USGC Efforts in the Japanese Market

U.S. Grains Council
For ISCC
January 21, 2025

U.S. GRAINS COUNCIL

A global network of professionals building worldwide demand and developing markets for U.S. grains and ethanol.

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20 F St. NW, Suite 900 ▪ Washington, DC 20001 ▪ 202-789-0789 ▪ www.grains.org

Members: Partnership of Producers

✓**28 State Checkoff Boards**
- Corn
- Barley
- Sorghum

✓**1 National Checkoff Board**
- United Sorghum Checkoff Program

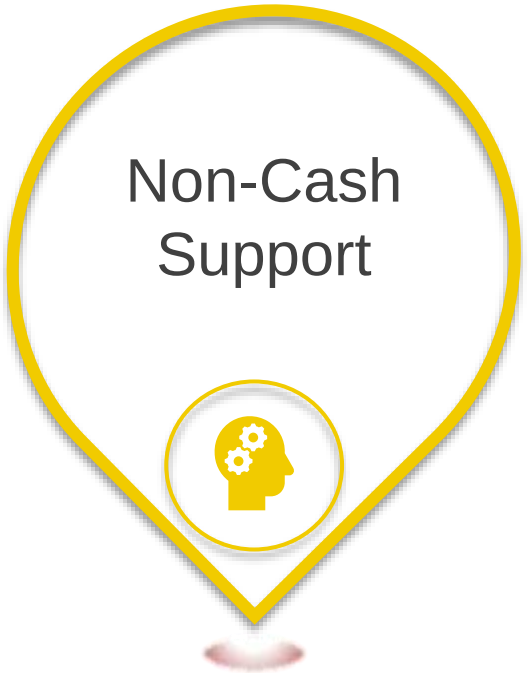
✓ **27 Grower Associations & Farm Bureaus**
- County, State & National

✓**117 Agribusinesses**
- Life Science
- Seed Providers
- Equipment, Storage and Handling
- Marketing, Commodity Traders
- Transportation
- Ethanol Plants

✓**8 State Non-Checkoff Entities**
- State Departments of Agriculture

Public/Private Partnership

Checkoff &
Agribusiness
Dollars Leveraged

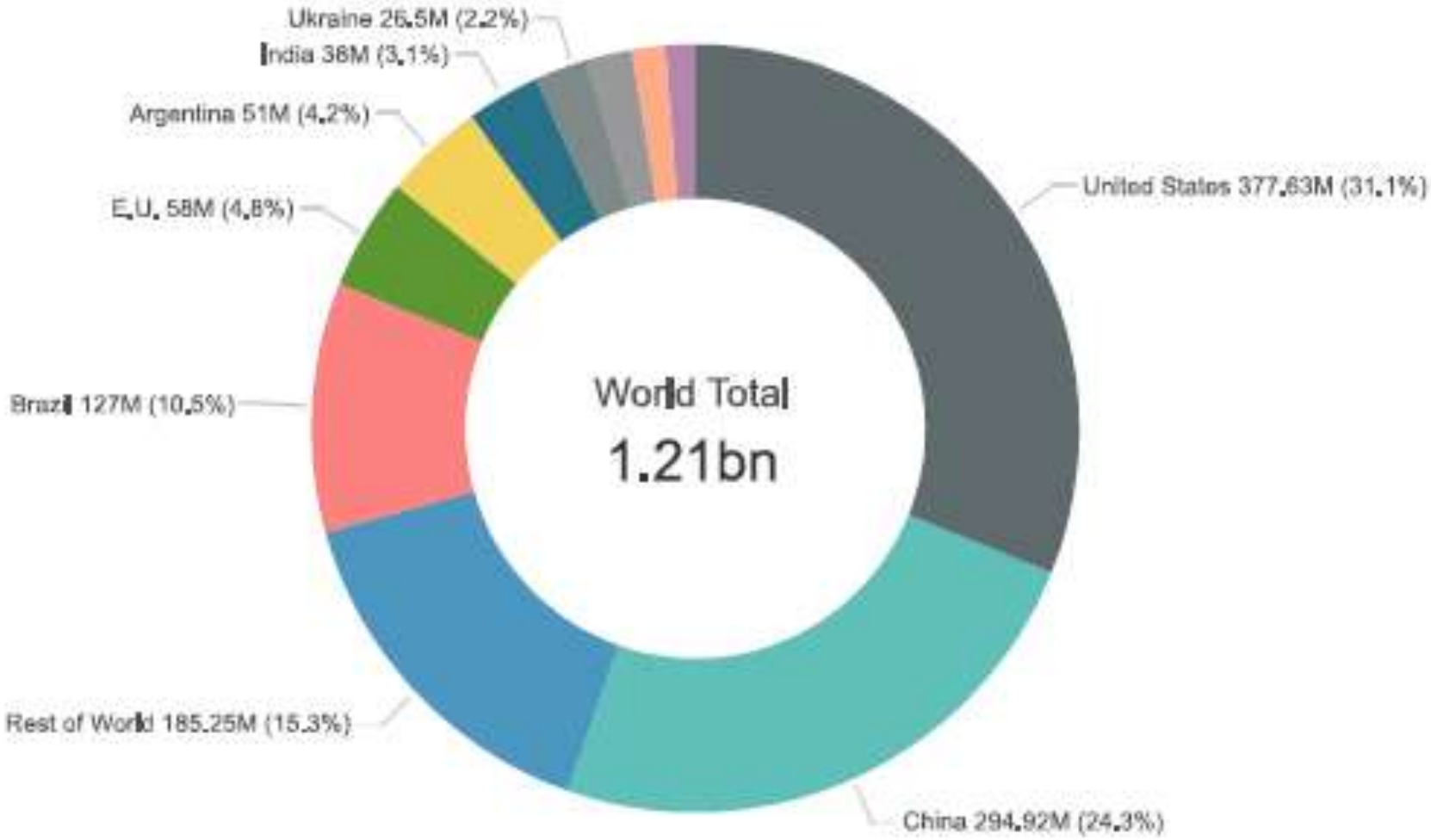


Good & Services
of U.S. and
Foreign Partners

USGC Competes
for MAP/FMD
Dollars

Corn

MY24/25 World Corn Production (MT)



