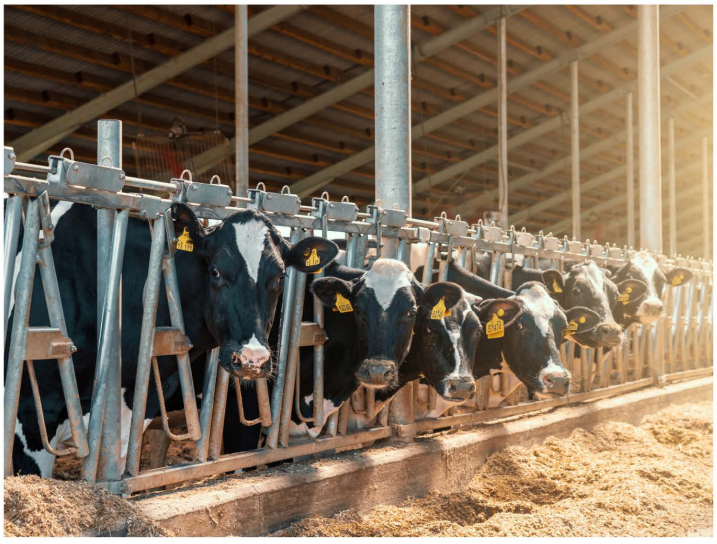
The Contribution of the Ethanol Industry to the U.S. Economy

2025



RFA
RENEWABLE FUELS ASSOCIATION

The Contribution of the Ethanol Industry to the U.S. Economy in 2025

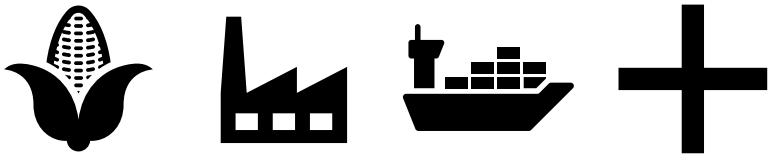
Executive Summary

U.S. ethanol production hit a record 16.4 billion gallons (bg) in 2025, as exports surged past the record set in 2024 and domestic consumption remained solid. The industry continued to make a substantial contribution to the overall U.S. economy, given increased output and stabilizing prices of ethanol and related commodities.

The industry contributed $50 billion to U.S. gross domestic product (GDP), generated $28 billion in employment-related income, and supported more than 315,000 full-time equivalent jobs (Figure 1). This included 79,000 direct jobs, along with 237,000 indirect and induced jobs across all sectors of the economy. Additionally, the industry generated $10 billion in tax revenues.

The largest share of the ethanol industry's economic impact was in the agriculture sector, as more than 5.5 billion bushels of corn valued at $24 billion were processed into renewable fuel and coproducts.

Figure 1: Summary of the Ethanol Industry's Economic Contribution in 2025



	Agriculture	Ethanol Production	Exports	Total
GDP	$29.9B	$15.4B	$3.8B	$50.4B
Income	$17.5B	$8.0B	$2.0B	$28.3B
Employment	233.1K	66.8K	6.2K	316.5K

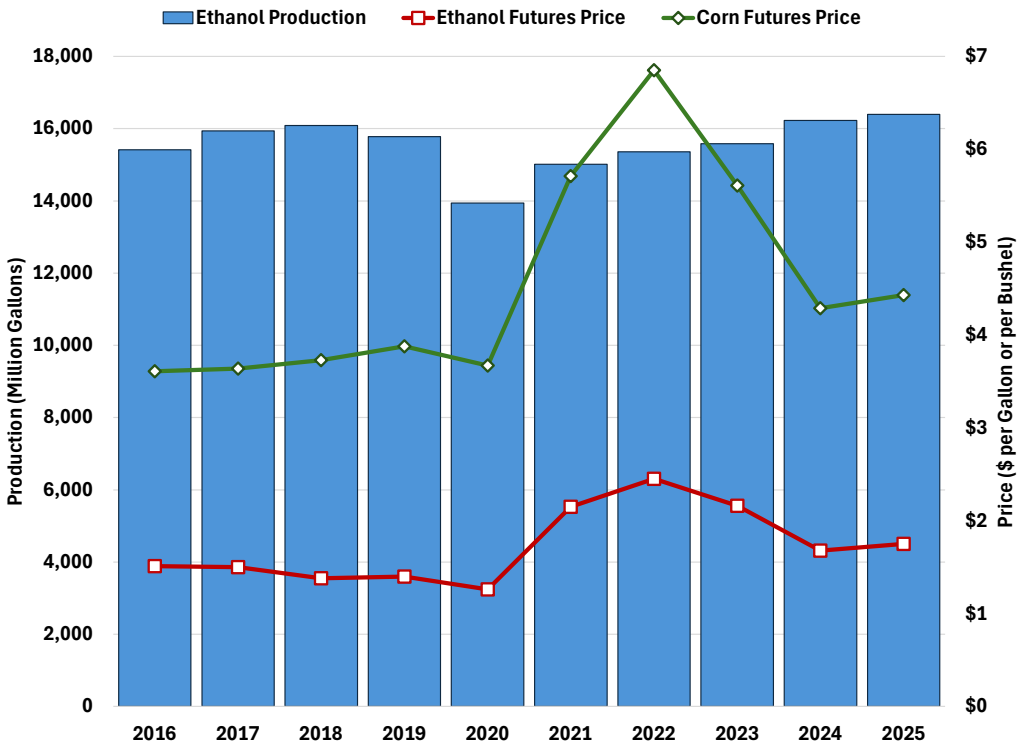
Source: RFA
Note: The total includes the economic contribution from construction and R&D activities

