

**Name of Organization:** Plant Based Products Council

**Date:** February 18, 2025

**Subject:** 2022 North American Industry Classification System (NAICS)—Revisions for 2027 Comments

**FR Reference:** Federal Register / Vol. 89, No. 245 / Friday, December 20, 2024 / Notices

**Docket Number:** USBC-2024-0032

The Plant Based Products Council (PBPC) appreciates this opportunity to provide input in response to the Office of Management and Budget’s (OMB) December 20, 2024 solicitation for proposals to revise portions of the North American Industry Classification System (NAICS) for 2027. PBPC requests revisions to the NAICS codes that better reflect the bioeconomy and biobased products, allowing for more consistent and accurate measurement of this growing sector of U.S. manufacturing.

PBPC represents businesses large and small who are committed to advancing the bioeconomy and advocating for a shift toward more sustainable and responsible consumer products and packaging through greater use of plant-based materials (sometimes termed “bioproducts” or “biobased products”). Plant-based products are derived from renewable sources, such as algae, bamboo, corn, hemp, soy, and agriculture waste. Plant-based products are just one aspect of the broader bioeconomy. A successful U.S. bioeconomy helps ensure increased market opportunities for farmers and expanded investment in biomanufacturing infrastructure—two key drivers of healthy, vibrant, and growing rural communities.

Presidential Administrations have made growth of the bioeconomy a priority for more than 25 years. In fact, the 2019 White House Summit on America’s Bioeconomy noted that it “represents the infrastructure, innovation, products, technology, and data derived from biologically-related processes and science that drive economic growth, improve public health, agricultural, and security benefits. Bioeconomy outputs are incredibly diverse, and future applications limitless in terms of both application and value, including new ways to treat cancer; enable novel manufacturing methodologies for medicines, plastics, materials, and consumer products; create pest and disease resistant crops; and support DNA-based information systems that can store exponentially more data than ever before.”<sup>1</sup>

Given the range of opportunity and innovation, defining “bioeconomy” and related terms can be a challenge across government and industry. To help address this hurdle, in 2022, the National Institute of Standards and Technology (NIST), in consultation with an interagency working group with participants from across the U.S. government, developed a lexicon to harmonize “a base set of terms and definitions with the goal of helping to enable the development of measurements and measurement methods for the bioeconomy that support uses such as economic measurement, risk assessments, and the application of machine learning and other artificial intelligence tools.” This recently developed tool defines “bioeconomy” as

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<sup>1</sup> The White House Office of Science and Technology Policy. (2019, October). Summary of the 2019 White House Summit on America’s Bioeconomy. <https://trumpwhitehouse.archives.gov/wp-content/uploads/2019/10/Summary-of-White-House-Summit-on-Americas-Bioeconomy-October-2019.pdf>.

the “economic activity derived from the life sciences, particularly in the areas of biotechnology and biomanufacturing, including industries, products, services, and the workforce.”<sup>2</sup>

Growing global market demand and the history of U.S. Government prioritization of the sector, the domestic bioeconomy has grown rapidly over the past several decades. In fact, the most recent USDA-commissioned “An Economic Impact Analysis of the U.S. Biobased Products Industry” estimates that “the value-added contribution to the U.S. economy grew reached \$489 billion in 2021, up from \$470 billion in 2017.”<sup>3</sup> And, there are several examples to support that there is continued growth and investment across a range of product categories. Last year, a Boston Consulting Group report estimated “that scaling up industrial precision fermentation can create a \$200 billion market by 2040, seven times the current size, if companies build enough production capacity to lower costs.”<sup>4</sup>

With continued growth in the bioeconomy comes increased employment opportunities, many of which are happening in rural communities. The biomanufacturing sector provides nearly 4 million jobs, and for each biobased products industry job, 1.4 more jobs are supported in other sectors of the U.S. economy.<sup>5</sup> The growing plant-based products industry demands engineers and chemists as well as high-quality skilled manufacturing, service, and related employees. And, these are high-paying job opportunities. Employees in the agricultural feedstock and industrial biosciences earn an average of nearly \$102,000 per year. That’s significantly greater —about \$30,000 —than the U.S. average private sector wage.<sup>6</sup>