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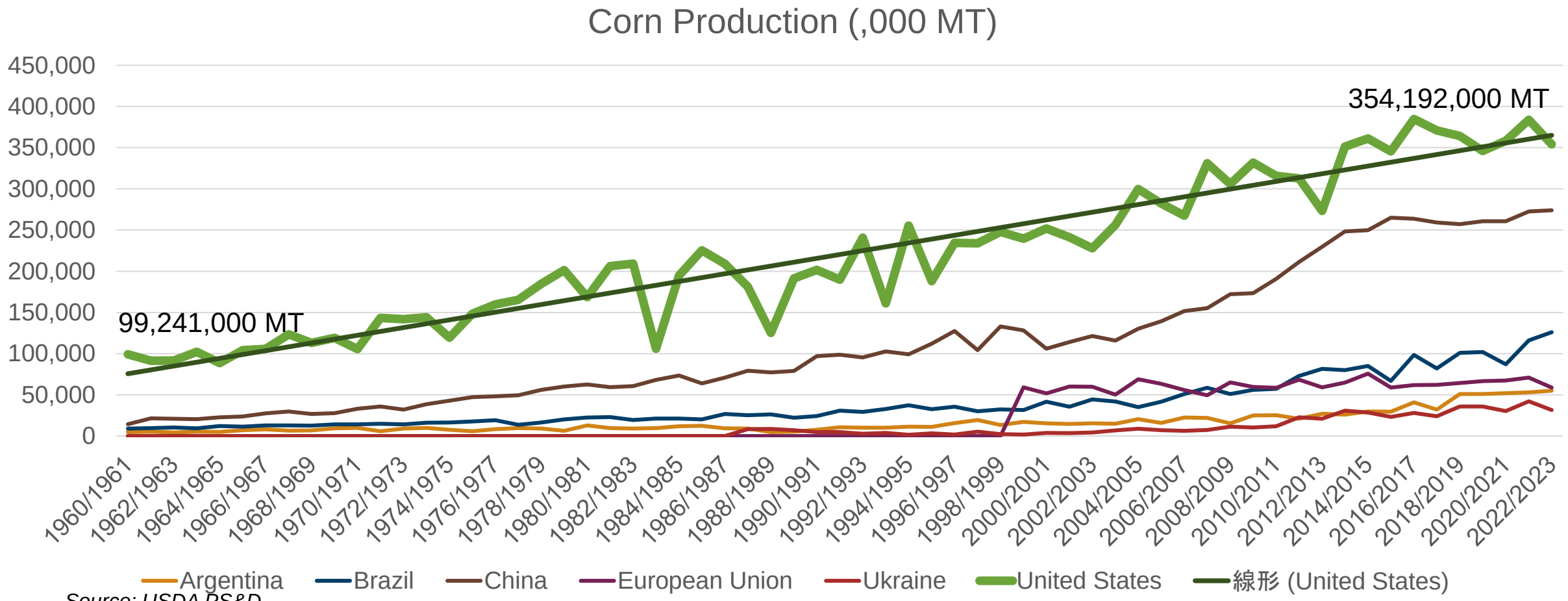
NCGA World of Corn

Source: USDA/FAS PS&D, Updated 2025/01/10

Corn Production Throughout History



Source: USDA PS&D

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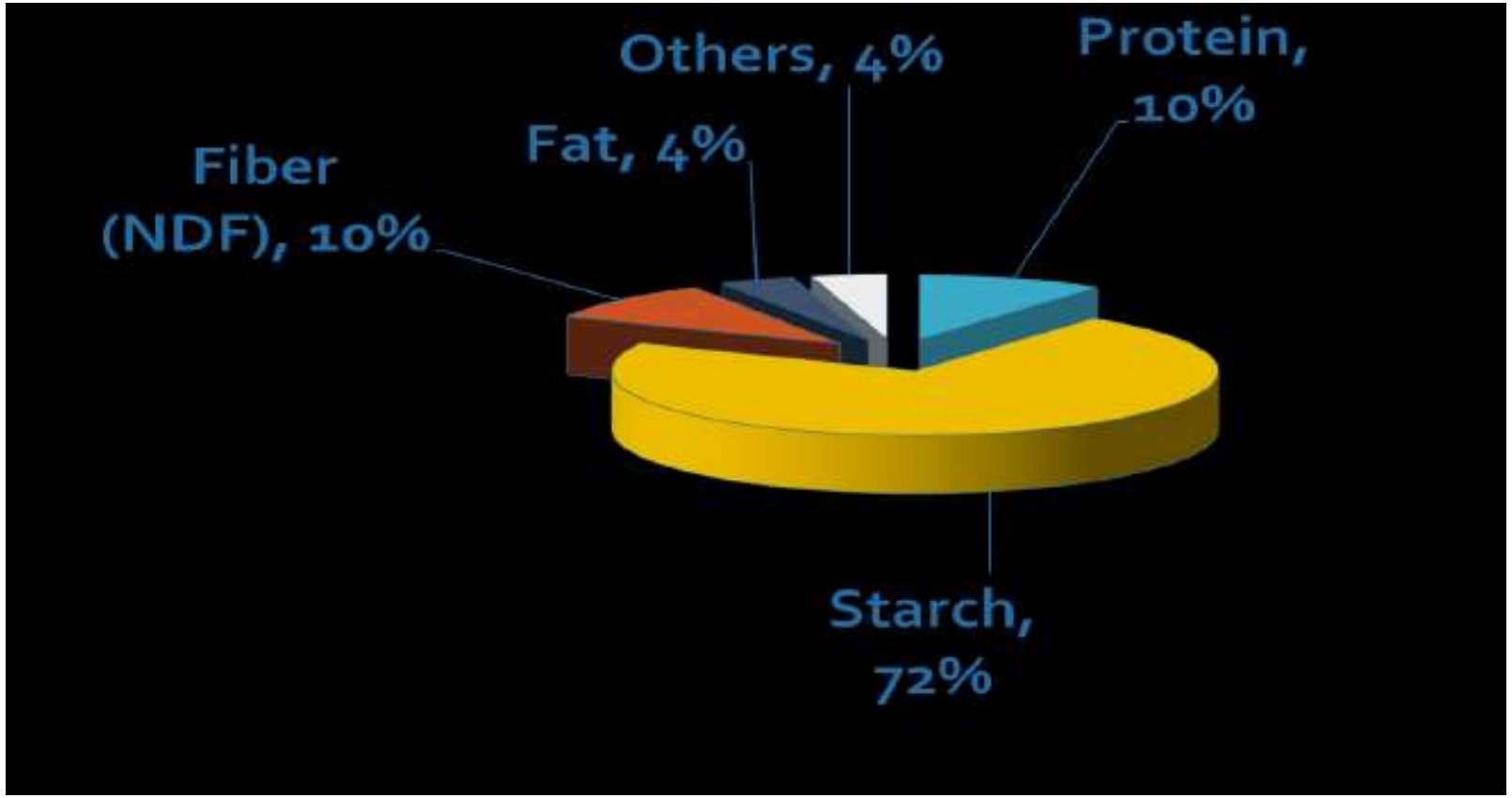
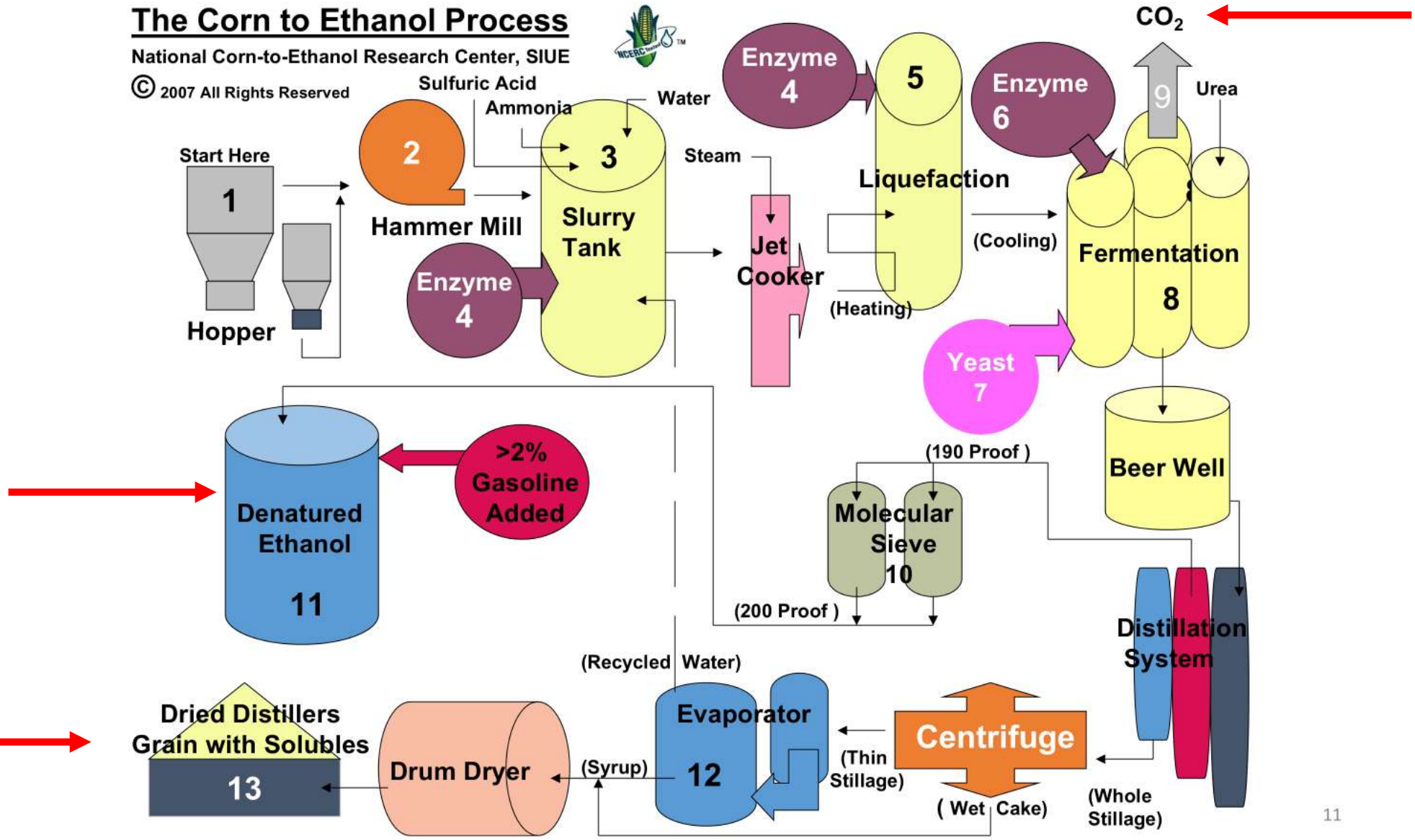
Ethanol

