

2025 POCKET GUIDE TO
ETHANOL

BACK TO OUR
ROOTS



This Pocket Guide offers up-to-date statistics and insights into the U.S. ethanol industry. It complements and distills the in-depth analyses featured in the Renewable Fuels Association's **2025 Ethanol Industry Outlook**, available in print and as a downloadable digital version.



Geoff Cooper
President & CEO

RFA is the leading trade association for the U.S. ethanol industry. Discover our members, initiatives, and resources at **EthanolRFA.org**.

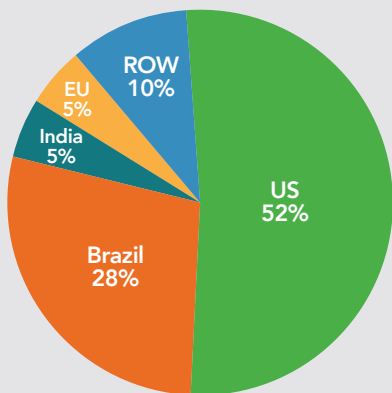
AN EXTRAORDINARY FUEL

Ethanol, or ethyl alcohol (C_2H_5OH), is a renewable fuel produced from plants—organic materials containing starches, sugars, or cellulosic matter. In the U.S., nearly all ethanol is processed by dry mills using field corn not intended for human consumption via milling, cooking, enzymatic breakdown, fermentation, distillation, and dehydration. Ethanol used as a fuel source checks several notable boxes:

- ✓ Renewable and sustainable
- ✓ Reduces greenhouse gases
- ✓ Boosts octane levels
- ✓ Improves combustion efficiency
- ✓ Supports energy independence
- ✓ Stimulates rural economies
- ✓ Offers savings to refiners and consumers

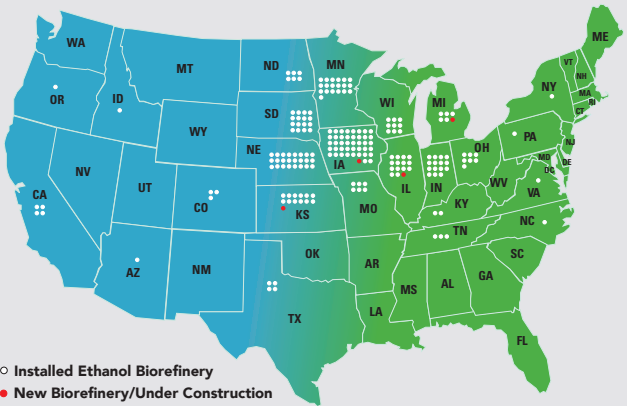
A U.S. POWERHOUSE

Global fuel ethanol production hit a record **31.1 billion** gallons in 2024. The United States remained the largest producer, accounting for over half of global output.

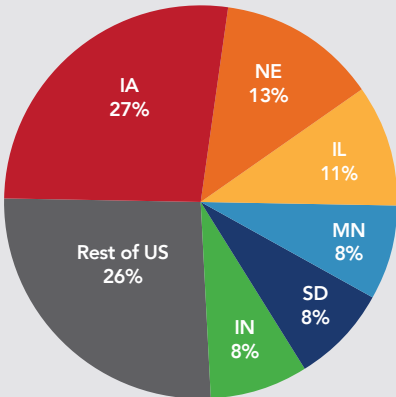


Nearly **200** ethanol biorefineries across **24** states have a cumulative total capacity of over **18 billion** gallons and an average per average plant capacity of **92 million** gallons per year.

Year	Installed Ethanol Biorefineries	Total Installed Production Capacity (mgy)	Average Capacity per Biorefinery (mgy)
2004	81	4,398	54
2009	189	13,028	69
2014	213	15,077	71
2019	205	16,924	83
2024	198	18,268	92



Over half of production capacity is installed in the largest corn states of Iowa, Nebraska, and Illinois.



FUELING THE ECONOMY

In 2024, biorefineries processed 5.5 billion bushels of corn worth roughly **\$23 billion** into **\$34.5 billion** of ethanol and co-products. This **50% boost** makes ethanol the most important value-added market for U.S. corn.

