

How Alcohol-to-Jet Can Meet Growing Jet Fuel Demand



NASDAQ: GEVO



Forward Looking Statement



This communication contains “forward-looking statements” within the meaning of Section 27A of the Securities Act of 1933, Section 21E of the Securities Exchange Act of 1934 and as defined in the Private Securities Litigation Reform Act of 1995. Forward-looking statements may be identified by the context of the statement and generally arise when the Company or its management is discussing its beliefs, estimates or expectations. Such statements generally include words such as “believes,” “expects,” “intends,” “anticipates,” “estimates,” “continues,” “may,” “plan,” “will,” “goal,” or similar expressions. Forward-looking statements are prospective in nature and are not based on historical facts, but rather on current expectations and projections of our management about future events and are therefore subject to risks and uncertainties, many of which are outside the Company’s control, which could cause actual results to differ materially from what is contained in such forward-looking statements as a result of various factors, including, without limitation: forecasts relating to synthetic aviation fuel and other products and feedstocks. These and other factors are identified and described in more detail in the Company’s Annual Report on Form 10-K for the year ended December 31, 2024, as well as the Company’s subsequent filings and is available online at www.sec.gov. Readers are cautioned not to place undue reliance on the Company’s projections and other forward-looking statements, which speak only as of the date thereof. Except as required by applicable law, the Company undertakes no obligation to update any forward-looking statement, or to make any other forward-looking statements, whether as a result of new information, future events or otherwise.

Summary: The World Needs More Jet Fuel, and We Believe We Can Make it Cost-Competitively Using Synthetic Aviation Fuel (SAF)



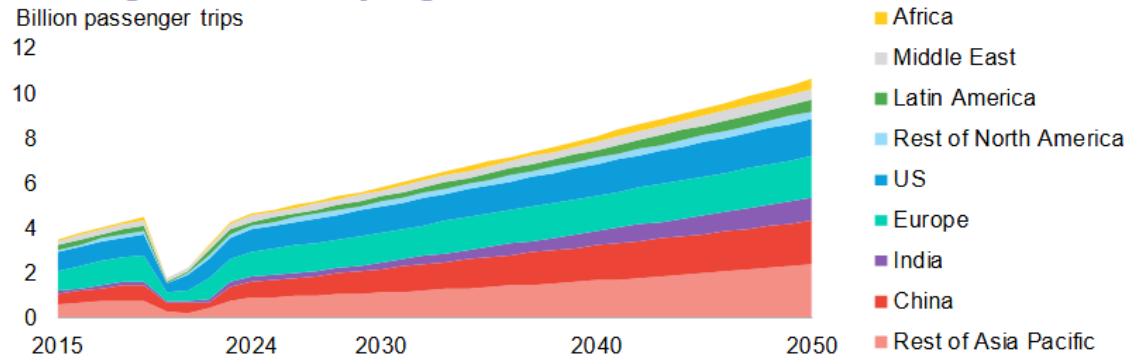
- We believe there is unmet demand for jet fuel, particularly in the US
 - Global jet fuel demand is growing
 - The US leads jet fuel demand, and we believe will require +2.3 billion gallons per year more by 2030
- The most economical and practical technologies to make SAF are Alcohol-to-Jet (ATJ) and Hydroprocessed Esters and Fatty Acids (HEFA)
 - Both are derived from biomass
 - ATJ
 - ATJ is about making jet fuel from ethanol, which is made from plant sugars
 - The US is the world's largest ethanol producer; ATJ diversifies this industry into high-valued jet fuel and SAF markets
 - Can achieve negative carbon footprints across the whole lifecycle
 - HEFA
 - Lower capital cost to deploy, but higher feedstock cost
 - The business systems can be influenced to improve footprint

