

THE U.S. BIOBASED ECONOMY: ECONOMIC IMPACT

The biobased economy is the entire value chain of producing consumer goods from biological feedstocks and processes. Industrial biotechnology uses the natural ability of microbes and enzymes to convert the following into chemical building blocks for consumer products:

- biomass from agriculture and forestry as well as algae;
- carbon from biodigesters, industrial off-gases and natural gas; and
- waste from food manufacturing, construction and municipal sources.



Feedstock

- Biomass
- Algae
- Methane
- Waste and Off-gases



Industrial Biotech

- Synthetic Biology
- Enzymes
- Biorefining
- Gene editing



Products

- Sustainable Fuels
- Chemicals
- Polymers
- Food Ingredients



Using data from USDA,¹ the US DOE,² ABF Economics,³ and MarketLine,⁴ BIO estimates the direct value of the U.S. biobased economy at \$205 billion, generating 1.665 million jobs. Every direct job creates additional employment and economic opportunities, so the **overall impact is \$505 billion and 4.63 million jobs.**

U.S. Biobased Economy



\$205 billion
1.665 million jobs

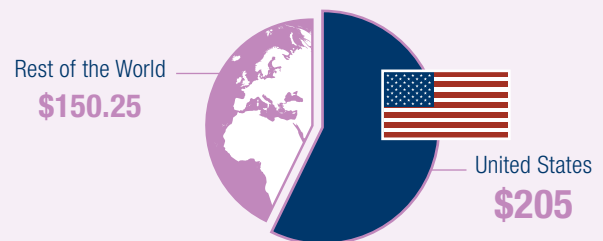
Overall Economic Impact



\$505 billion
4.63 million jobs

Using the same U.S. data along with worldwide data from Research and Markets,⁵ BIO estimates that **the global economic value of industrial biotechnology, biofuels, renewable chemicals and polymers, enzymes and biobased materials is \$355.28 billion.** The United States generates 58 percent of the value, or more than \$205 billion.

Global Biobased Economy (\$ billions)



¹ Golden, J.S., Handfield, R.B., Daystar, J., Morrison, B., and McConnell, T.E, An Economic Impact Analysis of the U.S. Biobased Products Industry: 2016 Update. Duke Center for Sustainability & Commerce and North Carolina St.

² U.S. Department of Energy. (2017) U.S. Energy and Employment Report (USEER). BW Research Partnership. Jan. 2017.

³ Urbanchuk, J. Contribution of the Ethanol Industry to the Economy of the United States in 2016. Doylestown, PA: ABF Economics, January 2017.

⁴ MarketLine. 2016. Industry Profile: Global Biotechnology. Report #0199-0695. London: November 2016.

⁵ Research and Markets. 2016. White Biotechnology Market Analysis By Product (Biofuels, Biomaterials, Biochemicals, Industrial Enzymes), By Application (Bioenergy, Food & Feed Additives, Pharmaceutical ingredients, Personal Care & Household Products) And Segment Forecasts To 2024. October 2016.