Ethanol's Value-Added Proposition

Based on average prices and product yields in 2024, a typical dry mill ethanol plant was adding approximately \$2.06 of additional value—nearly 50%—to every bushel of corn processed.

Corn Cost per Bushel

\$ 4.20



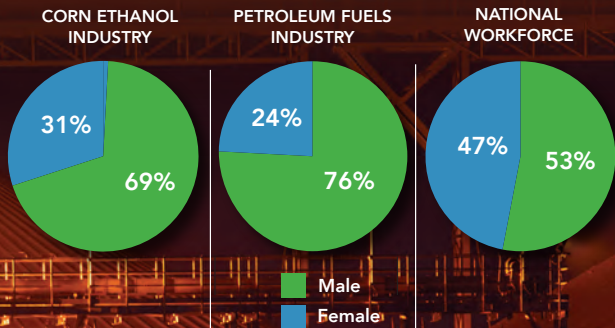
Value of Outputs per Bushel	
Ethanol	\$4.71
Distillers Grains	\$1.16
Distillers Corn Oil	\$0.39
TOTAL	\$6.26

Ethanol and the 2024 Economy

Direct Jobs	55,810
Indirect/Induced Jobs	258,089
Household Income	\$28.3 Billion
GDP Contribution.....	\$53.0 Billion
Tax Revenues.....	\$10.3 Billion

The ethanol industry provides **stable jobs** with **competitive wages** in rural communities, offering valuable employment opportunities where they are often scarce.

WORKFORCE DEMOGRAPHICS



SHARE OF WORKFORCE COMPOSED OF VETERANS

16%

10%

5%

FUEL AND FOOD

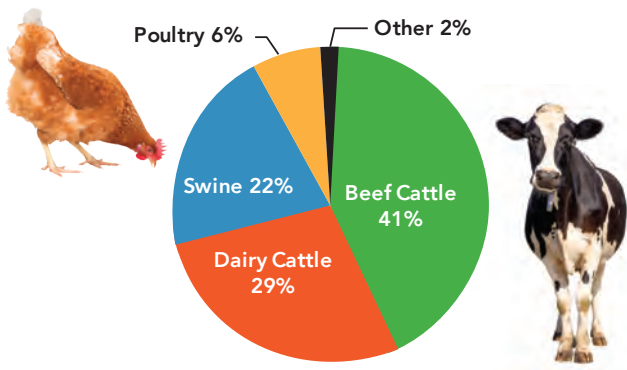
The U.S. ethanol industry is among the largest suppliers in the world of nutritious, high-protein animal feed. In 2024, ethanol biorefineries generated **36 mmt** of distillers grains and corn gluten feed and meal.

On average, **1 bushel of corn** yields:

2.9 gallons	Denatured fuel ethanol
14.5 pounds	Distillers grains (10% moisture)
0.9 pounds	Distillers corn oil
16.0 pounds	Captured biogenic CO ₂

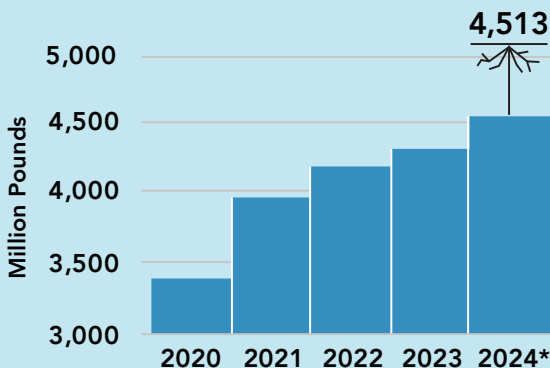
Distillers grains are an important ingredient in animal feed rations worldwide.

2024 DISTILLERS GRAINS CONSUMPTION BY SPECIES



Distillers corn oil is a key feedstock for biobased diesel and SAF. It is also an animal feed ingredient.