The Markets for Ethanol and Related Commodities

In 2024, the U.S. exported 1.9 bg of ethanol, which far exceeded the previous record. In 2025, exports surged beyond that mark, hitting 2.2 bg. Additionally, domestic consumption remained solid, bolstered by continued expansion in the availability of mid- and high-level ethanol blends, such as E15. To serve these markets, the U.S. produced a record 16.4 bg of ethanol (Figure 2).

Prices of ethanol, coproducts and corn generally stabilized after dropping in 2024. A massive 17-billion-bushel crop weighed on corn prices, pressuring growers but helping keep ethanol prices competitive in domestic and export markets, which, in turn, supported corn usage by the industry.

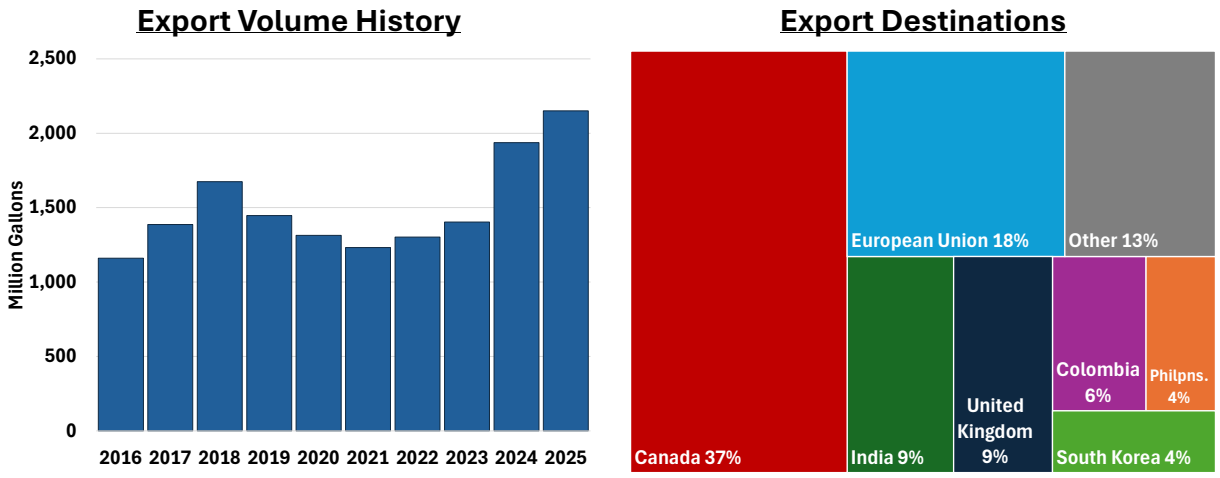
Figure 2: Ethanol Production and Commodity Prices Over the Last Decade



Sources: U.S. Energy Information Administration (historical ethanol production), RFA (2025 forecast), CME via Barchart (prices)

In the export market, Canada was by far the top destination, with shipments rising to more than 700 million gallons (mg), the largest volume ever exported to a single destination (Figure 3). Exports to the European Union jumped, moving it into second place, while shipments to other key markets including India and the United Kingdom remained strong.

Figure 3: U.S. Ethanol Export History and 2025 Destinations



Source: U.S. Census Bureau (historical data), RFA (2025 forecast)
Note: Destination shares are through November

Exports of distillers dried grains (DDGS) reached 12 million metric tons in 2024 for only the second time in history and remained near that level in 2025.