Corn kernel nutritional composition



Source: Dr. Vijay Singh, Professor & Executive DirectorIntegrated Bioprocessing Research Laboratory University of Illinois Urbana-Champaign



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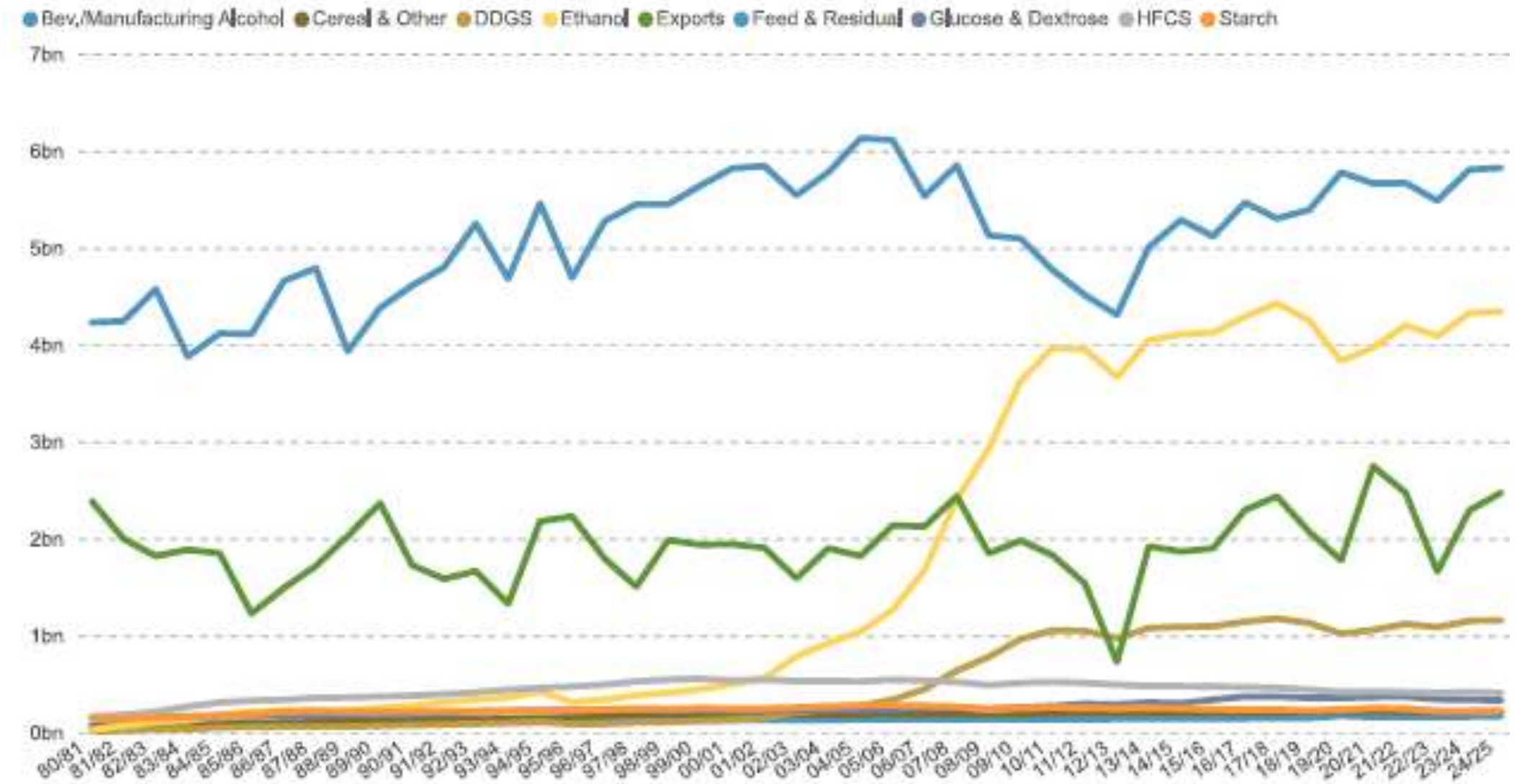
MY80/81 – MY24/25* U.S. Corn Usage Summary (Bu)



NCGA World of Corn
*Source: USDA/ERS Feed Grains Yearbook, Projected Values, Updated 12/13/2024

