



# Ingredients

## THAT MATTER



Green Plains

2021 SUSTAINABILITY REPORT

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## ESG PILLARS



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# About this Report

**This sustainability report showcases Green Plains' dedication to good corporate citizenship and meeting the needs of a growing global population through the use of innovative technologies that generate more valuable ingredients from fewer resources. This report covers our environmental, social and governance (ESG) data and initiatives during calendar year 2021 (January 1, 2021 through December 31, 2021). We also share details on goals and initiatives that extend into 2022 and beyond.**

The environmental data within this report is limited to the biorefinery production segment of our operations, including our biorefining facilities. The data does not include our fuel terminals or corporate office, as these facilities have a comparatively negligible footprint.

The social and governance data in this report is enterprise-wide except for employee turnover metrics, which exclude assets divested in 2021 (Green Plains Ord LLC and Green Plains Grain Company LLC's Hopkins, MO and Essex, IA locations) as the divestment events artificially increased the turnover rate.

Inquiries related to the report and its content should be directed to our sustainability team at [sustainability@gpreinc.com](mailto:sustainability@gpreinc.com). More information can also be found at [www.gpreinc.com](http://www.gpreinc.com).

This report references select Global Reporting Initiative (GRI) 2016 standards, as well as applicable United Nations Sustainable Development Goals (UN SDGs). We also disclose under the Biofuels Standard from the Sustainability Accounting Standards Board (SASB) and align with the Task Force on Climate-related Financial Disclosures (TCFD) framework. See page 63 for GRI, SASB and TCFD indices.

**SUSTAINABLE  
DEVELOPMENT  
GOALS**



**TCFD**

TASK FORCE ON  
CLIMATE-RELATED  
FINANCIAL  
DISCLOSURES



# Letter from our Chief Executive Officer

**Our inaugural 2020 sustainability report was the result of the dedication and hard work of the Green Plains multi-departmental ESG Work Group. This was a team of dedicated employees who understand the importance of leading our goal and strategy formation, as well as ESG reporting and compliance for all of our stakeholders. This foundational work group is part of our commitment to the Task Force on Climate-Related Financial Disclosures (TCFD) framework, reaching all the way to the Board of Directors, where the Nominating and Governance Committee oversees all ESG topics, including the approval of sustainability reports and ESG goals.**

Green Plains has always been a true ESG story, but it's not enough to simply state that. We strive to embody sustainability in all its facets, and know that these reports are not just words on paper. This is our roadmap to continued climate friendliness and good global citizenship.

In preparation for this 2021 Sustainability Report, Green Plains conducted a materiality assessment to help guide our principles in alignment with what our stakeholders value, and we have established our goals appropriately with that feedback in hand. We are prioritizing climate change mitigation and emissions, a diverse workforce and employee health and safety.

In 2021, we reached a 35% reduction in operational greenhouse gas emissions from our 2018 baseline, keeping us on track to achieve our goals of a 50% reduction by 2030 and carbon neutrality by 2050.

We continue to add diverse perspectives to our workforce, while offering training and advancement opportunities at all levels of the company. We are expanding our networks to recruit a diverse pool of

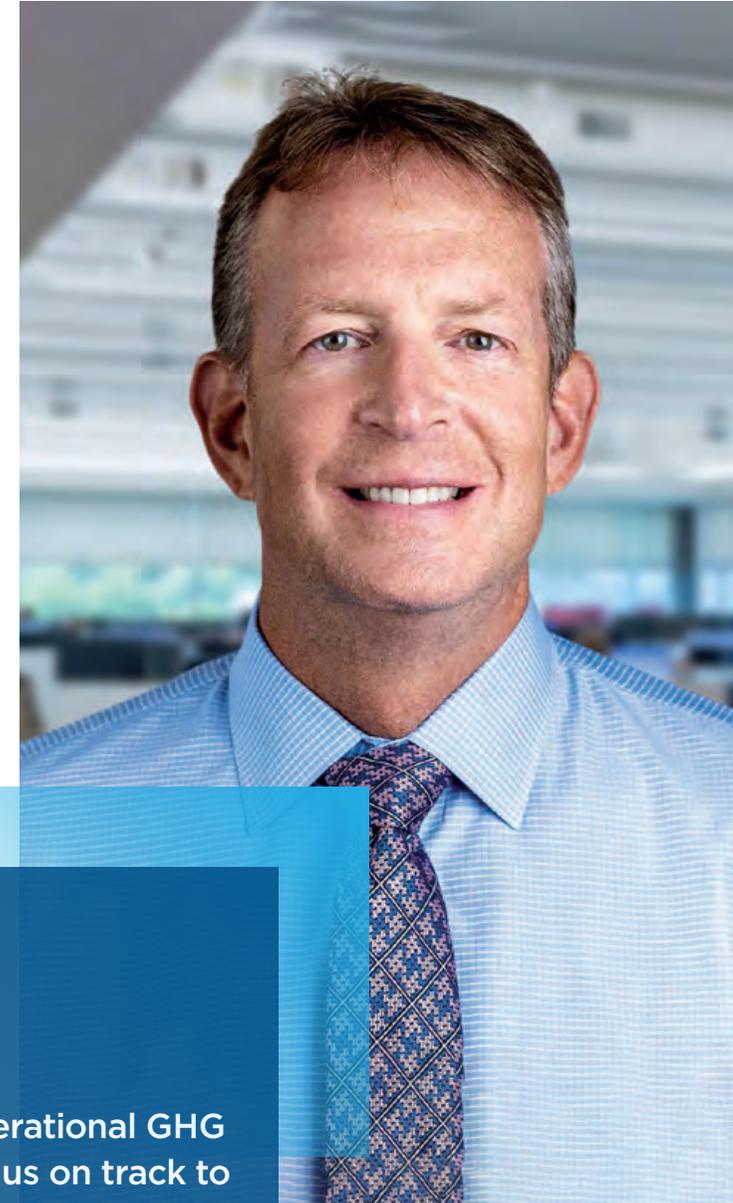
candidates, and now focus squarely on changing what an agriculture-centric company's workforce will look like over the next 50 years. It is time to change the standard.

We expanded our safety practices across our platform to be best in class, and enhanced our environmental health and safety audit programs. We are holding ourselves accountable and remaining transparent to our stakeholders in these efforts.

Even while prioritizing all these initiatives, we are still executing our transformation plan to become a leading agriculture technology-focused producer of

## PATH TO CARBON NEUTRALITY

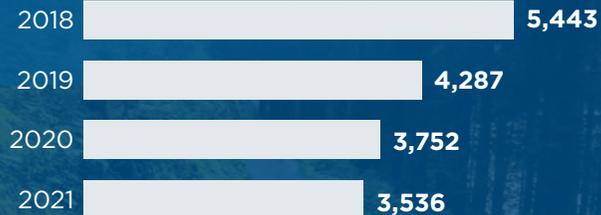
**In 2021, we reached a 35% reduction in operational GHG emissions from our 2018 baseline, keeping us on track to achieve our carbon neutrality goal.**



# EMISSIONS DATA

## TOTAL OPERATIONAL GHG EMISSIONS (SCOPE 1, 2 AND BIOGENIC)

Thousand MT CO<sub>2</sub>e



sustainable, value-added low-carbon ingredients. During 2021 we completed our Maximized Stillage Co-products technology installation at Wood River, as well as groundbreakings for construction at three more locations. Our Clean Sugar Technology holds enormous promise, amplified by its suitability to create a low-carbon feedstock for the forthcoming bio-economy. This disruptive technology produces dextrose through a low-carbon process and has a lower GHG footprint than fossil-based feedstocks, placing it in direct alignment with our climate change mitigation priorities.

We continue to aggressively execute on our vision to create the biorefinery of the future, attracting the talent and investment needed to achieve it.

In this report, we also present the facts related to the concept of land-use change in biofuel production, demonstrating that agricultural technologies have led to a consistent increase in production per acre, all while requiring fewer inputs to achieve these yields on fewer acres of cropland with less water and energy use.

Green Plains has always been inherently sustainable, established on the principle of reducing transportation emissions with low-carbon biofuels.

With each annual sustainability report, we are grateful for the opportunity to share what we are building on our foundation of sustainability and innovation. We are working tirelessly to produce more ingredients from the same locally sourced material grown with ecologically sound practices. It is time to evolve from a closed loop carbon system which already reduces emissions by almost 50% relative to fossil fuels, to capturing the carbon for sequestration or other commercial uses that can truly create the lowest carbon-intense products on the planet.

Green Plains' processes and innovations are the epitome of sustainability, and we are a true ESG story. The pages that follow, and each annual sustainability report after this one, will illustrate that.

**Todd Becker**  
PRESIDENT AND CEO

# About Green Plains

## Our Business

**Green Plains Inc. (NASDAQ:GPRE) is a leading biorefining company engaged in the development and utilization of fermentation, agricultural and biological technologies to process renewable crops into sustainable, value-added ingredients. We produce cleaner, low-carbon biofuels, renewable feedstocks for advanced biofuels, high-protein ingredients for animal diets and high-purity alcohols for use in cleaners and disinfectants.**

As we continue our transformation into Green Plains 2.0, we are expanding our capabilities through novel technologies and partnerships to extract additional ingredients from the same annually renewable crops. We are increasing production of our new high-protein ingredients for pet, livestock and aquaculture diets, and providing low-carbon renewable biofuel options for consumers in the United States and abroad. In addition, we are focusing on our Clean Sugar Technology, a novel process with applications in biosynthetics, bioplastics and other sectors.

On March 25, 2022, we completed a \$350 million sustainability-linked credit facility tied to ESG Key Performance Indicators (KPIs) and targets. This is an important next step in our sustainability journey as it aligns our financial structure with our sustainability initiatives. This meaningful connection between our financial practices and sustainability strategy demonstrates our commitment to achieving our ESG goals.

For more information, visit [www.gpreinc.com](http://www.gpreinc.com).



**44,702,000**metric tons of  
carbon reduction to date<sup>(1)</sup>**958,000,000**gallons renewable biofuel  
production capacity<sup>(2)</sup>**219,807,000**pounds of renewable corn oil  
sold in 2021**11**

biorefineries

**2**

fuel terminals

**1**Fluid Quip  
Technologies  
office**1**corporate  
office**100%**of corn purchased from non-deforested,  
US-domestic sources<sup>(3)</sup>**750,648,000**gallons of renewable biofuel  
sold in 2021**259,786,000**bushels of corn consumed  
in 2021**2,500,000**tons of animal feed  
production capacity

## OUR TECHNOLOGY SUITE AND STRATEGIC PARTNERS ENABLE

the continuous evolution and enhancement of our sustainable production capabilities. We continuously strive to find more innovative ways to produce more from our existing renewable resources.

## Memberships and Awards



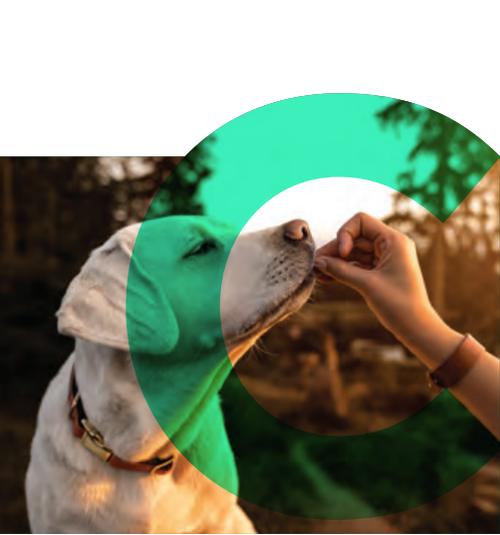
Green Plains was awarded the 2021 Ethanol Producer Magazine Project of the Year Award for completing upgrades related to reducing energy and water usage, lowering operating costs, and most importantly, reducing our carbon footprint.



- 1 Estimated CO<sub>2</sub> amount to have been kept out of the atmosphere due to Green Plains-produced low-carbon fuel between 2007 and 2021.
- 2 2021 10-K Production Capacity.
- 3 Based on compliance with RFS regulations (40 CFR § 80.1401), which requires the use of "renewable biomass" as an ethanol feedstock and by definition means that planted crops cannot come from deforested land. Additionally, we use U.S. corn and have not imported corn from international markets where deforestation might be prevalent.

# Our Principles and Values

Our five core principles help us to CHART our course and provide a framework for evolving in a rapidly decarbonizing world.



## CUSTOMER CENTRIC HUNGRY

We make a difference in the world by providing quality ingredients to safely meet customer needs.

- **Ingredient mindset**
- **Quality and safety focus**
- **Understand our impact**

We are passionate, collaborative and seek achievement across all areas of our business. We are all in this together.

- **Competitive spirit**
- **Collaborative**
- **All-in mentality**

## ACCOUNTABILITY

We exercise sound judgment and self-discipline to drive impactful results.

- **Self-discipline**
- **Sound judgment**
- **Impactful results**

## RESPONSIBILITY

We serve our customers, communities, investors and families by striving for sustainability and diversity in all that we do.

- **Leadership in ESG**
- **Diversity and inclusion**
- **Work / life balance**

## TRANSPARENCY

We respectfully challenge ourselves to achieve excellence, while focused on our clear mission to innovate and create sustainable ingredients that matter.

- **Clear corporate mission**
- **Respectful candor**
- **Culture of innovation**

# Our Commitment TO SUSTAINABILITY

Green Plains is a leader in sustainability, producing biofuels that help mitigate climate change, while also focusing on corporate social responsibility. We strive to have a positive impact on all of our stakeholders: employees, customers, shareholders, communities and the environment.

## SUSTAINABILITY OVERVIEW

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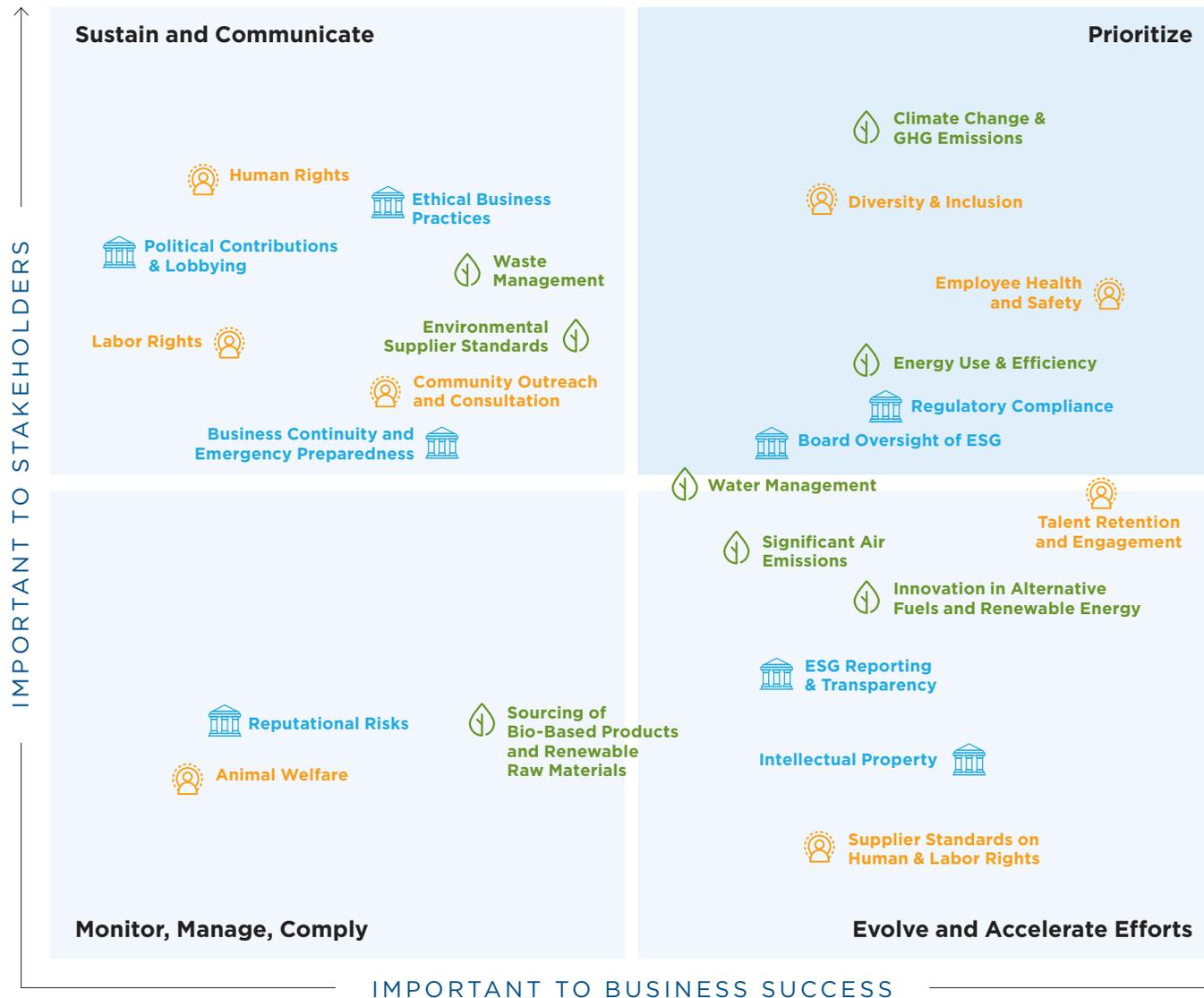
ESG Highlights

# Stakeholder Engagement and Material Topics

In 2021, we enhanced our stakeholder engagement process by conducting a formal materiality assessment. We communicated directly with key internal and external stakeholders and leveraged ESG research and ratings, global frameworks and standards to understand and execute on goals associated with environmental and social impact for the company and relevant stakeholders. Our key stakeholder groups and our methods of engagement are set forth in this report’s GRI index in response to disclosure 102-40 (page 67).

Our stakeholder-oriented, data-driven and forward-looking approach helped identify our top environmental, social and governance risks and opportunities for the company. It further provided us with valuable information to help prioritize disclosure, data collection, goal setting and strategy development.

The Materiality Map ranks ESG topics based on importance to our business success and key stakeholder groups and enables us to prioritize material topics based on their relevance to stakeholders and the impact on the business. Based on our assessment, this report focuses on the topics in the “Prioritize” quadrant, while addressing nearly all other topics.



# SUSTAINABLE DEVELOPMENT GOALS

## Sustainability in Action

Our commitment to sustainability is ingrained in our operations and culture. Not only have we set meaningful and actionable goals for ourselves, but we hold our partners and vendors to the same standards of equality, responsibility and accountability.

Our emphasis on human rights due diligence, emissions reduction, renewable energies, community outreach and involvement, and business ethics aligns with many of the United Nations Sustainable Development Goals.

The downstream benefits of our sustainability in action positively impact people in communities here and around the world.

### 1 NO POVERTY



Directly supports over 800 jobs across the U.S.

Indirectly supports over 23,000 jobs across the U.S.

### 3 GOOD HEALTH AND WELL-BEING



Contributes to global health and safety through production of high-purity alcohol for hand sanitizer and disinfectants

### 7 AFFORDABLE AND CLEAN ENERGY



Provides consumers with less expensive, renewable biofuel alternatives to regular gasoline

### 9 INDUSTRY, INNOVATION AND INFRASTRUCTURE



Drives innovative biorefinery process and product development

### 12 RESPONSIBLE CONSUMPTION AND PRODUCTION



Meets the world's growing food and dietary protein demands with high-protein and plant-based feeds

### 14 LIFE BELOW WATER



Develops innovative aquaculture diets to reduce overfishing of our oceans

### 16 PEACE, JUSTICE AND STRONG INSTITUTIONS



Promotes a fair and just society via enhanced ethics and compliance procedures and oversight and community outreach and consultation

### 2 ZERO HUNGER



Meets growing global demand for plant-based protein in a sustainable way

### 6 CLEAN WATER AND SANITATION



Engages in robust efforts to clean water and efficiently manage water resources across 11 biorefineries

### 8 DECENT WORK AND ECONOMIC GROWTH



Plays a significant role in agricultural economic activity in the U.S. Midwest, including purchasing corn locally and directly from American farmers as well as providing a reliable source of employment in rural communities

### 10 REDUCED INEQUALITIES



Contributes to the protection of human and labor rights via our robust corporate governance policies and procedures

### 13 CLIMATE ACTION



Reduces particulate matter emissions and carbon footprint of liquid fuel vehicles

### 15 LIFE ON LAND

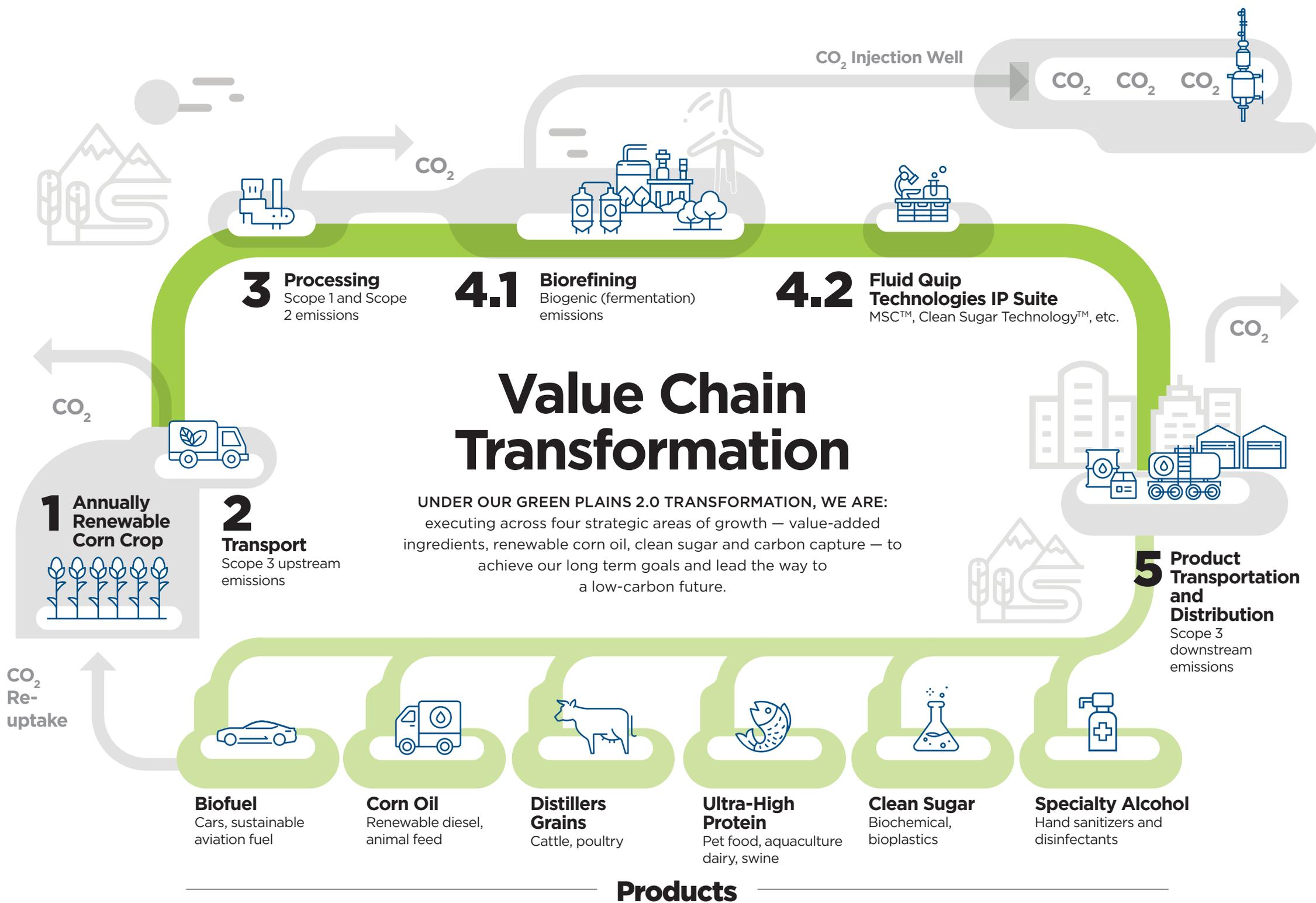


Reduces need to further deforest land for agricultural purposes by using locally sourced corn

### 17 PARTNERSHIPS FOR THE GOALS



Engages with strategic partners to deploy advanced agricultural technology and achieve sustainability goals



# Value Chain Transformation

UNDER OUR GREEN PLAINS 2.0 TRANSFORMATION, WE ARE:  
executing across four strategic areas of growth — value-added ingredients, renewable corn oil, clean sugar and carbon capture — to achieve our long term goals and lead the way to a low-carbon future.

**3 Processing**  
Scope 1 and Scope 2 emissions

**4.1 Biorefining**  
Biogenic (fermentation) emissions

**4.2 Fluid Quip Technologies IP Suite**  
MSC™, Clean Sugar Technology™, etc.

**1 Annually Renewable Corn Crop**

**2 Transport**  
Scope 3 upstream emissions

**5 Product Transportation and Distribution**  
Scope 3 downstream emissions

**Biofuel**  
Cars, sustainable aviation fuel

**Corn Oil**  
Renewable diesel, animal feed

**Distillers Grains**  
Cattle, poultry

**Ultra-High Protein**  
Pet food, aquaculture dairy, swine

**Clean Sugar**  
Biochemical, bioplastics

**Specialty Alcohol**  
Hand sanitizers and disinfectants

## Products

## Technology Highlights

### Maximized Stillage Co-Products™ Technology — Revolutionizing Sustainable, Plant-Based Proteins

In 2021, Green Plains broke ground on three additional MSC™ installations: Central City, Nebraska; Mount Vernon, Indiana; and Obion, Tennessee. With our Shenandoah, Iowa, and Wood River, Nebraska, biorefineries already producing Ultra-High Protein with Fluid Quip Technologies' (FQT) MSC™ technology, we're quickly evolving into the biorefinery platform of the future. While other plant-based protein separation technologies rely on harsh chemicals and solvents to extract their product, our mechanically separated Ultra-High Protein is cleaner, more consistent and more nutritious.