More information about ethanol and DDGS exports is available in RFA's annual Trade Summary publications.

Ethanol Industry Revenues and Expenses

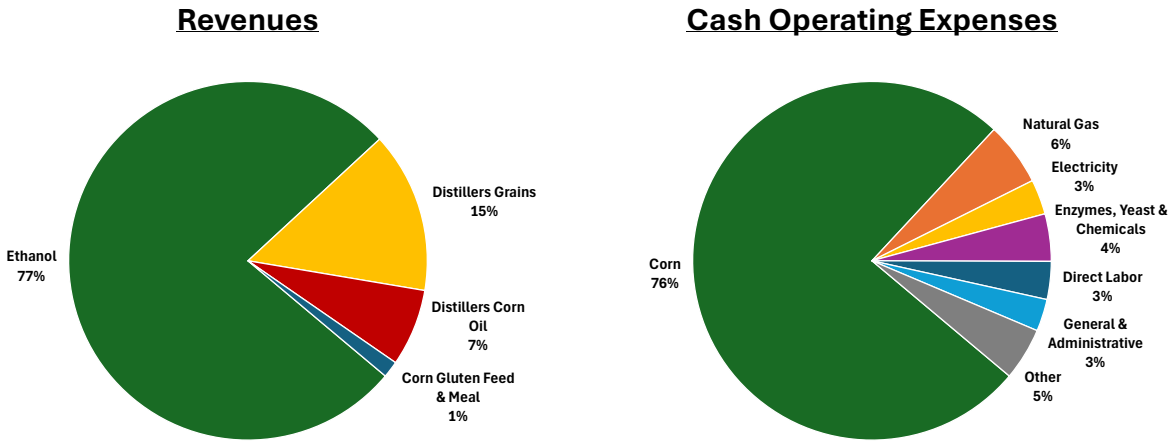
The industry's revenues and expenses increased modestly in 2025, driven mainly by volume expansion. Revenues were $36 billion, consisting of $28 billion in ethanol sales and $8 billion in coproduct sales (Figure 4). Coproducts include feed ingredients such as DDGS, as well as distillers corn oil, which is used mainly in the production of biomass-based diesel.[1]

Cash operating expenses totaled $31 billion, of which three-quarters was for the purchase of feedstock, predominantly corn (and grain sorghum).[2] Energy costs ranked a distant second, including $2 billion for natural gas and $1 billion for electricity. Direct labor costs were an additional $1 billion. Remaining expenses included enzymes, yeast, and chemicals; denaturant; water; maintenance and repairs; transportation; and general and administrative costs.

[1] Estimated revenues exclude carbon dioxide captured for sale, as well as food-grade corn oil from wet mills.
[2] Operating expenses were modeled for dry mills, which accounted for more than 90% of production. Depreciation was excluded from expenses, since it does not generally reflect an annual cash outlay.

Annual average ethanol production margins improved moderately from 2024, when they were negatively affected by commodity price compression.

Figure 4: Composition of Ethanol Industry Revenues and Operating Expenses in 2025



Source: RFA
Note: Grain sorghum is included in corn costs

The Economic Contribution of the Ethanol Industry

In 2025, the ethanol industry contributed $50 billion to U.S. GDP, generated $28 billion in employment-related income (Table 1). It supported more than 315,000 full-time equivalent jobs, including approximately 79,000 direct jobs and 237,000 indirect and induced jobs. That is, for every direct job, three additional full-time equivalent positions were supported elsewhere in the economy.

The overall contribution is the sum of three types of economic effects:

- Direct Effects: The economic activity directly associated with the ongoing operations of the industry or industries being analyzed. In this study, direct effects occur predominantly in the grain-farming industry and the ethanol production industry (i.e., the processing of grain into ethanol).
- Indirect Effects: The economic activity generated through supply-chain purchases by the directly affected industries from their suppliers (i.e., business-to-business transactions upstream in the supply chain). For example, corn growers purchase inputs, such as fertilizer and crop protection chemicals, as well as services, such as agronomic and financial services.
- Induced Effects: The economic activity supported by household spending of employment-related income earned through the direct and indirect activity. For

example, employees shop at retail stores, eat at restaurants, and use various services.