Products derived from renewable agricultural commodities are an important part of the U.S. and global bioeconomy. Biobased products span a diverse array of product categories including renewable chemicals, cleaning supplies, packaging, tableware, furniture, and clothing. And, innovation is a constant within the product categories. Historically, USDA’s BioPreferred Program has identified about 20,000 biobased products, and there are currently about 10,000

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<sup>2</sup> National Institute of Science and Technology. Bioeconomy Lexicon. (2022, December) <https://www.nist.gov/bioscience/nistbioeconomy-lexicon>.

<sup>3</sup> Golden, J.S., Handfield, R.B. Daystar, J., and S. Pires (2024). An Economic Impact Analysis of the U.S. Biobased Products Industry: 2023 Update. Volume V. A Joint Publication of the Dynamic Sustainability Lab at Syracuse University and the Supply Chain Resource Cooperative at North Carolina State University.

<sup>4</sup> Bobier, J.F., Cerisy, T., Coulin, A. D., Blecher, C, Sassoon, V, and B. Alexander (2024, February). Breaking the Cost Barrier in Biomanufacturing. Boston Consulting Group. <https://web-assets.bcg.com/b6/15/6a10d22c481e8bebaf0c2fab8294/bcg-breaking-the-cost-barrier-on-biomanufacturing-rev.pdf>

<sup>5</sup> Golden, J.S., Handfield, R.B. Daystar, J., and S. Pires (2024). An Economic Impact Analysis of the U.S. Biobased Products Industry: 2023 Update. Volume V. A Joint Publication of the Dynamic Sustainability Lab at Syracuse University and the Supply Chain Resource Cooperative at North Carolina State University.

<sup>6</sup> Teconomy Partners LLC. (2024, June). The Economic Impact of the U.S. Industrial Bioeconomy. <https://content.presspage.com/uploads/2544/4f7314e2-c45e-4e26-86be-70580565812b/economicimpactofu.s.industrialbioeconomy.v6.6.pdf?10000>

products listed in the database. However, there are estimates that over 40,000 biobased products are actually in the marketplace because not all eligible products participate in the voluntary BioPreferred program.<sup>7</sup>

A significant challenge facing the U.S. bioeconomy stems from the fact that NAICS currently does not provide an effective way to track the economic and job implications of the growing industry. There are no industry- or product-specific NAICS codes that accurately or clearly represent the bioeconomy, making it difficult to transparently and consistently measure the U.S. bioeconomy. Improved industry statistics from a readily accessible source are crucial to measuring the economic impact. New biobased NAICS codes and language will enhance the ability of firms and researchers to track the industry, and for government policymakers and other stakeholders to make better informed decisions and policy. For more than a decade, academics, stakeholders, and Congress have recommended that NAICS codes be developed for the bioeconomy, including biobased products and chemicals.

For example:

- *USDA Biobased Economy Indicators: A Report to the U.S. Congress (September 2011):*<sup>8</sup>

“As the NAICS system now stands, there is no simple way to gather data on biobased products since there is not a NAICS three-digit code for products manufactured out of biobased feedstocks, as has been defined for the metal fabrication product manufacturing sector. Also, for the various three-digit NAICS categories more aligned with end-use products, there are no six-digit numbers set aside for biorenewable feedstocks, with few exceptions. For example, some information on the use of wood in biobased products could be captured in some of the subsectors like nonupholstered wood household furniture manufacturing, which was previously mentioned. However, a chair made out of a recently developed biorenewable feedstock, like polylactide acid (PLA), could not be easily captured. A chair that is predominantly made out of PLA would currently be captured in the household furniture (except wood and metal) manufacturing (337125) subsector. Similar difficulties occur with other NAICS sectors. The ability to capture trade information is limited since many of the subsectors within the wholesale trade and retail trade sectors are similar to manufacturing subsectors. For instance, the sale of biobased furniture could be captured in both of the generic subsectors furniture merchant wholesalers (423210) and furniture stores (442110).”