#### NUTRITIONAL PROFILE

This technology allows us to achieve protein concentrations of 50% or greater through mechanical separation. We have conducted trials at higher concentrations, with a path to commercial-scale concentrations above 60% in sight. Additionally, through exclusive technology partnerships, we are leveraging a suite of biotechnology enhancements to achieve even further improvements to the nutrition profile of our Ultra-High Protein, replacing existing proteins that contain anti-nutritional characteristics.

Our Ultra-High Protein is a regulatory compliant high concentration alternative protein product. In trials, it has been used to replace a variety of different vegetable proteins, protein isolates and fishmeal on an equal protein basis to achieve better performance.

Due to the high levels of protein and the high digestibility of the proteins, full replacement of vegetable proteins in most rations is achievable and comes with a higher energy level. A recent study concluded that the energy value of Ultra-High Protein was determined to be significantly higher than another common vegetable protein. Further, the study found the amino acid digestibility values for Ultra-High Protein were actually higher than many of the values for the common alternative (see nutrient comparison table). The sulfur amino acid requirement is almost always the first-limiting amino acid in poultry diets and the values for the sulfur amino acids methionine and cysteine in Ultra-High Protein compare well with the relevant values for common alternative vegetable protein. Overall, the results of the study indicated that the nutritional value of Ultra-High Protein compares favorably with that of the alternative.<sup>4</sup>

#### ULTRA-HIGH PROTEIN NUTRITIONAL PERFORMANCE VS A COMMON PROTEIN ALTERNATIVE

NUTRIENT	ULTRA-HIGH PROTEIN	COMMON PROTEIN ALTERNATIVE
True Metabolizable Energy	●	
Crude Protein	●	
Methionine	●	
Cysteine	●	
Lysine		●
Threonine	●	
Valine	●	
Arginine		●
Isoleucine		●
Tryptophan	●	

<sup>4</sup> Nutritional value of ethanol coproduct evaluated for poultry, Bill Dudley-Cash, Feedstuffs Vol. 89, No. 11, November 6, 2017.

## A TRULY UNIQUE PRODUCT

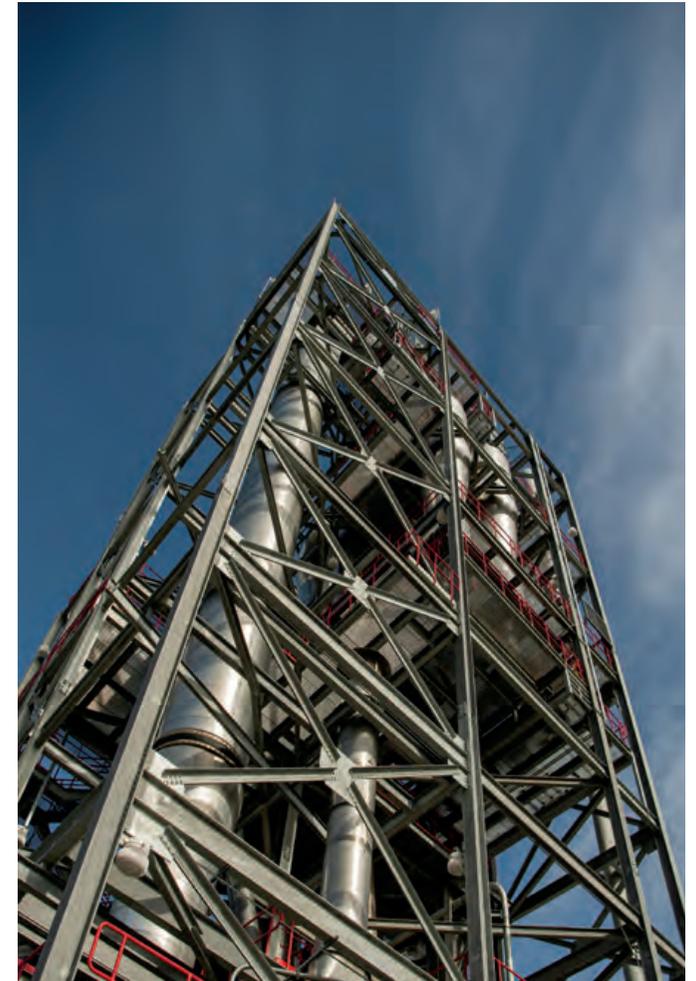
Yeast is one of the most valuable sources of feed protein, and 24% of the dry matter in our Ultra-High Protein is spent brewer's yeast. The ethanol industry is the largest source of yeast that can be used for animal feed. While the amount of yeast added to fermentation is measured and known, there is an approximate 40-fold generation of yeast during the fermentation process. Yeast is shown to be a high-quality protein source, resulting in high growth rates, feed intake and feed efficiency and positive effects on robustness and health.<sup>5</sup> According to Cruz & Hakenasen et al., adding up to 14.6% yeast in diets for weanling pigs supported higher growth performance and improved nutrient digestibility.<sup>6</sup>

MSC™ Technology's unique separation and drying process also leads to a high amino acid availability in the final product. A recent study found that yeast as a protein source has a favorable amino acid profile, good taste and positive health effects.<sup>7</sup> Experiments with yeast in diets for salmon concluded that it supports high growth performance and improves fish health.<sup>8</sup> Another study on the effect of yeast on gut health in Atlantic salmon found that it reduced inflammation in the gut, strengthened the gut barrier function and increased protection against pathogens.<sup>9</sup>

## A SUPERIOR SCALABLE SOLUTION

The livestock industry relies on consistent sources of ingredients to manufacture feed. An alternative protein must be available year round and in volumes which feed producers can access to merit feed bin space in their mill. Furthermore, the benchmarks for volume production, regulatory compliance and resilience in the supply chain are hurdles that technologies such as insect protein may find challenging to meet.

The development and commercialization of a new protein alternative into the world-wide livestock feed sector that can meet these benchmarks, is regulatory compliant, and at the same time will contribute to the circular economy is a major breakthrough in the feed sector. This MSC™ technology innovation is the cornerstone of our transformation and when installed platform-wide, our anticipated annual Ultra-High Protein production capacity will be approximately 600,000 tons. We are also proud to now offer this technology across the biofuels industry as well as through exclusive turnkey partnerships. We possess a unique value and opportunity to roll out a 50%+ plant-based protein feed from a dry milling process on a large scale.



5 Overland & Skrede 2016, Yeast derived from lignocellulosic biomass as a sustainable feed resource for use in aquaculture, J. Sci. of Food & Agriculture

6 Cruz & Hakenasen et al., 2019; Lakhno et al., In progress

7 Overland & Skrede 2017, Review, J. Sci. of Foods & Agriculture

8 Overland et al., 2013, Aquaculture, Sahlmann & Djordjevic et al., 2019; Aquaculture, Hansen et al., 2019, Aquaculture, Reveco & Hofosaeter et al., PlosOne In press

9 Grammes et al., 2013 Plos One; Reveco & Hofosaeter et al., Plos One In press; Hansen et al., 2019, Aquaculture; Sahlmann, Djordjevic et al., 2019 Aquaculture

## CIRCULAR ECONOMY

Our Ultra-High Protein product contributes to a circular economy by significantly improving the value of the coproduct stream at a biorefinery. Many of the common critiques of traditional feed production are neutralized if the feed in question is the coproduct of an existing process, for example the production of biofuel. Instead of using valuable land or marine resources, we are creating feed from substances that humans cannot consume. Such feeds are examples of the circular economy principle — promoting greater resource productivity, reduced waste, and avoidance of pollution by designing safe pathways for material flows to re-enter the biosphere.

In contributing to a circular economy, biorefinery coproduct streams are more sustainable and therefore merit a superior value and superior product status.<sup>10</sup> It is unquestionably a high value alternative protein product with distinct environmental benefits.

## CARBON FOOTPRINT OF ULTRA-HIGH PROTEIN VS. COMMON PROTEIN ALTERNATIVE

### Salmon (kg CO<sub>2</sub>e/kg growth)

Ultra-High Protein	1.37
Common Protein Alternative	1.59

### Broiler (kg CO<sub>2</sub>e/kg growth)

Ultra-High Protein	2.01
Common Protein Alternative	2.48

As mentioned previously, our Ultra-High Protein product is a nutritionally viable option for partial replacement of vegetable protein in the diets of fast growing meat species. This replacement will reduce the environmental impact of meat production without impacting growth performance. It is shown to result in lower carbon intensity poultry and fish production compared to another common vegetable protein. A recent study revealed that the replacement of 10% of a common vegetable protein with MSC™ is associated with a 19% and 14% reduction in CO<sub>2</sub> emissions associated with poultry and salmon production, respectively.<sup>11</sup>

Notably, aquaculture is one of the fastest-growing industries in the world. We have a unique opportunity to become a key supplier of high-quality, plant-based aquafeed for land-based recirculating aquaculture systems (RAS), thereby reducing overfishing of our oceans. Our Ultra-High Protein product is currently being tested in our aquafeed formulations and could potentially reduce demand for fish meal in fish feed formulations. We believe the inclusion of our Ultra-High Protein product in aquafeed formulations has the potential to have a positive impact on the Fish In/Fish Out (FIFO) ratio of aquafeed. FIFO is a measure of kilograms of whole wild fish for fishmeal production per every one kilogram of farmed fish production.

A recent salmon study concluded that yeast-based proteins are a sustainable feed resource with a low carbon footprint as there is no need for additional arable land and a high level of bio-security.<sup>12</sup> This is due to the fact that the product is produced in a closed loop system and yeast is grown on the relatively small footprint of a modern day biorefinery.



<sup>10</sup> FQPT Seizes Upon Underappreciated Source of Yeast and Protein for Feed- Bioethanol Production, Feedinfo News Service, 06/11/2017

<sup>11</sup> Burton et al., 2021, Use of an Ethanol Bio-Refinery Product as a Soy Bean Alternative in Diets for Fast-Growing Meat Production Species: A Circular Economy Approach, MDPI

<sup>12</sup> Environmental benefits of novel non-human food inputs to salmon feeds. Couture et al., 2019; Bren School of Env. Sci & Management, UCSB & Foods of Norway, NMBU

## Clean Sugar Technology™ — Feedstock from the Most Abundant Renewable Carbon Source Available

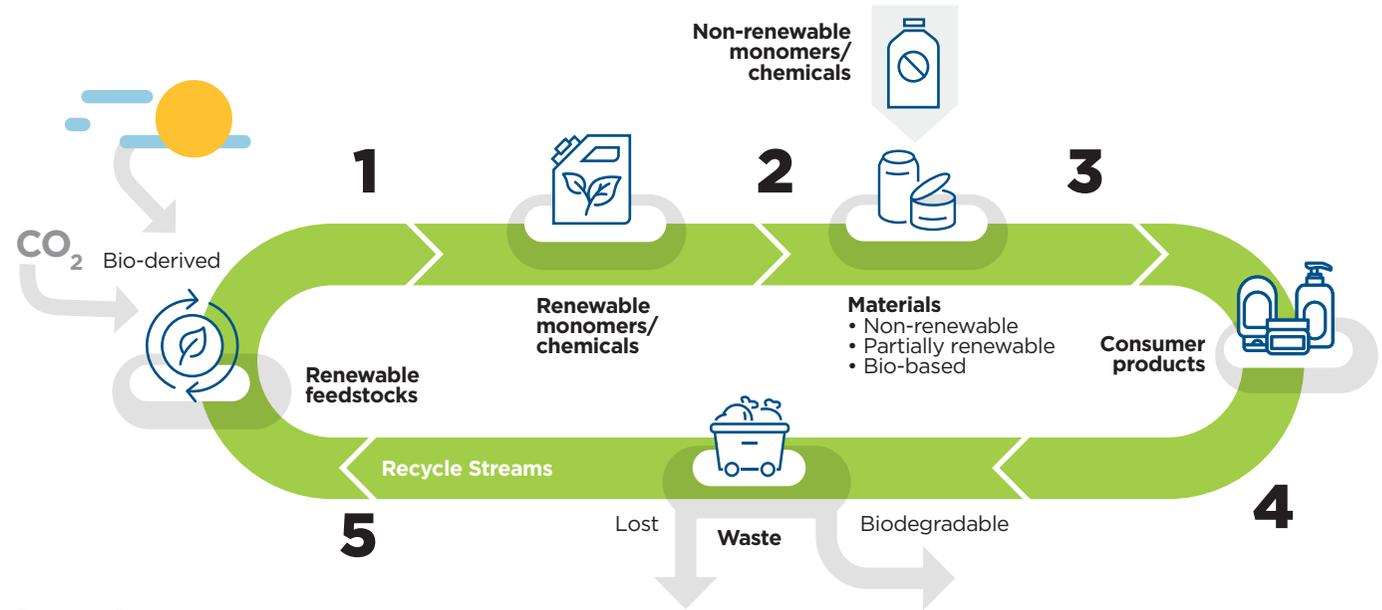
In North America, bio-based glucose and dextrose derived from corn — the most abundant renewable carbon source available — is in high demand and anticipated to grow as the demand for bioproducts expands, requiring new sources of glucose and dextrose. We believe we can successfully meet this need with our CST™.

The bio-based glucose and dextrose industry, including bioplastics, biochemicals, renewable chemicals and synthetic biology, is diverse and evolving quickly. According to the Biotechnology Innovation Organization, the global economic value of the biotechnology industry is estimated to be \$355 billion.<sup>13</sup> Large amounts of fermentable sugars will be required for next generation biopolymer, biochemical, biofuel and food products.<sup>14</sup> Even if society recycles 100% of products, there will still be a need for virgin materials to keep pace with overall economic growth.<sup>15</sup> Consumers are also expecting products to be derived from renewable sources and manufactured in a safe and non-invasive manner. We are uniquely positioned to meet this demand.

<sup>13</sup> Biotechnology Innovation Organization. Renewable chemical platforms building the biobased economy. *Ind. Biotechnol.* 14:109, 2018  
<sup>14</sup> Singh V, Stone J, Roberts JP, et al. Industrial biotechnology shaping corn biorefineries of the future. *Cereal Foods World* 2019;64(4).  
<sup>15</sup> Expert View: Five ways biotech supports the transition to a more circular economy. *Bio Market Insights* Feb 14, 2019 by Christophe Schilling, CEO, Genomatica.

## BIOTECHNOLOGY: PART OF MOVING TO A MORE CIRCULAR ECONOMY

Renewable feedstocks; new materials to reduce waste; better design; compostability; “recycle or better” at end of life



Source: Genomatica





### Our products contribute to the circular economy:

- Produced clean, without harsh chemicals
- Lower carbon intensity than alternatives
- Renewable source of carbon

In 2021, FQT engineered and constructed a fully scalable commercial CST production facility at the Green Plains Innovation Center at York, Nebraska. In 2022, engineering began for a full scale CST production facility that can process up to 30,000 bushels of corn per day, which we expect to break ground in late 2022. We believe this technology can transform a dry-mill facility into a clean sugar biorefinery, where dextrose and glucose replace ethanol as the primary product. Our process extracts the sugar using simple enzymes and mechanical separation, avoiding harsh chemicals traditionally used at wet-mills.

Further, carbohydrate (renewable carbon) feedstocks attained using CST can deliver considerably lower carbon intensity (CI) scores than conventional fossil-derived feedstocks, such as crude oil and coal. Importantly, our dry milling process produces bio-based glucose and dextrose at a dramatically lower CI than other available technologies, such as

wet milling. A recent technical report shows this CI reduction is anywhere from 20% to 48%, due to the unique advantages of FQT's patented technology, which allows a dry mill to skip an energy intensive portion of the sugar production process on the front end of a wet-mill. This results in a CI score similar to that of Brazilian cane sugar, which is traditionally thought of as the industry standard low-CI carbohydrate feedstock.

### CARBON INTENSITY (KG CO<sub>2</sub>E/MT DRY SUGAR)

**Dry Mill Clean Sugar 641**

**Wet Mill Sugar 1050**

Non-renewable petroleum based monomers are so widely used, with markets of millions of tons per year spanning a wide range of industries, that replacing them with renewable carbon feedstocks can achieve far reaching sustainability benefits.

## ESG Highlights

The following table outlines our Material ESG Topics, existing goals that were set in 2021, progress related to those goals, as well as our planned initiatives and any new goals and targets for 2022 and beyond.





<p><b>Water Management</b></p>	<ul style="list-style-type: none"> <li>• Reduce water permit deviations 50% by 2025 compared to 2020 baseline</li> </ul>	<p><b>11.46%*</b> reduction in water withdrawn (Thousand Cubic Meters) in 2021 vs. 2018 baseline</p> <p><b>63.41%</b> reduction in water permit deviations in 2021 vs. 2020 baseline, achieving our 50% target</p> 	<ul style="list-style-type: none"> <li>• Developing goals to increase total water recycled</li> <li>• Incorporating improvement ideas to reduce water usage (land application, wastewater pond projects and PEMS/CEMS system installs on scrubbers) into strategic plan</li> <li>• Planned installation of a controlled back-wash system at our Otter Tail facility that will return water that previously was being discharged to the river back into the process, increasing water efficiency</li> </ul>
<p><b>Biodiversity and Land Stewardship</b></p>	<ul style="list-style-type: none"> <li>• Achieve 60% origination from the farmer in 2022, an increase of 5% from 2020<sup>16</sup></li> </ul>	<p><b>100%</b> US domestic feedstock sourced within trucking distance</p> <p><b>60%</b> of feedstock originated directly from the farmer in 2021, achieving our 2022 target one year early</p>  	<ul style="list-style-type: none"> <li>• Finalize a multi-year farm carbon strategy/ grain origination roadmap by the end of 2022</li> <li>• Build out our corn procurement team with carbon/traceability experience</li> </ul>
<p><b>Waste, Circularity and Environmental Compliance</b></p>	<ul style="list-style-type: none"> <li>• New material topic, currently establishing goals</li> </ul>	<p>Calculated and disclosed environmental compliance metrics related to hazardous waste, spills, fines, etc. and began to tackle tracking and disclosure of non-hazardous waste</p>	<ul style="list-style-type: none"> <li>• Plan to complete tracking and consolidation of non-hazardous waste data at all of our biorefineries for public disclosure in our 2022 Sustainability Report.</li> <li>• <b>NEW</b> Goal to enhance our corporate recycling program at our Omaha, NE headquarters in 2022.</li> </ul>

<sup>16</sup> At two of our biorefineries, we contract with a third-party grain originator to supply the corn necessary for biofuel production. These contracts terminate in November 2023, which, if not renewed, would allow us to further increase direct origination of corn.

\* Reductions a result of energy efficiency projects and asset divestments

MATERIAL  
ESG TOPICS

GOAL

Where We Are  
(Progress in 2021)

Where We Are Going  
(2022 and Beyond)



Social



Workforce  
Equality,  
Diversity and  
Inclusion

- Increase the number of female employees 25% from 2020 numbers by 2030
- Increase the number of employees who add diversity to our workforce by 15% from 2020 numbers by 2030

**13.60%**

increase in the number of female employees in 2021, keeping us on track to accomplish our 2030 goal

**14.00%**

increase in the number of employees who add diversity to our workforce in 2021

Initiated a diverse intern program in 2021-2022

Identified tactical/short term DEI targets



- Enhancing goals and plans on talent management, leadership training, and diversity, equity and inclusion
- **NEW** 2022 short term target to increase culturally diverse hires by 2% and an increase in women hiring by 4% over 2021
- Developing diverse recruiting and outreach network with HBCUs, Society of Women Engineers, Latino Center of the Midlands, Panhellenic Council, 100 Black Men, among others

Talent Retention  
and Engagement

- New material topic, currently establishing goals

Made significant upgrades to employee benefits package in 2021

Implemented leadership training at VP and above level in 2021

- Continue to deliver leadership best practices to company leaders and managers via monthly and quarterly leadership training sessions
- Review and consider implementing talent acquisition software and tools
- Implement targeted job opportunity communication plan: Women in Agriculture (WIA), Radio Lobo, El Perico, Omaha Star, New Era, LinkedIn
- Launching company-wide Learning Management System (LMS) in 2022

<p><b>Employee Health and Safety</b></p>	<ul style="list-style-type: none"> <li>• Reduce OSHA TRIR by 35% by 2025 compared to 2020 baseline</li> <li>• Implement cardinal rules of environment, health, safety and security (EHSS)</li> </ul>	<p><b>24.27%</b> decrease in OSHA TRIR in 2021 vs. 2020, keeping us on track to meet our 2025 target</p> <p>Safety metric included in executive compensation plan since 2012 and Cardinal Rules implemented in 2020</p> <p>Occupational Health &amp; Safety Policy published in September 2021</p> 	<ul style="list-style-type: none"> <li>• 6S implementation across our platform, STOP Work Program, formalized shift change communication worksheets, standardize PPE and JSA card locations</li> <li>• Integrate all EHSS training with new LMS launch and reimagine safety training for 2023 to be more interactive and inclusive</li> </ul>
<p><b>Customer Health and Safety</b></p>	<ul style="list-style-type: none"> <li>• Implementation of Quality Management System (QMS) and corresponding Quality Procedures at all facilities equipped with Fluid Quip's MSC™</li> <li>• No findings on FDA Audit for FSMA program.</li> <li>• Quality Deviation Report (QDR) and Corrective Action and Preventative Action (CAPA) program/tools and training for all employees working at facilities equipped with Fluid Quip's MSC™</li> <li>• Establishment of KPI to track % of shipped products that meets feed tags, Certificate of Analysis (COA) and/or other product specifications</li> </ul>	<p><b>100%</b> of products are subject to either a Certificate of Analysis process, feed tag with guarantee, and/or other type of Quality Assurance document</p> <p>Audited by the U.S. Food and Drug Administration (FDA) regarding compliance with the Food Safety Modernization Act (FSMA). None of our facilities received negative findings.</p> <p>Product Quality and Food Safety Manual established in 2021</p> <p>Resumed customer appreciation days in 2021</p> 	<ul style="list-style-type: none"> <li>• Plan to implement Product Quality and Food Safety Manual across all facilities equipped with MSC technology in 2022</li> <li>• Implementing internal audit program in 2022 to maintain no negative findings on future FDA audits</li> <li>• Training on QDR on track to be complete for all MSC facilities by the end of 2022</li> <li>• Currently building the database to pull all testing (feed tags, COA, etc.) for product specifications to establish limits and identify out of spec product, putting us on track to accomplish our goal of creating a KPI for tracking % of shipped products that meet spec</li> </ul>

<p><b>Supplier Relationships</b></p>	<ul style="list-style-type: none"> <li>• <b>Maintain 50% bulk shipping goal (rail and barge) instead of truck to lower our CI scores and reduce Scope 3 emissions</b></li> </ul>	<p><b>100%</b> of yeast, enzyme and other chemical suppliers screened using ESG criteria since 2018</p> <p>Code of Vendor Conduct adopted in May 2021</p> <p><b>75%</b> of biorefinery volume shipped by bulk transport (rail or barge) in 2021, exceeding goal of 50%</p>	 <ul style="list-style-type: none"> <li>• <b>Execute backhaul program with third party carriers by 2023 to decrease deadheading (hauling from terminals to our biorefineries with an empty trailer) to reduce Scope 3 emissions</b></li> <li>• <b>Directly engage with third party carriers and trucking companies to discuss and collaborate on sustainability goals, alignments and backhaul program, with a new goal to meet with all of our top outside carriers by the end of 2022. This will keep us on track for implementing the backhaul program by 2023.</b></li> </ul> 
<p><b>Communities</b></p>	<ul style="list-style-type: none"> <li>• <b>Increase donations and sponsorships by 10-20% from 2021 to 2022</b></li> <li>• <b>Invest in 10 employee-led new priorities for donations in 2022 (in addition to existing priorities)</b></li> <li>• <b>Dedicate 2,000 hours of volunteering company-wide in 2022</b></li> </ul>	<p><b>100%</b> of our operations have implemented environmental impact assessments and ongoing monitoring via EPA's Risk Management Program and our Process Safety Management policy and procedure</p> <p>Infused over \$1.5 billion into local communities near our biorefineries via grain purchases in 2021, including over \$580 million in direct purchases from area farmers.</p> <p>Donated \$243,918 in 2021</p>	 <ul style="list-style-type: none"> <li>• <b>Engage with employees via surveys, roundtables, company intranet, etc. in order to establish at least 10 new priorities for donations in 2022</b></li> <li>• <b>Established a partnership with the Food Bank for the Heartland to commit employee volunteers on a recurring basis throughout the year</b></li> <li>• <b>Establish system for tracking employee volunteer hours in order to achieve 2,000-hour target for 2022</b></li> </ul>

**MATERIAL  
ESG TOPICS**

**GOAL**

**Where We Are  
(Progress in 2021)**

**Where We Are Going  
(2022 and Beyond)**



**Governance**



**Board Composition and Structure**

- **Two female board members and one board member who adds diversity by 2022**
- **33% of Board members gender/ethnically diverse by 2022 annual meeting**

Appointed two female directors and two directors who add diversity, accomplishing our 2022 goals



Achieved 33% gender/ethnically diverse board members prior to 2022 annual meeting



Appointed a Lead Independent Director

Adopted new Board Governance Guidelines

Company Bylaw improvements concerning shareholder rights

Adopted a new Diversity & Qualifications Policy

- **NEW Proposal to declassify Board included in 2022 Proxy Statement, allowing vote to occur at our 2022 Annual Meeting of Shareholders**
- **NEW Goal to reduce Board size to eight members by 2023 Annual Meeting**

**Ethics and Compliance**

- **By 2022, 100% of Green Plains employees will be trained on Code of Ethics, Anti-Corruption and Human and Labor Rights policies**

Updated and improved Anti-Corruption Policy published in May 2021

Human and Labor Rights Policy adopted in May 2021

Initiated a new Vendor Screening program in 2021, screening 7,558 foreign and domestic vendors and suppliers against 63 different watches, sanctions and most-wanted lists, including key human rights list

- **Incorporate training for all employees on Code of Ethics, Anti-Corruption and Human and Labor Rights into company-wide launch of the new LMS in 2022, keeping us on track to accomplish our 2022 goal of 100% of employees trained**

# Environmental

Our commitment to environmental stewardship is exemplified in all we do, and we are constantly striving to do even more.

