

# USDA Bioeconomy Accomplishments, 2023

## Overview

President Biden’s Executive Order 14081, “Advancing Biotechnology and Biomanufacturing Innovation for a Sustainable, Safe, and Secure American Bioeconomy,” charts an ambitious Government-wide strategy to develop our Nation’s bioeconomy to drive economic development, equity, and resilience in communities and landscapes across America.

USDA has been serving America’s bioeconomy since its founding in 1862 and now plays a central role in carrying out EO 14081. USDA’s bioeconomy enterprise focuses on biotechnology research and development, biomass feedstock production, biobased products, and bioenergy generation. USDA’s approach coordinates efforts in research and development, capacity building for production and processing, and market assessment for the bioeconomy’s many goods and services. USDA’s programs: register thousands of biobased products; support biotechnology and the use of genetics to improve crops for climate resilience and develop organisms that make pesticides, fertilizers, and veterinary medicine more effective and sustainable; and spur innovation in the use of biological processes in manufacturing to promise greater food security and safety.

USDA continued its significant investments in our domestic bioeconomy in 2023 so that we “invent it here, grow it here, and make it here.” Some highlighted USDA activities in 2023 included the following:

## Rural Development (RD)

RD invested over \$200 million in bioeconomy projects, including advanced biofuels, biofuel infrastructure, renewable fertilizer production, and biogas and biomass projects; as well as greatly expanded the BioPreferred® Program:

- The Rural Energy for America Program (REAP) provided 8 loans for \$120 million and over \$48 million across 56 grants for REAP biogas and biomass projects to create new capacity for producing biofuel, electricity, and heat from biomass, mainly to develop anaerobic digesters that convert manure and other on-farm waste to renewable energy. Funding also supported such projects as retrofitting an ethanol plant to generate an additional 4.8 million gallons of biofuel annually and upgrading a poultry litter energy facility to produce an additional 1.6 MWh per year, which is enough electricity to power 145 homes.
- The Biorefinery, Renewable Chemical, and Biobased Product Manufacturing Assistance Program (Section 9003) completed construction on a \$104.6 million loan guarantee for a first-of-its-kind, community-scale anaerobic digester in Wisconsin that processes dairy manure and food waste into Renewable Natural Gas (RNG), concentrated nutrients, and clean water. The facility serves 7 dairy farms and includes 16 digesters to process manure from 30,000 cows, replacing up to 2 million gallons of fuel used on American highways annually.
- The Higher Blends Infrastructure Incentive Program (HBIIP) announced \$34.7 million in awards to expand fueling stations and other infrastructure for biofuels derived from U.S. farms, projected to increase renewable fuel sales by at least 391 million gallons annually.



- The Fertilizer Production Expansion Program (FPEP) announced \$50.1 million of investments in projects that use renewable biomass sources (e.g., compost, animal waste) for fertilizer production, such as a Texas facility that uses anaerobic digestion to convert food waste into 690,000 gallons of liquid potassium fertilizer annually.
- The Business and Industry Guaranteed Loan Program (B&I) provided over \$20 million to 5 business entities to support activities that relate to the bioeconomy. One example is a \$3 million loan for equipment to process shelving and smoker chips from woody biomass.
- The Rural Economic Development Loan Program (REDL) provided \$4 million for equipment to convert biodiesel from fatty acids and other new biobased product lines.
- The Value-Added Producer Grants (VAPG) program invested almost \$1 million in grants for processing and marketing of planters and wall panels made from hemp fiber.
- The Advanced Biofuel Payment Program (ABPP) supported more than 90 producers of biodiesel, cellulosic ethanol, and other advanced biofuels with almost \$7 million in payments.
- RD's BioPreferred® Program Catalog added 1,456 new products (a 17 percent increase), now totaling 9,948 products at the end of FY23, and 521 new suppliers (a 27 percent increase) for a current total of 2,452 companies. The 2023 contractor spending reports showed \$90.5 million in spending on biobased products for 2022, a 19 percent increase from 2021 and a 1,200 percent increase from 2020.

## Research, Education, and Economics (REE)

USDA National Institute of Food and Agriculture and USDA Agricultural Research Service programs invested over \$500 million in new research and development to advance the Nation's bioeconomy. Programs include the Bioproduct Pilot Program, the Agriculture and Food Research Initiative, and the Biomass Research Centers and Utilization Centers in a wide range of topics such as:

- \$20 million to commercialize winter oilseed crops—pennycress and carinata—to diversify crop portfolios, increase farm income by up to \$40/acre, create jobs, and provide new sources of fuel and feed without requiring additional cropland.
- \$7.1 million to demonstrate the conversion of feedstocks such as soy into thermoplastic rubber and bio-binders for use in recycled asphalt pavements and repairs to existing pavements.
- \$2.4 million to demonstrate conversion of food waste into biodegradable plastics using a combination of anaerobic digestion, fermentation, and thermal processing.
- \$1 million to advance development of lignocellulosic plastic films to replace petroleum-based plastics for the horticulture industry.
- ARS research that helped to launch a company that led to \$7.5 million in A-1 funding to produce a sustainable and high-performance biobased synthetic motor oil that is commercially available with pennycress protein.
- ARS research that resulted in synthesizing the industrial chemical 2-ethylhexanol from agricultural biomass, currently produced from petroleum with a global market value of ~\$6

billion used to produce plastics. The technology has lower costs, higher yields, and easy product recovery.