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<sup>7</sup> Golden, J.S., Handfield, R.B. Daystar, J., and S. Pires (2024). An Economic Impact Analysis of the U.S. Biobased Products Industry: 2023 Update. Volume V. A Joint Publication of the Dynamic Sustainability Lab at Syracuse University and the Supply Chain Resource Cooperative at North Carolina State University.

<sup>8</sup> USDA, *Biobased Economy Indicators: A Report to the U.S. Congress*. Washington (2011). [https://www.usda.gov/oce/reports/energy/USDA%20Bioindicators982011\\_2.pdf](https://www.usda.gov/oce/reports/energy/USDA%20Bioindicators982011_2.pdf)

- *USDA. An Economic Impact Analysis of the U.S. Biobased Products Industry (2015):*<sup>9</sup>  
 “NAICS does not provide an effective means of tracking the economic and job implications of the biobased products sector in the United States. This results from a lack of industry-specific codes that were representative of the biobased products sectors of the economy. Many economists and industry groups recommended that NAICS codes be developed for biobased products and that reporting requirements be established to allow more effective tracking.”
- *Robert Carlson, Estimating the biotech sector's contribution to the US economy (2016):*<sup>10</sup>  
 “Consequently, using the current NAICS to estimate biotech employment is a difficult proposition, because the current codes do not map well onto existing and emerging bioproduction methods. Modernizing the NAICS must be a priority of both the public and private sectors to enable accurate economic analyses, employment measurements and appropriate marshaling and allocation of resources.”
- *USDA. An Economic Impact Analysis of the U.S. Biobased Products Industry (2018):*<sup>11</sup>  
 “One of the limitations of undertaking this research is that, at present, no North American Industry Classification System (NAICS) codes have been established specifically for biobased products. The NAICS is the standard used by federal agencies in classifying business establishments for the purpose of collecting, analyzing, and publishing statistical data related to U.S. businesses.”
- *Agriculture Improvement Act of 2018 Section 9002(2) (2018 Farm Bill):*<sup>12</sup>  
 The 2018 Farm Act specifically calls for the federal government to develop NAICS codes for biobased products.  
 “(1) NAICS CODES.—The Secretary [of Agriculture] and the Secretary of Commerce shall jointly develop North American Industry Classification System codes for—  
 (A) renewable chemicals manufacturers;  
 and  
 (B) biobased products manufacturers.”

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<sup>9</sup> Golden, Jay S. et al. *An Economic Impact Analysis of the U.S. Biobased Products Industry: A Report to the Congress of the United States of America*. Industrial Biotechnology 11 (2015).  
[https://www.researchgate.net/publication/280979090\\_An\\_Economic\\_Impact\\_Analysis\\_of\\_the\\_US\\_Biobased\\_Products\\_Industry\\_A\\_Report\\_to\\_the\\_Congress\\_of\\_the\\_United\\_States\\_of\\_America](https://www.researchgate.net/publication/280979090_An_Economic_Impact_Analysis_of_the_US_Biobased_Products_Industry_A_Report_to_the_Congress_of_the_United_States_of_America)

<sup>10</sup> Carlson, R. *Estimating the biotech sector's contribution to the US economy*. *Nat Biotechnol* 34, 247–255 (2016).  
<https://doi.org/10.1038/nbt.3491>

<sup>11</sup> Daystar, Jesse et. al. *An Economic Impact Analysis of the U.S. Biobased Products Industry*. United States Department of Agriculture BioPreferred® Program (2018).  
<https://www.biopreferred.gov/BPResources/files/BiobasedProductsEconomicAnalysis2018.pdf>

<sup>12</sup> Agriculture Improvement Act of 2018, § 9002 (2).

- *National Academies. Safeguarding the Bioeconomy (2020)*.<sup>13</sup>

“Recommendation 2-2: The existing North American Industry Classification System (NAICS) and North American Product Classification System (NAPCS) codes should be revised to more accurately capture and track commercial activity and investments related to the biological sciences and track the growth of individual segments of the bioeconomy (e.g., biological production of chemicals and materials). In addition, the U.S. Department of Commerce’s Office of Technology Evaluation should undertake a study aimed at richer characterization of the permeation of biologically based products, processes, and services in the U.S. economy. Such a study would greatly inform revisions of the NAICS and NAPCS codes. Additionally, the U.S. Census Bureau should refine and regularly collect comprehensive statistics on bioeconomic activities.”