## OUR MATERIAL TOPICS

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Our Climate Change Strategy

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Energy Use and Efficiency

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Water Management

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Biodiversity and Land Stewardship

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Waste, Circularity and Environmental Compliance

Transformation is at the core of our business: Every day, we turn an annually renewable feedstock — corn — into sustainable ingredients. Since distilling our first gallon of renewable biofuel, we have been focused on gaining efficiencies and reducing our carbon footprint. As part of our transformation to Green Plains 2.0, we are forming strategic partnerships and employing innovative technologies to further reduce our environmental impact. We are taking steps to reduce our GHG emissions through energy efficiency projects, clean energy sourcing and carbon capture. We are committed to water conservation, increasing biodiversity, promoting land stewardship and the preservation of natural resources. The way in which our products are processed and consumed is in harmony with the circular economy that is core to who we are and our #ingredientsthatmatter.

## Our Climate Change Strategy

The issue of global climate change continues to attract considerable public and scientific attention with widespread concern about the impacts of human activity, especially the emissions of greenhouse gases such as carbon dioxide and methane. Climate change legislation in the U.S. and abroad is likely to receive increased focus and consideration for the foreseeable future, with numerous past and future proposals made at the international, national, regional and state levels of government to limit emissions of GHG.

Our products are created from annually renewable crops — primarily corn — with a low-carbon footprint. However, our biorefineries emit biogenic CO<sub>2</sub> through the process of fermentation and additional CO<sub>2</sub> from the combustion of natural gas to run our boilers and dryers. We are taking action now to reduce our own GHG emissions, but we also recognize that our business is not immune to physical or transitional impacts related to climate change. This global issue is likely to affect almost every aspect of our company, including potential impacts on the health and wellness of our employees, implications for how our facilities operate, sourcing of our raw materials and impacts on our customers' use of our products. However, as a producer of low-carbon fuels and ingredients, we are well-positioned to serve as part of the solution to climate change.

To decrease our exposure and build our resilience to climate change, we've enhanced our ESG governance, including a cross-functional ESG Work Group comprised of subject-matter experts to more systematically identify and address our

climate-related risks and opportunities. We've set aggressive GHG reduction goals with a path to carbon-neutral operations by 2050. We monitor our progress with key performance indicators that have short-, medium- and long-term goals. Components of our strategy are discussed below, and information about our ESG governance is set out in "ESG and Climate Change Governance" in the Governance section of this report.

### Risks

As the world moves toward a low-carbon future, Green Plains acknowledges the possible risks associated with climate change and we incorporate them into our overall business strategy and planning.

Green Plains considers two climate related risks: physical and transitional. We regularly review and evaluate topics that have the potential to present physical risks and actively develop methods to mitigate them. Our Emergency Response Plans for all our operational sites detail the procedures for emergency scenarios, including adverse weather events. We are using existing technologies where possible and assessing new technologies to reduce our emissions, improve carbon efficiency and identify energy transition opportunities. We also consider the potential risks associated with rapidly transitioning to a low-carbon economy and pay close attention to policy, legal, technology and market changes. We continually engage with stakeholders, policy makers, regulators and our industry partners about climate change issues and to address our impact on the environment.

Additionally, we have identified inherent climate-related risks with the potential to substantively affect our financials or broader business strategy. First, compliance with evolving

environmental laws and regulations, particularly those related to climate change, could be costly. Compliance with future laws or regulations to decrease GHG emissions may have an adverse impact on our operations, cash flows and financial position. Secondly, our biorefineries are subject to extensive environmental regulations. Our ability to maintain the required regulatory permits or manage changes in environmental regulations is essential to successfully operating our biorefineries. Governing state agencies could impose costly conditions or restrictions that are detrimental to our profitability and may have a materially adverse effect on our business. Lastly, climate change itself has been shown to cause increasingly more extreme weather conditions such as intense hurricanes, thunderstorms, tornadoes and winter storms, as well as increased volatility in seasonal temperatures. Extreme weather conditions and droughts may adversely affect the availability, quality and price of the annually renewable agricultural commodities we rely on to supply our biorefineries, as well as our operations and operating results.

The risk process incorporates risks disclosed in the Risk Factors section of Green Plains Inc.'s Form 10-K SEC filing, as well as considers potentially relevant risk factors disclosed in peer companies' Form 10-K SEC filings.

## Opportunities

We recognize that where there is risk, there is opportunity. We are in a unique position to help address the most significant ESG risk of climate change as we are in the business of producing low-carbon ingredients and fuels. In 2005, the U.S. Congress enacted the Renewable Fuel Standard to reduce surface transportation GHG emissions, expand the nation's renewable fuels sector, decrease our reliance on imported fossil fuels and encourage ethanol production for use as a gasoline oxygenate to replace MTBE, which had been banned in multiple states.<sup>17</sup> We believe that low-carbon biofuel will continue to play a critical role in decarbonizing the economy while creating green jobs and reinforcing our domestic energy security.

**Our biofuel has a 46% lower GHG profile on average than petroleum-based gasoline.<sup>18</sup>**

In addition, ethanol is the most cost-effective octane enhancer available and displaces some of the toxic elements of gasoline — aromatics such as xylene, toluene and benzene — thereby reducing not only GHG emissions but also particulate matter that negatively impacts air quality.

**From 2007 through 2021, the renewable biofuels we produced have reduced GHG emissions by more than 44.7 million metric tons of carbon dioxide equivalents (MMT), the equivalent of taking 9.7 million passenger vehicles off the road for one year.<sup>19</sup>**

Our biorefinery platform has the capacity to produce nearly 1 billion gallons of renewable biofuels annually and future opportunities abound, including pathways to convert ethanol to sustainable aviation fuel.

Our products are derived from corn plants, which naturally sequester CO<sub>2</sub> throughout the growing season and store it in the soil and the kernel. Using fermentation, we separate corn kernels into their main components: alcohol, fibrous protein-rich solids and CO<sub>2</sub>. This biogenic CO<sub>2</sub> is released back into the atmosphere and subsequently recaptured during the growing season by corn, soybeans, trees and other plants. Even though this life cycle loop makes our products less carbon intensive than fossil fuel alternatives, we can do more to further enhance the sustainability of our operations.



<sup>17</sup> <https://www.epa.gov/renewable-fuel-standard-program>

<sup>18</sup> <https://iopscience.iop.org/article/10.1088/1748-9326/abde08/pdf>

<sup>19</sup> <https://www.epa.gov/energy/greenhouse-gas-equivalencies-calculator>

In 2021, we took steps to keep that biogenic carbon dioxide from being released back into the atmosphere via a Carbon Capture and Sequestration (CCS) project,<sup>20</sup> in collaboration with Summit Carbon Solutions (SCS), a subsidiary of Summit Agricultural Group. This new venture would capture almost all of the CO<sub>2</sub> from fermentation at eight of our biorefineries and put our biofuel on a path toward achieving carbon neutrality. It is important to note that none of this captured CO<sub>2</sub> will be used for enhanced oil recovery (EOR). The amount of Green Plains CO<sub>2</sub> sequestered per year at the eight biorefineries on the SCS project is expected to be approximately 1.9 million metric tons, the same amount that would be sequestered by 2.3 million acres of U.S. forests in a year.<sup>21</sup> Further, by capturing and sequestering the CO<sub>2</sub> from our biorefineries, we believe we will be able to reduce the CI score of our biofuel by as much as 50%, making it comparable to or lower than other low-carbon fuels

available in the market today, and positioning our renewable fuels for low-carbon markets domestically and abroad.

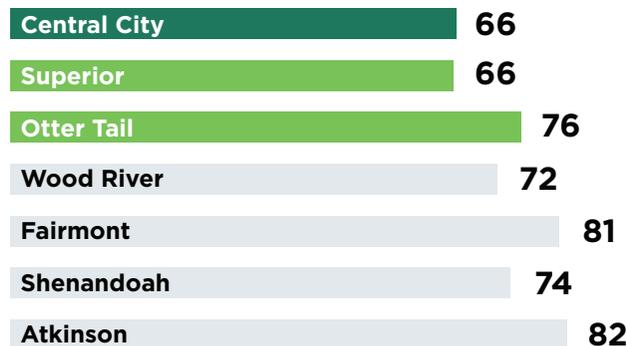
## Metrics and Targets

To align our strategy and risk management process with our assessment of climate-related risks and opportunities, we began by tracking and publishing various relevant metrics and KPIs in the annual sustainability report. From those metrics, we developed short, medium and long-term goals and targets. Our ESG Work Group evaluates, monitors and establishes targets by working with goal owners who develop specific plans, budgets and timelines to achieve the goal. These are then reviewed and approved by the Senior Leadership Team (SLT) and the Board's Nominating and Governance Committee.

We report on several key areas of impact, metrics and targets associated with climate-related risks and opportunities including GHG emissions, energy use, water use and land stewardship. The primary metric associated with our climate-related risks and opportunities is our obligation to report GHG emissions and develop procedures and methods to collect data critical for calculating these emissions. Through data collection, we can closely monitor our environmental impact and adjust over time. We continue to analyze our overall environmental performance across our company and identify areas for improvement. We have processes in place and continue to implement new ones to better understand and minimize our environmental impact.



### CALIFORNIA LCFS CI SCORES KG CO<sub>2</sub>E/MJ



<sup>20</sup> [https://19january2017snapshot.epa.gov/climatechange/carbon-dioxide-capture-and-sequestration-overview\\_.html](https://19january2017snapshot.epa.gov/climatechange/carbon-dioxide-capture-and-sequestration-overview_.html)

<sup>21</sup> <https://www.epa.gov/energy/greenhouse-gas-equivalencies-calculator>

## GHG Emissions

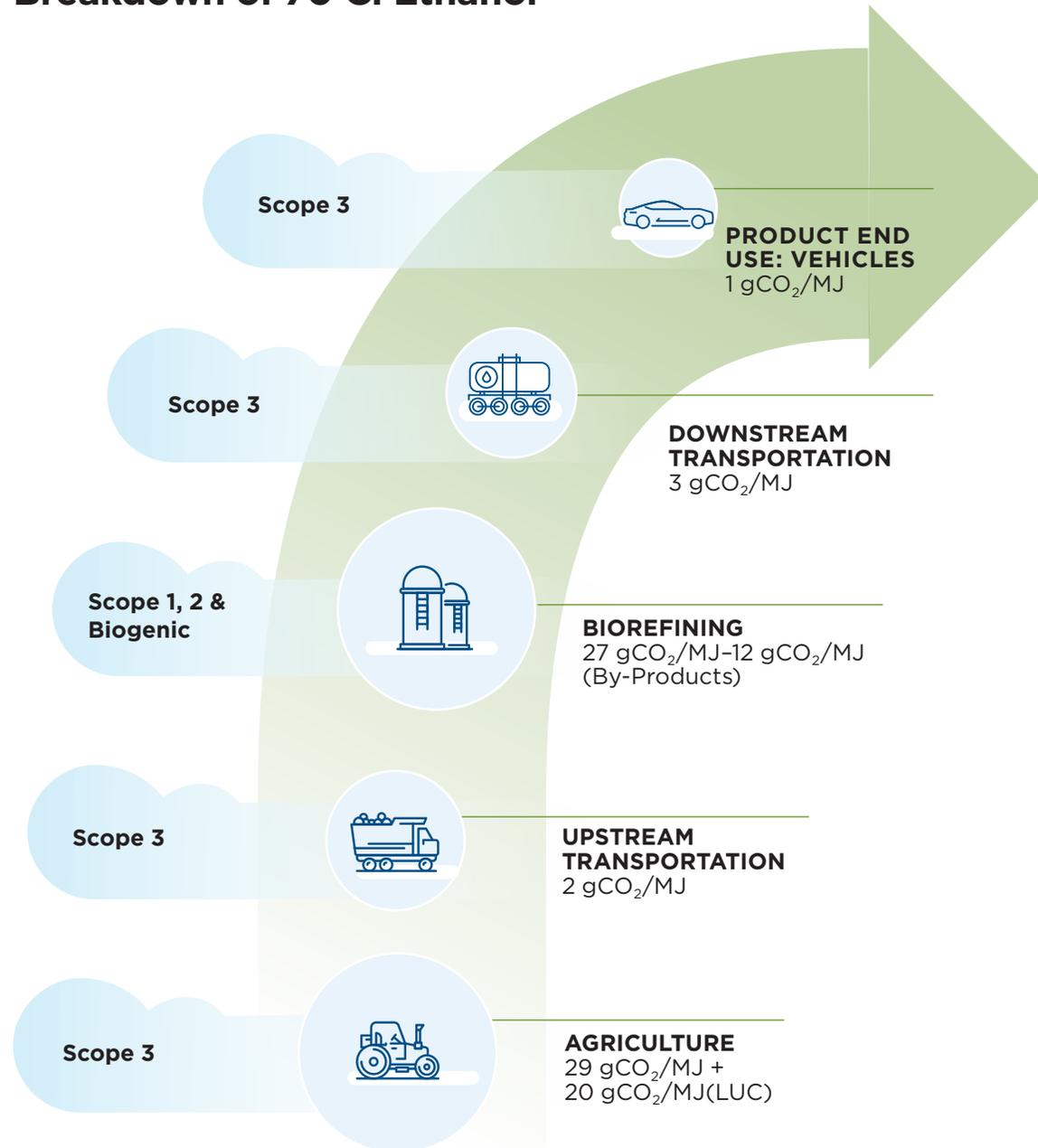
The majority of our operating emissions are released by the ethanol fermentation process and are classified as biogenic emissions. Most of the remaining emissions are from natural gas combustion (Scope 1) for steam generation and drying of distillers' grains as well as indirect (Scope 2) emissions associated with electricity consumption. A very small amount of GHG emissions from gasoline, diesel and Liquefied Petroleum Gas (LPG) fuel combustion occurs on-site related to our mobile equipment and generators, and is included in our Scope 1 emissions.

We have an established carbon neutrality goals and set aggressive targets of a 50% reduction in operational GHG emissions by 2030 and 100% reduction by 2050 over a 2018 baseline. Since 2018, we have reduced our operational GHG emissions by 35%, keeping us on track to achieve our 2030 and 2050 targets.

In addition, we:

- Plan to submit our GHG emissions reduction targets to the Science-Based Targets Initiative (SBTi) for validation by the end of 2022.
- Set a target to reduce our operational GHG emissions intensity to 16.5% by 2026 compared to a 2020 baseline.
- Calculated and disclosed our Scope 3 emissions in this report.
- Are evaluating initiatives to reduce our Scope 3 emissions.

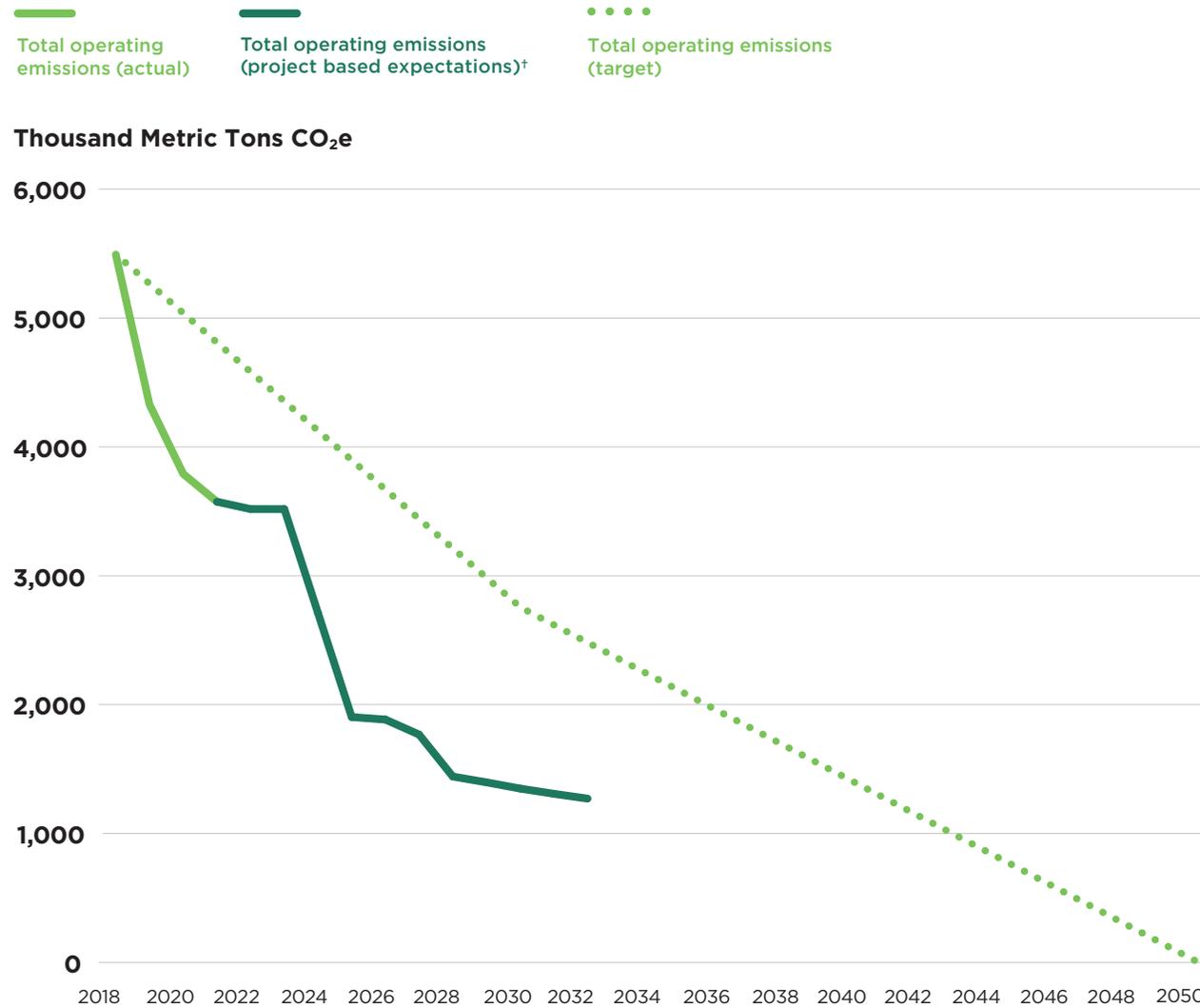
## Breakdown of 70 CI Ethanol



Source: Our analysis of CARB breakdown of 70 CI ethanol.

# Low-Carbon Future

## Path to Carbon-Neutral Operations by 2050 (Scope 1, 2 and Biogenic)



<sup>†</sup>2022-2032 Project Based Expectations estimates based on various carbon and energy efficiency related projects and initiatives

GREEN PLAINS PERFORMANCE DATA*	UNIT OF MEASUREMENT	2021	2020	2019	2018
Direct GHG Emissions (Scope 1)	Thousand Metric Tons (MT) CO <sub>2</sub> e	1,098	1,179	1,316	1,688
Carbon Dioxide (CO <sub>2</sub> )	Thousand MT	1,096	1,178	1,315	1,686
Methane (CH <sub>4</sub> )	Thousand MT CO <sub>2</sub> e	0.519	0.557	0.620	0.795
Nitrous Oxide (N <sub>2</sub> O)	Thousand MT CO <sub>2</sub> e	0.631	0.677	0.739	0.947
Indirect GHG Emissions (Scope 2)	Thousand MT CO <sub>2</sub> e	338	348	527	655
CO <sub>2</sub>	Thousand MT	336	345	524	652
CH <sub>4</sub>	Thousand MT CO <sub>2</sub> e	0.893	0.910	0.215	0.267
N <sub>2</sub> O	Thousand MT CO <sub>2</sub> e	1.536	1.567	2.599	3.230
Biogenic GHG Emissions (CO <sub>2</sub> from Fermentation)	Thousand MT	2,101	2,225	2,444	3,100
Total Operational GHG Emissions (Scope 1, 2 and Biogenic)	Thousand MT CO <sub>2</sub> e	3,536	3,752	4,287	5,443
Operational Emissions Intensity	MT of CO <sub>2</sub> e/ Raw Material MT	0.536	0.538	0.566	0.569
Indirect GHG Emissions (Scope 3)	Thousand MT CO <sub>2</sub> e	1,885	—	—	—
Category 1	Thousand MT CO <sub>2</sub> e	1,751	—	—	—
Category 4	Thousand MT CO <sub>2</sub> e	44.79	—	—	—
Category 7	Thousand MT CO <sub>2</sub> e	2.39	—	—	—
Category 9	Thousand MT CO <sub>2</sub> e	87.17	—	—	—

\* Scope 1 emissions reflect publicly reported data submitted to regulatory agencies as part of the annual air emission inventory reporting. Emission factors are derived through stack testing or through the use of commonly accepted emissions factors. The Scope 2 emissions we are currently reporting is purchased electricity. They are calculated using utility billing statements and the [EPA GHG Emissions Calculator](#). We use a grid/location-based method of converting purchased electricity into GHG emissions. Scope 3 emissions are reported for category 1 (purchased goods and services), category 4 (upstream transportation and distribution, category 7 (employee commuting) and category 9 (downstream transportation and distribution).

## Non-GHG Emissions

Biorefineries produce some level of volatile organic compounds (VOCs), hazardous air pollutants (HAPs) and particulate matter (PM) in the production of ingredients. To reduce these emissions from our operations, we employ thermal oxidizer (TO) and regenerative thermal oxidizer (RTO) emissions systems to remove up to 98% of the VOCs, HAPs and PM caused by the manufacturing process. For example, we upgraded the environmental controls for the dryers at our Madison, Illinois, biorefinery in 2020 to reduce VOCs, HAPs and PM. These upgrades also lowered the biorefinery’s natural gas consumption, reducing the Scope 1 GHG emissions (MT CO2e) of the facility by 62% per gallon of undenatured ethanol produced.<sup>22</sup> We are also installing these upgrades at our Mount Vernon, Indiana biorefinery.

We are also well on our way to achieving our 2025 target of a 60% reduction in air permit deviations over a 2020 baseline. In 2021, we reduced our deviations by 37%.

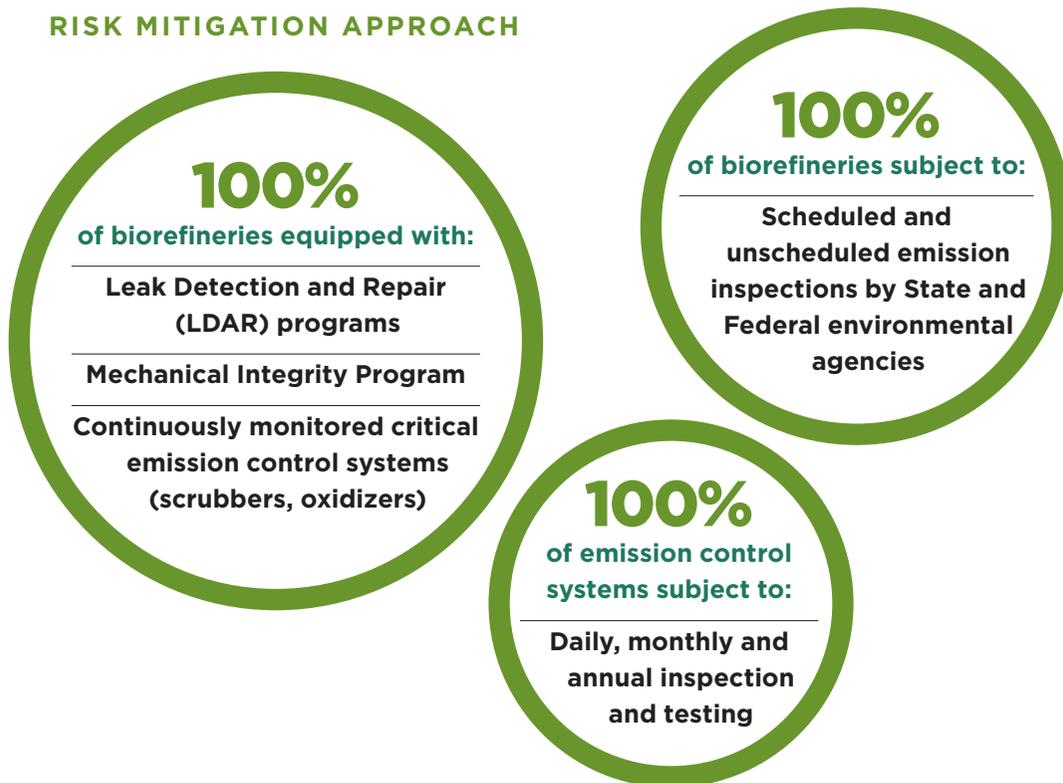
<sup>22</sup> The Madison facility emitted 6,928.3 MT CO2e for Scope 1 in 2021 and produced 6,737,437 gallons of undenatured ethanol after the upgrades were complete, resulting in 0.001028326 MT CO2e per gallon of undenatured ethanol produced. The facility emitted 29,531.4 MT CO2e for Scope 1 in 2020 and produced 10,868,986 gallons of undenatured ethanol prior to completion of the upgrades, resulting in 0.002717038 MT CO2e per gallon of undenatured ethanol produced.

