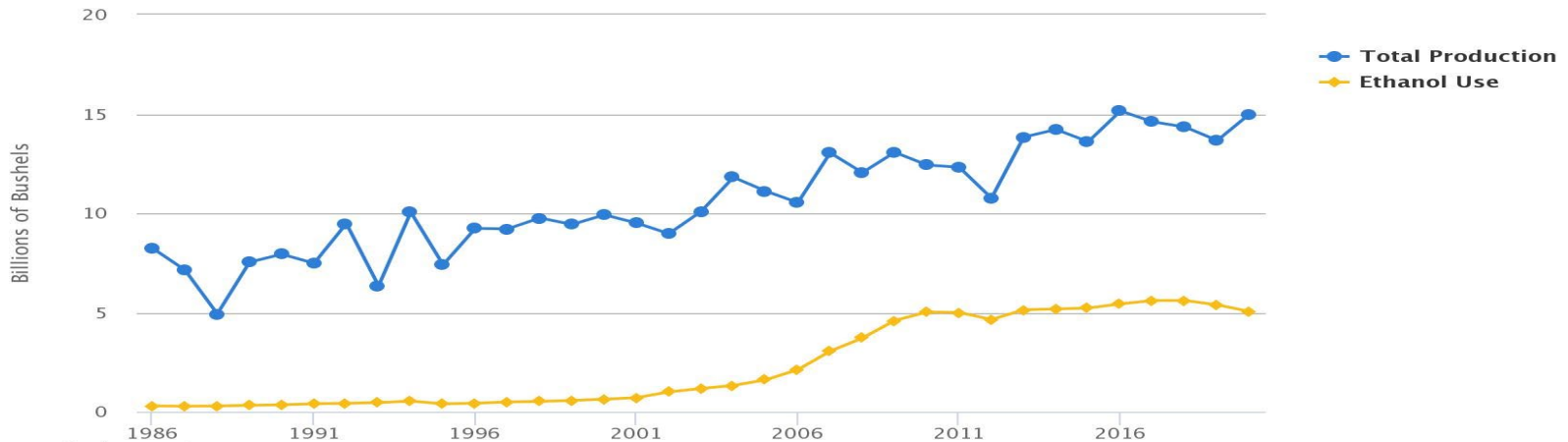
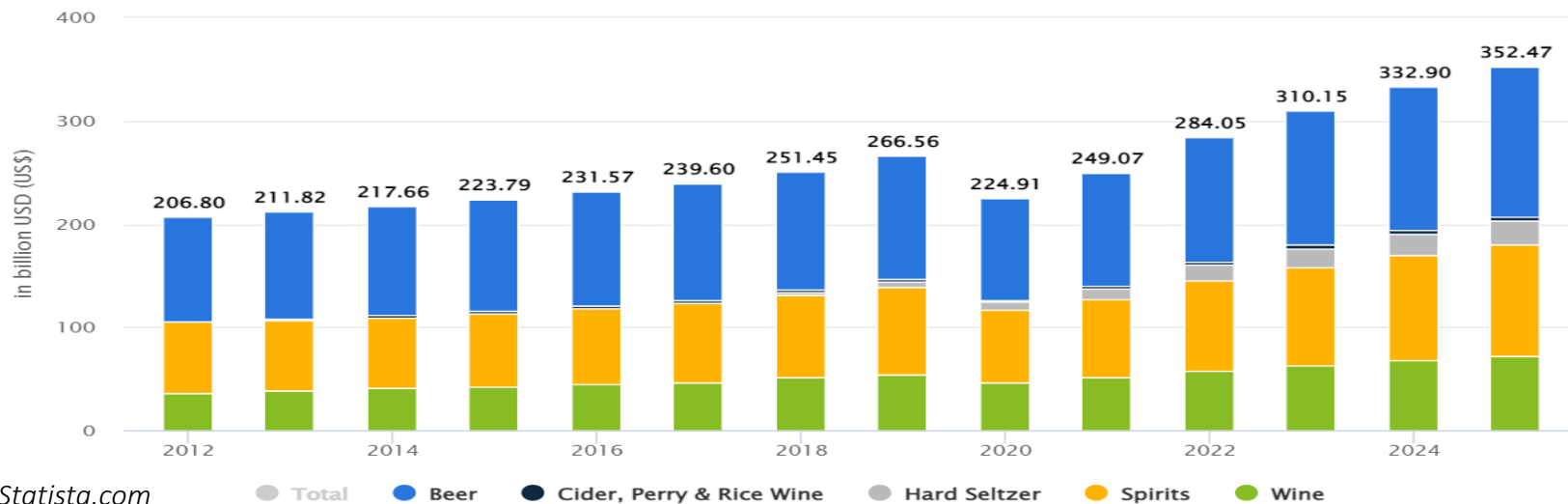


Sustainability

U.S. Corn Production and Portion Used for Fuel Ethanol



United States Department of Agriculture, Economic Research Service



Statista.com

● Total
 ● Beer
 ● Cider, Perry & Rice Wine
 ● Hard Seltzer
 ● Spirits
 ● Wine

Sustainability Sub-Committee Members

Sustainability Sub-Committee is new, started in February 2022.