Unmet Demand for Jet Fuel

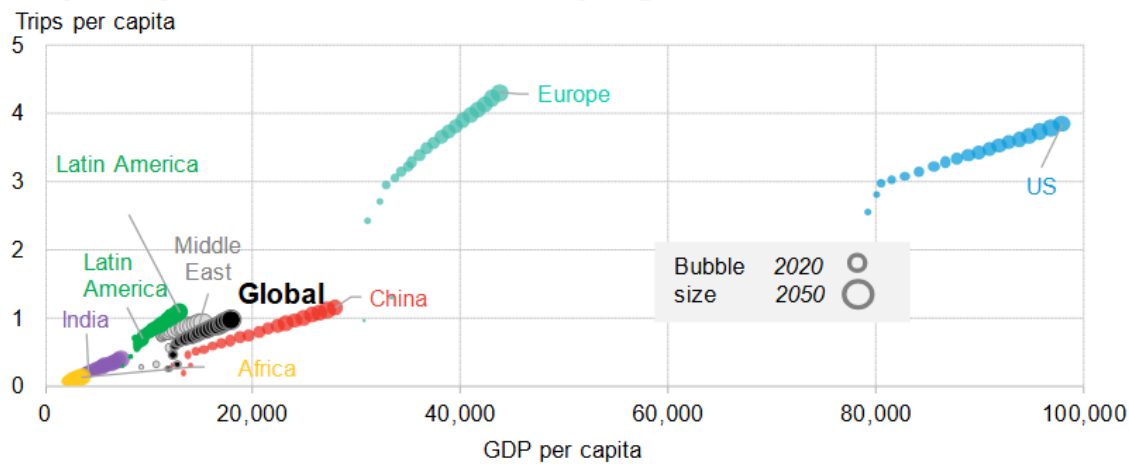


Global Jet Fuel Demand Continues to Grow, Lead by the US

Passenger numbers, by region

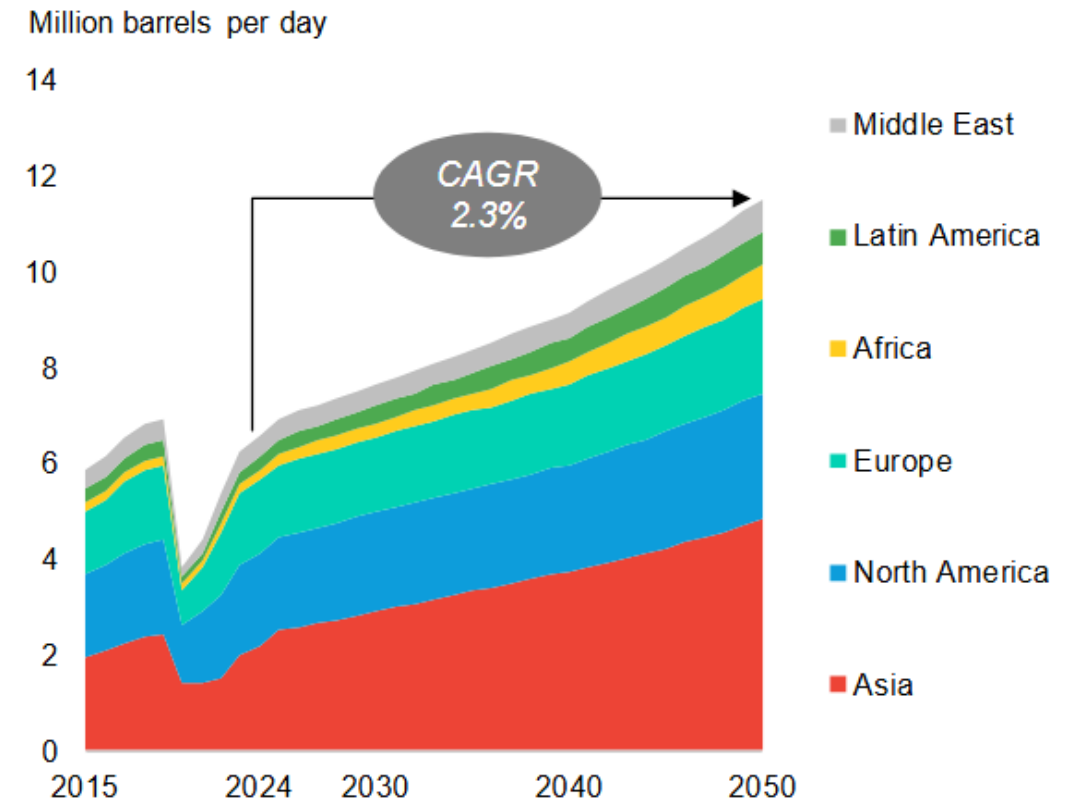


Propensity to travel versus wealth, by region



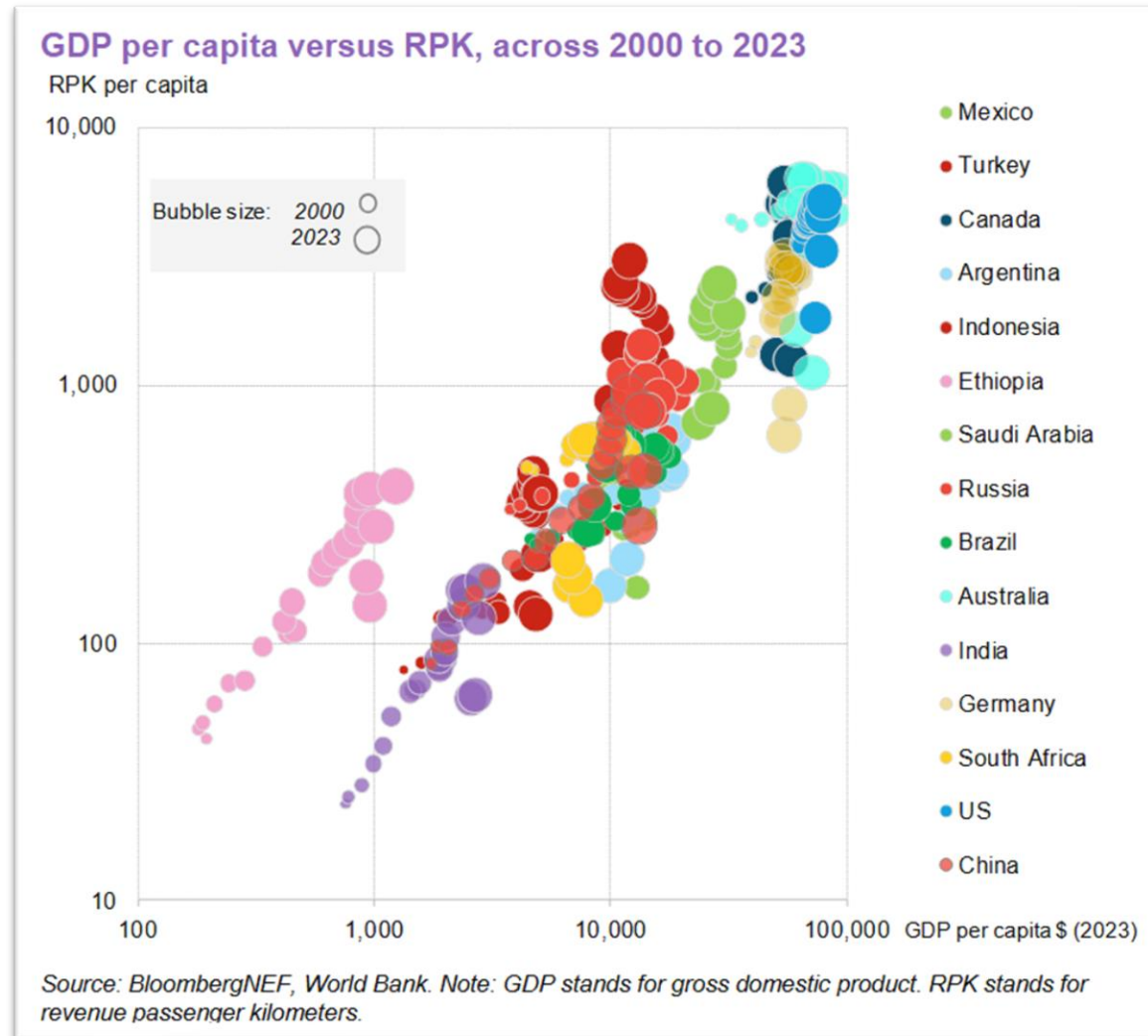
Source: BloombergNEF, International Energy Agency, World Bank, International Civil Aviation Organization.

Aviation fuel demand, by market

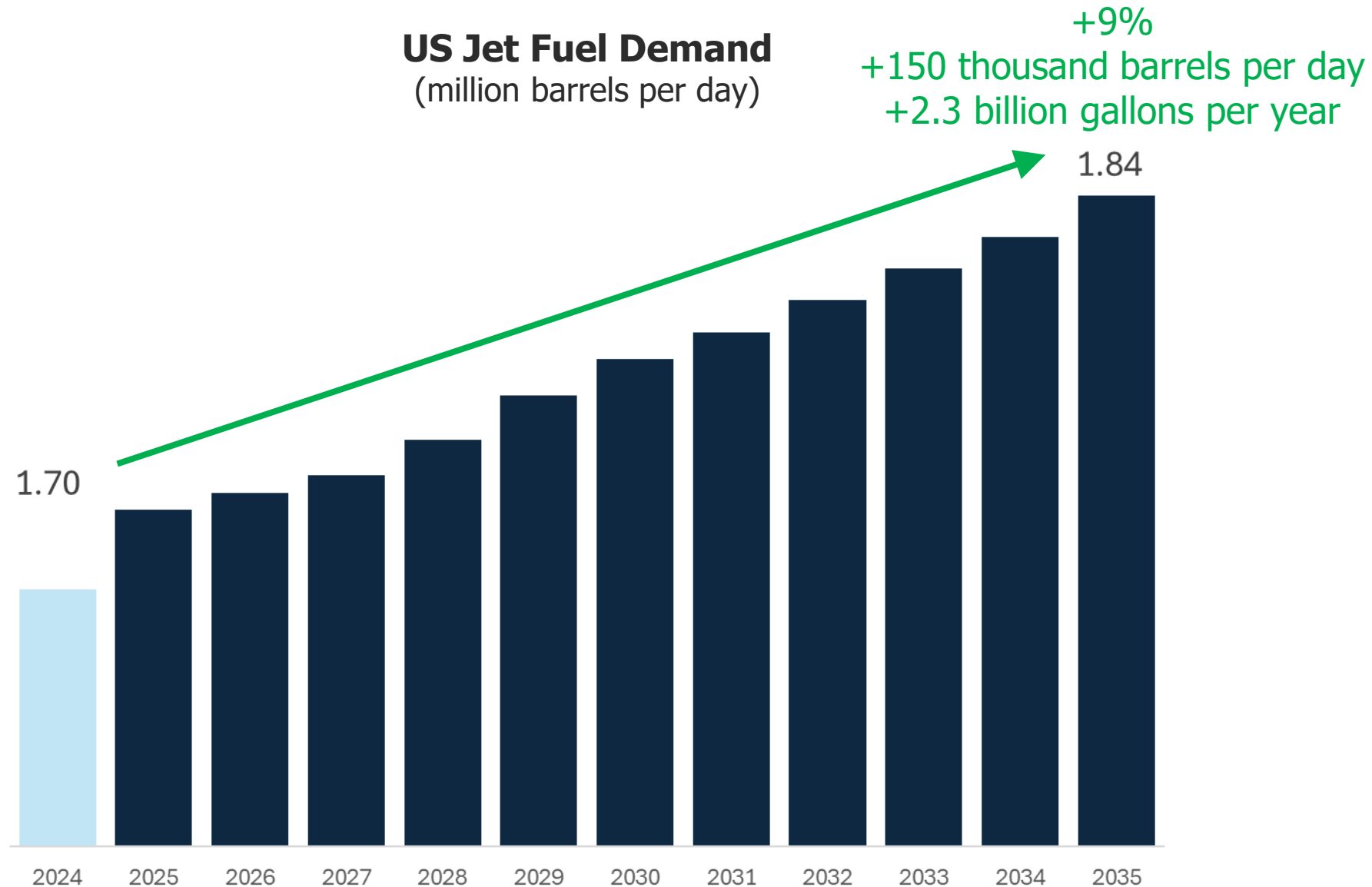


Source: BloombergNEF, International Energy Agency. Note: Aviation fuel demand includes jet, aviation gasoline and sustainable aviation fuels for both passenger aircrafts and freighters.