## Enterprise-Wide Air Emissions (Excludes GHGs)\*

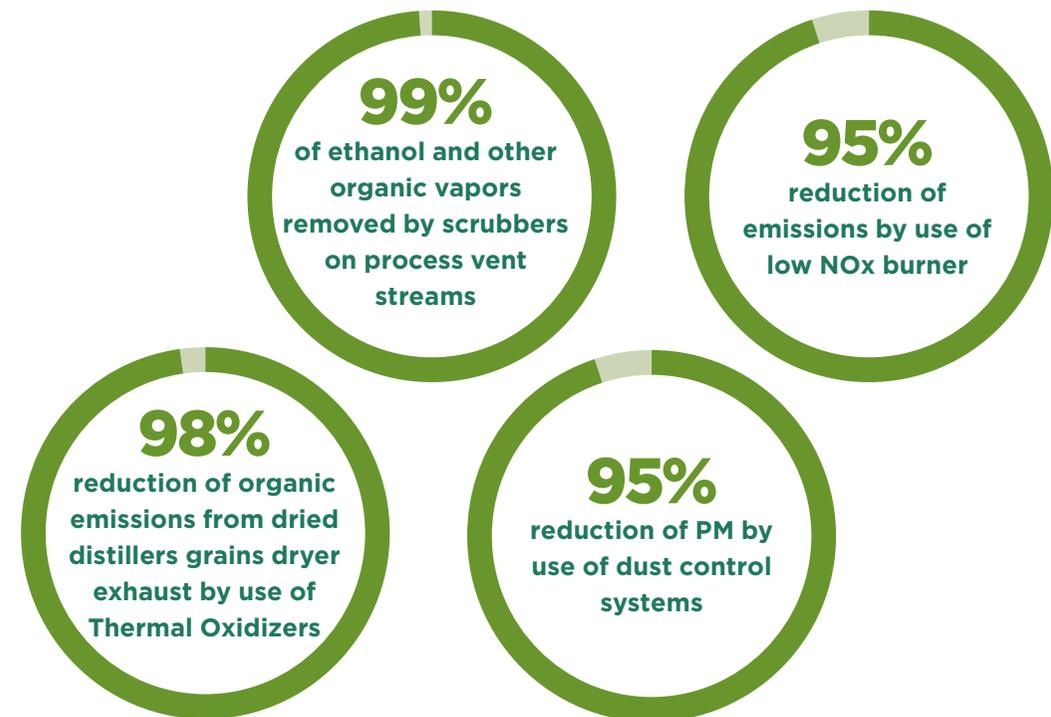
GREEN PLAINS PERFORMANCE DATA	UNIT OF MEASUREMENT	2021	2020	2019	2018
Sulfur Dioxide (SO <sub>2</sub> )	Thousand Metric Tons	0.087	0.098	0.099	0.122
Nitrogen Oxides (NO <sub>x</sub> )	Thousand Metric Tons	0.482	0.551	0.634	0.826
VOC Emissions	Thousand Metric Tons	0.649	0.563	0.583	0.746
Carbon Monoxide Emissions	Thousand Metric Tons	0.341	0.354	0.377	0.489
Particulate Matter Emissions	Thousand Metric Tons	0.329	0.379	0.397	0.452
Air Quality Permits, Standards and Regulations	Incidents of Non-Compliance	959	1532	-	-

\* Investments in emissions control systems exceed local environmental regulations.

## RISK MITIGATION APPROACH



## OPERATIONAL ACHIEVEMENTS



## Energy Use and Efficiency

We are reducing our energy use and increasing efficiency across our platform by incorporating energy efficiency projects into our annual capital expenditures plan. Such projects include boiler and economizer upgrades, centrifuge power packs and Variable Frequency Drives (VFD). Since 2018, we have realized a 29.70% reduction in off-site electricity consumption (thousand megawatt hours) and a 33.19% reduction in on-site natural gas fuel consumption (MMBtu). We are continually developing goals to further increase energy efficiency. We recently set a new target to reduce natural gas intensity (MMBtu/Raw Material MT) 2% per year through 2026.

GREEN PLAINS PERFORMANCE DATA	UNIT OF MEASUREMENT	2021	2020	2019	2018
Electricity Use	Thousand Megawatt Hours	650	661	735	924
Energy Intensity	Kilowatt Hours (KWh) / Raw Material MT	98.438	94.846	97.038	96.585
Natural Gas	Metric Million British Thermal Unit (MMBtu)	20,622,819	22,158,963	24,778,741	30,874,334
Natural Gas Intensity	MMBtu / Raw Material MT	3.125	3.179	3.271	3.226

### Clean Energy: Renewable Corn Oil

We aim to be a key player in the production of clean fuels in addition to creating low-carbon feedstocks for advanced biofuel production. One of our main goals is to contribute in a bigger way to the production of low carbon-intensity fuels such as renewable diesel and sustainable aviation fuel via a 50% increase in renewable corn oil yield by 2025 over a 2020 baseline. Renewable corn oil has a lower carbon intensity than most available feedstocks<sup>23</sup> because it is considered a “waste oil” under low

carbon fuel standard programs. The renewable corn oil produced at our biorefineries is an ideal low CI feedstock, and we have already made progress by realizing corn oil yield of 0.85 pounds per bushel in 2021, a 9% increase over 2020, keeping us on track to achieve our 2025 target of 1.2 pounds per bushel. This is another example of how we are constantly working on extracting additional value from every kernel of corn we procure, creating more value for farmers and for our stakeholders, while reducing GHG emissions.

<sup>23</sup> <https://iopscience.iop.org/article/10.1088/1748-9326/abde08>

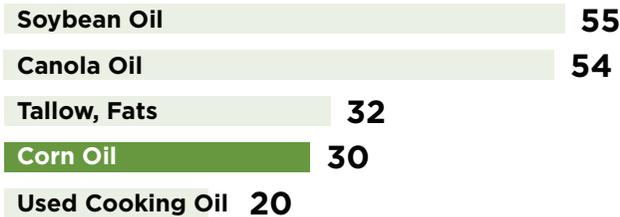
NATURAL  
GAS  
INTENSITY  
DECREASE

**1.46%**  
decrease by the  
end of 2020 over 2018  
baseline

**3.13%**  
decrease by the  
end of 2021 over 2018  
baseline



**AVERAGE CI PATHWAYS FOR BIODIESEL AND RENEWABLE DIESEL FEEDSTOCK**



Source: Company analysis of California Air Resources Board's pathways

**Product Transportation & Infrastructure**

According to the Association of American Railroads, moving freight by rail rather than trucks reduces GHG emissions by up to 75%<sup>24</sup>. Today, we move 75% of our biorefinery output via rail or barge, and our goal is to maintain at least 50% in bulk transport in 2022 in order to keep our CI scores low. Our main strategic ESG initiative for this key area of impact is to execute a backhaul program with our third party carriers by 2023 to decrease deadheading. Deadheading is the return trip from our product's destination, usually our terminals, back to our biorefineries with an empty trailer. Traveling with an empty trailer significantly increases the GHG emissions intensity of the trip (MT CO<sub>2</sub>e per ton-mile). Studies show that decreasing

deadheading can reduce Scope 3 emissions between 3-20%.<sup>25</sup> Our immediate objective is to directly engage with third party carriers and trucking companies to discuss and collaborate on sustainability goals, alignments and the backhaul program, with a new goal to meet with all of our top outside carriers by the end of 2022. This will keep us on track for implementing the backhaul program by 2023. Additionally, we have an established network of biofuel storage facilities at or near our 11 biorefineries, allowing fuel and other value-added products to be easily loaded into railcars and tanker trucks. Each location features fuel storage tanks and access to major rail lines for transportation.

By utilizing rail transportation assets, we are further reducing the need to truck biofuel long distances. Through our controlling stake in Green Plains Partners, a master limited partnership, we oversee a leased railcar fleet with an aggregate capacity of 85 million gallons dedicated to transporting end products. Green Plains Partners' wholly owned subsidiary, BlendStar LLC and its network of rail accessible fuel terminals with a combined storage capacity of approximately 6.9 million gallons, puts us in an effective position to reach southern markets that previously did not have efficient access to renewable fuel.

<sup>24</sup> <https://www.aar.org/wp-content/uploads/2020/06/AAR-Sustainability-Fact-Sheet.pdf>

<sup>25</sup> Lin, Dung Ying and Nig, Kuok Hou. (December 2021). "The impact of collaborative backhaul routing on carbon reduction in the freight industry." Transportation Research Part D: Transport and Environment, Volume 17, Issue 8, pp. 626-628.

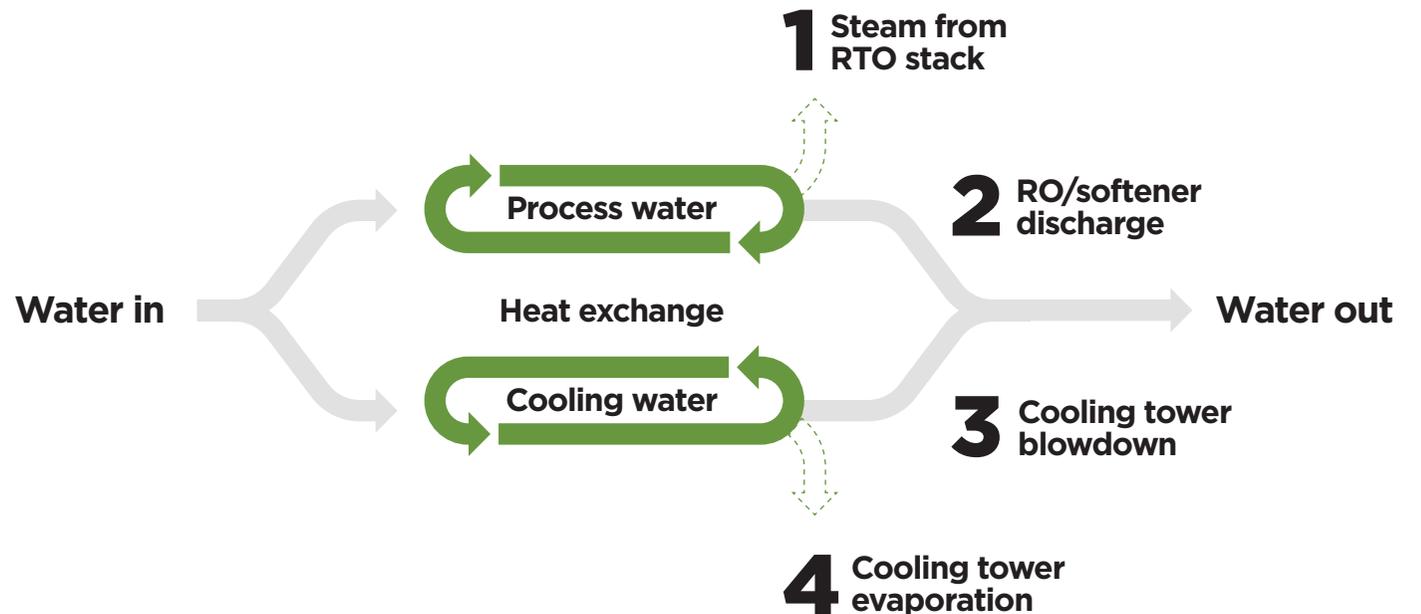
# Water Management

Each of our biorefineries requires a consistent and reliable supply of water, and we understand that efficient water use in production minimizes water disruption and pollution in the communities where we operate. The water used is sourced from ground water (well water), and to a lesser degree, from third-party providers (municipal water, including recycled municipal water). Much of the water used is recycled back into our biorefinery process. Since 2018, we have realized an 11.46% reduction in water withdrawn (thousand cubic meters). We have also achieved our main water-related goal to reduce water permit deviations 50% by 2025, compared to a 2020 baseline, four years early by reaching a 63.41% reduction in 2021. We are developing goals to further reduce water consumption and increase total water recycled. Further, we are incorporating improvement ideas to reduce water usage (land application, wastewater pond projects and Predictive Emissions Monitoring System (PEMS)/Continuous Emissions Monitoring System (CEMS) installs on scrubbers) into our strategic plan. The first such project to be implemented in 2022 is the planned installation of a controlled back-wash system at our Otter Tail facility that will return water that was previously being discharged to the river back into the process, increasing water efficiency.

Two streams of water are used in our biorefinery processes — cooling water and process water — and they do not come in contact with one another. Due to this stream separation, the majority of our cooling water and nearly all of our process water can be recirculated. Some water is lost through water treatment discharge (RO reject and softener regeneration), evaporation via dryer stacks,

evaporation via cooling towers, or (at all but one of our facilities) the discharge of cooling water via continuous or periodic cooling tower blowdowns. Continuously recirculating cooling water eventually builds up dissolved solids to the point where it needs to be replenished with fresh water. Process water vapor coming out of our dryer stacks can be condensed into liquid and recycled, saving both water and heat. We follow all local and federal appropriation, pollution and permitting requirements for water utilization at our facilities, and all but one of our facilities are zero liquid process water discharge facilities. Additionally, our Shenandoah facility utilizes treated municipal recycled water in its cooling tower,

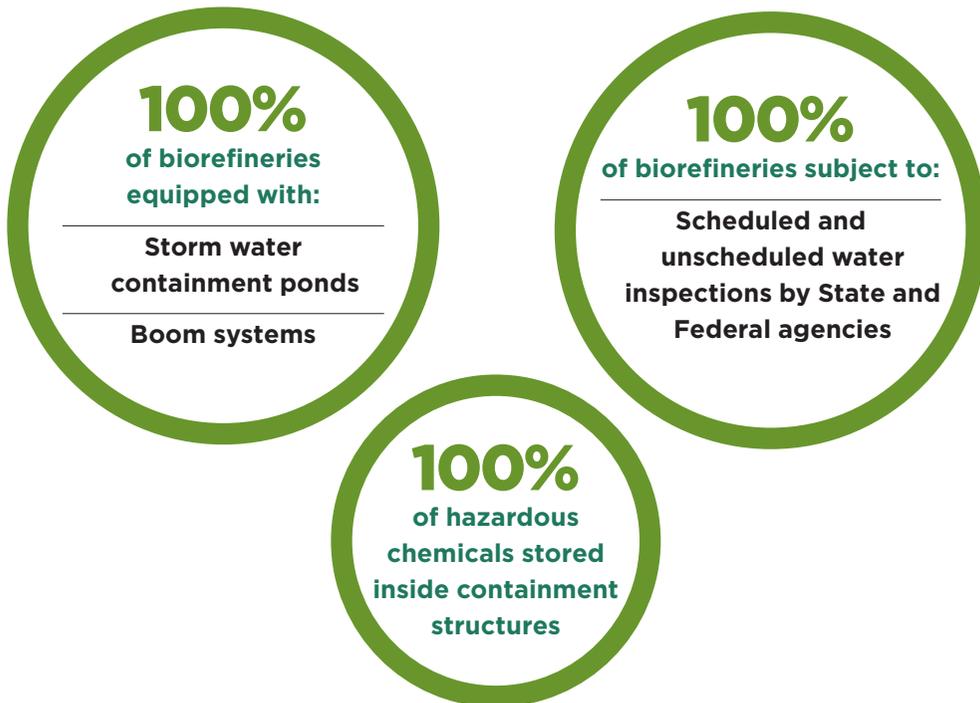
reducing the amount of fresh water we pull away from the local community. We currently do not have any known significant water-related impacts identified by local authorities or other stakeholders. All of our facilities are regulated for effluent standards via various state and federal regulatory agencies. Each state or federal authority is able to apply specific standards to meet the needs of local water bodies receiving effluents. Green Plains works with these authorities to ensure that proper standards are applied. Our water release is managed through Stormwater Monitoring Planning & National Pollutant Discharge Elimination System (NPDES) Permitting, Monitoring and Reporting.



GREEN PLAINS PERFORMANCE DATA	UNIT OF MEASUREMENT	2021	2020	2019	2018
Groundwater Withdrawal	Thousand Cubic Meters	9,182	8,861	9,328	9,366
Municipal Water Withdrawal	Thousand Cubic Meters	759	1,239	1,458	1,897
Reclaimed Water Withdrawal	Thousand Cubic Meters	288	313	317	290
Saltwater Withdrawal	Thousand Cubic Meters	0	0	0	0
Surface Water Withdrawal	Thousand Cubic Meters	0	0	0	0
Total Water Withdrawal	Thousand Cubic Meters	10,229	10,413	11,103	11,553
Total Water Discharged	Thousand Cubic Meters	3,546	3,966	4,151	5,102
Total Water Use	Thousand Cubic Meters	6,683	6,447	6,952	6,451
Total Water Intensity	Cubic Meters Water / Raw Material MT	1.013	0.925	0.918	0.674
Water Quality Permits, Standards and Regulations	Incidents of Non-Compliance	15	41	-	-

## Water Management in Manufacturing

### BEST AVAILABLE CONTROL SYSTEMS



### RISK MITIGATION APPROACH

## Recycled water goal

Process water, internal recycling/zero liquid discharge by design

Heat/cooling efficiencies by design

Process efficiency measures (energy use)

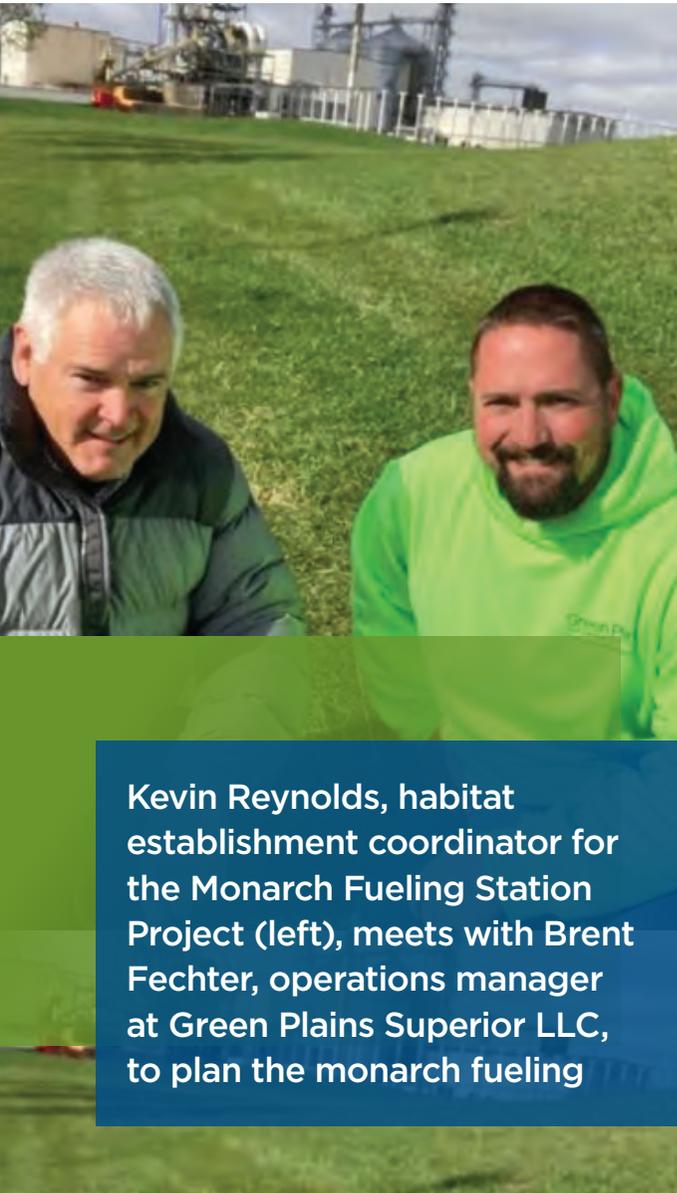
Recycled water for evaporative cooling

Evaporative re-use

Scrubbing efficiency

Utility efficiency (offset by environmental)





Kevin Reynolds, habitat establishment coordinator for the Monarch Fueling Station Project (left), meets with Brent Fechter, operations manager at Green Plains Superior LLC, to plan the monarch fueling

## Biodiversity and Land Stewardship

### Biodiversity

The need to protect and preserve our natural ecosystems is more apparent than ever before. Green Plains is committed to supporting biodiversity efforts, reducing deforestation and preserving areas of high biodiversity value. In 2021, we began assessing the broader biodiversity and other nature-related impacts of our operations and are taking steps to mitigate our impact. Our most material nature-related issues include ensuring long-term sustainable land use that keeps land in agriculture production (as opposed to urban development which claims 2 million acres of farmland per year in the U.S.)<sup>26</sup> and that fosters soil regeneration and resilient ecosystem services. In November 2021, we began establishing habitat for migratory monarch butterflies onsite at our Shenandoah and Superior biofuel facilities in Iowa. The projects are part of a larger initiative called the Monarch Fueling Station Project spearheaded by the Iowa Renewable Fuels Association and the [Iowa Monarch Conservation Consortium](#), which promotes habitat for endangered pollinators. Its objective is to provide patches of native grasses and other pollinator-friendly plants to promote monarch feeding and reproduction during their layover in the state on their 2,500-mile journey from the U.S. and Canada to the hibernation grounds in central Mexico.

Since the initiative started in 2017, it has established 19 fueling stations covering 48 acres. The Green Plains Shenandoah station will cover 1.75 acres, with

planting expected to begin in the spring of 2022. The station at Superior will be established on a nearby field, beginning with one or two acres, with the potential to expand. The establishment of the monarch fueling stations aligns with Green Plains' sustainability initiatives to promote and preserve wildlife habitat.

### Land Stewardship

Land stewardship and the conservation of natural resources are top priorities for Green Plains. Our practice of buying locally from U.S. farmers not only keeps farms in business, but it also helps to mitigate deforestation around the globe and decreases the environmental impact of long-haul transportation. Further, our new FQT MSC™ systems enhance renewable corn oil yields, allowing us to increase the production of an important clean energy feedstock source without expanding cropland acreage. The amount of corn we processed in 2021 can be grown on 256,000 fewer acres than in 2007<sup>27</sup>, and none of our feedstock comes from land converted to cropland from forests, in compliance with RFS regulations related to renewable biomass. We are growing more of the same annually renewable feedstocks on fewer acres, while using fewer resources and inputs.

Each of our biorefineries uses approximately 17 to 42 million bushels of corn annually, and we rely on our strong relationships with local farmers to ensure we receive a steady supply of corn. We locally source 100% of feedstock from farmers, grain elevators and cooperatives in the U.S., and within trucking distance from each of our biorefineries.

<sup>26</sup> [Farmland losing to urban sprawl | Farm Progress](#)

<sup>27</sup> (259,786,000 bushels of corn processed in 2021 / average US corn yield in 2007 of 150.7 bushels per acre) – (259,786,000 bushels of corn processed in 2021 / average US corn yield in 2021 of 177 bushels per acre) = 256,144.46



**Out of this, 60% of the corn we processed in 2021 came directly from farmers, achieving our 2022 sourcing goal one year early.**

A number of farmers in our supply chain use sustainable farming techniques, such as precision agriculture and the split application of nutrients, to increase yields while simultaneously lowering the levels of traditional inputs needed (such as land, water, fertilizer, herbicides and insecticides).<sup>28</sup> Many of these farmers also use cover crops and conservation tillage practices to reduce the risk of land degradation and often enroll marginal ground in federal conservation programs. To further enhance our sustainable sourcing strategy, we have set several objectives for 2022. First, by the end of 2022, we plan to finalize a multi-year farm carbon strategy and sustainable grain origination roadmap. Second, we plan to build out our corn procurement team with additional carbon and traceability experience.

### **BIOFUELS: THE TRUTH ABOUT LAND USE CHANGE, FOOD VS. FUEL AND GAS PRICES**

A kernel of corn is not completely removed from the food supply when processed into ethanol, a clean, environmentally friendly and necessary octane booster and extension of the liquid fuel supply, but

rather has its usage expanded to produce low-carbon feedstock for renewable diesel, CO<sub>2</sub> for commercial use or permanent sequestration, and to feed animals (33% of the kernel) who would otherwise consume corn and other row crops.

