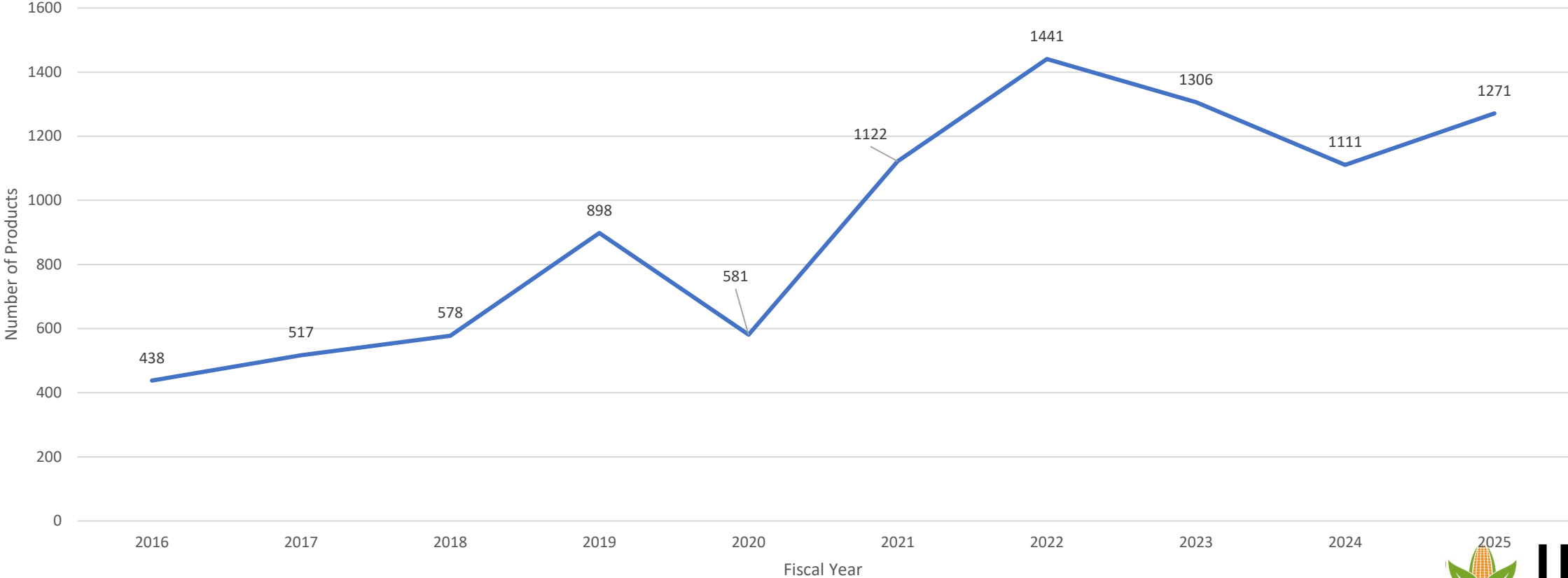
FP indicates product qualifies for preferred federal purchasing

Number of Companies Receiving Certification



Number of Certified Products

Certified Products Added



Legislation

- National Biotechnology Initiative Act
- Biobased Materials Investment and Production Act
- Renewable Chemicals Act

Farm Bill Provisions

- Changes to USDA 9003 Guaranteed loan program supporting infrastructure for biobased fuels and chemicals
- Reauthorization of BioPreferred program
- Establishment of a USDA SAF Strategy
- Uniform Bioproduct labeling
- Changes to oversight of Hemp
- Changes to EPA oversight of plant biostimulants and certain plant-incorporated protectants
- Establish an Office of Biotechnology Policy

Gregory Jaffe
President
Jaffe Policy Consulting LLC



Thank You for Attending!

Please support our work by making a gift to Farm Foundation.

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