Increasing Air Travel is Associated with Increasing Prosperity



The US Will Need More Jet Fuel



Key Drivers

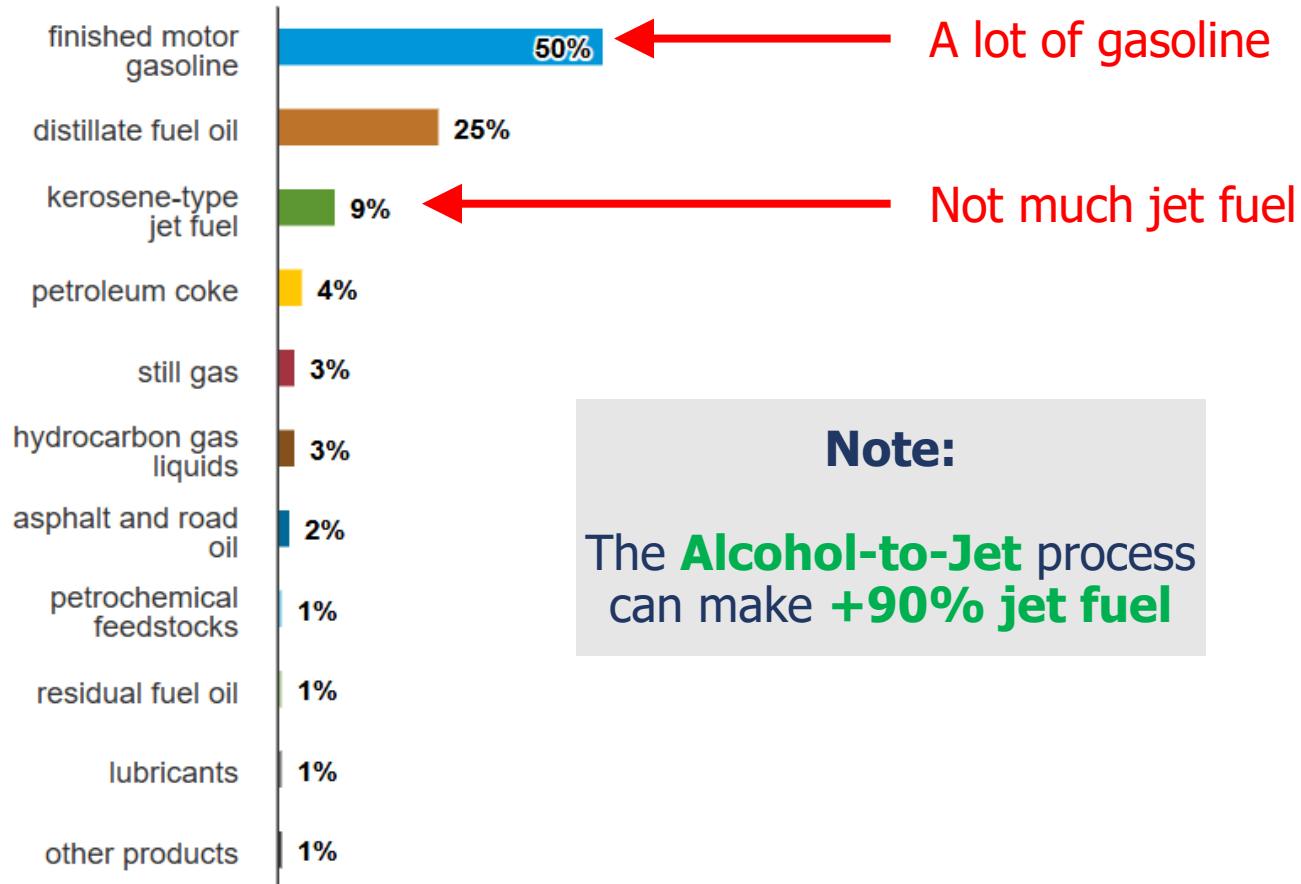
- Population growth
- Increasing prosperity
- More passenger miles flown

But US Refineries Make Mostly Gasoline, Not Jet Fuel

U.S. refiner and blender net production of petroleum products, 2023



total = 7.10 billion barrels



Note:
The **Alcohol-to-Jet** process can make **+90% jet fuel**

Key Drivers

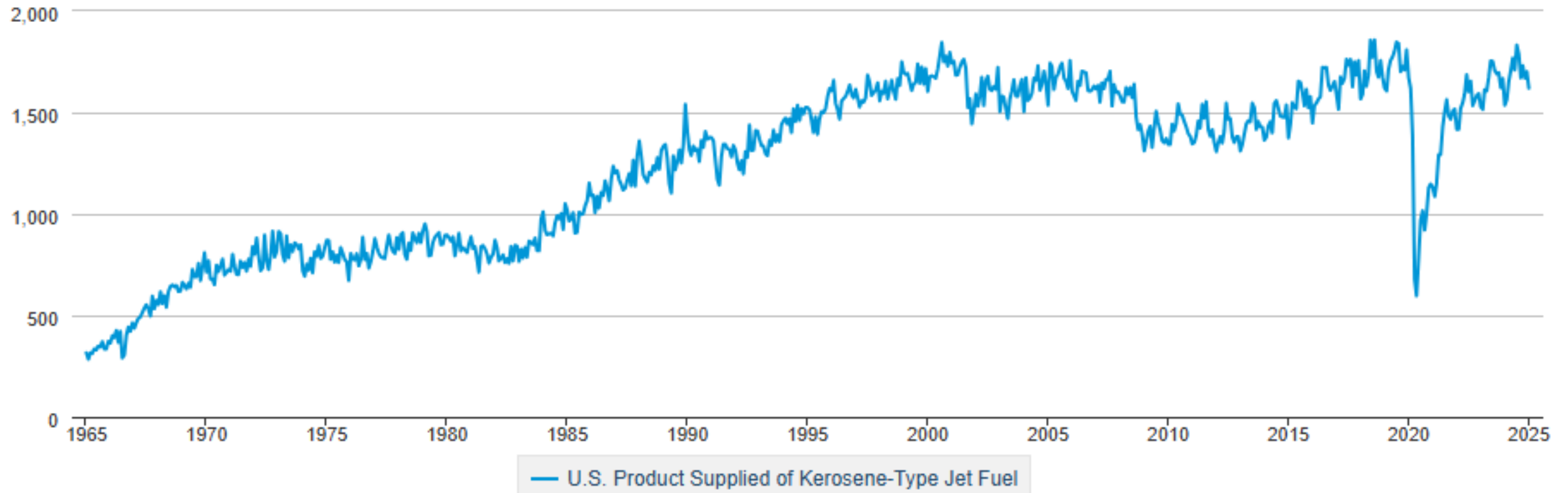
- The equipment and configuration of existing refineries
- The diet of crude oil types available: light and sweet vs. heavy and sour

For 25 Years, There Has Been No Growth In US Jet Fuel Production



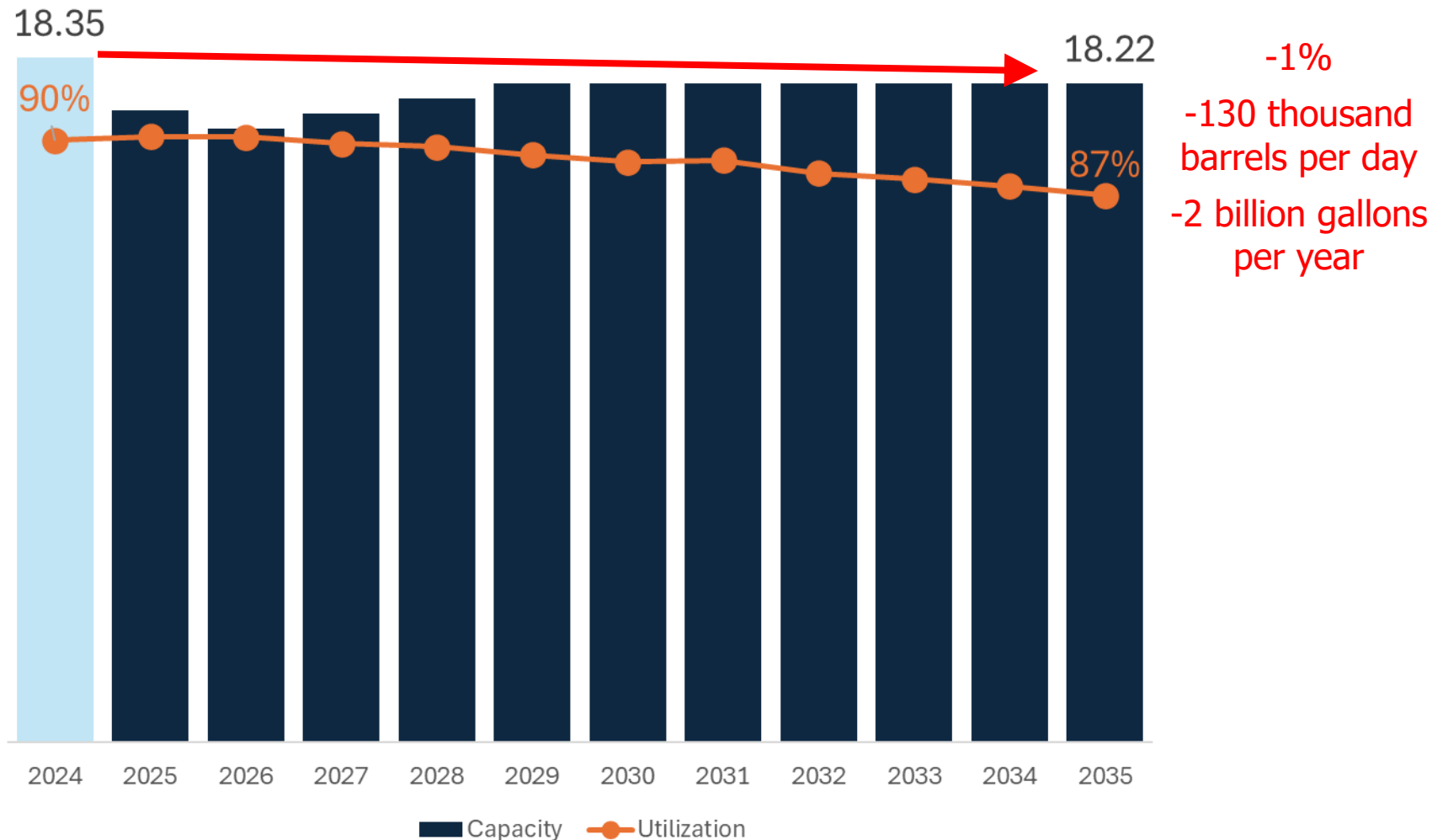
U.S. Product Supplied of Kerosene-Type Jet Fuel