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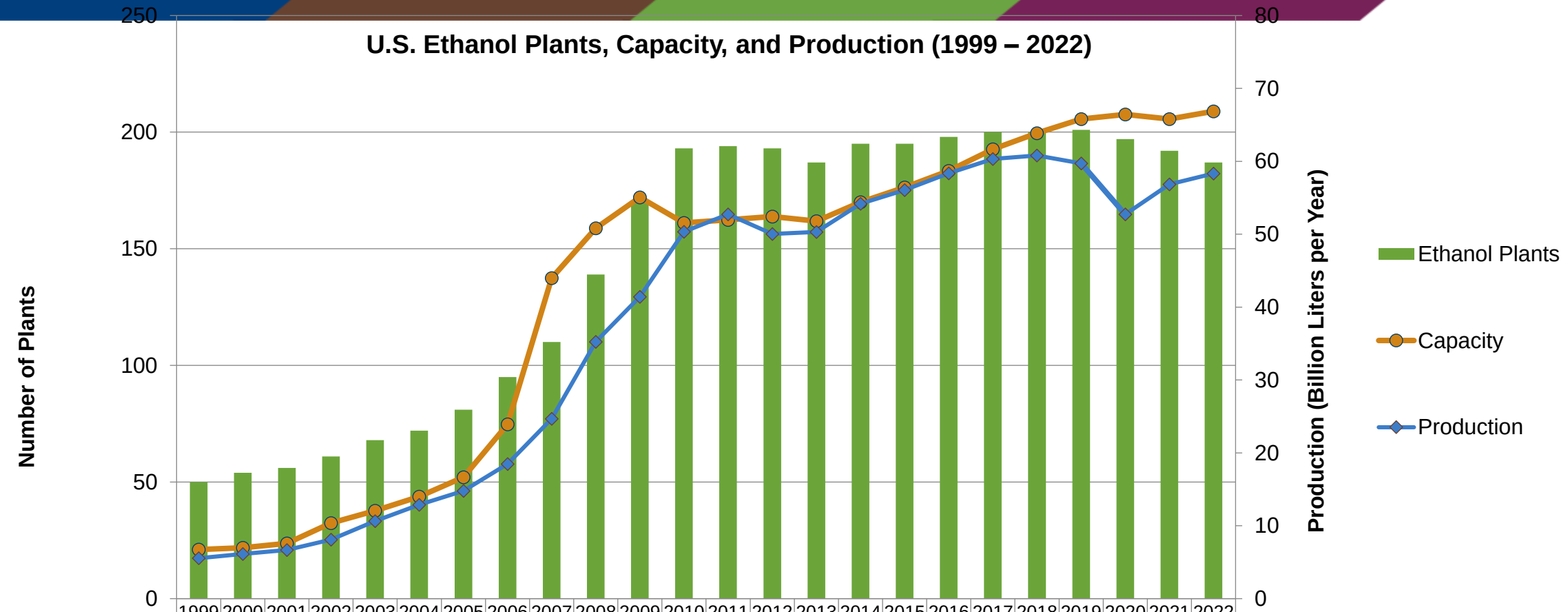
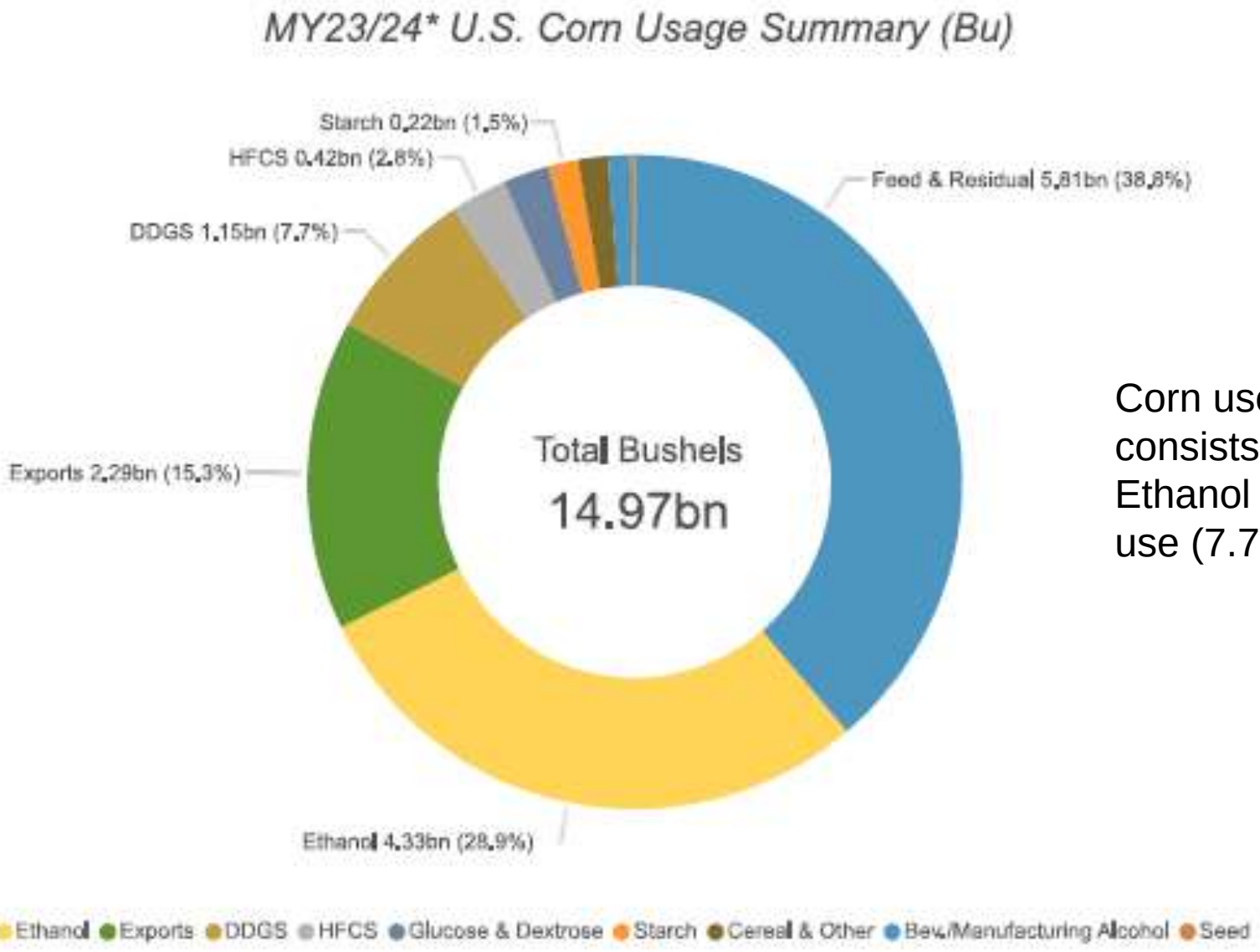
U.S. ethanol production capacity continues to expand with excess capacity at nearly 9 billion liters



	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022
Ethanol Plants	50	54	56	61	68	72	81	95	110	139	170	193	194	193	187	195	195	198	200	200	201	197	192	187
Capacity	6.73	6.96	7.59	10.3	12.0	14.0	16.6	23.9	43.9	50.8	55.0	51.5	51.9	52.4	51.7	54.3	56.4	58.6	61.6	63.8	65.7	66.4	65.7	66.8
Production	5.54	6.14	6.68	8.10	10.6	12.8	14.7	18.4	24.6	35.2	41.4	50.3	52.7	50.0	50.3	54.1	56.0	58.3	60.3	60.7	59.7	52.7	56.8	58.3

Data Source: U.S. EIA; DOE, Energy Efficiency & Renewable Energy, Alternative Fuels Data Center



NCGA World of Corn
*Source: USDA/ERS Feed Grains Yearbook, Estimated Values, Updated 12/13/2024

Corn use in the ethanol sector consists of 36.6%, sum of Ethanol use (28.9%) and DDGS use (7.7%).