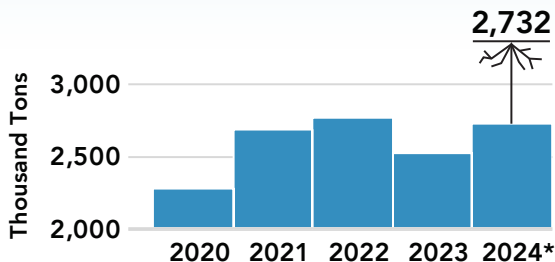
DISTILLERS CORN OIL PRODUCTION



**Projected based on Jan.-Oct. 2024 data*

High-purity CO₂ plays a vital role in the food and beverage industry and serves a wide range of essential industrial applications.

ANNUAL BIOGENIC CO₂ CAPTURED AT U.S. ETHANOL FACILITIES



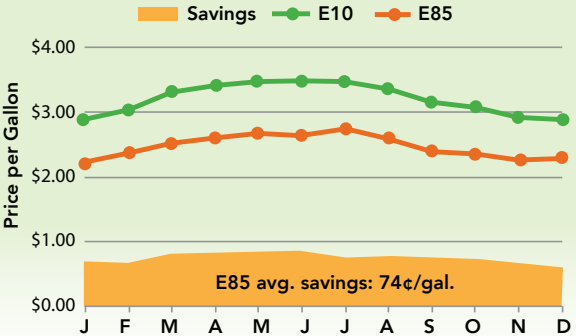
**Projected based on Jan.-Nov. data*

HIGHER ETHANOL BLENDS

EPA approves E15 in **100%** of cars and light trucks built over the past 25 years. Automakers endorse E15 use in **94%** of vehicles sold in 2024.

Over **20 million** flex fuel vehicles (FFVs) on the road today can use fuel blends with up to 85% ethanol. Still, automakers scaled back from 80 FFV models a few years ago to just a handful in 2025.

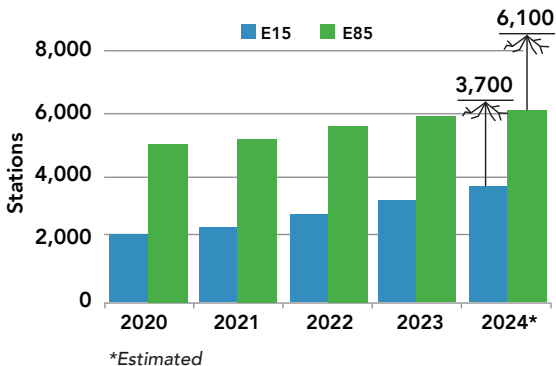
2024 NATIONAL AVERAGE RETAIL PRICES



In 2024, drivers choosing E85 pocketed **74 cents** on every gallon versus regular gas.

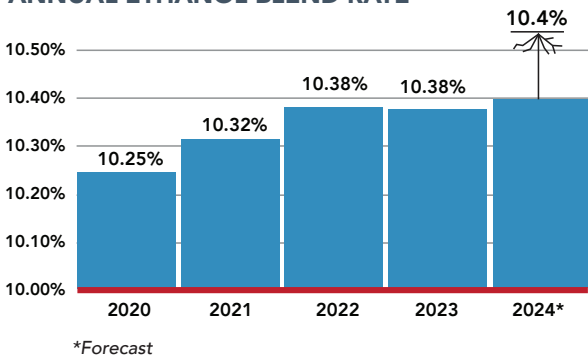


EXPANSION OF U.S. RETAIL STATIONS OFFERING E15 & E85



Expanded availability of E15 and higher level ethanol blends sustained the national average blend rate in 2024 at nearly **10.4%**—well beyond the so-called “10% blend wall.”

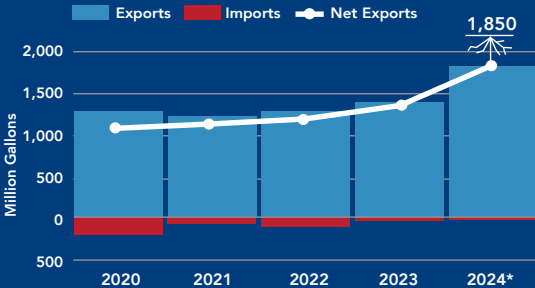
ANNUAL ETHANOL BLEND RATE



A GLOBAL MARKET

Record 2024 U.S. ethanol exports represented **12%** of production and **\$4.2 billion** in sales. Record-low imported ethanol was recorded.