Thousand Barrels per Day



And US Refining Capacity & Utilization Are Declining

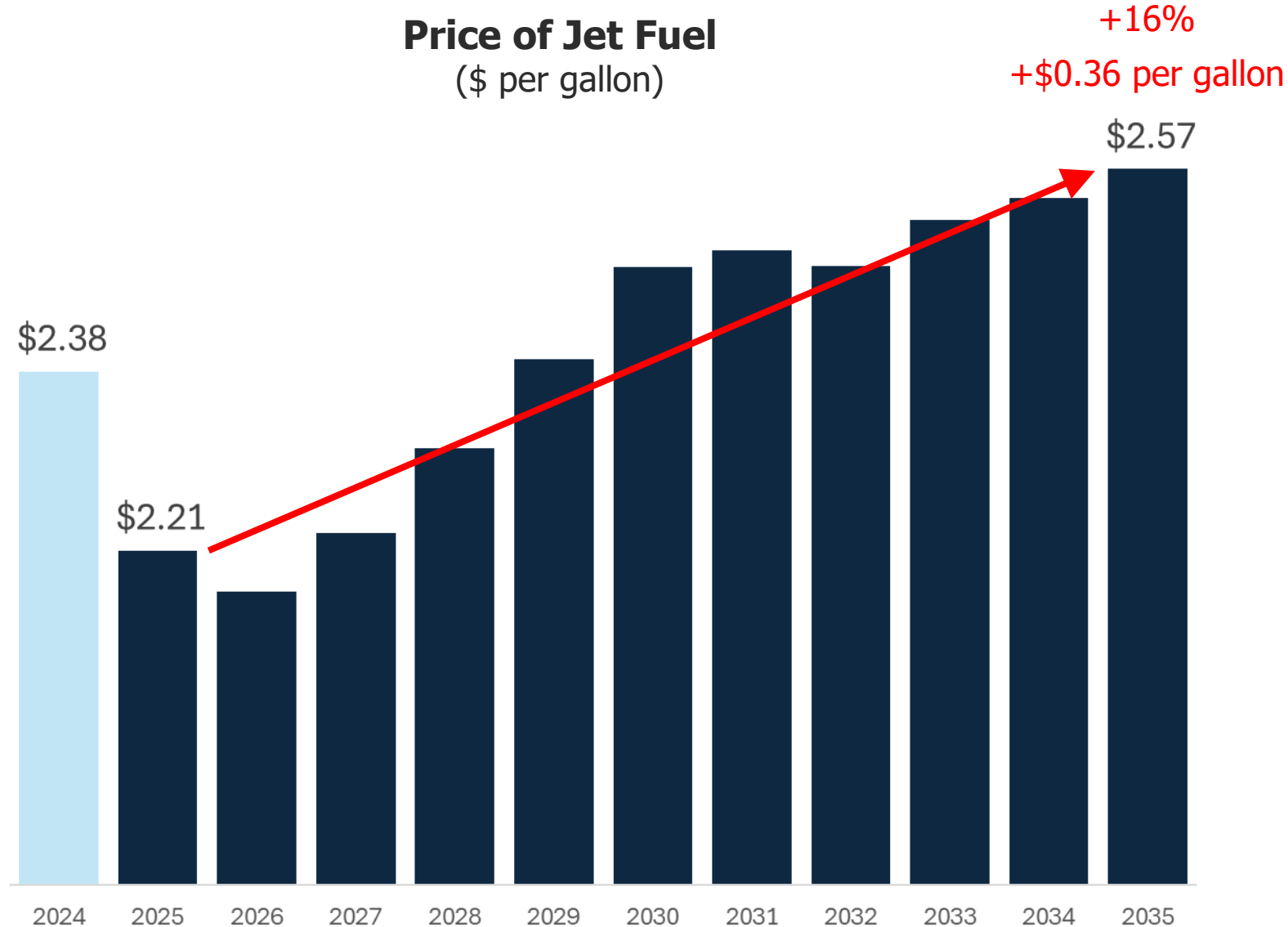
US Refining Capacity & Utilization (million barrels per day)



Key Drivers

- Decreasing total fuels demand
- Refinery shut ins
- Decreasing utilization outlook disincentivizes new capacity construction
- No new, large fuels refineries built in last ~50 years

This Picture Leads to Higher Jet Fuel Prices ...



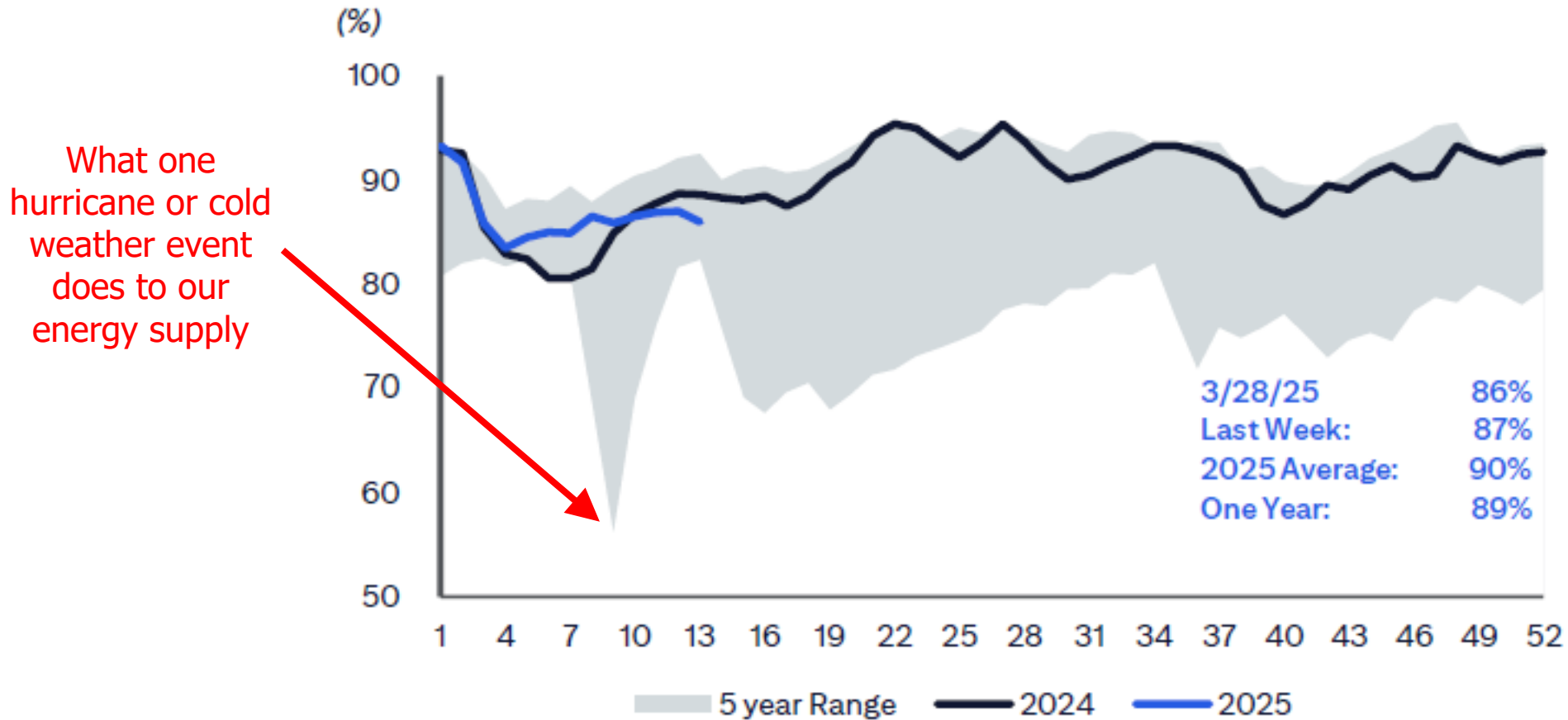
Why it's a Problem

- Without more US jet fuel production, the price will increase
- Higher prices mean less US energy security, higher costs for consumers and less air travel
- Less air travel means less economic activity and growth