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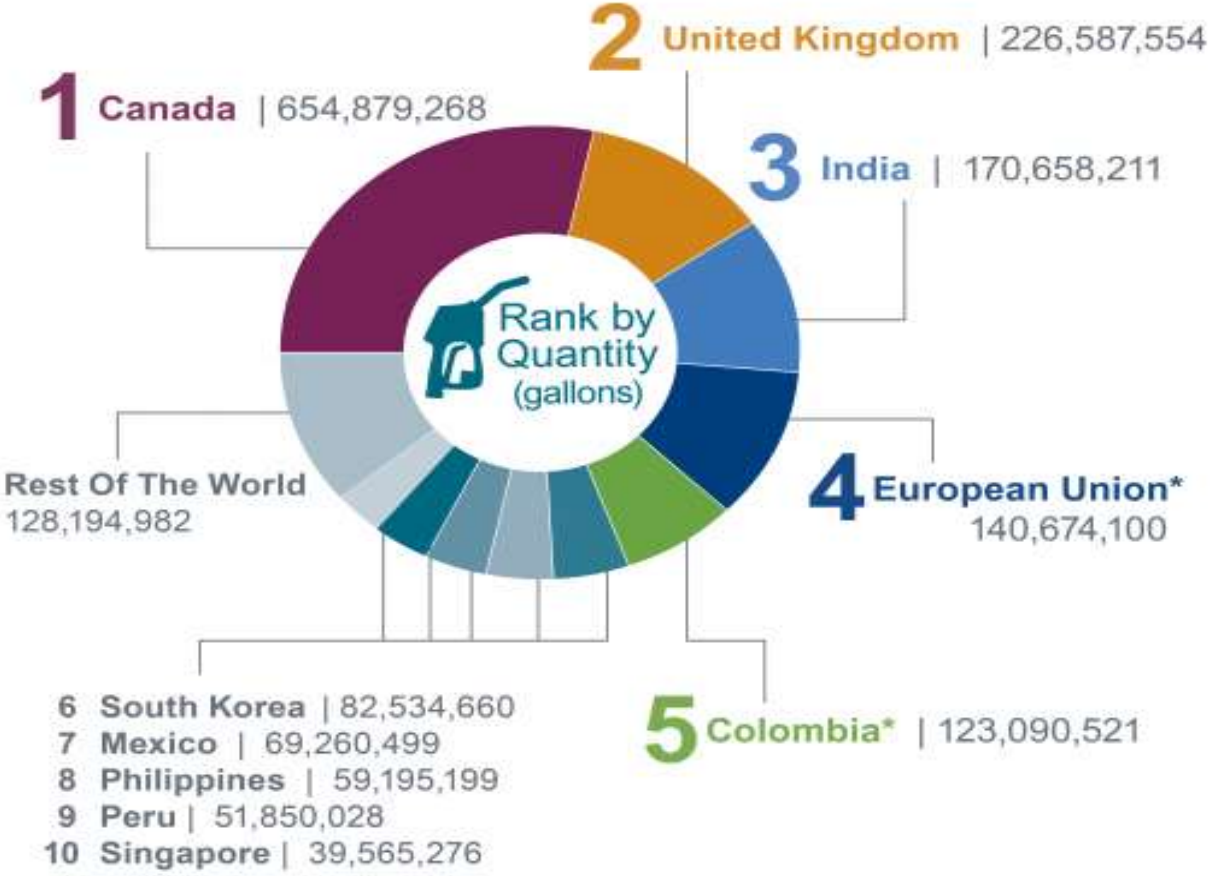
WHERE IS U.S. ETHANOL GOING?

TOP U.S. EXPORT CUSTOMERS IN MARKETING YEAR 2023/2024



6 South Korea | 82,534,660
7 Mexico | 69,260,499
8 Philippines | 59,195,199
9 Peru | 51,850,028
10 Singapore | 39,565,276

6 South Korea	$189,107,400	9 Philippines*	$130,530,035
7 Mexico	$183,560,685	10 Singapore	$82,648,232
8 Peru*	$137,029,503	Rest Of The World	$283,904,411

Source: USDA Foreign Agricultural Service's Global Agriculture Trading System report for marketing year September 1, 2023, to August 31, 2024.
**Ethanol is sold based on contract and at varying rates, therefore top rankings for gallons do not align with rankings for value.*

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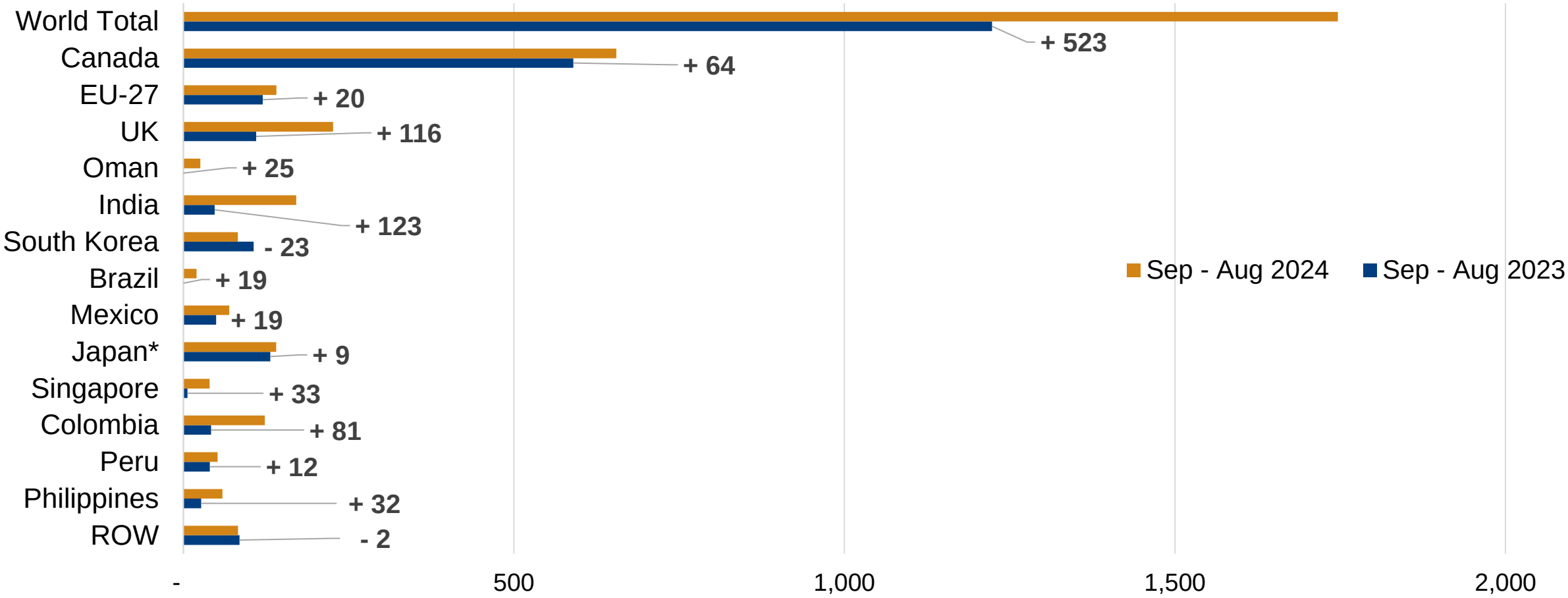
U.S. ethanol exports total 1.75 billion gallons in MY 2023/24, the largest export year on record.



Source: USDA Global Agricultural Trade System & *USGC estimates for Japan

ANTICIPATED U.S. ETHANOL OPPORTUNITIES IN EMERGING GLOBAL ETJ SAF MARKETS

The U.S. Grains Council anticipates the U.S. and Japan will be thriving markets in the near-term for corn ethanol-to-jet (ETJ).

Considering current production announcements and ETJ production capacity, approximately **2.25 billion gallons of ethanol will be needed for SAF by 2030**.