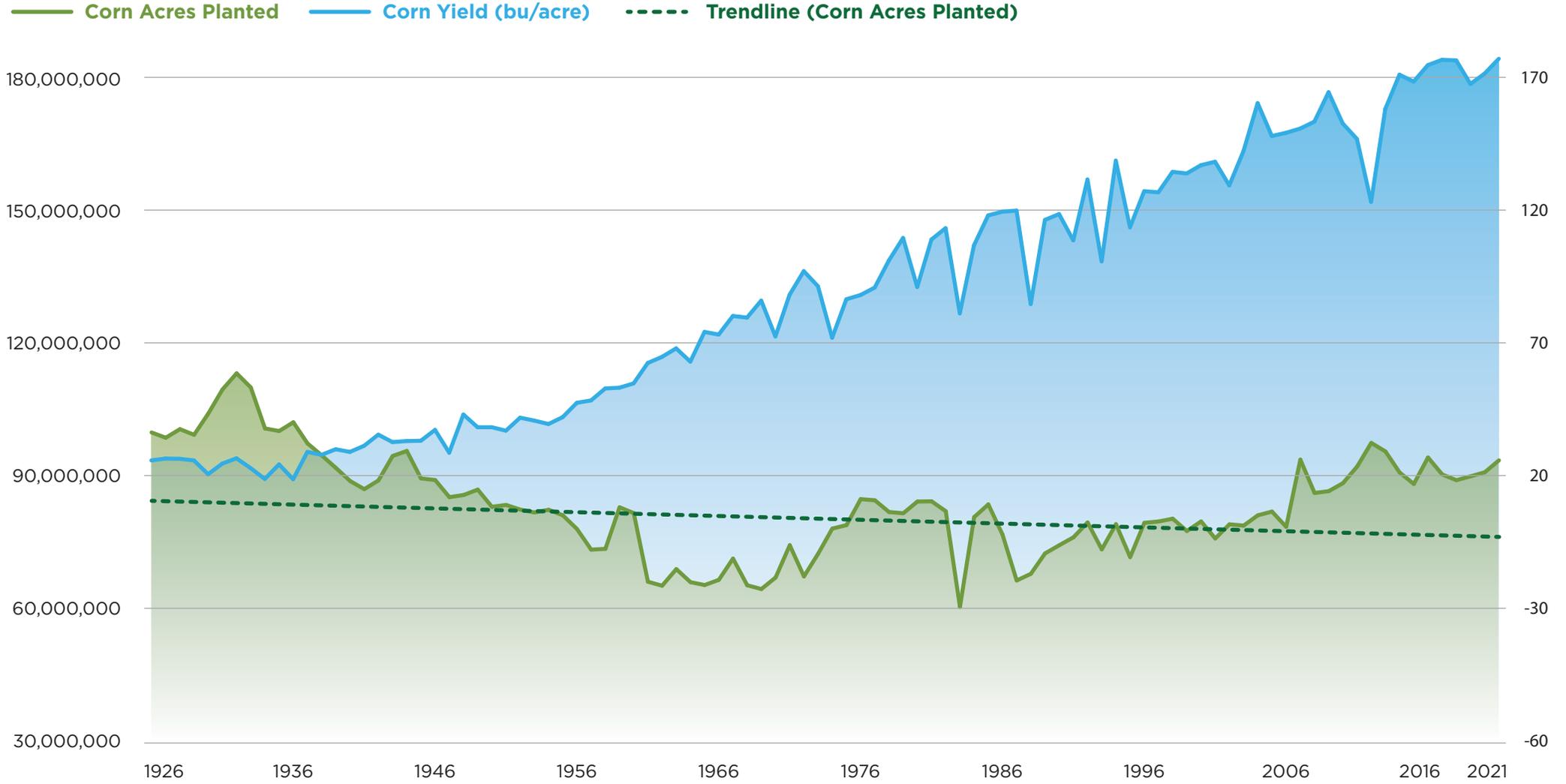
Corn is the most abundant crop in the U.S., and while overall production has increased dramatically over the past hundred years, actual land use for corn production has been on a downward trend. In 1926, our nation's farmers planted more than 99 million acres of corn. For the first 10 years that USDA recorded "corn acres planted" (1926-1935), the average was 103.4 million acres each year. This number is more than the average annual corn acres planted during the entirety of the Renewable Fuel Standard (RFS) era (2007-2021), namely 90.9 million acres. Furthermore, over the last decade, corn acres planted is trending down from over 97 million in 2012 to 93 million in 2021. The USDA is projecting fewer than 90 million acres will be planted to corn in 2022.<sup>29</sup> Advances in precision agricultural technology, better seed genetics and production practices have led to much higher yield on the same acres, all while using fewer chemical, fertilizer and water inputs for every kernel grown. In 2007, the average corn yield was 150.7 bushels per acre and rose to 177 bushels per acre in 2021 and since the 1970s, the amount of nitrogen fertilizer application (in pounds per bushel of corn) has dropped over 50%.<sup>30</sup>

<sup>28</sup> See <https://sustainableamerica.org/blog/what-is-precision-agriculture/> and <https://nutrientstewardship.org/implementation/split-fertilizer-application-helps-optimize-nutrient-management/>.

<sup>29</sup> [USDA/NASS QuickStats Ad-hoc Query Tool](#)

<sup>30</sup> [USDA ERS - Fertilizer Use and Price](#)

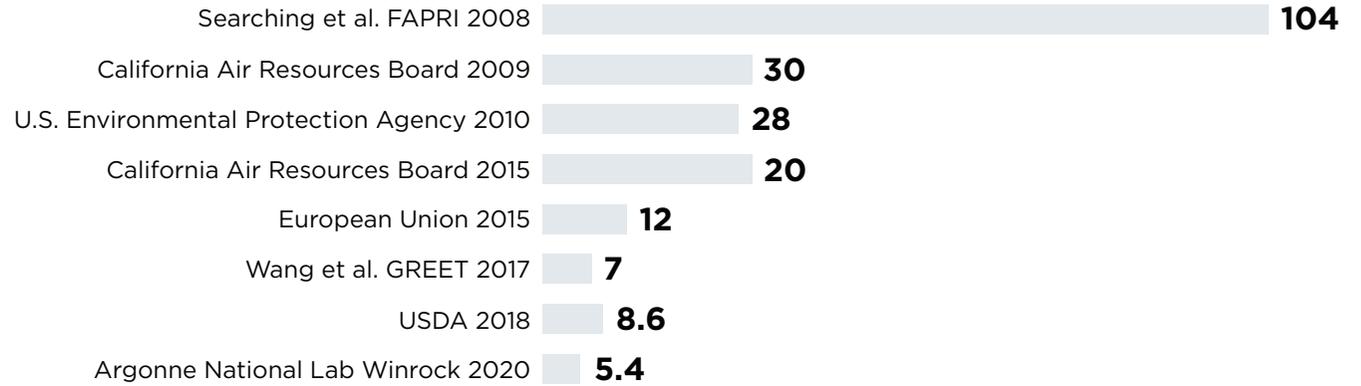
**CORN ACRES PLANTED VS. YIELD (1926-2021)**



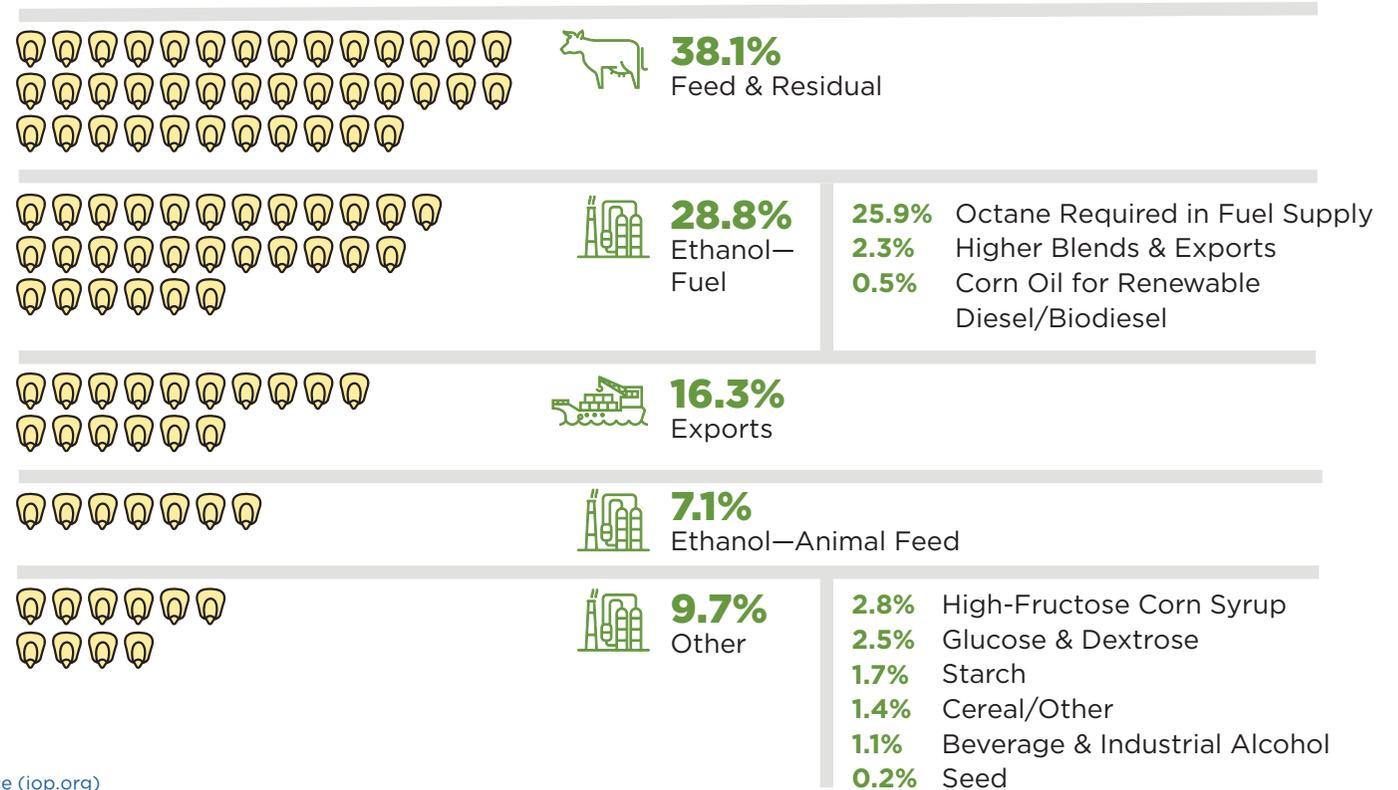
Additionally, emissions estimates from Land Use Change related to corn biofuel production have gone down since 2008. This is due to many factors including improvements in sustainable farming practices as well as advancements in accurate data collection. For example, an early technique for analyzing Land Use Change in the 2008 Searchinger et al. FAPRI model is faulty. According to the study: “To predict land specific crop acres, FAPRI relies upon Moderate Resolution Imaging Spectroradiometer (MODIS) satellite imagery data which has been demonstrated to misclassify agricultural and non-agricultural lands, resulting in inaccurate predictions of land types that convert to cropland and unreliable emission estimates associated with LUC” (Melissa J Scully, 2021).<sup>31</sup>

Biofuel production helps to reduce price inflation in food as well as fuel. Gas and diesel prices at the pump are a combination of the price of oil, refining costs, distribution and marketing and taxes. All of these are largely fixed with the exception of oil prices, which has a [direct correlation with gas prices](#).<sup>32</sup> Likewise, the price of retail food is a most heavily correlated with transportation costs (petroleum use),<sup>33</sup> marketing and labor costs, with the input cost of the underlying commodity a distant fourth. By extending the liquid fuel supply, and making it more cost effective (10% ethanol blended into gasoline can reduce the price at the pump by \$0.40-\$0.60 on average) greater biofuel use actually reduces both food and fuel prices for consumers.

**LAND USE CHANGE EMISSIONS (GCO<sub>2</sub>/MJ)**



**CORN USAGE BY SEGMENT 2021**



<sup>31</sup> [Carbon intensity of corn ethanol in the United States: state of the science \(iop.org\)](#)

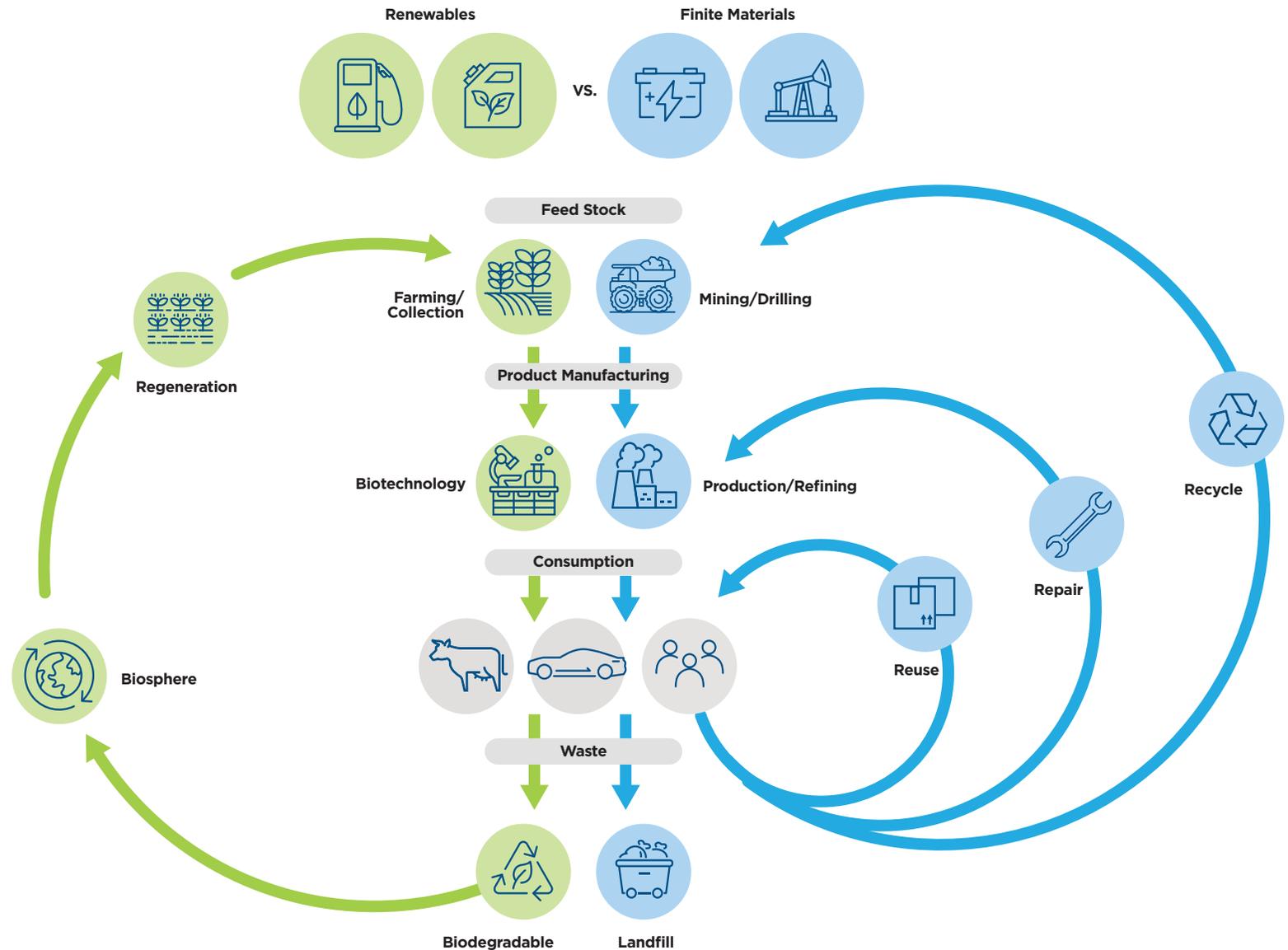
<sup>32</sup> [Fuels Prices - In Context, not Hype | Fuels Institute](#)

<sup>33</sup> Luft, R. Z. (2008, May 6). Food vs. fuel a global myth. Chicago Tribune.

# Waste, Circularity and Environmental Compliance

Our operations produce very little waste and our products are almost completely absent of any packaging. When feedstock, primarily corn, arrives onsite, it is unloaded from trucks in bulk and dumped directly into a receiving pit. From there, the corn is passed through a scalping deck that removes any cobs and husks, leaving only corn kernels. The number of cobs and husks is very low as the farm machinery that harvested the corn has already separated the kernels from the rest of the plant. The water treatment process at some of our biorefineries produces some lime cake, which is disposed of as solid waste. However, our Superior, Iowa facility donates that lime to local area farmers for field application.

The ingredients we produce are shipped in bulk quantities and loaded directly onto outbound rail cars and trucks. From there, the products are consumed relatively quickly, either by being blended and then combusted in an engine or consumed by livestock and other animals, leaving behind no packaging waste. There are only a very small number of our products that ship in packages. This lack of packaging for a majority of our products differentiates us and our industry from others that rely more heavily on finite materials and produce products that contain a lot of packaging and are more





difficult to recycle at the end of life. Circularity is inherent in our processes and products, and our alignment with the circular economy is evident — it is core to who we are and our #ingredientsthatmatter. Moving forward, our waste management objectives are to complete tracking and consolidation of non-hazardous waste data at all of our biorefineries for public disclosure in our next Sustainability Report as well as enhance a corporate recycling program at our Omaha, Neb. headquarters in 2022.

WASTE	UNIT OF MEASUREMENT	2021
Hazardous Waste Disposal	Thousand Metric Tons	0.002

We are committed to the protection of natural resources and compliance with all related laws and regulations, including around waste prevention and management. Throughout our operations, we seek to comply with all applicable environmental laws and regulations, including the management of hazardous chemicals.<sup>34</sup> All of our biorefinery locations are registered as Renewable Fuel Producers with the U.S. Environmental Protection Agency (EPA) and meet the requirements for the Renewable Fuel Standard (Title 40 CFR Part 80). Additionally, 100% of the denatured fuel ethanol we produce is RFS compliant.

ENVIRONMENTAL COMPLIANCE	UNIT OF MEASUREMENT	2021	2020	2019	2018
Number of Sites	Count	12	14	14	17
Number of Reportable Spills <sup>35</sup>	Count	1	1	1	0
Weight of Reportable Spills	Liters	1,210	9,971	22,933	0
Number of Environmental Fines	Count	1	1	1	2
Amount of Environmental Fines	USD	\$13,992	\$25,000	\$2,720	\$11,570

<sup>34</sup> GPRE complies with environmental laws and regulations from the following U.S. based agencies: NDEE, DHHS, IDNR, MPCA, MNDNR, MDH, EIPA, IDEM and TDEC.

<sup>35</sup> As defined by the U.S. EPA, a reportable spill is an uncontrolled release of material to the ground in excess of the reportable quantity. Ethanol facilities are classified as Very Small Quantity Generators (VSQGs) per U.S. EPA HazWaste Requirements (40 CFR Part 262.14), disposing of hazardous materials or waste according to authorized HazWaste haulers (Categories of Hazardous Waste Generators | US EPA).

# Social

Our relationships with stakeholders — employees, customers, suppliers and community members — are crucial to our continued success.

## OUR MATERIAL TOPICS

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Workforce  
Diversity,  
Equity and  
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Communities



# Social

**Nourishing relationships among employees, customers, suppliers and other stakeholders is key to our success.**

We encourage our employees to implement new sustainable best practices and ideas. We pay utmost attention to their safety, health and well-being, and we are committed to furthering workforce equality, diversity and inclusion. We are also dedicated to giving back to the communities where we live and work.

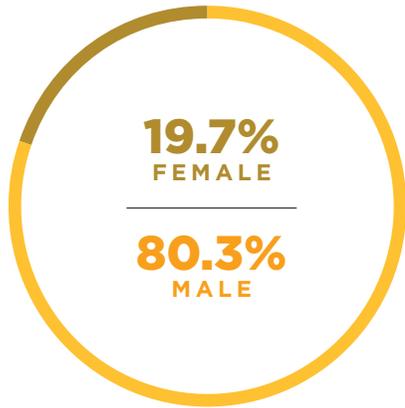
## Employees

Our highly trained employees make Green Plains an exceptional place to work. Their expertise in specific areas and dedication to their work allows us to do our business more efficiently. We work diligently toward ensuring the safety and well-being of our employees by creating a safe and secure working environment. We continue to seek ways to support our employees and encourage clear and responsive communication across all levels.

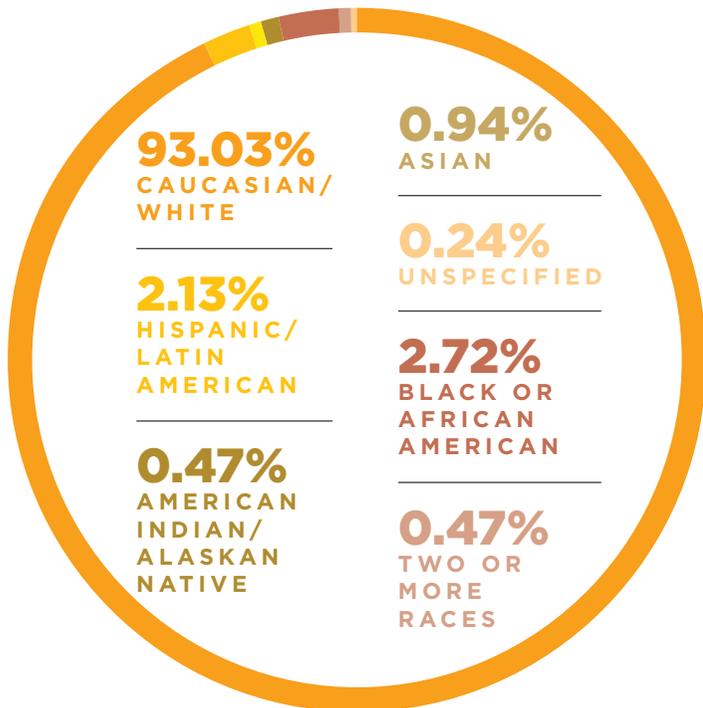
## Workforce Diversity, Equity and Inclusion

In line with our CHART values of safety, collaboration, sound judgment and innovation, we put an emphasis on fostering a diverse workforce. Our Human Resources team is focused on amplifying diversity and workplace culture and leading the effort to enhance diversity at all levels. This team is currently developing diverse recruiting and outreach networks with Historically Black Colleges and Universities (HBCUs), Society of Women Engineers, Latino Center of the Midlands, Panhellenic Council, 100 Black Men and many others. In 2021, we enhanced our recruiting strategies to focus on diverse hiring practices. By 2030, we aim to increase female employees by 25% and diverse employees in our workforce by 15% from our 2020 levels. We are rolling out a talent management program that will include training hiring managers throughout the organization, personality assessments and tracking diversity metrics in recruitment. We have also expanded our internship program in 2021-2022 to help increase generational diversity and have identified tactical/short-term Diversity, Equity and Inclusion (DE&I) targets. We are focused on building relationships with on-campus diversity groups through our internship program. Our 2022 short-term target is to increase culturally diverse hires by 2% and female hires by 4% over 2021. All employees have access to equal training opportunities within their respective departments and roles.

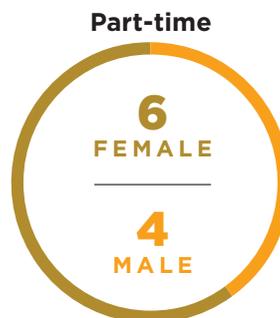
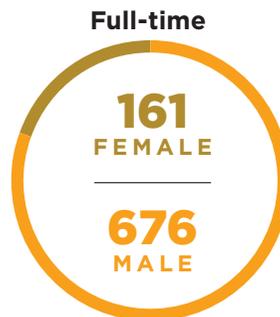
## 2021 Employee Diversity



Employees per diversity category\*



Employment Type



Employees per diversity category\*

	2021	2020
<b>Male</b>	680 (80.3%)	630 (81.10%)
<b>Female</b>	167 (19.7%)	147 (18.90%)
<b>Under 30</b>	162 (19.1%)	133 (17.10%)
<b>30-50</b>	415 (48.9%)	403 (51.80%)
<b>Over 50</b>	270 (31.8%)	241 (31.10%)
<b>Caucasian/White</b>	788 (93.03%)	726 (93.44%)
<b>Hispanic/Latin American</b>	18 (2.13%)	15 (1.93%)
<b>American Indian/Alaskan Native</b>	4 (0.47%)	3 (0.39%)
<b>Asian</b>	8 (0.94%)	6 (0.77%)
<b>Black or African American</b>	23 (2.72%)	21 (2.70%)
<b>Two or More Races</b>	4 (0.47%)	5 (0.64%)
<b>Unspecified</b>	2 (0.24%)	1 (0.13%)
<b>Total Employees</b>	847 (100%)	777 (100%)

\* All of our employees are based in North America.

2021 Employment Type

	MALE	FEMALE
<b>Full-Time</b>	676	161
<b>Part-Time</b>	4	6
<b>Total Employees</b>	680	167

\* All of our employees are based in North America.



**5.51x**

Ratio of average entry-level wage\* to the federal minimum wage (2021)

**13.5%**

Average one time supplemental wage increase across all levels of the company (2021)

## Talent Retention and Engagement

Aside from Employee Health and Safety, we view Talent Retention and Engagement as our most important Material ESG topic, in terms of its impact on our success as a business. If it weren't for our talented and dedicated employees, we would not be able to execute on our transformation plan. With that said, we have made this topic a priority and plan to launch many new initiatives to retain existing talent and recruit new talent. We also plan to review and consider implementing talent acquisition software and tools as well as implement a targeted job opportunity communication plan. That communication plan involves reaching out to a diverse audience via collaborations with Women in Agriculture (WIA), Radio Lobo, El Perico, Omaha Star and New Era, among others. In 2021, we implemented an employee referral program that rewards current employees with up to \$3,000 when a referred employee is hired into a salaried role and up to \$1,000 when a referred employee is hired into an hourly role, provided the referred employee remains with the company for a year.