... And Continued Concentration Risk to Our Energy Supply



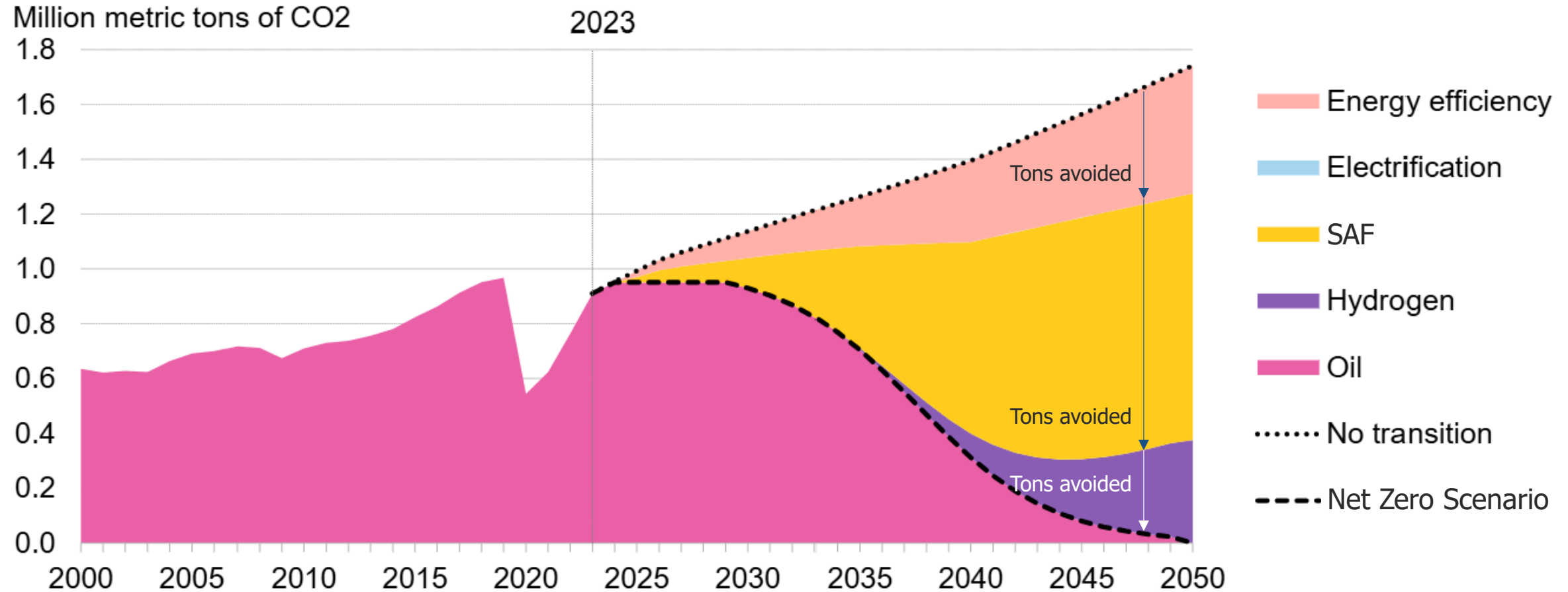
Historical US Refining Utilization



- The US has highly concentrated fuel production in the Gulf Coast, which creates strategic risk
- Hurricane Harvey in 2017 shut down 20% of the nation's fuel supply
- A cold weather event in 2021 shut down 40% of the nation's fuel supply

Source: Citigroup, US EIA as of 1Q 2025.

SAF is Key to Reducing Aviation Sector Emissions ...

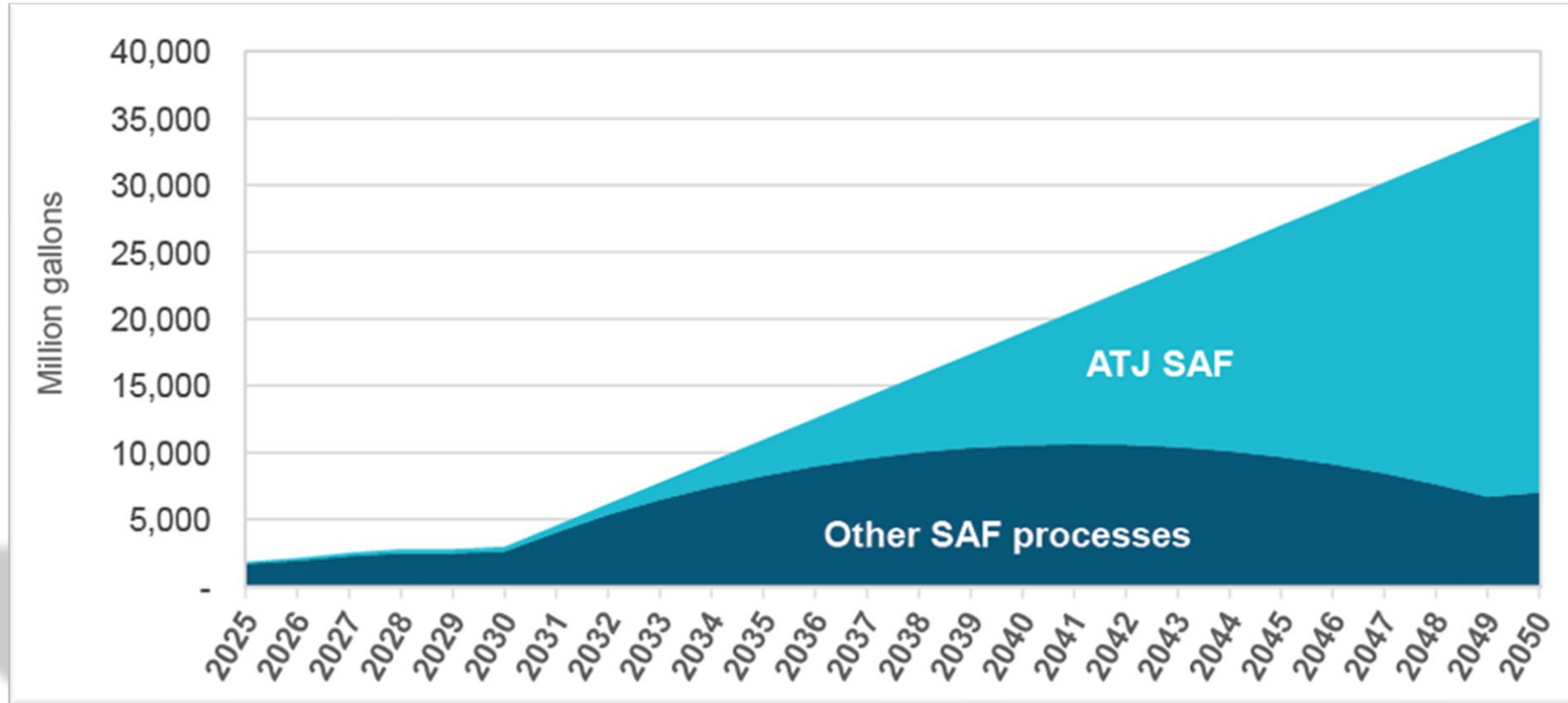


Source: BloombergNEF, LexisNexis Risk Solutions Inc. Note: Based on BNEF's New Energy Outlook 2024

... And ATJ is Key to Meeting SAF Demand



Projected US SAF Demand



- Other SAF processes are limited by available feedstocks
- But plant sugars are overabundant, and growing due to yield increases
- ATJ is the only effective long term solution to decarbonize aviation

Source: Charles River Associates analysis based on Bloomberg Forecast, U.S. SAF Grand Challenge Goals, and Gevo estimates as informed by US EIA and ICF Resources.

So, Where Will More Jet Fuel Come From?