Table 1: Economic Contribution of the Ethanol Industry in 2025

	GDP Contribution (Mil. $)	Income (Mil. $)	Employment (FTEs)
Ethanol Production	**$15,410**	**$7,995**	**66,834**
Direct	$6,234	$3,348	13,519
Indirect	$4,584	$2,197	18,882
Induced	$4,592	$2,450	34,434
Agriculture	**$29,878**	**$17,504**	**233,149**
Direct	$5,576	$3,528	60,890
Indirect	$14,274	$8,626	106,878
Induced	$10,027	$5,350	65,380
Exports	**$3,824**	**$1,975**	**6,231**
Construction	**$652**	**$397**	**6,072**
Research & Development	**$604**	**$387**	**4,235**
Total	**$50,367**	**$28,258**	**316,521**
Direct	$12,292	$7,224	79,228
Indirect	$23,007	$12,994	134,196
Induced	$15,068	$8,040	103,096

Source: RFA analysis using the IMPLAN system and USDA-ERS export multipliers

The agriculture sector accounted for over half of the total GDP and income that were generated, along with three-quarters of the jobs that were supported. This is reflective of the fact that ethanol facilities processed more than 5.5 billion bushels of corn (and grain sorghum) valued at $24 billion, and feedstock costs represented three-quarters of cash operating expenses.

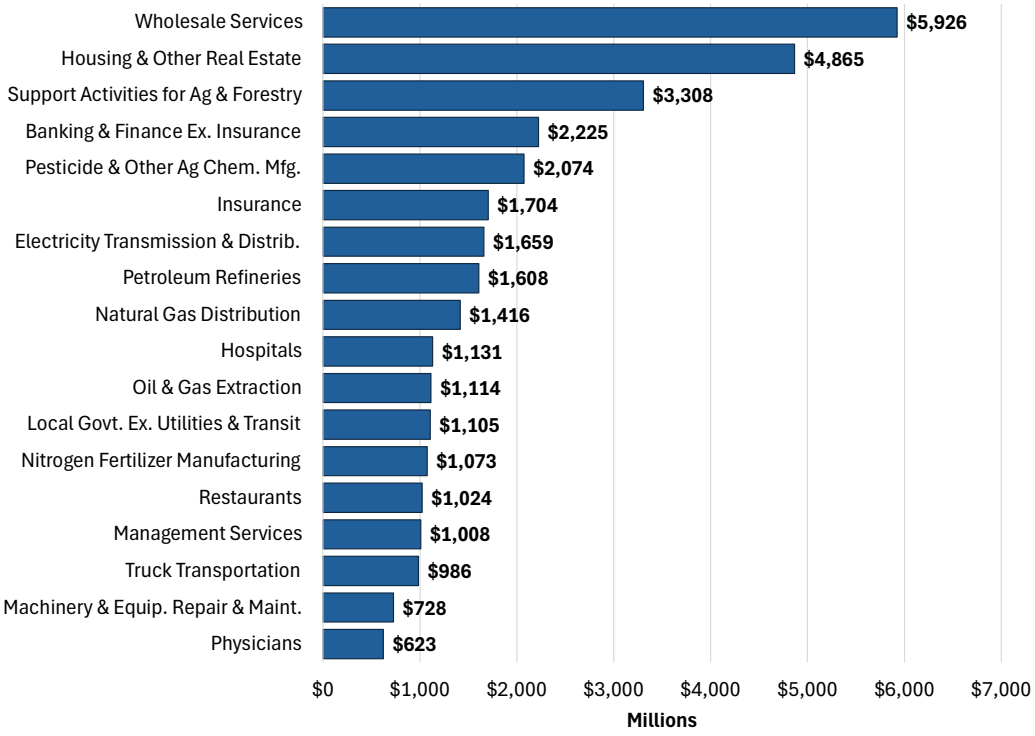
Together, ethanol production (i.e., the processing of grain into ethanol) and agriculture accounted for 90% of value added and income, as well as 95% of jobs. Export-related services (e.g., transportation and wholesale services) contributed most of the remainder.

Construction (including equipment) and research-and-development activities also made significant, but smaller contributions. Construction or expansion of plants to provide an additional 275 million gallons of annual ethanol production was ongoing during the course of the year or underway at the end of the year. This was undertaken to serve expanding markets or in response to tax incentives such as the section 45Z Clean Fuel Production Credit.

The ripple effects throughout the broader U.S. economy are reflected in the fact that more than 400 industries have ethanol-related output of $1 million or more (Figure 5).[3] Excluding the primary grain-farming and ethanol production industries and incremental export services, other key industries (and categories of industries) in which economic activity is concentrated include:

- Wholesale services;
- Housing and other real estate;
- Support activities for agriculture and forestry; and
- Banking and finance (excluding insurance).