UNITED STATES

PRODUCTION ANNOUNCEMENTS BY PRODUCERS

	Start Year	ETJ in million gals/yr	Ethanol in million gals/yr
ADM-Gevo	2025-26	500	900
Gevo Net-Zero 1	2026	55	99
LanzaJet-Marquis	2023	120	216
Blue Blade Energy	2028	135	243
Summit Agriculture	2025	250	450

JAPAN

PRODUCTION ANNOUNCEMENTS BY PRODUCERS

	Start Year	ETJ in million gals/yr	Ethanol in million gals/yr
Idemistu - Project 1	2026	26	48
Idemistu - Project 2	2030	106	190
Cosmo Oil & Mitsui & Co.	2027	58	105

*Ethanol volume is assumed based on 1.8:1 ethanol to ETJ conversion

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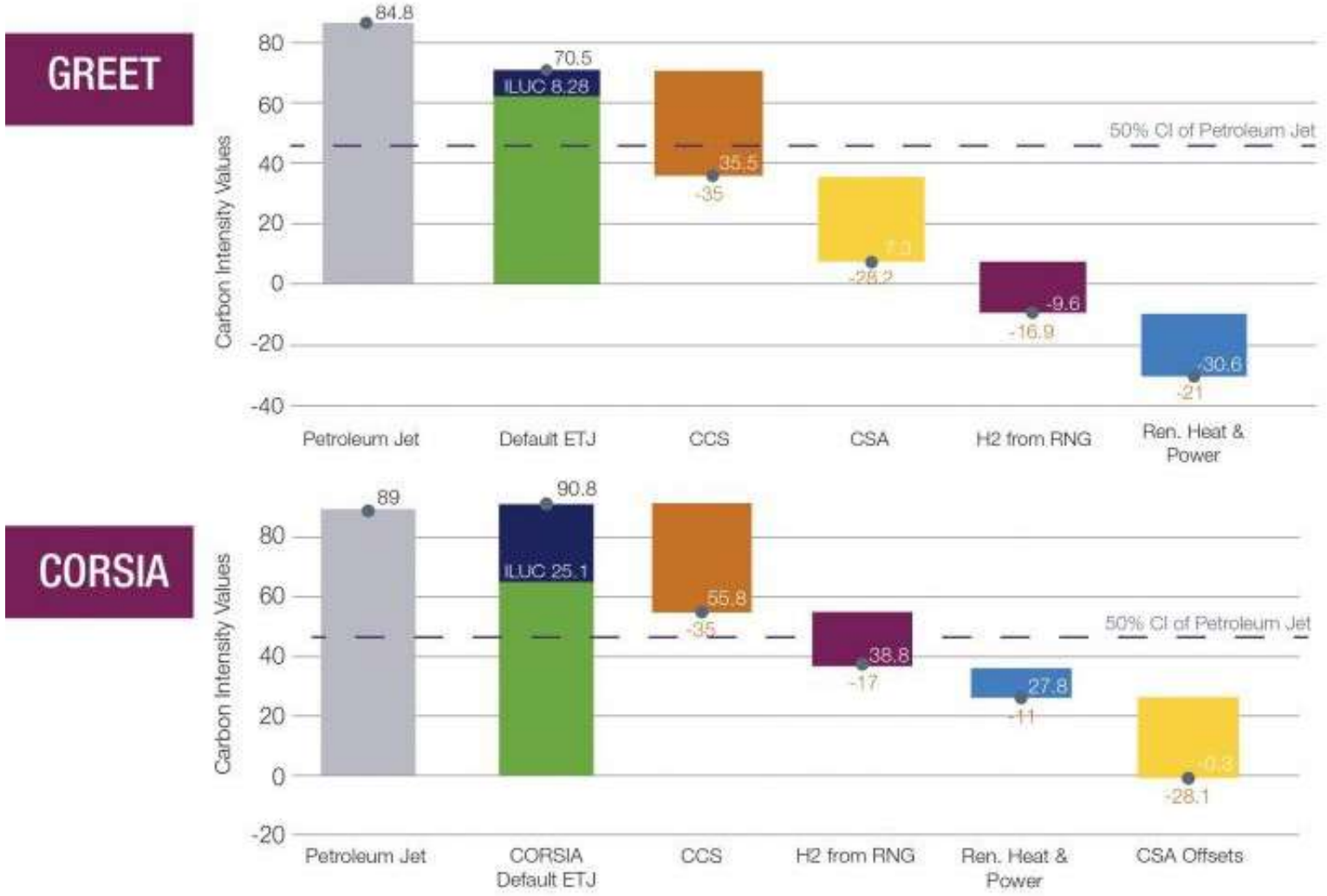
Carbon Intensity Reduction Potential of U.S. Corn Ethanol in Jet Fuel

Under the DOE GREET Model and the ICAO CORISA Model



*Charts for illustration purposes only. | Default EJT in GREET chart uses standalone configuration with corn oil extraction. | CCS = carbon capture and sequestration. CCS technology is not currently recognized by CORSIA; the figure in the CORSIA chart assumes a hypothetical scenario where CCS is accepted in the policy. | CSA = climate smart agriculture. The figure of CSA Offsets in the CORSIA chart shows indirect CI reduction through carbon offsets from regenerative agricultural practices assuming same inputs in GREET.

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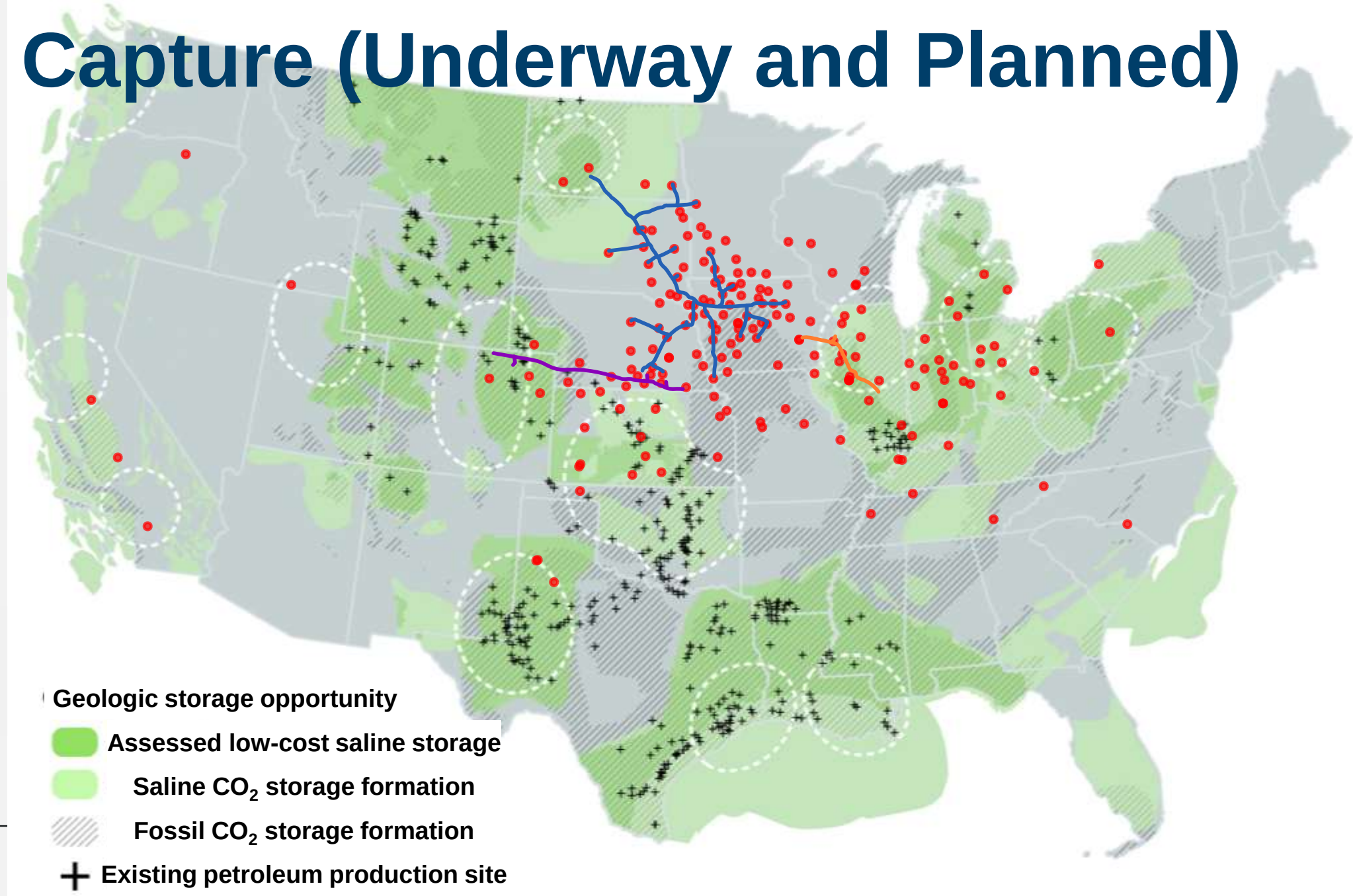
Carbon Capture (Underway and Planned)