Option 1

Use existing US refineries, but this **could require more capital and retooling, and changes to crude oil diet / refined products mix.**

Option 2

Import more jet fuel, but this risks **less energy security and higher prices.**

Best Option

Build **Alcohol-to-Jet** facilities for a more secure, cost-effective and high product yield solution.

The Advantages of ATJ SAF

- ✓ **Cost:** cash cost of production competitive with fossil fuels
- ✓ **Feedstock:** abundant plant sugars & ethanol
- ✓ **Product:** drop-in to existing infrastructure (jet fuel, diesel, naphtha)
- ✓ **Technology:** unit operations already exist at industrial scale today
- ✓ **Sustainability:** net-zero capable, synergistic with food and land use
- ✓ **Complementary:** complements and extends fossil fuel (through blending)



A critical part of a cost-effective domestic energy strategy and the key to scaling Synthetic Aviation Fuel (SAF)

**Ample Feedstock
Supply for ATJ**



Extending an Existing Industry to Meet New Demand

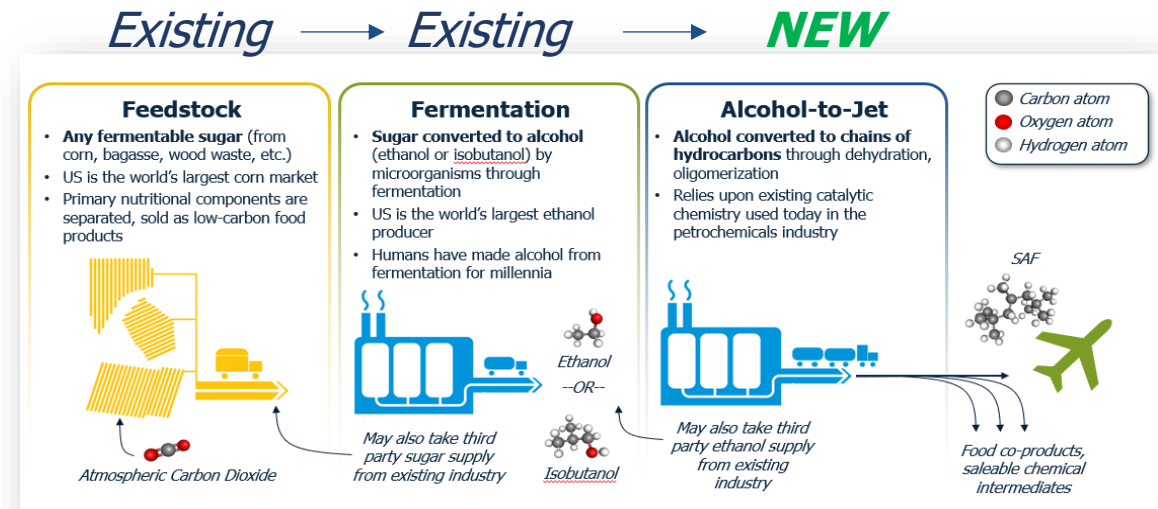
Alcohol production is an efficient industry. ATJ can extend its reach to sectors that can't be easily electrified.

Ample Supply

- Ethanol
- Plant sugars
- Animal manure
- Cellulosic biomass
- Rural wind resource
- CCS geology
- Jet aircraft fleets
- Truck fleets
- Fossil fuel infrastructure (blending, transport)

Unmet Demand

- Energy ("all of the above" strategy)
- Aviation fuel
- Heavy duty vehicles (diesel)
- Reduce carbon footprint
- Optimize land use
- Sustainable growth
- Nutrition for growing population