Figure 5: Output by Industry/Category, Excluding Grain Farming, Ethanol Production, and Incremental Export Services



Source: RFA analysis using the IMPLAN system
Note: RFA aggregated the wholesale services, housing and other real estate, banking and finance, insurance, and restaurants categories. Others are IMPLAN industries.

[3] Output is the value of production by an industry or industries. Value added is equal to output minus the intermediate inputs that are purchased by an industry. When looking at the entire economy or an aggregation of multiple industries, value added is used to avoid double counting. See: https://support.implan.com/hc/en-us/articles/360025171053-Output-Value-Added-and-Double-Counting

This economic activity led to higher tax revenues for local, state, and federal governments. Economic activity associated with the ethanol industry generated tax revenues of $9 billion in 2025, including $6 billion at the federal level, $2 billion at the state level, and over $1 billion at the local level.

Economic Analysis Methodology

RFA developed estimates of ethanol industry volumes, revenues, and expenditures and then modeled the industry's contribution to the U.S. economy utilizing the IMPLAN system.[4] As described by the developer, "IMPLAN is a regional economic analysis software and data application that is designed to estimate the impact or ripple effect of a given economic activity or the contribution of some existing activity within a specific geographic area."[5]

RFA analyzed the contribution of the ethanol industry to value added, income, and employment. GDP is the sum of the value added by all industries in the economy. In IMPLAN, income encompasses "all forms of employment income, including employee compensation (wages and benefits) and proprietor income," which is the "income of sole proprietorships, partnerships, and tax-exempt cooperatives."[6]

IMPLAN does not have an industry code specific to ethanol production, so RFA developed a custom spending pattern; corn purchases were excluded from the pattern so that they could be modeled separately.[7] For ethanol production, the analysis was structured as an industry contribution analysis to illustrate the existing industry's role in the U.S. economy, rather than as an economic impact analysis focused on the effects of a new policy or the construction of new facilities. This approach constrained feedback effects within this segment of the analysis. For corn production, RFA used the grain-farming industry in IMPLAN but scaled the employment, compensation, and output values that were used, in order to avoid overstating the impact on the agriculture sector.

Finally, although IMPLAN was utilized for a large majority of the analysis, agricultural trade multipliers from the U.S. Department of Agriculture's Economic Research Service (ERS) were

[4] IMPLAN® model, 2024 Data, using inputs provided by RFA and IMPLAN Group LLC, IMPLAN System (data and software), 16905 Northcross Dr., Suite 120, Huntersville, NC 28078 www.IMPLAN.com.
[5] Candi Clouse, "IMPLAN Report Toolkit," *IMPLAN Support Site*, IMPLAN Group LLC, August 30, 2023, https://support.implan.com/hc/en-us/articles/360044985833-IMPLAN-Report-Toolkit.
[6] Clouse, "IMPLAN Report Toolkit."
[7] The other basic organic chemical manufacturing industry encompasses dry-mill ethanol production, which accounts for more than 90% of U.S. ethanol output.

used for exports, since ERS provides multipliers specific to ethanol and DDGS exports.[8] Given that the economic contribution of ethanol production was already modeled in IMPLAN, only the incremental activity associated with exports is estimated in this step, in order to avoid double-counting. For this report, export services were the only economic activity downstream from ethanol production that was included in the economic analysis (i.e., otherwise, only backward linkages in the supply chain were considered).

Conclusion

The industry's contribution to the U.S. economy has been felt most profoundly in rural America. However, it is important to note that this report does not capture all the economic benefits of ethanol, since it does not address activity downstream from ethanol facilities other than exports. Most notably, because ethanol is present in almost all gasoline sold in the United States, consumers across the country save money every time they fill up at the pump.[9]

Moreover, ethanol has benefits beyond the economy, including enhancing America's energy security and cutting emissions of greenhouse gases and tailpipe pollutants. And the industry's economic and other benefits can grow further, if midlevel blends such as E15 are allowed to be sold year-round, export markets continue to be opened, and new uses, such as in marine and aviation fuel, are developed.

[8]U.S. Department of Agriculture, Economic Research Service, *Agricultural Trade Multipliers*, updated July 2, 2025. https://ers.usda.gov/data-products/agricultural-trade-multipliers.
[9] See: https://ethanolrfa.org/media-and-news/category/blog/article/2025/11/ethanol-is-making-travel-more-affordable-this-thanksgiving