## COMPENSATION & BENEFITS

2021 presented many challenges for both employers and employees, including rising inflation, hitting nearly 7%, and a competitive talent market for employers. We made the decision to institute one-time salary increases at all levels of the company in the summer of 2021. These increases outpaced inflation, even by 2021 standards, and was on top of normal wage increases. We also made significant upgrades to our employee benefits package in 2021 and are committed to regularly analyzing credible salary data guides and resources to be competitive in total compensation packages and top tier benefits for our employees. We adjust compensation according to the state/municipalities in which we operate. All of our hourly employees are paid well above the federal minimum wage, and we monitor local minimum wages to ensure we are complying and are paying above the higher applicable wage rate. The benefits package upgrades we made in 2021 now include up to 6% matching 401(k) contribution at hire and 8% match after five years, 6 weeks paid bonding leave for birthing parents after 6 weeks of short-term disability and 2 weeks paid bonding leave for non-birthing parents, generous paid time off, and 11 paid holidays including 1 floating holiday of the employee's choosing.

\* Average entry-level wage defined as the average wage of all new employees whose hire date fell within the calendar year 2021.

## Employee Benefits

### 401(K)

Green Plains offers a defined contribution 401(k) plan to interns, temporary, part-time and full time employees that features 100% immediate vesting and matches up to 6% of eligible employee contributions upon hire, and 8% at five years of service.

### EMPLOYEE WELLNESS PLAN

Employees can qualify for a wellness incentive that pays them \$360/year if they enroll in one of our medical plans. In order to qualify, employees must complete a health survey, biometric screening, and certify they are tobacco-free or complete a tobacco cessation program.

Corporate employees have access to an on-site wellness facility and are offered free weekly fitness classes.

### COMPANY HOLIDAYS

New Year's Day, Martin Luther King, Jr. Day, Presidents Day, Good Friday, Memorial Day, Independence Day, Labor Day, Veterans Day, Thanksgiving Day, Christmas Day and one floating holiday of the employee's choosing.

### OTHER BENEFITS

- Flexible Spending Account (Medical and Dependent)
- Health Savings Account
- Travel Assistance
- Identity Protection
- Hearing Discount Program

### HEALTH BENEFITS

- All full-time employees can enroll in the following:
  - Medical insurance coverage that offers three options
  - Dental insurance and two options for vision insurance
  - Voluntary supplemental medical coverages
    - Accident insurance
    - Critical illness insurance
    - Hospital Indemnity insurance
  - Voluntary Life and AD&D for the employee, spouse, and children

Green Plains also offers and pays for:

- Life and AD&D for employees, spouse, and children
- Short-term disability
- Long-term disability
- Bonding leave for birthing and non-birthing parents

### EMPLOYEE ASSISTANCE PLAN

Our Employee Assistance Plan (EAP) is available to all full-time employees and their dependents.

The EAP assists with things dealing with matters like:

- Family and relationship
- Emotional well-being
- Financial wellness
- Substance abuse and addiction
- Legal assistance
- Physical health
- Work and career

## TRAINING AND CAREER DEVELOPMENT

We offer several training and career development initiatives for our associates, including:

- Our **Learning Management System (LMS)** provides training in safety, ethics, legal policies and procedures, information technology (IT) and cybersecurity and professional development, among other topics. We plan to launch this system in 2022.
- **Leadership training is given to two groups:** Those in Vice President (VP) positions and above and those in Director positions and below. VP and above leaders can participate in a two-day off-site retreat covering relevant topics such as developing the leader within, emotional intelligence, effective communication and communication styles, conflict management and change management. Learning occurs through small and large group discussions, team presentations and brainstorming. We also plan to deliver leadership best practices to company leaders and director positions and below via monthly and quarterly leadership training sessions.
- Each employee receives an **annual performance review** and can provide their supervisor with feedback during the review as well as throughout the year. Beginning in 2022, our annual review process will be enhanced with a more robust Performance Management system designed to foster communication between employees and managers, allow for greater insight into personal, departmental and company goals, while providing feedback and guidance to employees.

OUR OCCUPATIONAL HEALTH AND SAFETY MANAGEMENT SYSTEM IS BASED ON THE FOLLOWING RECOGNIZED RISK MANAGEMENT STANDARDS:

- Occupational Safety and Health Administration (OSHA)
- Process Safety Management (PSM)
- American National Standards Institute (ANSI)
- National Fire Protection Association (NFPA)
- Steel Tank Institute (STI)

## Employee Health and Safety

We work tirelessly to promote the health and safety of our employees in the workplace and have committed to reducing our OSHA Total Recordable Incident Rate (TRIR) by 35% by 2025 compared to our 2020 baseline. In fact, we are well on our way to meeting that target as we reached a 24% decrease in OSHA TRIR in 2021. As part of operational safety, we evaluate and continuously improve our Health and Safety program through our Program Review and Enterprise Implementation program, which includes policies, controls, elimination of hazards and safety training. The program also conducts regular safety training, inspections, incident reporting and investigation as well as internal and external audits. All facilities have Health and Safety committees that meet monthly, and all employees are invited

to participate in the meetings, which include multifunctional panel decision-making. Additionally, all employees at our 11 biorefineries are covered under our Process Safety Management (PSM) policy and procedures covering regulated, highly hazardous chemicals and non-regulated chemicals, as well as other safety protocols.

All of our Occupational Safety and Health Administration (OSHA) and PSM program policies and procedures, along with our Contractor Management System and Emergency Response Planning & Training, are intended to prevent or mitigate significant negative occupational health and safety impacts linked to our operations.



## Occupational Health & Safety Management System

### Occupational Health & Safety Policy

#### PROGRAM REVIEW AND ENTERPRISE IMPLEMENTATION

- Cardinal Rules

#### CONTROLS

- Hierarchy of Controls
- Contractor Management System (FirstVerify)
- Process Safety Management (PSM) program policy

#### OCCUPATIONAL SAFETY AND HEALTH ADMINISTRATION (OSHA) POLICIES

- Industrial Hygiene Testing
- Audiometric Surveys
- Hearing Conservation
- Respiratory Fit Testing

#### SAFETY TRAINING

- Program Matrix
- Emergency Response Planning and Training

#### RISK MANAGEMENT STANDARDS

- American National Standards Institute (ANSI)
- National Fire Protection Association (NFPA)
- American Petroleum Institute (API)
- Steel Tank Institute (STI)

#### INCIDENT REPORTING SYSTEM

- Incident Investigation Policy and Procedure
- Incident Investigation Teams
- Corrective Actions

#### HAZARD ASSESSMENT AND IDENTIFICATION

- Process Hazard Analysis
- Inspections
- Audits

#### HAZARD COMMUNICATION PROGRAM

- Globally Harmonized System (GHS) of Classification and Labeling of Chemicals

#### HEALTH AND SAFETY COMMITTEES

- Meets monthly
- All employees welcome to participate

## STRATEGIC SAFETY INITIATIVES FOR 2022

As a Material ESG Topic that is important to our management team and employees, we are committed to continuous improvements in health and safety. While the following list is not all inclusive of what we have planned, it is a sample of some of the key health and safety initiatives we have lined up for 2022: 6S implementation across our platform, Stop Work Authority (SWA), formalized shift change communication worksheets, standardize Personal Protective Equipment (PPE) and Job Safety Analysis (JSA) card locations.

### 6S LEAN: 5S + SAFETY

6S (otherwise known as 5S + Safety) is a system that aims to promote and sustain a high level of productivity and safety throughout a workspace.



## CARDINAL RULES OF ENVIRONMENTAL, HEALTH, SAFETY AND SECURITY

Protecting the health and safety of our employees is a core value of Green Plains, and we believe that all incidents, injuries and environmental harm are preventable. To that end, we continue to adhere to the Cardinal Rules of Environmental, Health, Safety and Security (EHSS), implemented in 2020. All employees, contractors and visitors of Green Plains and its related subsidiaries are expected to understand and abide by the Cardinal Rules and have a Stop Work Authority if a rule is being ignored or an unsafe condition or hazard is present in the workplace.

## HAZARDS & INCIDENT REPORTING

We use the following tactics to identify and prevent work-related hazards and assess risks on both a routine and non-routine basis:

- Job hazard assessments
- Process hazard analysis
- Safety committees
- Periodic internal and external audits and inspections
- Hierarchy of controls
- Industrial hygiene testing
- Audiometric surveys
- Hearing conservation program
- Respiratory fit testing
- Internal and external health and safety assessments

## INCIDENT TRACKING

Green Plains employees are encouraged to report work-related hazards and hazardous situations through our Incident Reporting System, Employee Concerns Reporting and GP Alert Line System. We use an Incident Investigation Policy & Procedure and Incident Investigation Teams to investigate work-related incidents and determine corrective actions and needed improvements. Employees may also participate in Safety and PSM committees and meetings to share concerns and brainstorm solutions.

The Globally Harmonized System (GHS) of Classification and Labeling of Chemicals Hazard Communication Program, which we utilize, has been recognized by multiple government agencies as best practice across the biofuel, petroleum and chemical industries. Each applicable biorefinery facility with hazardous chemicals has instituted a Hazard Communication Policy, which includes program employee training, management responsibilities, maintenance of chemical listing and applicable documentation such as safety data sheets (SDS), container labeling and pictogram requirements. This policy is updated and reviewed annually.

## SAFETY TRAINING

Green Plains uses a Safety Training Program Matrix that meets all OSHA covered and applicable topics. The program includes monthly online training, quarterly classroom training and on-the-job training for all production employees. Production employees at our 11 biorefineries are required to attend 25 hours per year of safety training. Our goal for 2022 is to integrate all EHSS training with our new Learning Management System (LMS) launch. We also have plans to completely reimagine safety training for 2023 to be more interactive and inclusive.

## EXECUTIVE COMPENSATION AND SAFETY GOALS

We emphasize safety by linking executive compensation to successfully meeting our safety goals, which we have been doing for over 10 years. The biorefinery safety goal in our annual incentive bonus plan consists of 11 different leading and lagging safety and environmental metrics, including OSHA and Lost Time Injury (LTI) rate, safety training, completion of safety drills, environmental plan review and training, environmental incident, third-party audit closeouts and process safety management compliance.

GREEN PLAINS PERFORMANCE DATA	UNIT OF MEASURE	2021	2020
<b>Employee fatalities as a result of work-related injury</b>	Total Number (Rate)	0 (0.0*)	1 (0.12*)
<b>Employee Days Away From Work (DAFW) injuries</b>	Total Number (Rate)	2 (0.24*)	10 (1.17*)
<b>Employee total recordable work-related injuries and rate (TRIR)</b>	Total Number (Rate)	22 (2.66*)	30 (3.51*)

\* per 200,000 hours worked.



OUR CUSTOMER  
SAFETY GOALS  
INCLUDE:

1. **Implementation of Quality Management System (QMS) and corresponding Quality Procedures at all MSC™ operational facilities.**
2. **No findings on Internal Audit and FDA Audit of FSMA program.**
3. **Implementation of QDR and CAPA program/tools and training to all employee at MSC™ operational facilities.**
4. **Establishment of KPIs to track percentage of shipped products that meets feed tags, Certificate of Analysis (COA) and/or other product specifications.**

## Customers

Our value chain model, operational excellence, risk management strategy and strong relationships with industry partners enable us to successfully meet the needs of our customers, regardless of their size, order volume or location. Green Plains Trade Group, our marketing and distribution segment, sells and distributes our ingredients that matter from our 11 biorefineries, bringing 1 billion gallons of renewable biofuel, 2.5 million tons of animal feed and 276 million pounds of renewable corn oil to the market in 2021. As our world has started to return to a new form of normal, we were able to resume our customer appreciation days in 2021 with events held at our biorefineries throughout the year to show our appreciation for the patronage of our loyal customers, many of whom are our neighbors in the community.

Whether we're selling a tanker of corn oil, a barge of distillers' grains, or a unit train of renewable biofuel, we strive to deliver the best product at the highest value as safely and efficiently as possible. Our diverse customer market includes individual farmers, international corporations, pet food companies, retailers, traders and aquaculture companies.

Due to the strategic location of our facilities in the Midwest, delivery to almost anywhere in the country is convenient, fast and efficient. We utilize trucks for local markets and use major U.S. rail carriers to ship to other parts of the country. Our terminals also allow us to deliver to blenders in previously underserved regions, further expanding our customer base.

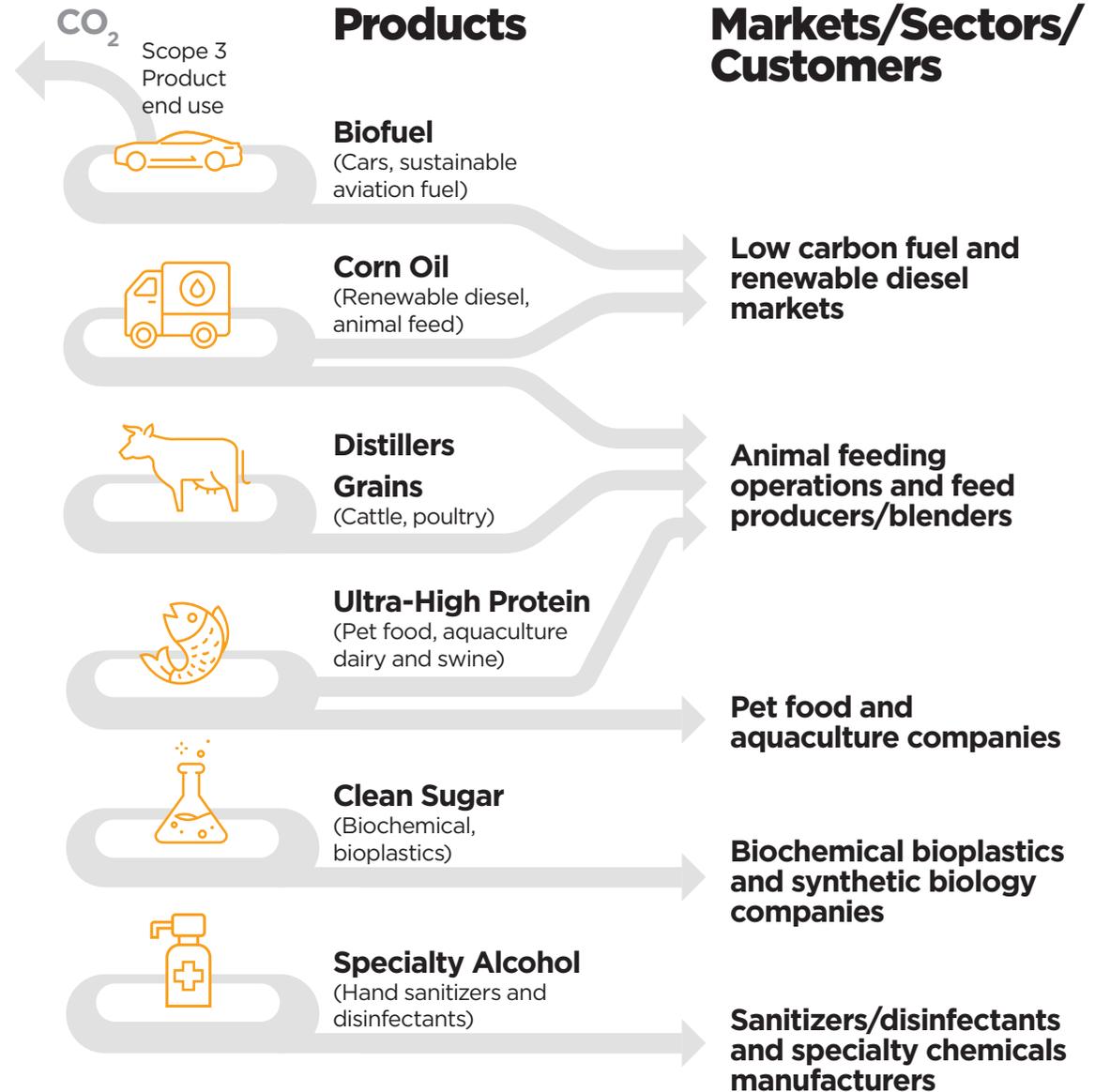
Brazil, Canada, China, India, Indonesia, Japan, Mexico, Peru, South Korea, Thailand, Turkey, Vietnam, as well as the European Union and others are among our international markets receiving our product.

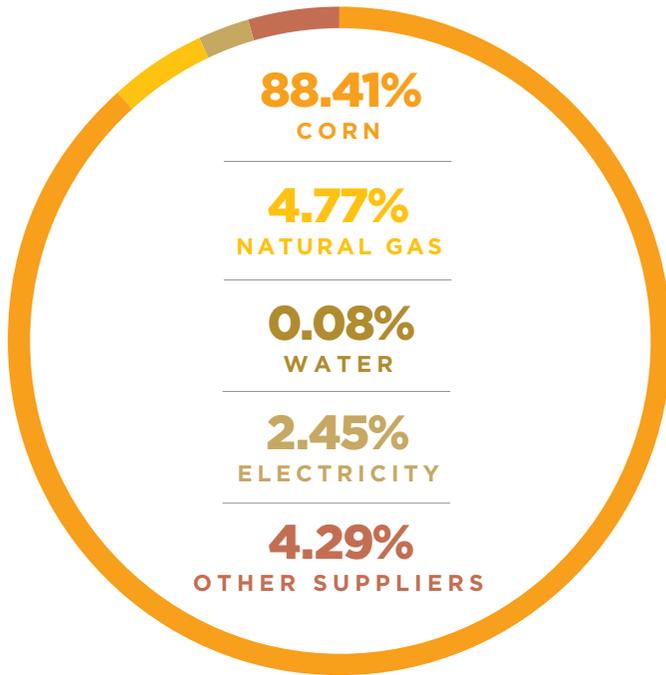
Green Plains products help our customers meet the following state, national and international policies:

- U.S. Renewable Fuel Standard
- California Air Resources Board Low Carbon Fuel Standard (LCFS)
- Oregon Clean Fuels Program
- Washington State Clean Fuel Standard
- British Columbia's Greenhouse Gas Reduction (Renewable & Low Carbon Fuel Requirements) Act and the Renewable & Low Carbon Fuel Requirements Regulation
- Canadian Clean Fuel Standard
- Brazil RenovaBio

We prioritize the health and safety of our customers by ensuring that all of our products are subject to either a Certificate of Analysis process, feed tag with guarantee or another type of quality assurance document. Our facilities continue to perform well during audits by the FDA regarding compliance with the Food Safety Modernization Act (FSMA) regulation, with no facilities receiving negative findings. Additionally, all our products have Safety Data Sheets (SDS) that include information on sourcing of components, substances that might produce an environmental impact, safe use and disposal, which can be found [here](#).

We continue to make progress on our customer safety goals. We have established our Product Quality and Food Safety Manual in 2021, bringing us close to achieving the first goal. We are implementing this manual across all of our facilities equipped with MSC™ technology in 2022 as they come online. Our other strategic initiatives for 2022 include implementing an internal audit program to maintain no negative findings on future FDA audits and QDR training to be complete for all MSC™ facilities by the end of 2022. Additionally, we are currently building the database to pull all testing (feed tags, COA, etc.) for product specifications to establish limits and identify out-of-specification products. This will put us on track to accomplish our goal of creating a KPI for tracking percentage of shipped products that meet specification.





## Suppliers

Whether on the supply input side or parts for our facilities, we depend on our dedicated group of vendors and suppliers, primarily based in North America, to meet the needs of our business throughout the country and beyond. As we continue to grow, we appreciate the exceptional service we consistently receive from our preferred suppliers and vendors. We do not outsource any significant part of our activities.

While the majority of our enzyme, yeast and other chemical suppliers have been screened using limited ESG criteria since 2018, reaching 100% in 2020, we enhanced this process in 2021. Additionally, in 2021, we introduced a Code of Vendor Conduct to monitor our suppliers' compliance with our sustainability goals and assessed and screened more than 7,558 vendors, now including corn suppliers, across 63 different watchlists including criminal, sanctions, corruption and human rights.

## Our Suppliers and Service Providers

We rely on our strong relationships with suppliers, vendors and local municipalities for the following:



### CORN

Each of our biorefineries requires between 17 million and 42 million bushels of corn annually, depending on production capacity. We spend over 80% of our procurement budget on local corn suppliers, the majority of whom are family farms. Corn is an annually renewable crop that captures CO<sub>2</sub> from the air as it grows and sequesters it in the soil and in the kernel.



### NATURAL GAS

Our biorefineries use between 26,000 and 30,000 BTUs of natural gas per gallon of production. We have service agreements to acquire the natural gas we need and transport it through pipelines to our biorefineries.



### WATER

Many of our biorefineries use ground water, including one that uses recycled municipal water, for operations. Drinkable water is also obtained from the city. Local municipalities supply the necessary water to biorefineries without on-site wells.



### ELECTRICITY

Local utilities supply 0.5 to 1.6 kilowatt hours of electricity per gallon of production to all of our biorefineries. Many of these utilities source a significant portion of their energy supply from renewable sources, like our Superior, Iowa location, which is located near a wind farm.



### OTHER SUPPLIERS

Enzymes, yeast, denaturant and bulk commodity chemicals are obtained from domestic suppliers.





WE HAVE  
A LONG HISTORY

of good corporate citizenship  
and it remains an important  
part of our transformation into  
Green Plains 2.0

## Communities

In 2021, Green Plains continued to positively impact communities through increased donations and sponsorships for local economic development corporations, community projects and state sheriff's associations. We donated \$243,918 in 2021. We have made donations to organizations like Discovery Park in Union City, Tennessee, helped fund a playground for children with mobility limitations and developmental delays, and supported local FFA chapters and ag-focused youth camps. When tornadoes struck Obion County, Tennessee, in December of 2021, taking lives and destroying property and livelihoods, Green Plains donated \$100,000 towards recovery efforts in the area. We intend to match our employees' commitment and dedication to causes they support by investing in 10 new employee-led priorities for donations in 2022 (in addition to our existing commitments) and increase donations and sponsorships by 10-20% in 2022, over our 2021 level. We plan to engage with employees via surveys, roundtables, company intranet, among others in order to establish our new priorities for donations in 2022.

Beyond these donations, we maintained our commitment to the wellbeing of our employees and communities. When wildfires devastated farms and ranches near Green Plains Central City, we contributed 6,000 pounds of feed to local livestock operations. Many of our employees at our various locations serve on local city councils and volunteer for church groups, food pantries and other volunteer organizations in their free time. We want to enhance this and show our support by dedicating 2,000 hours of volunteering company-wide in 2022. Already in 2022, we established a partnership with the Food Bank for the Heartland to commit employee

volunteers on a recurring basis throughout the year. We plan to implement a system for tracking employee volunteer hours in order to monitor our progress in reaching our 2,000-hour target. Beyond donations and volunteerism, we also contribute to the health and safety of our local communities by ensuring that 100% of our operations have implemented environmental impact assessments and ongoing monitoring via EPA's Risk Management Program and our Process Safety Management policy and procedure.

## Operational Impacts

We maintain our mutually beneficial relationships with local farmers, infusing capital into the economy with a positive impact on rural communities throughout the U.S. Midwest. In 2021, we significantly helped rural communities and the nation's economy in the following ways:

- We directly infused over \$1.5 billion into local communities near our biorefineries via grain purchases in 2021, including over \$580 million in direct purchases from area farmers
- Our industry directly and indirectly supported more than 407,000 jobs in the country.
- Our industry added more than \$52 billion to the U.S. Gross Domestic Product (GDP) through annual operations, transportation and new project construction.
- Biofuel production provided an additional \$28.7 billion for U.S. households.
- Our MSC™ installations have an \$11 million impact in each community, through increased hotel, restaurant, entertainment and local contract spending.

# Governance

2021 brought robust transformation to our Board of Directors (Board), rotating and refreshing committee membership, adding diversity and increasing shareholder rights through new policies and guidelines.

## OUR MATERIAL TOPICS

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Board Composition  
and Structure

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Ethics and  
Compliance

# Board Composition and Structure

## Board Overview

The Green Plains Board consists of nine members with diverse qualifications, qualities and skills that support our near and long-term strategies, including our transformation to Green Plains 2.0. The company made numerous governance enhancements in 2021, including but not limited to adopting new Board Governance Guidelines and Company Bylaw improvements concerning shareholder rights. We have proposed to our shareholders a proposal to declassify our Board. We also intend to reduce the size of our Board to eight members by the 2023 annual shareholders meeting. A proposal to declassify the Board was included in the 2022 Proxy Statement, allowing a vote to occur at our 2022 Annual Meeting of Shareholders.