50%
PIPELINE

25%
ON-SITE

25%
FOOD/BEV



Growth Energy™

Situation in Japan

Fuel Ethanol Situation

Gasoline consumption:

- 12 billion gallons per year (vs. 135 billion gallons in the U.S.: one-tenth)

Ethanol consumption/introduction (Sophisticated Act):

- Target volume set by GOJ: 217 million gallon per year (500,000 KL/year crude oil equivalent)

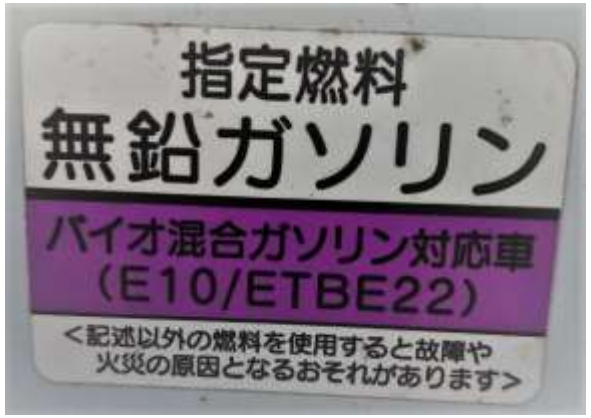
Use as ETBE (ethyl tertially butyl ether)

Gasoline specifications and ethanol blending

- Fuel Quality Control Act-Compulsory Standard
  - E3 is legally permitted since 2012
  - E10 specification; only for E10 compatible vehicles
- E3, E7 gasoline available by only one local blender

Gasoline specifications

Gasoline	
Items	Specification
Lead	Non-detectable
Sulfur content	0.001mass% max.
MTBE	7 vol% max.
Benzene	1 vol% max.
Kerosene	4 vol% max.
Methanol	Non-detectable
Washed gum	5 mg/100ml max.
Color	Orange
Oxgen content*1	1.3 mass% max.
Ethanol*1	3,0 vol% max.

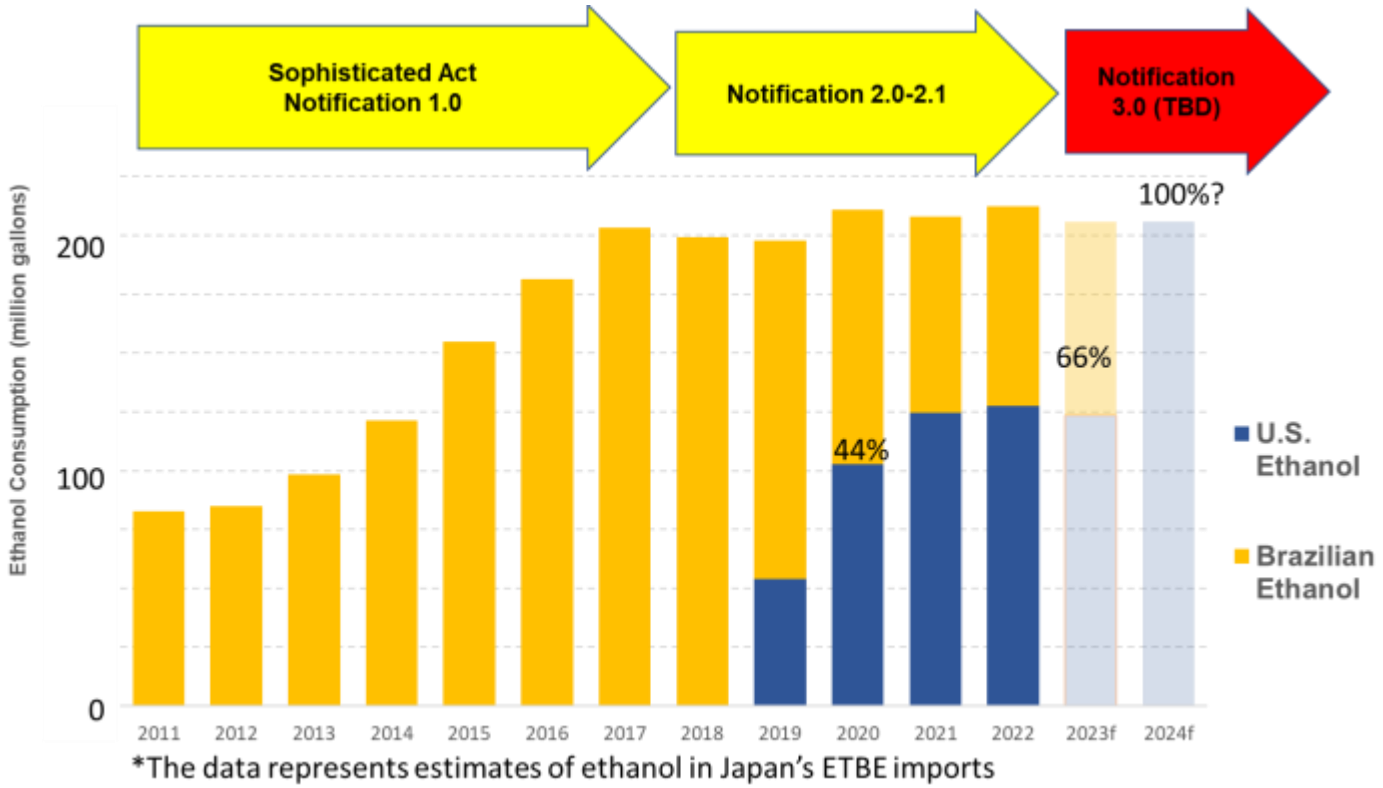


E10 compatible fueling cap label

E10 compatible vehicle fueling tank cap

‘Sophisticated Act’
Act on Sophisticated Methods of Energy Supply Structures

USDA/USGC efforts to increase U.S. fuel ethanol market access under Sophisticated Act



Enacted in 2010 for efficient use of petroleum
Biofuel as a part of it

Annual bioethanol target at 500,000 kL crude oil equivalent
(218 million gallons)

Ver. 3.0 went into effect on April 1, 2023
(U.S. 100% market access)

Carbon intensity values:

- Gasoline baseline: 88.74 gCO2/MJ
- U.S. corn-based ethanol: 36.86 gCO2/MJ
- Brazilian sugarcane-based ethanol: 28.59 gCO2/MJ
- U.S. ethanol can take 100% market share

U.S. market share depends on:

- Price competition
- Risk management by buyers

Roadmap for E10/E20 in Japan
METI and ENEOS plan for ethanol blending

METI (November 11, 2024)

2024 → 2030 → Early 2030's → 2040

- 2030: E10 Supply Start
- Early 2030's: 100% New Vehicle E20 Compatible
- 2040: E20 Supply Start

<u>What are needed</u>

1. Refineries and gas stations: Infrastructure development support
2. Auto sector: E10/20-compatible vehicles
3. Tax: Extension of gasoline tax ($1.2/gallon) exemption for ethanol
4. Consumer recognition of benefits

Future

Fueling Forward to Net-Zero

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Bioethanol is: **ABUNDANT**

The U.S. is the top international producer of bioethanol. With 187 bioethanol plants nationwide, the U.S. produces an estimated 17.7 billion gallons (67 billion liters) annually to meet growing global demands.*

Bioethanol is: **AFFORDABLE**

In most markets, bioethanol is generally priced lower than regular gasoline, reducing the price of blended fuel. Generally, the higher the bioethanol concentration, the more significant the price reduction of blended fuel.