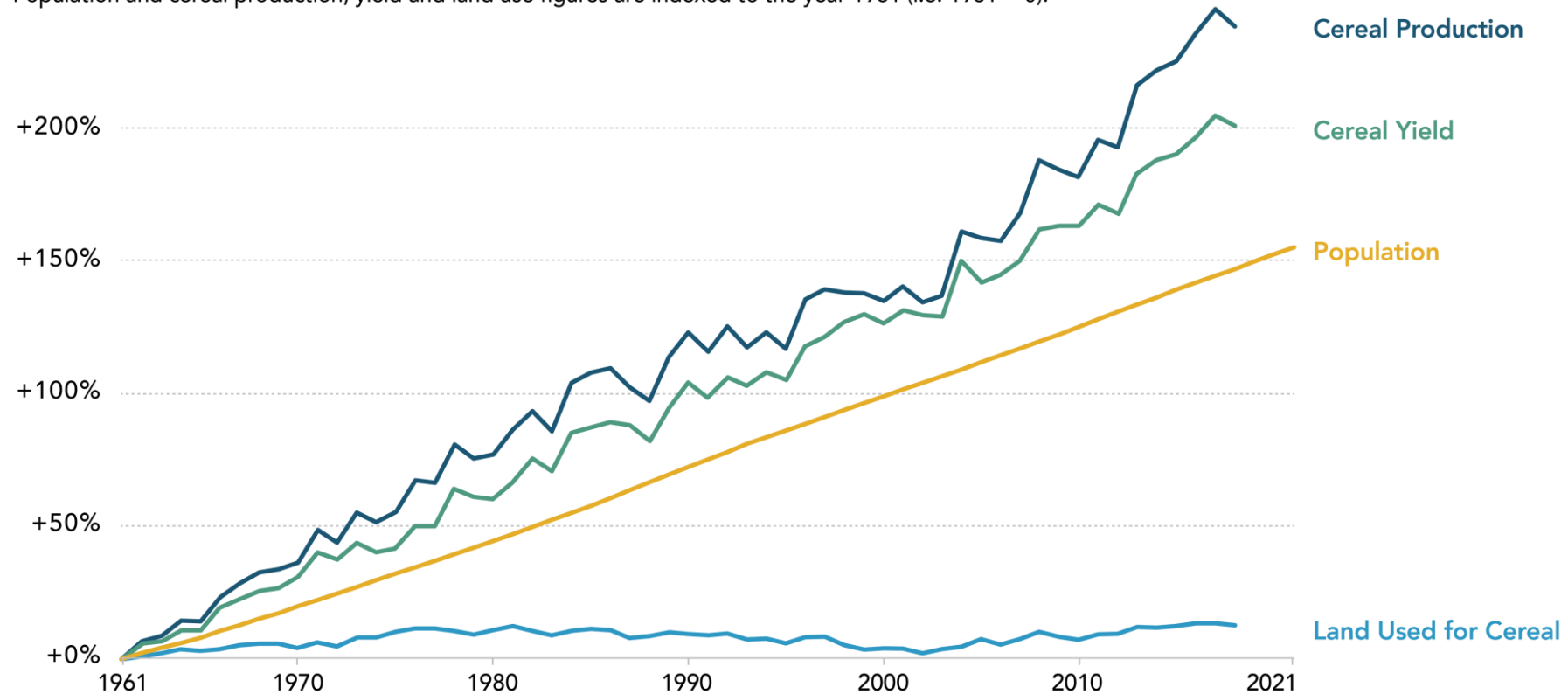


Globally, We Produce More Cereals from the Same Land



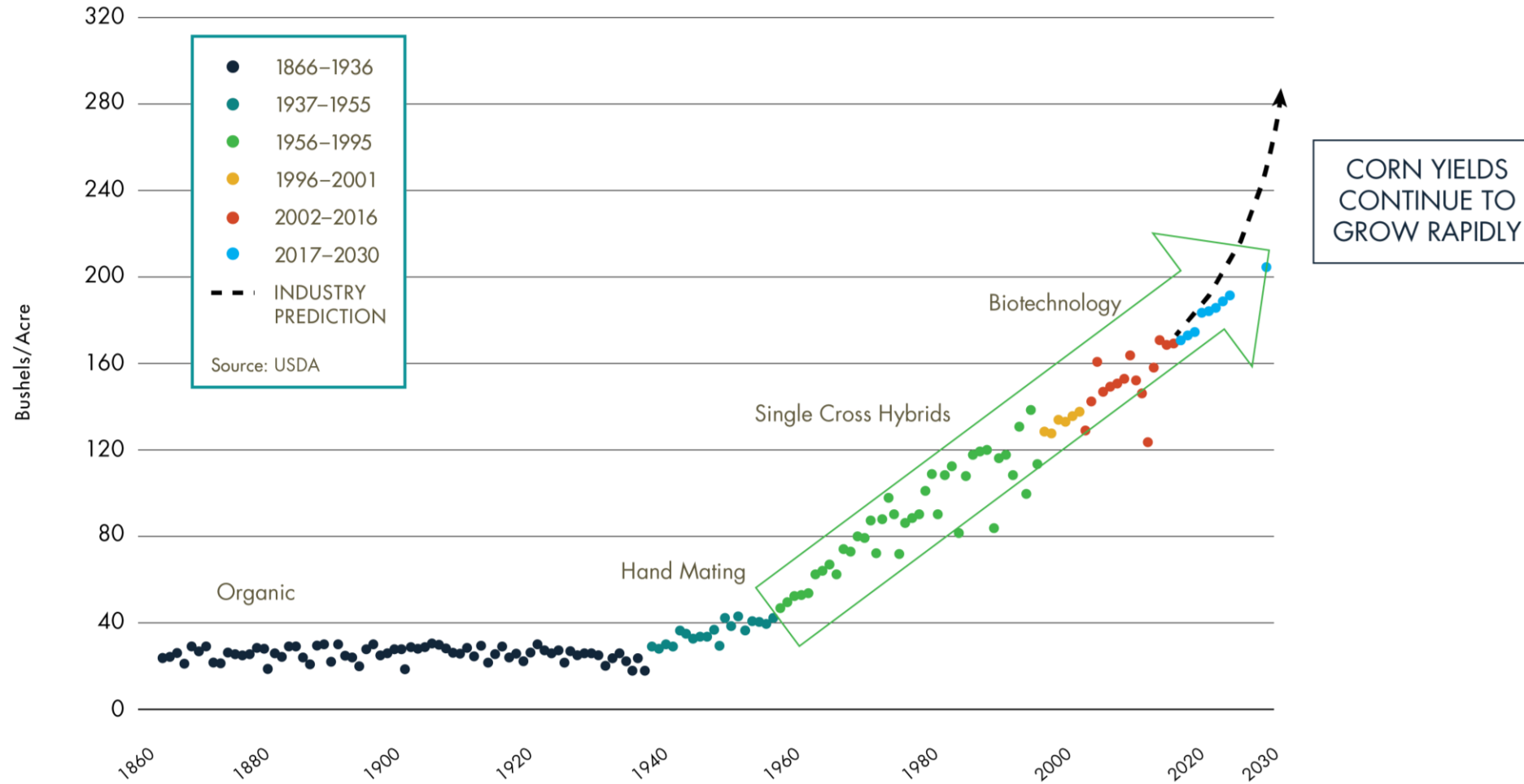
Change in cereal production, yield and land use, World, 1961-2021

Population and cereal production, yield and land use figures are indexed to the year 1961 (i.e. 1961 = 0).

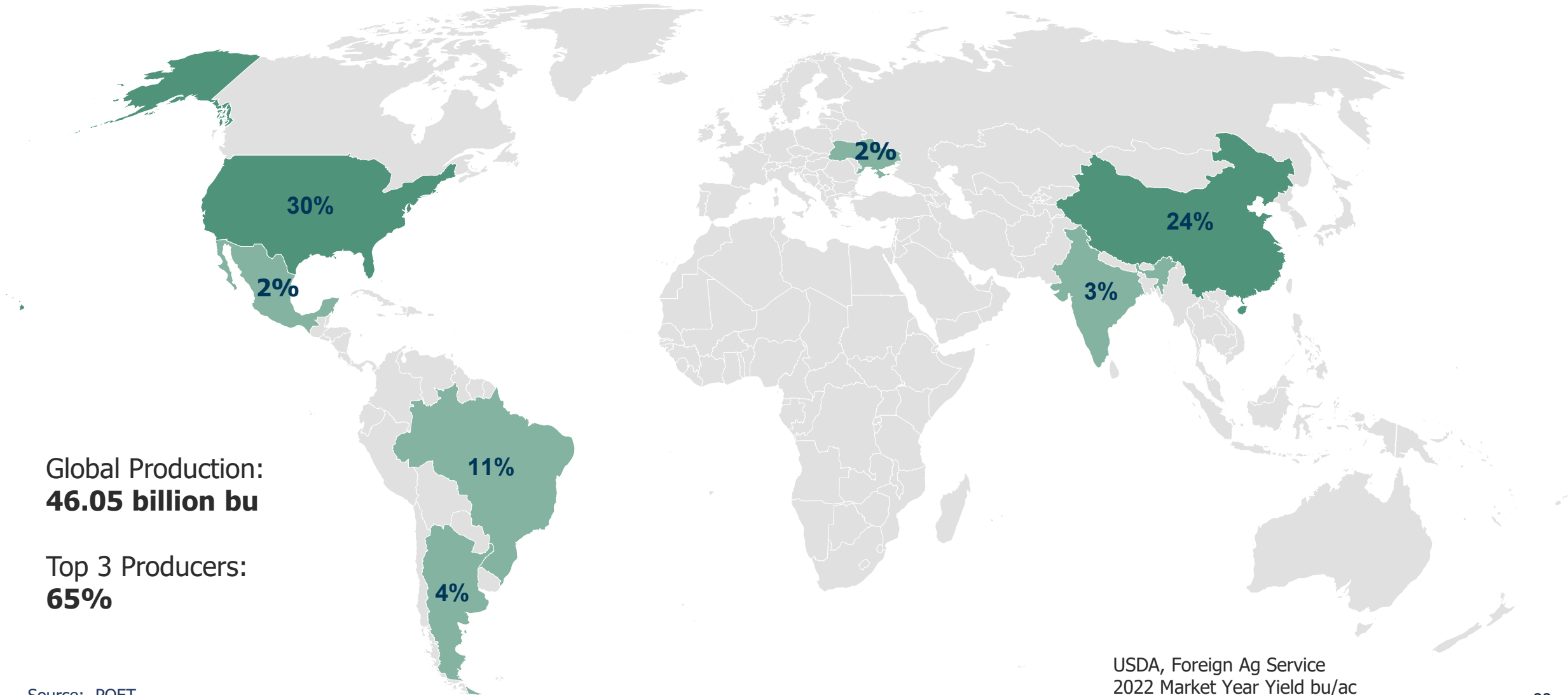


SOURCE: Our World in Data based on World Bank, Food and Agriculture Organization of the United Nations OurWorldInData.org/crops-yields - CC BY

In Particular, US Corn Yields Have Skyrocketed



Global Corn Production Today



Global Production:
46.05 billion bu

Top 3 Producers:
65%

Improving Yields Help Feed the Planet, Conserve Land



Year	World Population	US Population	Corn Yields US
1960	3 billion	180 million	40 bpa
1975	4 billion	220 million	80 bpa
1987	5 billion	245 million	88 bpa
1999	6 billion	280 million	138 bpa
2011	7 billion	310 million	155 bpa
2022	7.9 billion	335 million	180 bpa
2038	9 billion	363 million	?
2056	10 billion	386 million	?

World Bank
US Census
USDA

US Ethanol = More Than Fuel. It's Feeding the World



Ethanol plants make **Distiller Grains**, a high-protein co-product from corn.

Enough protein is produced **every year** to meet the USDA's daily protein needs for **~550 million people**.

This protein wouldn't exist without ethanol production.

Think about it:

Without ethanol, that protein wouldn't be produced in these amounts. Instead of taking food away, ethanol **creates more food**.

Bottom line:

US ethanol = cost effective energy + protein for hundreds of millions

Sugar: Sweetener or Fuel?

Ethanol production uses the sugar from field corn (after the protein is separated) and ferments it into alcohol for fuel.

If we **don't** use these sugars for ethanol, the main alternative is turning them into **cheap, high-calorie sweeteners** like **high-fructose corn syrup** (used in soft drinks).

These sweeteners offer **little nutritional value** and add to the **obesity epidemic** in a country already oversupplied with sugary products.

Bottom line: fermenting sugar into ethanol **reduces harmful sugar consumption** while producing cost-effective fuel.