U.S. NET ETHANOL EXPORTS



*Forecast based on Jan.-Oct. 2024 data

Booming demand pulled **37%** of U.S. distillers grains output into more than **50** countries.

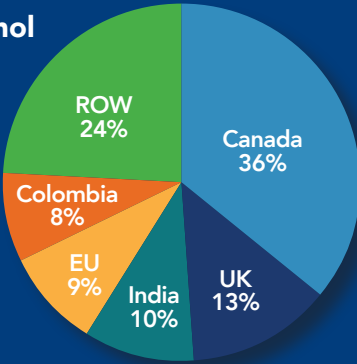
U.S. DISTILLERS GRAINS EXPORTS



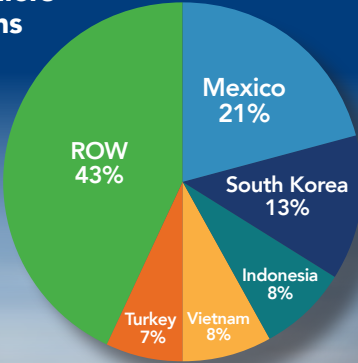
*Forecast based on Jan.-Oct. 2024 data

2024 TOP U.S. EXPORT MARKETS

Ethanol



Distillers Grains



(12 mo. moving avg. through Oct.)



THE POWER OF OCTANE

WHERE'S THE BUZZ AROUND OCTANE?

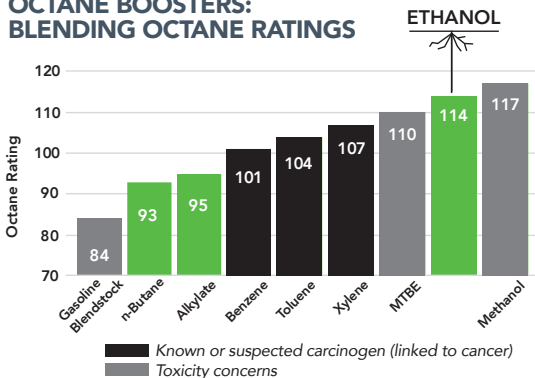
Automakers: Turbocharged, higher-compression engines thrive on high-octane gas to maximize performance.

Consumers: Sales of premium (high-octane) fuel has seen exponential growth for the last 15 years.

Refiners: Sub-octane gasoline blendstock gets a boost from cost-effective octane additives, creating the 87 AKI fuel drivers know and love.

Ethanol is the **safest** high-octane fuel additive available to refiners and blenders.

OCTANE BOOSTERS: BLENDING OCTANE RATINGS



Ethanol is also the **lowest cost** additive, so it helps lower prices at the pump.

LET'S CLEAR THE AIR

Ethanol is the **best tool available** to reduce tailpipe emissions of harmful pollutants.

Adding ethanol to gasoline reduced 2024 transportation sector GHGs by **54.3 mmt**. That's equivalent to:

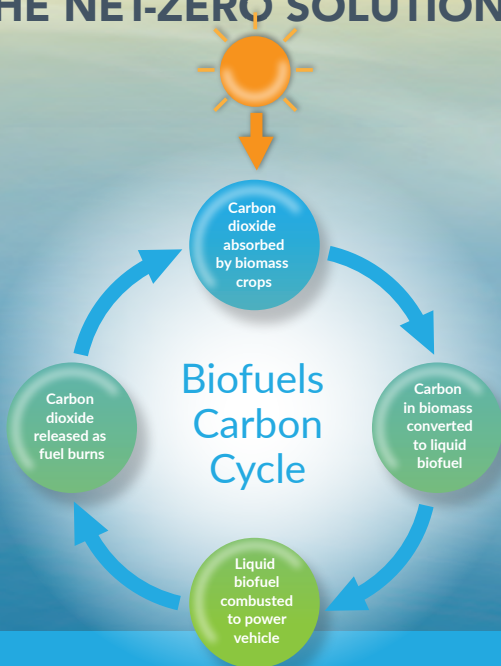
- Removing **12 million** cars from roads for 1 year
- Eliminating annual emissions from **14** coal-fired power plants
- Eliminating emissions from **313,000** roundtrip flights from LA to NYC