Bioethanol is: **SUSTAINABLE**

Bioethanol is produced from agricultural products, and farmers prioritize soil health, nitrogen and energy management to preserve farmland for future generations.

Bioethanol is: **COMPATIBLE**

Bioethanol is an existing renewable fuel that, when mixed with petroleum, can be used at levels from E5 through E85, depending on the type of components or infrastructure utilized in specific countries.

Source:

* According to EIA (https://www.eia.gov/energyexplained/biofuels/ethanol-supply.php#:~:text=U.S.%20fuel%20ethanol%20production%20in,17.7%20billion%20gallons%20per%20year.)

Global Leaders in Ethanol Adoption

- Canada
  - E10- moving towards E15
- European Union & UK
  - E10 mainstream momentum, E85 and E20 pilot success
- Japan
  - ATJ SAF policy, Future direct ethanol blending as one of CN fuel introduction
- Nigeria
  - E10 Pilot
- India
  - E10 – moving to E20
- Southeast Asia
  - Vietnam –E5 expansion
  - Philippines – E20 discretionary
  - Indonesia – E8 pilot and E3 import spec
- Latin America
  - Brazil - E27 up to E100
  - Chile – developing SAF policy
  - Colombia - E10
  - Central America – E10 adoption

Unlocking the Potential of Alcohol-to-Jet - NOW Through 1G & 2G Feedstock Integration

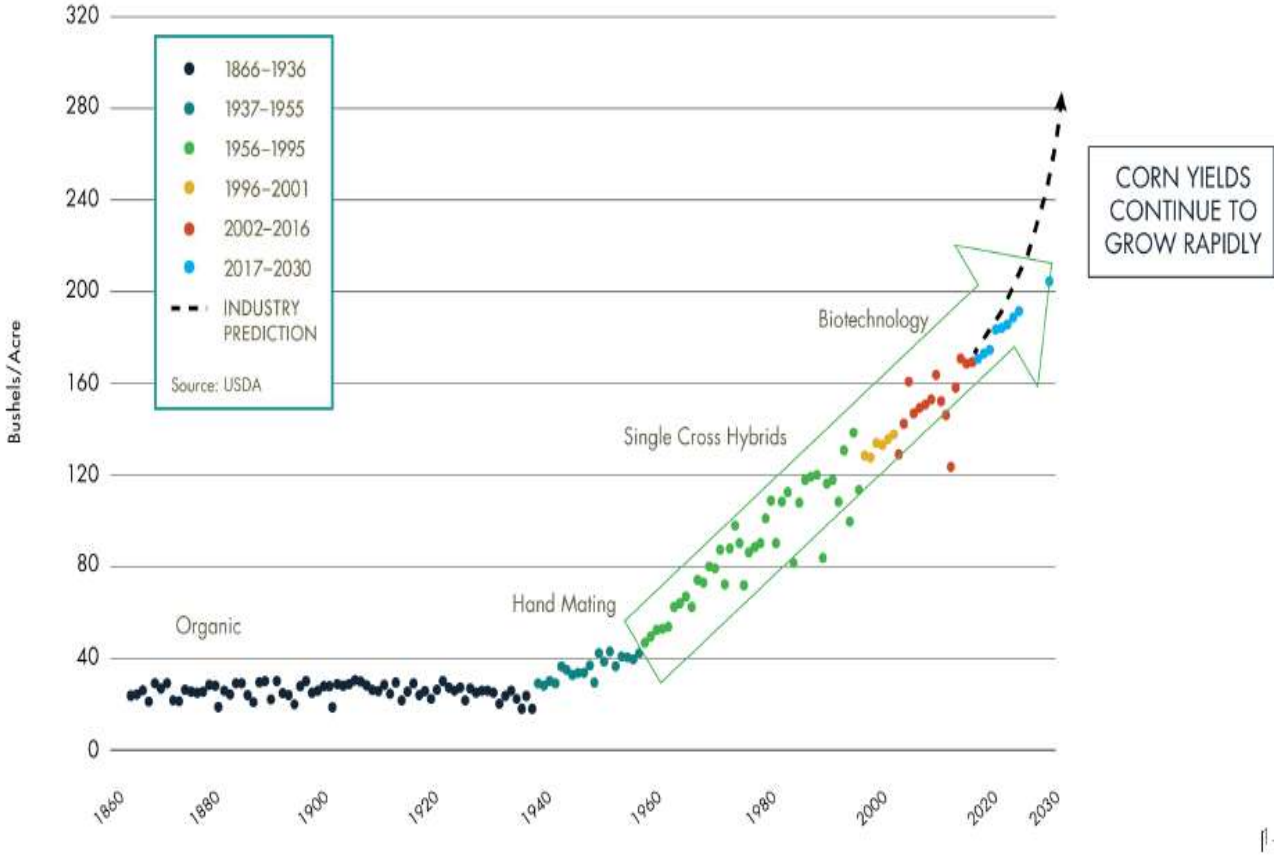
Bridging the Gap

Accelerate SAF Production Today: Leverage existing infrastructure and readily available, sustainable 1G feedstocks to rapidly scale SAF production and meet immediate demand.

Bridge to a Greener Future: While 2G technologies mature, sustainable 1G feedstocks provide a crucial bridge, enabling the aviation industry to significantly reduce its carbon footprint now.

Drive Decarbonization Now: Utilize readily available 1G feedstocks now, while supporting the advancement of complementary 2G technologies to diversify feedstock sources and enhance long-term sustainability.

US able to supplement domestic production



Approximately 10% of global bioethanol production enters global markets

U.S. dedicated 95 million acres to corn or 38.4 million hectares in 2023

- 37% of production feeds livestock
- 35% of production processed for bioethanol with coproduction of high-protein feed [dried distillers grains (DDGS)]
- Crop yields are expected to increase 1-2% per year
- Exceptional increase in residue harvesting technology expected

Source: U.S. Department of Energy 2023 Billion-Ton Report

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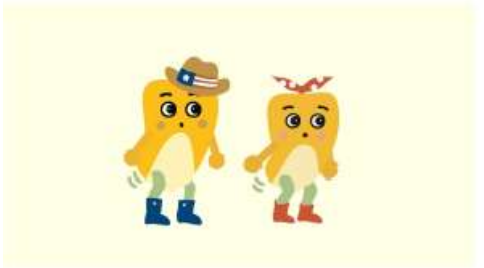
Ethanol Promotion

- Ethanol education teams to the U.S.
- Asia SAF and Bioethanol Summit
- Books, Magazines, Newspapers
- SNS campaign
  - X, Facebook, Instagram
  - YouTube



Thank you

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