## 2021 Key Skills and Experience

		Jim Anderson	Farha Aslam	Todd Becker	Wayne Hoovestol	Einar Knudsen	Brian Peterson	Martin Salinas, Jr.	Alain Treuer	Kimberly Wagner
INDUSTRY	 Industrial Manufacturing & Ingredient Production	●	●	●		●	●		●	●
	 Commodity Markets/Marketing	●	●	●	●	●	●	●	●	
STRATEGIC	 Strategy Development	●	●	●	●	●		●	●	●
	 International Business	●	●	●		●			●	●
	 M&A / Partnerships	●	●	●	●	●		●	●	●
	 Capital Markets	●	●	●		●		●	●	
	 Audit / Risk / Cybersecurity	●	●	●		●	●	●	●	●
LEADERSHIP	 Legal / Regulatory / Govt. Relations	●	●	●						●
	 Public Company / Corp. Governance / ESG	●	●	●				●	●	●
	 Executive Leadership	●	●	●	●	●	●	●	●	●
	 Executive Compensation	●	●	●	●			●	●	

## 2021 Board Composition and Participation

### Board of Directors

**67%**  
INDEPENDENT



### Audit Committee

**100%**  
INDEPENDENT



### Compensation Committee

**100%**  
INDEPENDENT



### Nominating & Governance Committee

**100%**  
INDEPENDENT



	2021	2020	2019
Executive	11%	9%	10%
Independent	67%	73%	80%
<b>TENURE</b>			
0-4 years	3	1	1
5-9 years	1	3	3
10+ years	5	7	6

	2021	2020	2019
Executive	0%	0%	0%
Independent	100%	100%	100%
<b>TENURE</b>			
0-4 years	2	0	1
5-9 years	0	1	1
10+ years	1	3	3

	2021	2020	2019
Executive	0%	0%	0%
Independent	100%	100%	100%
<b>TENURE</b>			
0-4 years	1	0	1
5-9 years	0	2	1
10+ years	2	2	2

	2021	2020	2019
Executive	0%	0%	0%
Independent	100%	100%	100%
<b>TENURE</b>			
0-4 years	2	0	1
5-9 years	0	1	0
10+ years	1	3	3

**88%**

Results of Annual  
Say on Pay Vote

**85%**

Board Meeting  
Attendance Rate

	UNIT OF MEASUREMENT	2021	2020	2019
Board Meeting Attendance Rate	%	85%	96%	95%

#### EXECUTIVE COMPENSATION

Annual Total Compensation ratio of CEO to median employee	Ratio	69/1	42/1	70/1
Annual Say on Pay Vote	Yes/No	Yes	Yes	Yes
Results of Annual Say on Pay Vote	%	88%	97%	93%

## Commitment to Board Diversity

The Board recognizes the value of nominating directors who bring varying perspectives, opinions, skills, experiences, backgrounds and personal characteristics to discussion and decision-making. Diversity is one of several key factors that our Nominating and Governance Committee considers when identifying director candidates. Our Board Qualifications and Diversity Policy, adopted in 2021, requires that each time a vacancy arises on the Board, the Nominating and Governance Committee must ensure that any search firm hired is instructed to provide a candidate pool that is comprised of at least 50% candidates that are women or otherwise considered diverse and at least 25% of the interviewed candidates are women or otherwise considered diverse. The Nominating and Governance Committee views diversity broadly and considers diversity of experience, skills and viewpoint, as well as traditional diversity concepts such as race, gender identity or expression, national origin, religion and sexual orientation when making nominations.

In October 2021, Farha Aslam was appointed as the newest director to the Green Plains Board. She is an experienced agribusiness public company director and former leading industry analyst on Wall Street, who brings investor perspective and financial expertise to the Board. Green Plains made significant progress related to board diversity in 2021. With the addition of two additional board members who add diversity, we accomplished our goals to appoint two female directors and one director who adds diversity and reach 33% gender/ethnically diverse board members prior to the 2022 annual meeting. As part of a refreshment initiative in 2021, the Board has also appointed a Lead Independent Director and rotated the leadership and adjusted the composition of its key committees. Jim Anderson serves as the Lead Independent Director and Martin Salinas, Jr. serves as Audit Committee chair. Kimberly Wagner serves as the Nominating and Governance Committee chair and Brian Peterson serves as the Compensation Committee chair.

## 2021 Board Diversity



PERCENTAGE OF INDIVIDUALS WITHIN OUR HIGHEST GOVERNANCE BODY IN EACH OF THE FOLLOWING DIVERSITY CATEGORIES	UNIT OF MEASUREMENT	2021	2020	2019
Gender				
Male	%	78%	91%	100%
Female	%	22%	9%	0%
Age				
30-50	%	11%	9%	20%
Over 50	%	89%	91%	80%
Race/Ethnicity				
Caucasian/White	%	78%	100%	100%
Hispanic/Latin American	%	11%	0%	0%
Black/African American	%	0%	0%	0%
Asian/Pacific Islander	%	11%	0%	0%
American Indian/Alaskan Native	%	0%	0%	0%
Two or More Races	%	0%	0%	0%
Unspecified	%	0%	0%	0%

## ESG and Climate Change Governance

### BOARD OVERSIGHT

The Green Plains Board is dedicated to the oversight of ESG topics, including climate change, GHG emissions and employee safety. The Nominating and Governance Committee of the Board has primary oversight of our ESG initiatives, with the goal of integrating ESG strategy into our overall business strategy. The Board's other committees provide support by overseeing certain key areas of impact.

### Nominating and Governance Committee

Pursuant to its charter, the Nominating and Governance Committee oversees ESG topics, including the development, approval and updating of the Company's ESG purpose, mission statements, strategies, policies and goals. It is responsible for monitoring progress of strategy and goals and reviewing climate-related topics on a quarterly basis. The committee is earnest about transparency and is responsible for oversight of ESG initiatives, including this Sustainability Report.

### Audit Committee

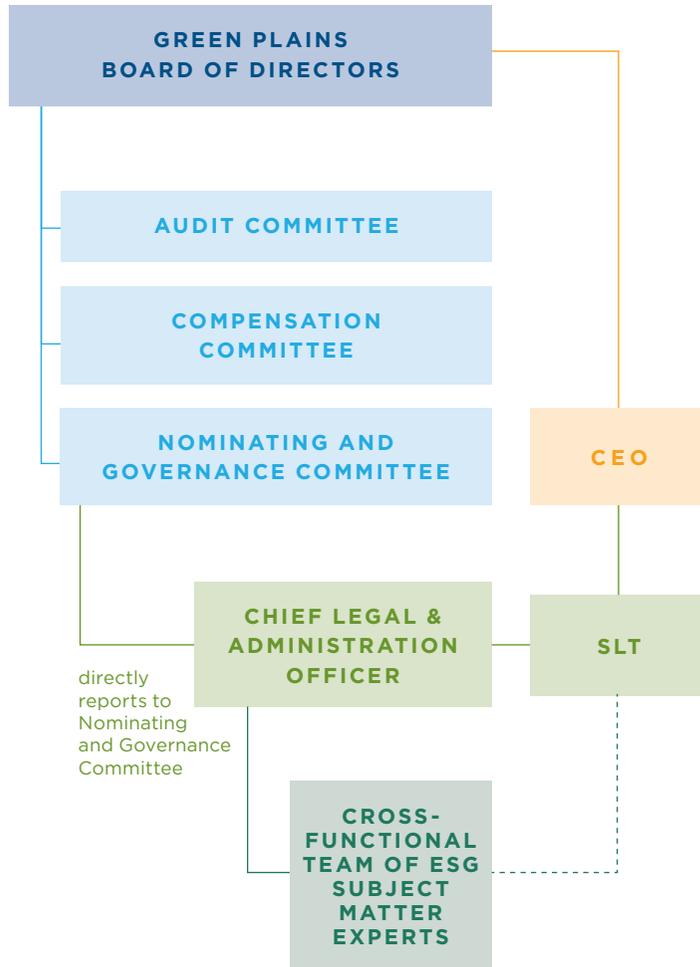
The Audit Committee monitors compliance with the company's Code of Ethics and regulatory requirements and reviews conflicts of interest and related-party transactions. The Audit Committee is also responsible for assessing risks related to information systems, information security and cyber security and mitigating those exposures with policies and procedures.

### Compensation Committee

The Compensation Committee determines remuneration policies with help from third-party compensation consultants. The committee holds our executives accountable for our ESG priorities by integrating performance measures that align with our goals. Since 2012, we have included a safety metric in our annual incentive award program and adopted a compensation recovery policy that goes beyond legal requirements and puts emphasis on ethics and compliance. Our 2021 compensation program incorporates ESG performance criteria.

### MANAGEMENT GOVERNANCE

Green Plains' President and CEO is the most senior member of the Senior Leadership Team (SLT) responsible for the Company's overall strategy and performance, including oversight of ESG topics, including climate-related risks and opportunities. The SLT is comprised of the President and CEO, Chief Financial Officer, Chief Accounting Officer, Chief Legal and Administration Officer, Chief People Officer, Executive Vice President of Investor Relations, Executive Vice President of Operations & Technology, Executive Vice President and Executive Vice President of Product Marketing & Innovation. The President and CEO is also a member of the Board, reporting to the Board on a regular basis. In recognition of the importance of collaboration and integration of ESG across the organization, our SLT is actively engaged with:



- Developing governance practices responsive to climate-related issues.
- Regularly reviewing the Company's performance versus targets related to ESG goals such as GHG emissions, energy use, customer relationships, employee safety, customer safety and community outreach.
- Incorporating risk assessment and ESG strategy into financial and operational plans
- Tying executive compensation to ESG performance.
- Implementing technical and operational changes that improve climate-related performance.
- Engaging with investors on climate-related issues.
- Participating in the Company's climate-related disclosure practices.

The SLT has the highest management-level responsibility with relation to climate-related issues and the ESG Work Group is responsible for the day-to-day identification and management of ESG topics and their impacts, risks and opportunities. This group consists of cross-functional subject matter experts at the associate, management and executive level and is led by the ESG Program Manager and Senior Vice President (SVP), Sustainability, who coordinates with and reports to the Chief Legal and Administration Officer (CLAO). The SLT and ESG Work Group review and approve all policies and approaches developed by subject matter experts and tracks metrics relative to ESG goals over time to the extent possible.

Our position as a leading biorefining company focused on transforming annually renewable crops into sustainable, value-added ingredients

dictates our responsibility to ESG issues at all levels. By including representatives from all key areas and levels of the company, the ESG Work Group ensures a coordinated, company-wide approach. The importance of ESG performance is well-integrated across operations, legal, trade, finance, accounting, product sales, technology, EHSS, investor relations and human resources. This work group facilitates outreach between certain stakeholders and the Board, using various means to consult with stakeholders and subsequently reporting back through the CLAO to the Nominating and Governance Committee.

Members of the ESG Work Group meet with the SLT monthly to report on our environmental performance and status of initiatives and to discuss ESG-related strategy. The ESG Work Group, through the ESG Program Manager and SVP, Sustainability, reports directly to the CLAO, who meets quarterly with the Nominating and Governance Committee on all ESG matters, including climate-related risks and opportunities.

All of our committee charters and corporate governance policies can be found on our [website](#). We continuously monitor performance tracking related to ESG based on analysis from ESG rating agencies (including but not limited to Sustainalytics, MSCI™, ISS, and S&P) as well as through stakeholder engagement processes, Q&A during quarterly earnings calls, annual shareholder meetings, feedback from our 24/7 ethics hotline and direct engagement with investors.





IN 2021  
WE MADE

financial and in-kind political corporate contributions in the amount of \$35,000 and political action committee (PAC) contributions in the amount of \$36,000.

## Ethics and Compliance

Green Plains has made several enhancements in the area of ethics and compliance over the past year. In 2021, we have updated and improved our Anti-Corruption Policy, adopted a Human and Labor Rights Policy and initiated a new Vendor Screening program, screening 7,558 foreign and domestic vendors and suppliers against 63 different watches, sanctions and most-wanted lists, including key human rights list. We have also set a goal to have 100% of Green Plains employees trained on Code of Ethics, Anti-Corruption and Human and Labor Rights policies by the end of 2022. We plan to accomplish this by incorporating this training into the company-wide launch of the new Learning Management System (LMS) in 2022.

We abide by our [Code of Ethics](#) (Code) and aim to operate at the highest levels of integrity and good corporate citizenship. The Board is responsible for the Code and has entrusted our management team with its implementation in satisfaction of Section 406 of the Sarbanes-Oxley Act of 2002. The Code:

- Prohibits employees and directors from taking unfair advantage of anyone through manipulation, concealment, abuse of privileged information, misrepresentation of material facts or any other unfair dealing practice.
- Contains a Conflicts of Interest policy that applies to all directors and employees, and outlines expectations and requirements, including mandatory reporting. Employees and directors are obligated to report any potential conflict of interest, and they cannot personally take opportunities or achieve personal gain using

company property, information or position. Additionally, employees and directors may not compete with the company in any manner.

- Provides advice about ethical and lawful behavior and offers various methods for seeking additional information, in addition to summarizing certain government laws and regulations.

Employees, customers, vendors and the general public have access to a Compliance Hotline to report concerns about unethical or unlawful behavior either by telephone (844.957.2596) or via our [online portal](#). This hotline is operated by a third party and is completely confidential. The CLAO and Audit Committee Chair receive all reports and the CLAO investigates all complaints. Every employee upon hire needs to attest to both the Code of Ethics and Code of Business Conduct. All new hires are obligated to participate in our New Employee Legal Orientation where we highlight our corporate policies and procedures, including the Code of Ethics.

In November 2021, the company updated its [Code of Business Ethics and Conduct](#) (“Code of Conduct”). The updated Code outlines in greater detail:

- What constitutes a Conflict of Interest;
- Rules and limits for Gifts and Entertainment;
- Proper uses and representations of using social media;
- Summaries of the company Insider Trading Policy, Risk Management Policy and Whistleblower Policy;
- Anti-harassment stance and procedures; and
- Political activities and public relations.

## IN 2021, WE ADOPTED

a Code of Vendor Conduct and set forth expectations for our suppliers in key areas such as ethical and lawful business practices, human rights, working conditions and the rights of vendor employees and environmental stewardship. Failure to comply with the Code of Vendor Conduct may result in termination of the relationship. Our Compliance Hotline is also available to our suppliers.

### Anti-Corruption Policy

We enhanced our [Anti-Corruption Policy](#) in May of 2021 and make every effort to conduct our business in accordance with the highest ethical standards to maintain the complete confidence and trust of our consumers, shareholders and the public. Each and every employee, officer and director are expected to carry out the performance of their business responsibilities ethically.



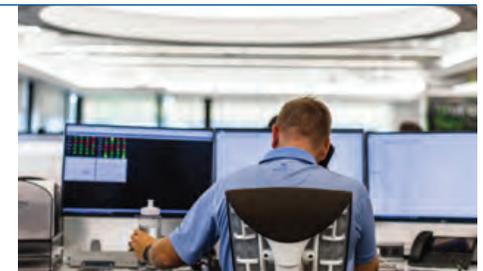
### Human and Labor Rights Policy

We are committed to upholding human rights where we operate, and this includes protecting and promoting labor rights of our employees and providing a safe work environment. We are also dedicated to respecting the rights of disadvantaged people. We monitor suppliers and customers for human rights violations and aim to create a positive impact in our communities. We abide by our [Human and Labor Rights Policy](#) and [Code of Vendor Conduct](#), both of which prohibit child and forced labor at Green Plains and its vendors, suppliers and customers. We screen all vendors for human rights violations on an annual basis, and any discrepancies are immediately investigated and reported to management. Any security personnel we hire would be required to attend formal training relating to our Human and Labor Rights Policy.



### Cybersecurity

Cyberattacks are a leading risk and continue to evolve and increase in sophistication and frequency. Our Information Security Program utilizes the latest technologies to keep our systems secure and provide training resources to keep our users informed. As key producer in the ag-tech space, we have the same vision for our cyber safety as we do our employee health and safety — a vision of zero — zero incidents, zero breaches and zero leaks thefts or losses of customer data. In 2021, we have not had any identified leaks, thefts or losses of customer data.





## Cybersecurity (cont.)

As with any operational risk, Green Plains has a strong governance structure around cybersecurity. We have a centralized information technology (IT) function at our corporate headquarters to have clear visibility into how well our policies enhance cyber security. We continuously monitor for potential threats, perform regular tests of our ability to respond and recover and conduct continuous assessments of our cybersecurity standards. To further mitigate threats, we collaborate with governments and regulatory agencies, and take part in external events to enhance our knowledge of the emerging threat landscape. We also engage independent third parties to audit our cybersecurity program, in accordance with top information security standards like ISO 27001.

Cybersecurity is embedded in our organizational structure and overall business strategy, where the Senior Leadership Team (SLT) briefs the Board about cybersecurity matters on a quarterly basis. The senior-most management level employee responsible for cyber security matters is our Chief Accounting Officer, who, along with our Director of Information Technology, discusses the current state of information security with the rest of the SLT on a regular basis. The Board Audit Committee provides oversight for the Cybersecurity Program and is briefed quarterly on program status. We engage in response readiness, cybersecurity training, disaster recovery and business continuity considerations. We also maintain an information security risk insurance policy.

# Reporting Frameworks

This report references certain 2016 GRI standards. We also disclose under the SASB Biofuels Standard and align with the TCFD framework.

## FRAMEWORKS AND STANDARDS

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Global Reporting Initiative (GRI)

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Biofuels Standard from the Sustainability Accounting Standards Board (SASB)

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Task Force on Climate-Related Financial Disclosures (TCFD)

# Global Reporting Initiative (GRI)

Disclosure Number	Disclosure Title	Response or Disclosure Location
<b>GRI 102: General Disclosures</b>		
102-1	<b>Name of the organization</b>	Green Plains Inc.
102-2	<b>Activities, brands, products, and services</b>	2021 Sustainability Report: About Green Plains, <a href="#">pages 6-7</a> ; Social – Customers, <a href="#">pages 50-51</a> 2021 Form 10-K: Item 1: Business – Overview, <a href="#">page 5</a> ; Operating Segments, <a href="#">pages 9-13</a>
102-3	<b>Location of headquarters</b>	1811 Aksarben Drive, Omaha, NE 68106
102-4	<b>Location of operations</b>	2021 Sustainability Report: About Green Plains, <a href="#">pages 6-7</a> 2021 Form 10-K: Item 1: Business – Overview, <a href="#">page 5</a> ; Operating Segments, <a href="#">pages 9-13</a>
102-5	<b>Ownership and legal form</b>	We are a publicly traded company on the NASDAQ Stock Exchange. Our state of organization is Iowa and our legal form is domestic for-profit corporation. 2021 Form 10-K: Cover, <a href="#">page 1</a>
102-6	<b>Markets served</b>	2021 Sustainability Report: Social – Customers, <a href="#">pages 50-51</a> 2021 Form 10-K: Item 1: Business – Operating Segments, <a href="#">pages 9-13</a>
102-7	<b>Scale of the organization</b>	Net Revenues: \$2,827,168,000 Total Capitalization (Assets): \$2,159,755,000 2021 Sustainability Report: About Green Plains, <a href="#">pages 6-7</a> 2021 Sustainability Report: Social – Employees – Workforce Diversity, Equity and Inclusion, <a href="#">pages 43-44</a> 2021 Form 10-K: Item 1: Business – Human Capital Resources, <a href="#">page 16</a>
102-8	<b>Information on employees and other workers</b>	2021 Sustainability Report: Social – Workforce Diversity, Equity and Inclusion, <a href="#">pages 43-44</a> The portion of Green Plains' activities performed by workers who are not employees is not significant The data was compiled from internal employee records
102-9	<b>Supply chain</b>	2021 Sustainability Report: Social – Suppliers, <a href="#">page 52</a>
102-10	<b>Significant changes to the organization and its supply chain</b>	There were no significant changes to our supply chain during the reporting period that can cause or contribute to significant economic, environmental, and social impacts. All of our corn suppliers and the majority of our other suppliers are based out of North America and we do not outsource any significant part of our activities. 2021 Sustainability Report: Letter from our Chief Executive Officer, <a href="#">pages 4-5</a> ; About Green Plains – Our Business, <a href="#">pages 6-7</a> 2021 Form 10-K: Item 7: Liquidity and Capital Resources, <a href="#">page 46</a>

Disclosure Number	Disclosure Title	Response or Disclosure Location
<b>GRI 102: General Disclosures</b>		
102-11	<b>Precautionary Principle or approach</b>	Although we do not currently apply the Precautionary Principle or approach, as defined by the 'Rio Declaration on Environment and Development', in our operational risk management planning or when we develop and introduce new products, we do consider potential environmental issues including whether the proposed operation or product could pose a serious threat of irreversible environmental damage.
102-12	<b>External initiatives</b>	2021 Sustainability Report: About this Report, <a href="#">page 3</a>
102-13	<b>Membership of associations</b>	2021 Sustainability Report: About Green Plains - Memberships and Awards, <a href="#">page 7</a>
102-14	<b>Statement from senior decision-maker</b>	2021 Sustainability Report: Letter from our Chief Executive Officer, <a href="#">pages 4-5</a>
102-15	<b>Key impacts, risks, and opportunities</b>	2021 Sustainability Report: Environmental - Our Climate Change Strategy, <a href="#">pages 26-29</a> ; Biodiversity and Land Stewardship - Biofuels: The Truth About Land Use Change, <a href="#">pages 37-39</a> 2021 Form 10-K: Item 1A: Risk Factors, <a href="#">pages 17-31</a>
102-16	<b>Values, principles, standards, and norms of behavior</b>	2021 Sustainability Report: About Green Plains - Our Principles and Values, <a href="#">page 8</a>
102-17	<b>Mechanisms for advice and concerns about ethics</b>	2021 Sustainability Report: Governance - Ethics and Compliance, <a href="#">pages 60-62</a> 2022 Proxy Statement: Corporate Governance - Other Governance Principles - Code of Ethics and Other Policies, <a href="#">page 33</a>
102-18	<b>Governance structure</b>	2021 Sustainability Report: Governance - Board Composition and Structure, <a href="#">pages 55-59</a> 2022 Proxy Statement: Corporate Governance - Committees of the Board, <a href="#">page 25</a>
102-19	<b>Delegating authority</b>	2021 Sustainability Report: Governance - Board Composition and Structure - ESG and Climate Change Governance, <a href="#">pages 58-59</a>
102-20	<b>Executive-level responsibility for economic, environmental, and social topics</b>	2021 Sustainability Report: Governance - Board Composition and Structure - ESG and Climate Change Governance, <a href="#">pages 58-59</a>
102-21	<b>Consulting stakeholders on economic, environmental, and social topics</b>	2021 Sustainability Report: Our Commitment to Sustainability - Stakeholder Engagement and Material Topics, <a href="#">page 10</a>
102-22	<b>Composition of the highest governance body and its committees</b>	2021 Sustainability Report: Governance - Board Composition and Structure, <a href="#">pages 55-59</a> 2022 Proxy Statement: Proxy Summary - Board Highlights, <a href="#">pages 7-10</a> ; Corporate Governance - Director Biographical Information and Experience, <a href="#">pages 14-21</a> ; Corporate Governance - Leadership Structure - Diversity and Refreshment, <a href="#">page 24</a>
102-23	<b>Chair of the highest governance body</b>	Board Chairman, Wayne Hoovestol is a non-executive director.  2022 Proxy Statement: Corporate Governance - Director Nominee Biographical Information and Experience - Continuing Directors with Terms Expiring in 2023, <a href="#">page 17</a> ; Corporate Governance - Leadership Structure - Board Leadership, <a href="#">page 23</a>

Disclosure Number	Disclosure Title	Response or Disclosure Location
<b>GRI 102: General Disclosures</b>		
102-24	<b>Nominating and selecting the highest governance body</b>	2021 Sustainability Report: Governance – Board Composition and Structure - Commitment to Board Diversity, <a href="#">page 57</a> 2022 Proxy Statement: Corporate Governance – Director Nomination Process, <a href="#">page 22</a>
102-25	<b>Conflicts of interest</b>	2021 Sustainability Report: Governance – Ethics and Compliance, <a href="#">pages 60-62</a> Code of Ethics Code of Business Ethics and Conduct
102-26	<b>Role of highest governance body in setting purpose, values, and strategy</b>	Pursuant to its charter, the Nominating and Governance Committee oversees ESG topics, including the development, approval and updating of the Company’s ESG purpose, mission statements, strategies, policies and goals. 2021 Sustainability Report: Governance – Board Composition and Structure – ESG and Climate Change Governance, <a href="#">pages 58-59</a> 2022 Proxy Statement: Corporate Governance – Board Oversight, <a href="#">pages 28-31</a>
102-27	<b>Collective knowledge of highest governance body</b>	2021 Sustainability Report: Governance – Board Composition and Structure, <a href="#">pages 55-59</a> 2022 Proxy Statement: Proxy Summary – Board Highlights – Board Snapshot – Skills and Experience, <a href="#">pages 8-10</a>
102-28	<b>Evaluating the highest governance body’s performance</b>	Corporate Governance Guidelines: Annual Performance Evaluation of the Board, <a href="#">page 3</a>
102-29	<b>Identifying and managing economic, environmental, and social impacts</b>	2021 Sustainability Report: Governance – Board Composition and Structure – ESG and Climate Change Governance, <a href="#">pages 58-59</a>
102-30	<b>Effectiveness of risk management processes</b>	2022 Proxy Statement: Corporate Governance – Board Oversight – Risk Oversight, <a href="#">page 28</a>
102-31	<b>Review of economic, environmental, and social topics</b>	2021 Sustainability Report: Governance – Board Composition and Structure – ESG and Climate Change Governance, <a href="#">pages 58-59</a>
102-32	<b>Highest governance body’s role in sustainability reporting</b>	The Nominating and Governance Committee is responsible for the review and approval of our ESG reporting, including this Sustainability Report. 2021 Sustainability Report: Governance – Board Composition and Structure – ESG and Climate Change Governance, <a href="#">pages 58-59</a>
102-33	<b>Communicating critical concerns</b>	2021 Sustainability Report: Governance – Ethics and Compliance, <a href="#">pages 60-62</a> 2022 Proxy Statement: Corporate Governance – Other Governance Principles – Communications with the Board, <a href="#">page 34</a>
102-35	<b>Remuneration policies</b>	2021 Sustainability Report: Governance – Board Composition and Structure – ESG and Climate Change Governance, <a href="#">pages 58-59</a> 2022 Proxy Statement: Corporate Governance – Compensation of Directors, <a href="#">pages 35-36</a> ; Executive Compensation – Compensation Discussion and Analysis, <a href="#">pages 44-66</a>

Disclosure Number	Disclosure Title	Response or Disclosure Location
<b>GRI 102: General Disclosures</b>		
102-36	<b>Process for determining remuneration</b>	2022 Proxy Statement: Corporate Governance – Compensation of Directors, <a href="#">pages 35-36</a> ; Executive Compensation – Compensation Discussion and Analysis, <a href="#">pages 44-66</a>
102-37	<b>Stakeholders' involvement in remuneration</b>	2022 Proxy Statement: Corporate Governance – Investor Engagement, <a href="#">page 32</a> ; Executive Compensation – Compensation Discussion and Analysis – Consideration of Say-On-Pay Vote, <a href="#">page 50</a>
102-38	<b>Annual total compensation ratio</b>	2021 Sustainability Report: Governance – Board Composition and Structure – 2021 Board Composition and Participation, <a href="#">page 56</a>  2022 Proxy Statement: Executive Compensation – CEO Pay Ratio, <a href="#">page 75</a>
102-40	<b>List of stakeholder groups</b>	2021 Sustainability Report: Stakeholder Engagement and Material Topics, <a href="#">page 10</a>  <b>Employees</b> – Press releases – 24/7 ethics hotline – Town halls – Charitable events – Company announcements – Weekly newsletter – Social media – Company intranet  <b>Customers, Vendors, Suppliers &amp; Business Partners</b> – Press releases – 24/7 ethics hotline – Social media – Customer appreciation days  <b>Local Communities</b> – Press releases – 24/7 ethics hotline – Company announcements – Charitable events – Social media – Direct outreach initiatives and site tours  <b>Lenders</b> – Press releases – Publicly accessible quarterly earnings conference calls – Social media – Loan compliance and reporting  <b>Shareholders</b> – Annual shareholder meetings – Publicly accessible quarterly earnings conference calls – Press releases – Social media  <b>Government Agencies</b> – Earnings releases – Regulatory reporting – Financial filings
102-41	<b>Collective bargaining agreements</b>	None
102-42	<b>Identifying and selecting stakeholders</b>	We engage with stakeholder groups based on an analysis of our business impacts.