REVIEW ARTICLE


Originally Published 24 August 2009 | 

 Check for updates

Dietary Sugars Intake and Cardiovascular Health: A Scientific Statement From the American Heart Association

Rachel K. Johnson, PhD, MPH, RD, Chair, Lawrence J. Appel, MD, MPH, FAHA, Michael Brands, PhD, FAHA, Barbara V. Howard, PhD, FAHA, Michael Lefevre, PhD, FAHA, Robert H. Lustig, MD, Frank Sacks, MD, FAHA, Lyn M. Steffen, PhD, MPH, RD, FAHA, Judith Wylie-Rosett, EdD, RD, and on behalf of the American Heart Association Nutrition Committee of the Council on Nutrition, Physical Activity, and Metabolism and the Council on Epidemiology and Prevention | [AUTHOR INFO & AFFILIATIONS](#)

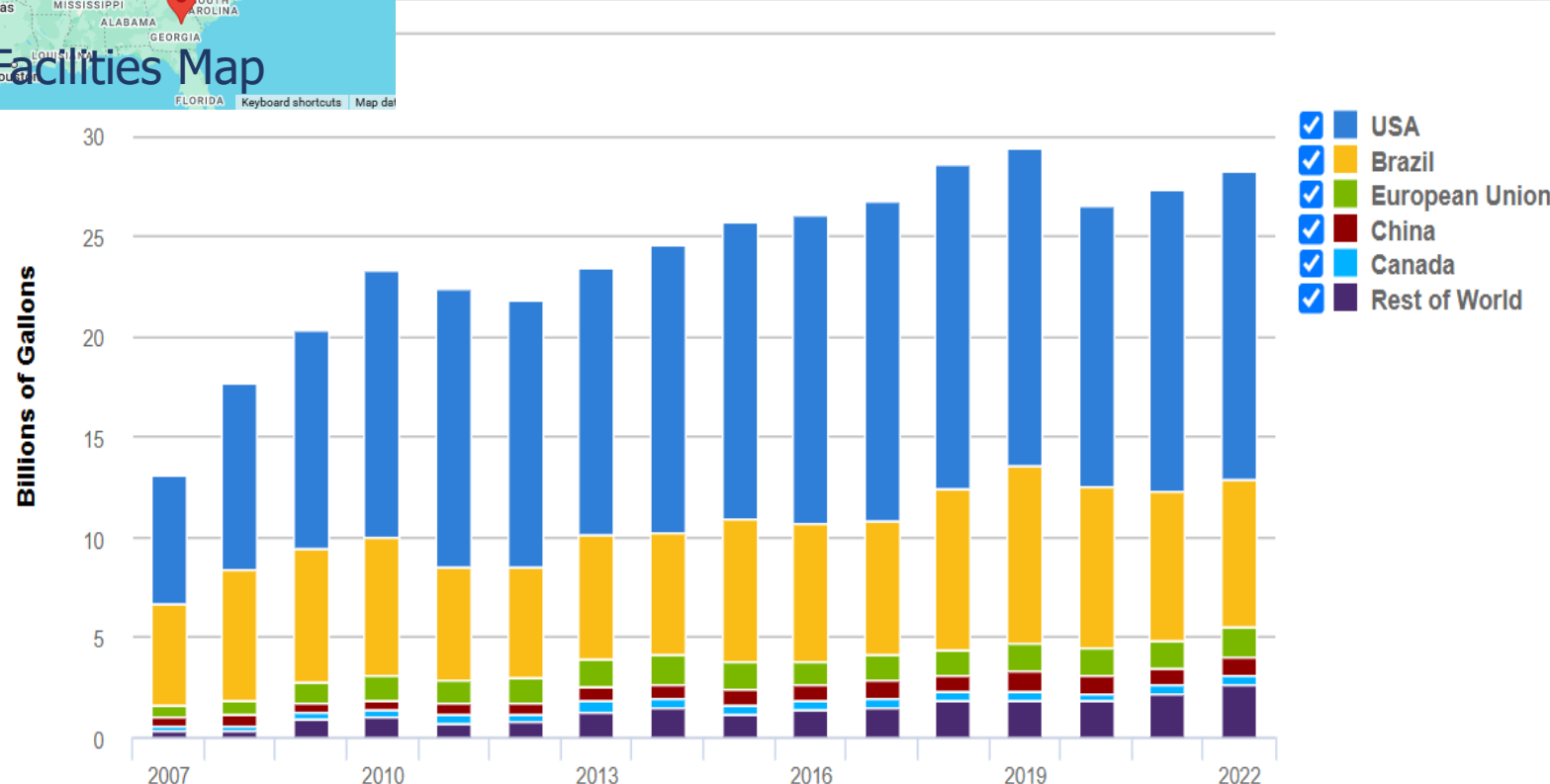
Circulation • Volume 120, Number 11 • <https://doi.org/10.1161/CIRCULATIONAHA.109.192627>

 295,176 / 935



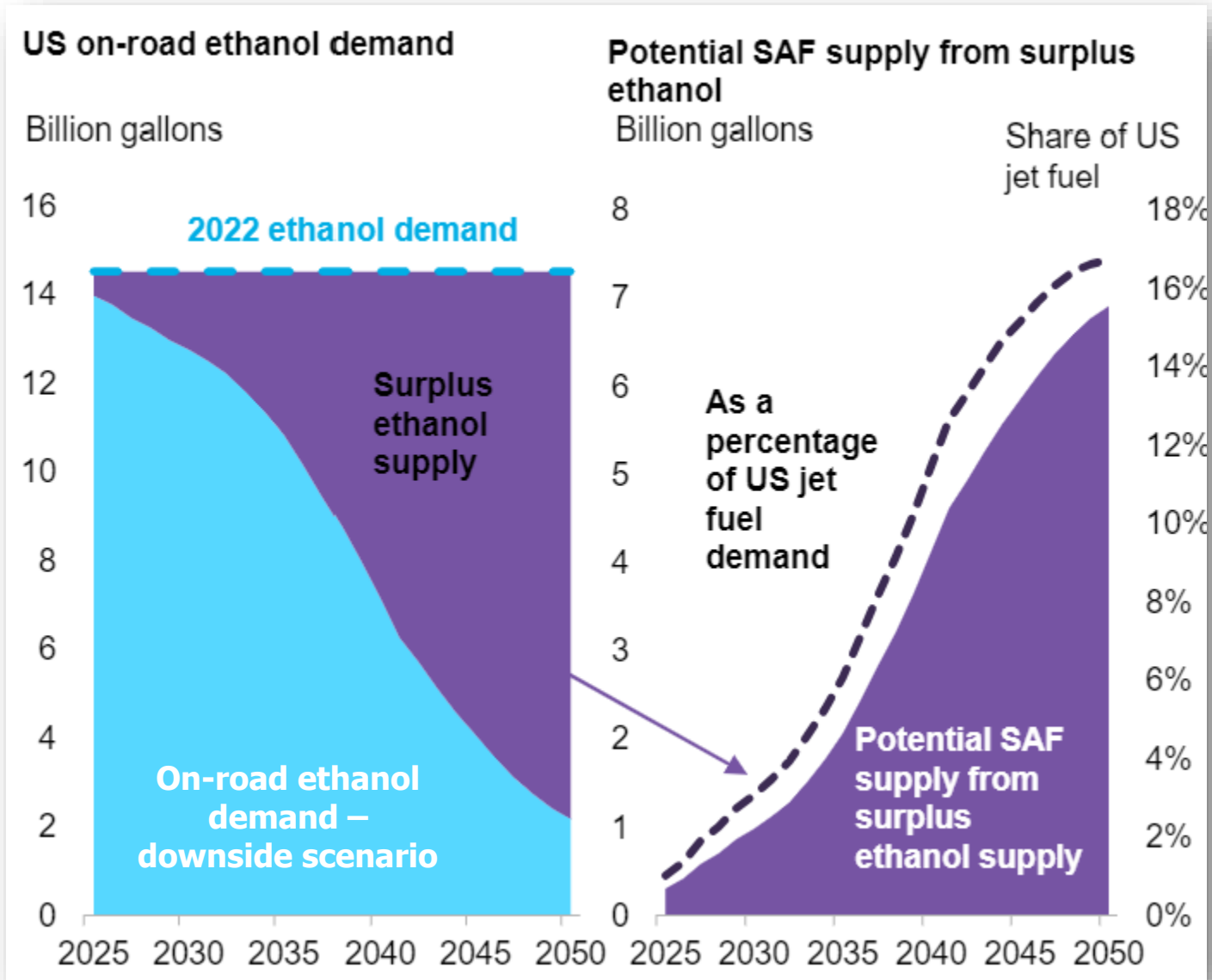
“High intakes of dietary sugars in the setting of a worldwide pandemic of obesity and cardiovascular disease have heightened concerns about the adverse effects of excessive consumption of sugars ... Between 1970 and 2005, average annual availability of sugars/added sugars increased by 19%, which added 76 calories to Americans’ average daily energy intake. Soft drinks and other sugar-sweetened beverages are the primary source of added sugars in Americans’ diets. Excessive consumption of sugars has been linked with several metabolic abnormalities and adverse health conditions, as well as shortfalls of essential nutrients.”

The US is the World's Largest Ethanol Producer



- \$57 billion to US GDP
- ~180 facilities
- Fuel ethanol is blended into gasoline
- Facilities concentrated near agriculture

If Passenger Vehicles are Electrified, ATJ Can Utilize the Ethanol





A Carbon Abatement Company

Thank You

gevo.com