- *USDA. An Economic Impact Analysis of the U.S. Biobased Products Industry (2021)*.<sup>14</sup>

“Recommendation #1: The authors have recommended the U.S. government develop annual measurements of the biobased products industry multiple times. Specifically, we have called for the development of NAICS codes for the biobased products industry similar to what exists for the rest of the domestic economy.”

Additionally, an Executive Order “directed the U.S. Bureau of Economic Analysis (BEA) to assess “the feasibility, scope, and costs of developing a national measurement of the economic contributions of the bioeconomy.” The conclusions of the BEA as stated in their report completed in just 180 days stated, “Developing a bioeconomy satellite account using a broad, comprehensive definition of the bioeconomy appears to be technically feasible and would correspond to similar efforts by the EU and other international organizations.”

And, further, “we strongly recommend that Congress and/or the Administration direct the USDA take the lead in coordination with the Department of Commerce to organize a Technical Advisory Council in some form that goes beyond prior work of a single agency to include technical experts from industry, academia, government and NGOs to develop a pathway for the Federal Government to develop the tracking of the economic impacts of the U.S. biobased products industry.”

Per USDA classifications, the major sectors that represent the U.S. biobased products industry’s contribution to the U.S. economy include Agriculture and Forestry, Biobased Chemicals, Bioplastic Bottles and Packaging, Biorefining, Enzymes, Forest Products, and Textiles. To

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<sup>13</sup> National Academies of Sciences, Engineering, and Medicine. *Safeguarding the Bioeconomy*. Washington, DC: The National Academies Press (2020). doi: <https://doi.org/10.17226/25525>.

<sup>14</sup> Golden, J.S., Handfield, R.B. Daystar, J., and S. Pires (2024). *An Economic Impact Analysis of the U.S. Biobased Products Industry: 2023 Update. Volume V. A Joint Publication of the Dynamic Sustainability Lab at Syracuse University and the Supply Chain Resource Cooperative at North Carolina State University.*

conduct an economic impact analysis of the biobased products industry, economists and other stakeholders must currently review each relevant sector and estimate the percentage of economic activity within that sector that is relevant to the biobased portion of the total sector. Percentage estimates are derived through analysis of sources such as published literature, reports, industry data, market reports, and consultations with relevant experts. Clearly, development of bioeconomy-specific NAICS codes would allow for more consistent and accurate analysis of the economic impact of biobased products and the growing bioeconomy.

In alignment with the recommendations of academics, policymakers, and industry stakeholders identifying the need for better data on the bioeconomy, in 2022, an Interagency Technical Working Group (ITWG) was established by the Chief Statistician of the United States to develop recommendations for bioeconomy related revisions to the NAICS and the North American Product Classification System (NAPCS) to the Economic Classification Policy Committee. The Bioeconomy ITWG is comprised of 14 voting members from 8 Federal agencies and 2 nonvoting members from the Economic Classification Policy Committee and the Office of Management and Budget. Federal agencies represented on the ITWG include the National Science Foundation (NSF), Department of Energy (DOE), Small Business Administration (SBA), Bureau of Economic Analysis (BEA), Environmental Protection Agency (EPA), U.S. Department of Agriculture (USDA), Bureau of Labor Statistics (BLS), the Food and Drug Administration (FDA), and the U.S. Census Bureau.

Before considering any revisions to the NAICS and NAPCS, the ITWG solicited comments and recommendations in a public and transparent manner. A Request for Information (RFI) was published in the Federal Register, and five listening sessions were held with industry experts, advocates and representatives. That process yielded recommendations to “add specific industry and product categories including expanding and creating specific NAICS codes to identify biomanufacturing processes as well as specific NAPCS codes for distinct biobased manufactured products.”<sup>15</sup>

In developing its recommendations, the ITWG considered identification of establishments, self-reporting and misclassification, data disclosure concerns, the purpose of NAICS and complexity of clearly different production processes, and time series consistencies.