## Natural Resources and Environment (NRE)

The USDA Forest Service made catalytic investments in the wood-based bioeconomy to support land management, wildfire risk reduction, climate adaptation, and local economies, totaling \$72 million across 160 projects to support innovation, market development, and new and expanded manufacturing capacity to bolster the critical connection between healthy and resilient Federal, State, Tribal, and private forests and the wood products economy.

- 11 projects totaling \$9.4 million, with \$36.3 million in matching funds, for Community Wood Grants to fund shovel-ready projects for community wood energy systems and innovative wood product facilities.
- 18 wood energy projects totaling \$5.4 million, with \$11.6 million in matching funds, through Wood Innovations Grants to stimulate and expand markets for low-value wood to support long-term management of the National Forest System and other forest lands.
- 15 wood energy projects totaling \$11.1 million, with \$11.9 million in matching funds, through Wood Products Infrastructure Assistance Grants to establish, improve, or expand facilities that buy and process byproducts from ecosystem restoration projects on economically vital Federal or Tribal lands at risk of unnaturally severe wildfire or insect and disease outbreaks.

The Forest Service partnered with the American Loggers Council to launch a \$5 million pilot to incentivize transportation of non-marketable forest biomass in high-priority wildfire risk areas to eight facilities that convert it to end uses such as renewable energy. This pilot will facilitate removal and transport of between 40,000 and 90,000 bone dry tons of forest biomass that would otherwise be open-pile burned or continue to pose a wildfire risk.

## Farm Production and Conservation (FPAC)

The USDA Risk Management Agency adopted new flexibilities to insure double-crop soybeans in approximately 845 additional counties, or on roughly 32 percent more acres in 2023 when compared to prior years (2014-2022). The agency also expanded insurance for camelina and carinata in 10 States, enabling farmers to supply these oilseed crops to meet increasing demand for biofuels.

## Marketing and Regulatory Programs (MRP)

The USDA Animal and Plant Health Inspection Service (APHIS) made several important advances in biotechnology for plant and animal health, both in improving regulatory direction and in licensing new vaccines:

- APHIS promoted biotechnology product innovation by completing 27 science-based regulatory status reviews for plants developed using biotechnology that were subsequently found not subject to USDA's biotechnology regulations. This is a large increase from the seven reviews in 2022 and an average of 4.5 reviews per year under USDA's legacy

regulations previously. Of the 27 plants reviewed, 89 percent were from small or mid-sized companies or academics, and 15 different plant species were represented.

- APHIS confirmed that 41 plants from 14 species met exemptions specified in the regulations, over 95 percent from small and mid-sized developers and compared to 17 confirmations in 2022.
- APHIS issued a draft proposal to expand regulatory exemptions for plants developed using biotechnology based on the ability to develop the same plants using conventional breeding methods.
- APHIS/Center for Veterinary Biologics issued a conditional license for the manufacture and distribution of Canine Parvovirus Monoclonal Antibody. This innovative product is the first monoclonal antibody licensed to treat an infectious disease (canine parvovirus 2b).
- APHIS/Center for Veterinary Biologics issued a conditional license for the manufacture and distribution of Paenibacillus Larvae Bacterin. This innovative product is the first vaccine for honeybees and prevents disease caused by Paenibacillus larvae (American Foulbrood).
- APHIS/Center for Veterinary Biologics issued a conditional license for the manufacture and distribution of Rabbit Hemorrhagic Disease Vaccine, Serotype 2, Killed Baculovirus Vector. This innovative product is the first licensed rabbit veterinary biologic for the vaccination against Rabbit Hemorrhagic Disease in the United States.

## Trade and Foreign Agricultural Affairs (TFAA)

The Foreign Agricultural Service made significant gains in market access for U.S. bioenergy over the course of FY23 through successful negotiation of:

- Japan’s revised carbon-intensity calculation for U.S. corn ethanol, securing full market access and potential for an additional 80 million gallons of U.S. fuel ethanol exports to Japan, the second largest export market for U.S. ethanol in 2023, with an estimated valued of \$440 million in 2023.
- Canadian approval of the U.S. application for legislative recognition for land use and biodiversity (LUB) under its Clean Fuel Regulation, preserving over \$3 billion in U.S. biofuels exports and future growth.
- The United Kingdom’s Biomass Strategy recognized the sustainability of the U.S. wood pellet industry, helping to maintain U.S. wood pellet exports valued at over \$1 billion in 2023—60 percent of U.S. global wood pellet exports.
- European Union’s revisions to its Renewable Energy Directive, which omitted problematic language for U.S. wood pellets and U.S. soybeans for the use of energy, as well as ensured continued access for U.S. corn ethanol, with a combined value of \$800 million in combined biofuel export value maintained in 2023.
- India’s removal of its 5 percent tariff on imports of ethanol for non-fuel use, which will lead to more economic opportunities for U.S. ethanol to India for industrial purposes, which was valued at \$248 million in 2023.

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