- Dr. Luke Adam, Beam Suntory
- Jackie Lissolo, ICM
- Dr. Janet Remus, IFF
- Kelly Davis, RFA
- Kurt Rosentrator, ED DGTC

Group co-product experience includes:

Manufacturing
Process technology
End Use Opportunities
Sustainability Practices, LCA's

Full, Affiliate, and Associate Members Welcome

Agenda

- DGTC Goal and Potential Focus Areas
 - Energy Star Program for Distilleries – New as of March 2022
- Sustainability in Terms of Environmental Impact
 - BIER – Beverage Industry Environmental Roundtable
 - LCA – Life Cycle Assessments Commentary by CAST
- Sustainability in Terms of Economic & Social Impact
 - BSI Global Corn Strategy Team – Internal Future Planning

DGTC Goal and Potential Focus Areas

The DGTC would be recognized in the future as the go to source of information for distillers feed products sustainability



Provide technical assistance to groups working on feed / ingredient sustainability.
Example: data and information accuracy

Example groups to support

- IFEEEDER – Institute for Feed Education and Research
- GFLI - Global Feed LCA Institute



Build a framework for evaluating efficiencies and environmental impact (water, energy, CO₂, phosphorus). BIER is an example benchmarking approach.



Provide Education to the industry on:

Energy efficiency improvements which leads to carbon footprint reductions.

- Promote Energy Star program for distillers
- Water efficiency improvements that are critical to water constrained areas.
- Environmental impact analysis involving carbon foot-printing or LCA



Be the industry watch tower for new technology which can change the sustainability landscape and how improvements are measured.

Environmental Impact - BIER

BIER: Beverage Industry Environmental Round Table

- Focus is on benchmarking water, Energy, Emissions use rates to drive future reductions
- Measurement units are by production volume (rates)
- Beverage Industry data collected and reported in 2015, 2017, 2020 from 1600 facilities. Another 2021 study compared KDA members + 3 other partner companies to the larger data set.
- Co-Product not included in any form regardless of type.
- Beverage companies are creating reduction goals for water use rate reductions, emission rate reductions, and energy Efficiency improvements by 2030 and 2050.
- Goals require technology uses such as:
 - closed loop cooling for water
 - Modular steam boiler array designs
 - Ethanol vapor and CO₂ collection at fermentation
 - Planting more trees than used

Go to <https://www.bierroundtable.com/work/benchmarking/> to download free full 2021 report.

Environmental Impact – Life Cycle Assessments

LCA Commentary by CAST: Council for Agricultural Science and Technology

Title: Goals, Strengths, and Limitations Governing the Use of Life Cycle Assessment in Food and Agriculture

While an overview, it presents comprehensively the factors and concepts involved in LCA's including customer driven needs such as:

- Food supply transparency
- Enabling informed decision making
- How LCA's are conducted and how to understand limitations

<https://www.cast-science.org/publication/goals-strengths-and-limitations-governing-the-use-of-life-cycle-assessment-lca-in-food-and-agriculture/>

BSI Global Corn Strategy Development

TREND ANALYSIS

General & Category Trends

- **CLIMATE CHANGE**
 - supply shortage, change in growing region, pests/diseases, natural disaster
- **POPULATION GROWTH**
 - food shortage, water, carbon emission
- **REGENERATIVE AGRICULTURE + FARMING INNOVATION**
 - reduce carbon, water usage, pesticide, improve biodiversity, climate resilience, automation
- **BIOETHANOL**
 - 40% of corn in US is for bioethanol, impacted by electric car growth
- **NON-GMO**
 - Deregulation of GMO vs Consumer shift to Non-GMO
- **CONSUMER PREFERENCE / REGULATION CHANGE**
 - Sustainable, super premium alcohol
- **RESPONSIBLE SOURCING**
 - traceability, transparency, certification, human rights
- **RENEWABLE ENERGY**
 - Environmentally friendly, energy efficient
- **HEALTH FOCUSED**
 - Clean food, less sugar, high-nutrition
- **LOCALLY SOURCED**
 - Local production, heritage crops
- **GLUCOSE, DEXTROSE SUPPLY/DEMAND**
- **CROP CHANGE**
 - Soy beans, other crops that are more beneficial
- **POST HARVEST PROCESS**
 - other parts of corn other than kernel used as fiber resource, packaging, food
- **TILLABLE LAND REDUCES EVERY YEAR in the US**
 - suburbs - due to building homes and business) vs yield improvement by GMO

Climate Change

- Crop failure, change in growing region, pests/diseases, natural disaster

Supply Risk

- Population growth
- Bioethanol demand change (impacted by eco-friendly shift)
- Glucose/dextrose demand change (impacted by health awareness)
- Crop change
- Farming land availability decline (climate + suburbanization)

Regenerative Agriculture/Farming Innovation

- Efforts against climate change (reduce water, pesticide, carbon, improve biodiversity, climate resilient)
- Automation
- Organic farming

GMO/Non-GMO

- Deregulation of GMO vs Consumer shift to Non-GMO
- Yield improvements

Sustainability/Responsible Sourcing


- Renewable energy, clean supply chain
- Locally sourced
- Reduce waste post harvest
- Traceability, transparency, certification
- Human rights

Innovative Technology for Corn/Alcohol

- Alternative starch
- Synthetic alcohol



UNCONSTRAINED IDEAL STATE

Minimized Supply Risks

Heritage & Premium Products	Regenerative Agriculture and Farming Innovation Fully Utilized: automation, less water consumption, improved biodiversity, climate resilience	
	GMO utilization eliminates toxic chemical usage allowing organic farming to be mainstream → consumer embraced	
New Premium and all other Products	Innovative Technology creates alternatives for starch and for alcohol	No Negative Impact to Human Rights



Sustainable and Responsible Sourcing

 Optimized Renewable Energy utilized for corn, alternative starch, alternative alcohol production
 Local production/sourcing allows lowest transportation energy consumption
 Elimination of post production waste
 Traceability, transparency, certification maintained



Stable Climate



IDEAL STATE

Farm Land Protected	Regulation Changes Achieved as Necessary All along the Way
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TRENDS	Climate Change	Supply Risk	Regenerative Agriculture Farming Innovation	GMO/Non-GMO	Sustainability Responsible Sourcing	Innovative Technology
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Thank You