Following a deliberative interagency process, the ITWG recommended twelve updates as part of the 2027 NAICS revisions. These recommended revisions include the following five that are of greatest interest to the plant-based products industry:

- (1) Differentiate biobased component of 325211 “Plastics Material and Resin Manufacturing”
  - 325211a “Plastics Materials and Resin Manufacturing, Petroleum Based”
  - 325211b “Plastics Materials and Resin Manufacturing, (Biobased)”

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<sup>15</sup> Interagency Technical Working Group. Measuring the Bioeconomy, Recommended Revisions to the NAICS and NAPCS. (Formatted for web, June 2024). <https://www.usda.gov/sites/default/files/documents/OCE-Measuring-the-Bioeconomy.pdf>

(2) Differentiating biobased 313110 “Fiber, Yarn, and Thread Mills” and 325220 “Artificial and Synthetic Fibers and Filaments Manufacturing”

313110b “Fiber, Yarn, and Thread Mills (Biobased)”

325220b “Artificial and Synthetic Fibers and Filaments Manufacturing (Biobased)”

(3) Breakout/rename 32512 “Industrial Gas Manufacturing”

325121 “Industrial Gas Refineries, (Excluding Biogas)”

325122 “Industrial Gas Refineries, (Biogas)”

(12) Establish five new industries under 325199 “All Other Basic Organic Chemical Manufacturing”

Production of Basic Organic Chemicals Using Synthetic Biology (Split out of 325199)

Production of Basic Organic Chemicals Using Biobased Feedstocks (Split out of 325199)

Fatty Acid Ester Production from Biobased Feedstocks. (Includes fatty acid esters for non-fuel use and fuel use (biodiesel). Split out of 325199)

Production of RNG from biogas. (Includes establishments whose primary output is pipeline-grade natural gas produced from biogas. Split out of 325199)

Hydrotreatment of Esters and Fatty Acids (Production of hydrocarbon fuels from vegetable oils or animal fats. Includes production of renewable diesel, renewable jet fuel, renewable naphtha, and renewable propane/butane. Split out of 325199. Does not include biodiesel, since biodiesel is chemically distinct from hydrocarbon fuels.)

(13) Split one new industry out from 324191 “Petroleum Lubricating Oil and Grease Manufacturing”

Biobased Lubricating Oil and Grease Manufacturing

In addition to the specific relevant revisions, the ITWG also recommended emerging technologies for additional monitoring for potential further revisions.

Consistent with the repeated conclusions by academics, policymakers, and industry stakeholders as well as the commitments across several Presidential Administrations to improve data and statistical measurement of the bioeconomy, PBPC requests revisions to the NAICS and NAPCS codes that better reflect the bioeconomy and biobased products.

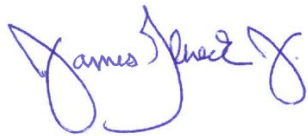
The 2027 NAICS revision is the right opportunity to address these long-overdue changes to allow for more consistent and accurate measurement of this valuable and growing aspect of the U.S. economy. PBPC requests that OMB and the ECPC advance the work of the ITWG and

develop NAICS codes for renewable chemicals and biobased product manufacturers. PBPC is prepared to serve as a resource in support of the work of the ITWG and the recommendations on bioeconomy NAICS codes.

NAICS codes are essential for the success of the domestic plant-based products industry as well as the future of the U.S. bioeconomy. It is imperative that steps be taken during the 2027 NAICS revision to ensure that the United States is a global leader in the industry and enjoyed the economic, national security, and environmental benefits that would entail.

Thank you for your consideration of these comments. Please contact me at [james@pbpc.com](mailto:james@pbpc.com) or 202-331-1634 with any questions.

Sincerely,

A handwritten signature in blue ink that reads "James Glueck, Jr." with a stylized flourish at the end.

James Glueck, Jr.  
Executive Director