UC Riverside research finds that replacing E10 with E15 reduces:

Particulate matter	18%
Carbon monoxide	17%
Hydrocarbon gas emissions	8%
Nitrogen oxide	3%

A groundbreaking study led by The Hormel Institute finds that ethanol use in fuel dramatically **reduces emissions of cancer-causing toxic chemicals.**

THE NET-ZERO SOLUTION



2021 RFA Member Producer Pledge

By 2030, ensure ethanol reduces lifecycle GHGs by at least **70%** on average.

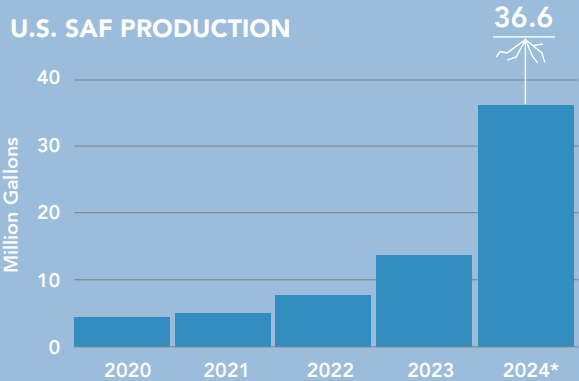
By 2050, ensure ethanol achieves **net-zero** lifecycle GHGs on average.

A landmark 2022 study identifies multiple technology pathways to achieving these goals **10 years ahead of schedule**. Indeed, today **8 out of 10** member facilities report they are already on track to reach these goals.

ETHANOL FLIES HIGH

In 2024, **26 billion gallons** of oil-based jet fuel accounted for **13%** of U.S. transportation-related emissions. Sustainable aviation fuel (SAF) can reduce those GHGs by **50-80% or more**.

U.S. SAF PRODUCTION



*Jan.-Nov.

- SAF production took off in 2024, nearly **tripling**.
- Most new SAF production came from lipid feedstocks like **distillers corn oil**.

Nascent SAF pathway **ethanol-to-jet (ETJ)** can approach **net-zero** or even **negative emissions** with innovations like carbon capture and climate-smart feedstocks.

Current U.S. ethanol production can meet **over 50%** of jet fuel demand when converted to SAF.



ENERGY SECURITY

The U.S. imports **one-third** of its crude oil. In 2024, Americans paid OPEC member countries **\$29 billion** for oil—that's **\$220 per household**.



90% of voters believe it's important that America strives for energy independence



77% think renewable fuels like ethanol are important for securing independence

Fortunately, the addition of ethanol to the U.S. fuel supply reduced the need for importing over **630 million** barrels of foreign oil.

HISTORIC OIL IMPORT DISPLACEMENT BY ETHANOL



*Estimated

RFA STAFF

Geoff Cooper President & CEO

Troy Bredenkamp SVP, Govt. & Public Affairs

Ken Colombini Communications Director

Kendra Coulson Marketing & Membership Manager

Mary Giglio VP, Events & Initiatives

Tad Hepner VP, Strategy & Innovation

Marylou Hoffman Office Manager & Human Resources

Edward S. Hubbard, Jr. General Counsel & VP, Govt. Affairs

Ann Lewis Senior Analyst

Cassie Mullen Director, Market Development

Jared Mullendore Policy Counsel & Director, Govt. Affairs

Scott Richman Chief Economist

Missy Ruff Director, Safety & Technical Programs

Justin Schultz Director, Environment, Health & Safety

Robert White SVP, Industry Relations & Market Development

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**ST. LOUIS
HEADQUARTERS**

16024 Manchester Rd.
Suite 101
Ellisville, MO 63011
636-594-2284

WASHINGTON, DC

601 Pennsylvania Ave. NW
North Building – Suite 200
Washington, DC 20004
202-289-3835



EthanolRFA.org



info@EthanolRFA.org



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