Disclosure Number	Disclosure Title	Response or Disclosure Location
<b>GRI 102: General Disclosures</b>		
102-43	<b>Approach to stakeholder engagement</b>	2021 Sustainability Report: Stakeholder Engagement and Material Topics, <a href="#">page 10</a>
102-44	<b>Key topics and concerns raised</b>	2022 Proxy Statement: Corporate Governance – Investor Engagement, <a href="#">page 32</a> ; Executive Compensation – Compensation Discussion and Analysis – Consideration of Say-On-Pay Vote, <a href="#">page 50</a>
102-45	<b>Entities included in the consolidated financial statements</b>	2021 Form 10-K: Exhibit 21.1: Subsidiaries of the Company
102-46	<b>Defining report content and topic Boundaries</b>	2021 Sustainability Report: About This Report, <a href="#">page 3</a> ; Our Commitment to Sustainability – Stakeholder Engagement and Material Topics, <a href="#">page 10</a>
102-47	<b>List of material topics</b>	2021 Sustainability Report: Stakeholder Engagement and Material Topics, <a href="#">page 10</a> ; Our Commitment to Sustainability – ESG Highlights, <a href="#">pages 18-24</a>
102-48	<b>Restatements of information</b>	There have been no restatements of information.
102-49	<b>Changes in reporting</b>	No significant changes in the list of material topics or topic boundaries.
102-50	<b>Reporting period</b>	This report covers our environmental, social and governance (ESG) data and initiatives during calendar year 2021 (January 1, 2021 through December 31, 2021), though we also share details on goals and initiatives that extend into 2022 and beyond.  2021 Sustainability Report: About This Report, <a href="#">page 3</a>
102-51	<b>Date of most recent report</b>	Our inaugural report, 2020 Sustainability Report, was release last December 07, 2021.
102-52	<b>Reporting cycle</b>	Annual
102-53	<b>Contact point for questions regarding the report</b>	Inquiries related to the report and its content should be directed to our sustainability team at sustainability@gpreinc.com. More information can also be found at www.gpreinc.com.  2021 Sustainability Report: About This Report, <a href="#">page 3</a>
102-54	<b>Claims of reporting in accordance with the GRI Standards</b>	This report references select Global Reporting Initiative (GRI) 2016 standards.  2021 Sustainability Report: About This Report, <a href="#">page 3</a>
102-55	<b>GRI content index</b>	This report references select Global Reporting Initiative (GRI) 2016 standards.  2021 Sustainability Report: About This Report, <a href="#">page 3</a>
102-56	<b>External assurance</b>	Our current policy and practice includes seeking external assurance for certain data in our report through APEX Companies, LLC. APEX Companies, LLC has assured the data as outlined in their letter. The relationship between Green Plains Inc. and APEX is limited in scope to ESG disclosure auditing services. There are no known conflicts of interest between Green Plains Inc. and APEX. Senior executives, including the CEO, approved the selection of the external assurance provider.

Disclosure Number	Disclosure Title	Response or Disclosure Location
<b>GRI 103: Management Approach</b>		
103-1	<b>Explanation of the material topic and its Boundary</b>	<p>The environmental data within this report is limited to the biorefinery production segment of our operations, including our biorefining facilities. The data does not include our fuel terminals or corporate office, as these facilities have a relatively negligible footprint.</p> <p>The social and governance data in this report is enterprise-wide except for employee turnover metrics, which exclude assets divested in 2021 (Green Plains Ord LLC and Green Plains Grain Company LLC's Hopkins, MO and Essex, IA locations) as the divestment events artificially increased the turnover rate.</p> <p>2021 Sustainability Report: About this Report, <a href="#">page 3</a>; Environmental section, <a href="#">pages 25-41</a>; Social section, <a href="#">pages 42-53</a></p>
103-2	<b>The management approach and its components</b>	2021 Sustainability Report: Our Commitment to Sustainability, <a href="#">pages 9-24</a> ; Environmental section, <a href="#">pages 25-41</a> ; Social section, <a href="#">pages 42-53</a> ; Governance section, <a href="#">pages 54-62</a>
103-3	<b>Evaluation of the management approach</b>	2021 Sustainability Report: Our Commitment to Sustainability, <a href="#">pages 9-24</a> ; Environmental section, <a href="#">pages 25-41</a> ; Social section, <a href="#">pages 42-53</a> ; Governance section, <a href="#">pages 54-62</a>
<b>GRI 201: ECONOMIC PERFORMANCE</b>		
201-2	<b>Financial implications and other risks and opportunities due to climate change</b>	<p>2021 Sustainability Report: Environmental – Our Climate Change Strategy, <a href="#">pages 26-29</a></p> <p>2021 Form 10-K: Item 1A: Risk Factors, <a href="#">pages 17-31</a></p>
<b>GRI 202: MARKET PRESENCE</b>		
202-1	<b>Ratios of standard entry level wage by gender compared to local minimum wage</b>	<p>All of our hourly employees are paid well above the federal minimum wage, and we monitor local minimum wages to ensure we are complying and are paying above the higher applicable wage rate.</p> <p>2021 Sustainability Report: Social – Employees – Talent Retention and Engagement – Compensation &amp; Benefits, <a href="#">pages 45-46</a></p>
<b>GRI 203: INDIRECT ECONOMIC PRESENCE</b>		
203-1	<b>Infrastructure investments and services supported</b>	2021 Sustainability Report: Social – Communities, <a href="#">page 53</a>
203-2	<b>Significant indirect economic impacts</b>	2021 Sustainability Report: Social – Communities, <a href="#">page 53</a>
<b>GRI 203: INDIRECT ECONOMIC PRESENCE</b>		
203-1	<b>Infrastructure investments and services supported</b>	2021 Sustainability Report: Social – Communities, <a href="#">page 53</a>
203-2	<b>Significant indirect economic impacts</b>	2021 Sustainability Report: Social – Communities, <a href="#">page 53</a>
<b>GRI 204: PROCUREMENT PRACTICES</b>		
204-1	<b>Proportion of spending on local suppliers</b>	2021 Sustainability Report: Environmental – Land Stewardship, <a href="#">pages 36-39</a> ; Social – Suppliers, <a href="#">page 52</a>

Disclosure Number	Disclosure Title	Response or Disclosure Location
<b>GRI 205: ANTI-CORRUPTION</b>		
205-1	<b>Operations assessed for risks related to corruption</b>	Anti-Corruption Policy, Scope, <a href="#">page 1</a>
205-2	<b>Communication and training about anti-corruption policies and procedures</b>	Green Plains Board receives annual compliance updates Anti-Corruption Policy, Scope, <a href="#">pages 1 and 6</a>
205-3	<b>Confirmed incidents of corruption and actions taken</b>	2021 Sustainability Report: Governance – Ethics and Compliance – Anti-Corruption Policy, <a href="#">page 61</a>
<b>GRI 206: ANTI-COMPETITIVE BEHAVIOR</b>		
206-1	<b>Legal actions for anti-competitive behavior, anti-trust, and monopoly practices</b>	2021 Sustainability Report: Governance – Ethics and Compliance – Anti-Corruption Policy, <a href="#">page 61</a>
<b>GRI 301: MATERIALS</b>		
301-1	<b>Materials used by weight or volume</b>	Our products are almost completely absent of any packaging.  2021 Sustainability Report: About Green Plains – Our Business, <a href="#">pages 6-7</a> ; Environmental – Waste, Circularity and Environmental Compliance, <a href="#">pages 40-41</a> ; Social – Suppliers, <a href="#">page 52</a>
<b>GRI 302: ENERGY</b>		
302-1	<b>Energy consumption within the organization</b>	2021 Sustainability Report: Environmental – Energy Use and Efficiency, <a href="#">pages 32-33</a>
302-2	<b>Energy consumption outside of the organization</b>	2021 Sustainability Report: Environmental – Energy Use and Efficiency, <a href="#">pages 32-33</a>
302-3	<b>Energy intensity</b>	2021 Sustainability Report: Environmental – Energy Use and Efficiency, <a href="#">pages 32-33</a>
302-4	<b>Reduction of energy consumption</b>	2021 Sustainability Report: Our Commitment to Sustainability – ESG Highlights, <a href="#">pages 18-24</a> ; Environmental – Energy Use and Efficiency, <a href="#">pages 32-33</a>
<b>GRI 303: WATER AND EFFLUENTS</b>		
303-1	<b>Interactions with water as a shared resource</b>	2021 Sustainability Report: Environmental – Water Management, <a href="#">pages 34-35</a>
303-2	<b>Management of water discharge-related impacts</b>	2021 Sustainability Report: Environmental – Water Management, <a href="#">pages 34-35</a>
303-3	<b>Water withdrawal</b>	2021 Sustainability Report: Environmental – Water Management, <a href="#">pages 34-35</a>
303-4	<b>Water discharge</b>	2021 Sustainability Report: Environmental – Water Management, <a href="#">pages 34-35</a>
303-5	<b>Water consumption</b>	2021 Sustainability Report: Environmental – Water Management, <a href="#">pages 34-35</a>
<b>GRI 304: BIODIVERSITY</b>		
304-1	<b>Operational sites owned, leased, managed in, or adjacent to, protected areas and areas of high biodiversity value outside protected areas</b>	2021 Sustainability Report: Environmental – Biodiversity and Land Stewardship – <a href="#">pages 36-39</a>

Disclosure Number	Disclosure Title	Response or Disclosure Location
304-2	<b>Significant impacts of activities, products, and services on biodiversity</b>	2021 Sustainability Report: Environmental – Biodiversity and Land Stewardship – <a href="#">pages 36-39</a>
304-3	<b>Habitats protected or restored</b>	2021 Sustainability Report: Environmental – Biodiversity and Land Stewardship – Biodiversity, <a href="#">page 36</a>
<b>GRI 305: EMISSIONS</b>		
305-1	<b>Direct (Scope 1) GHG emissions</b>	2021 Sustainability Report: Environmental – Low-Carbon Future, <a href="#">pages 30-31</a>
305-2	<b>Energy indirect (Scope 2) GHG emissions</b>	2021 Sustainability Report: Environmental – Low-Carbon Future, <a href="#">pages 30-31</a>
305-3	<b>Other indirect (Scope 3) GHG emissions</b>	2021 Sustainability Report: Environmental – Low-Carbon Future, <a href="#">pages 30-31</a>
305-4	<b>GHG emissions intensity</b>	2021 Sustainability Report: Environmental – Low-Carbon Future, <a href="#">pages 30-31</a>
305-5	<b>Reduction of GHG emissions</b>	2021 Sustainability Report: Environmental – ESG Highlights, <a href="#">pages 18-24</a> ; Our Climate Change Strategy – GHG Emissions, <a href="#">page 29</a>
305-7	<b>Nitrogen oxides (NO<sub>x</sub>), sulfur oxides (SO<sub>x</sub>), and other significant air emissions</b>	2021 Sustainability Report: Environmental – Carbon-Free Future, <a href="#">pages 30-31</a>
<b>GRI 306: WASTE</b>		
306-1	<b>Waste generation and significant waste-related impacts</b>	2021 Sustainability Report: Environmental – Waste, Circularity and Environmental Compliance, <a href="#">pages 40-41</a>
306-2	<b>Management of significant waste-related impacts</b>	2021 Sustainability Report: Environmental – Waste, Circularity and Environmental Compliance, <a href="#">pages 40-41</a>
306-3	<b>Waste generated</b>	2021 Sustainability Report: Environmental – Waste, Circularity and Environmental Compliance, <a href="#">pages 40-41</a>
<b>GRI 307: ENVIRONMENTAL COMPLIANCE</b>		
307-1	<b>Non-compliance with environmental laws and regulations</b>	2021 Sustainability Report: Environmental – Waste, Circularity and Environmental Compliance, <a href="#">pages 40-41</a>
<b>GRI 401: EMPLOYMENT</b>		
401-1	<b>New employee hires and employee turnover</b>	APEX Companies, LLC Statement of External Assurance
401-2	<b>Benefits provided to full-time employees that are not provided to temporary or part-time employees</b>	2021 Sustainability Report: Social – Employees – Talent Retention and Engagement – Compensation & Benefits, <a href="#">pages 45-46</a>
401-3	<b>Parental leave</b>	2021 Sustainability Report: Social – Employees – Workforce Diversity, Equity and Inclusion – Compensation & Benefits, <a href="#">pages 45-46</a>
<b>GRI 403: OCCUPATIONAL HEALTH AND SAFETY</b>		
403-1	<b>Occupational health and safety management system</b>	2021 Sustainability Report: Social – Employees – Employee Health & Safety, <a href="#">page 47</a>

Disclosure Number	Disclosure Title	Response or Disclosure Location
403-2	<b>Hazard identification, risk assessment, and incident investigation</b>	2021 Sustainability Report: Social - Employees - Occupational Health & Safety Management System, <a href="#">pages 48-49</a>
403-3	<b>Occupational health services</b>	2021 Sustainability Report: Social - Employees - Occupational Health & Safety Management System, <a href="#">pages 48-49</a>
403-4	<b>Worker participation, consultation, and communication on occupational health and safety</b>	2021 Sustainability Report: Social - Employees - Employee Health & Safety, page 47; Occupational Health & Safety Management System, <a href="#">pages 48-49</a>
403-5	<b>Worker training on occupational health and safety</b>	2021 Sustainability Report: Social - Employees - Occupational Health & Safety Management System, <a href="#">pages 48-49</a>
403-6	<b>Promotion of worker health</b>	2021 Sustainability Report: Social - Employees - Talent Retention and Engagement - Compensation & Benefits, <a href="#">pages 45-46</a>
403-7	<b>Prevention and mitigation of occupational health and safety impacts directly linked by business relationships</b>	2021 Sustainability Report: Social - Employees- Employee Health & Safety, <a href="#">page 47</a>
403-8	<b>Workers covered by an occupational health and safety management system</b>	2021 Sustainability Report: Social - Employees- Employee Health & Safety, <a href="#">page 47</a>
403-9	<b>Work-related injuries</b>	2021 Sustainability Report: Social - Employees - Occupational Health & Safety Management System, <a href="#">pages 48-49</a>
<b>GRI 404: TRAINING AND EDUCATION</b>		
404-1	<b>Average hours of training per year per employee</b>	2021 Sustainability Report: Social - Employees - Safety Training, <a href="#">page 49</a>
404-2	<b>Programs for upgrading employee skills and transition assistance programs</b>	2021 Sustainability Report: Social - Employees - Talent Retention and Engagement - Training and Career Development, <a href="#">page 46</a>
404-3	<b>Percentage of employees receiving regular performance and career development reviews</b>	2021 Sustainability Report: Social - Employees - Talent Retention and Engagement - Training and Career Development, <a href="#">page 46</a>
<b>GRI 405: DIVERSITY AND EQUAL OPPORTUNITY</b>		
405-1	<b>Diversity of governance bodies and employees</b>	2021 Sustainability Report: Social - Employees - Workforce Diversity, Equity and Inclusion, <a href="#">pages 43-44</a> ; Governance - Board Composition and Structure - 2021 Board Composition and Participation, <a href="#">page 56</a>
<b>GRI 408: CHILD LABOR</b>		
408-1	<b>Operations and suppliers at significant risk for incidents of child labor</b>	Green Plains does not permit the employment of underage children in our workforce or the use of forced or compulsory labor in any of our operations.  Human and Labor Rights Policy

Disclosure Number	Disclosure Title	Response or Disclosure Location
<b>GRI 409: FORCED OR COMPULSORY LABOR</b>		
409-1	<b>Operations and suppliers at significant risk for incidents of forced or compulsory labor</b>	Green Plains does not permit the employment of underage children in our workforce or the use of forced or compulsory labor in any of our operations.  Human and Labor Rights Policy
<b>GRI 410: SECURITY PRACTICES</b>		
410-1	<b>Security personnel trained in human rights policies or procedures</b>	All security personnel hired are required to attend formal training relating to our Human and Labor Rights Policy.  2021 Sustainability Report: Governance - Ethics and Compliance - Human and Labor Rights Policy, <a href="#">page 61</a>
<b>GRI 413: LOCAL COMMUNITIES</b>		
413-1	<b>Operations with local community engagement, impact assessments, and development programs</b>	2021 Sustainability Report: Our Commitment to Sustainability — ESG Highlights, <a href="#">pages 18-24</a> ; Social - Communities, <a href="#">page 53</a>
<b>GRI 414: SUPPLIER SOCIAL ASSESSMENT</b>		
414-1	<b>New suppliers that were screened using social criteria</b>	2021 Sustainability Report: Social - Suppliers, <a href="#">page 52</a> ; Governance - Ethics and Compliance, <a href="#">pages 60-62</a>
414-2	<b>Negative social impacts in the supply chain and actions taken</b>	2021 Sustainability Report: Social - Suppliers, <a href="#">page 52</a> ; Governance - Ethics and Compliance, <a href="#">pages 60-62</a>
<b>GRI 415: PUBLIC POLICY</b>		
415-1	<b>Political contributions</b>	2021 Sustainability Report: Governance - Ethics and Compliance, <a href="#">pages 60-62</a>
<b>GRI 416: CUSTOMER HEALTH AND SAFETY</b>		
416-1	<b>Assessment of the health and safety impacts of product and service categories</b>	We ensure the health and safety of our customers by guaranteeing that 100% of our products are subject to either a Certificate of Analysis process, feed tag with guarantee or another type of quality assurance document.  2021 Sustainability Report: Social - Customers, <a href="#">pages 50-51</a>
416-2	<b>Incidents of non-compliance concerning the health and safety impacts of products and services</b>	Our facilities continue to perform well during audits by the FDA regarding compliance with the Food Safety Modernization Act (FSMA) regulation, with no facilities receiving negative findings.  2021 Sustainability Report: Social - Customers, <a href="#">pages 50-51</a>
<b>GRI 418: CUSTOMER PRIVACY</b>		
418-1	<b>Substantiated complaints concerning breaches of customer privacy and losses of customer data</b>	In 2021, we have not had any identified leaks, thefts or losses of customer data.  2021 Sustainability Report: Governance - Ethics and Compliance - Cybersecurity, <a href="#">pages 61-62</a>

# Biofuels Standard from the Sustainability Accounting Standards Board (SASB)

Topic	Accounting Metrics	Category	Unit of Measure	Code	Answer, Cross-Reference, Omissions and Explanations	Location
<b>Air Quality</b>	Air emissions of the following pollutants: (1) NOx (excluding N2O), (2) SOx, (3) volatile organic compounds (VOCs), (4) particulate matter (PM10), and (5) hazardous air pollutants (HAPs)	Quantitative	Metric tons (t)	RR-BI-120a.1	Yes, except (5) hazardous air pollutants (HAPs)	2021 Sustainability Report: Environmental – Carbon-Free Future, <a href="#">pages 30-31</a>
	Number of incidents of non-compliance associated with air quality permits, standards, and regulations	Quantitative	Number	RR-BI-120a.2	959 incidents	2021 Sustainability Report: Environmental – Carbon-Free Future, <a href="#">pages 30-31</a>
<b>Water Management in Manufacturing</b>	(1) Total water withdrawn, (2) total water consumed, percentage of each in regions with High or Extremely High Baseline Water Stress	Quantitative	Thousand cubic meters (m3), Percentage (%)	RR-BI-140a.1	Yes, except (2), percentage of each in regions with High or Extremely High Baseline Water Stress	2021 Sustainability Report: Environmental – Water Management, <a href="#">pages 34-35</a>
	Description of water management risks and discussion of strategies and practices to mitigate those risks	Discussion and Analysis	n/a	RR-BI-140a.2	We currently do not have any known significant water-related impacts identified by local authorities or other stakeholders.	2021 Sustainability Report: Environmental – Water Management, <a href="#">pages 34-35</a>
	Number of incidents of non-compliance associated with water quality permits, standards, and regulations	Quantitative	Number	RR-BI-140a.3	15	2021 Sustainability Report: Environmental – Water Management, <a href="#">pages 34-35</a>
<b>Lifecycle Emissions Balance</b>	Lifecycle greenhouse gas (GHG) emissions, by biofuel type	Quantitative	Grams of CO2-e per megajoule (MJ)	RR-BI-410a.1	Discloses Scope 1, Scope 2 and Scope 3 GHG emissions	2021 Sustainability Report: Environmental – Carbon-Free Future, <a href="#">pages 30-31</a>
<b>Sourcing &amp; Environmental Impacts of Feedstock Production</b>	Discussion of strategy to manage risks associated with environmental impacts of feedstock production	Discussion and Analysis	n/a	RR-BI-430a.1	Yes, under Biodiversity and Land Stewardship section	2021 Sustainability Report: Environmental – Biodiversity and Land Stewardship, <a href="#">pages 36-39</a>
	Percentage of biofuel production third-party certified to an environmental sustainability standard	Quantitative	Percentage (%) of gallons	RR-BI-430a.2	All of our biorefinery locations are registered as Renewable Fuel Producers with the U.S. Environmental Protection Agency (EPA) and meet the requirements for the Renewable Fuel Standard (Title 40 CFR Part 80). Additionally, 100% of the denatured biofuel we produce is RFS compliant.	2021 Sustainability Report: Environmental – Waste, Circularity and Environmental Compliance, <a href="#">pages 40-41</a>
<b>Management of the Legal &amp; Regulatory Environment</b>	Amount of subsidies received through government programs	Quantitative	Reporting currency	RR-BI-530a.1		
	Discussion of corporate positions related to government regulations and/or policy proposals that address environmental and social factors affecting the industry	Discussion and Analysis	n/a	RR-BI-530a.2		2021 Form 10-K: Item 1: Business – Regulatory Matters, <a href="#">pages 14-15</a> ; Item 1A: Risk Factors – Risks Related to our Business and Industry, <a href="#">pages 17-29</a>
<b>Operational Safety, Emergency Preparedness &amp; Response</b>	Process Safety Incidents Count (PSIC), Process Safety Total Incident Rate (PSTIR), and Process Safety Incident Severity Rate (PSISR)	Quantitative	Number, Rate	RR-BI-540a.1	There were no Process Safety Incidents in 2021.	2021 Sustainability Report: SASB Index

Activity Metrics	Category	Unit of Measure	Code	Answer, Cross-Reference, Omissions and Explanations	Location
<b>Biofuel production capacity</b>	Quantitative	Millions of gallons (Mgal)	RR-BI-000.A	958,000,000 gallons renewable biofuel production capacity	2021 Sustainability Report: About Green Plains – Our Business, <a href="#">pages 6-7</a>
<b>Production of: (1) renewable fuel, (2) advanced biofuel, (3) biomass-based diesel, and (4) cellulosic biofuel</b>	Quantitative	Millions of gallons (Mgal)	RR-BI-000.B	750,648,000 gallons sold in 2021	2021 Sustainability Report: About Green Plains – Our Business, <a href="#">pages 6-7</a>
<b>Amount of feedstock consumed in production</b>	Quantitative	Metric tons (t)	RR-BI-000.C	259,786,000 bushels of corn consumed in 2021	2021 Sustainability Report: About Green Plains – Our Business, <a href="#">pages 6-7</a>

# Task Force on Climate-Related Financial Disclosure (TCFD)

Topic	Recommended Disclosure	Response or Location
<b>Governance: Disclose the organization’s governance around climate-related risks and opportunities.</b>	<p>a. Describe the board’s oversight of climate-related risks and opportunities.</p> <p>b. Describe management’s role in assessing and managing climate-related risks and opportunities.</p>	<p>2021 Sustainability Report: Governance – Board Composition and Structure – ESG and Climate Change Governance, <a href="#">pages 58-59</a></p> <p>2022 Proxy Statement: Corporate Governance – Board Oversight – Corporate Responsibility/ESG/Sustainability Oversight, <a href="#">pages 30-31</a></p> <p>2021 Sustainability Report: Environmental – Our Climate Change Strategy, <a href="#">pages 26-29</a></p> <p>2021 Sustainability Report: Governance – Board Composition and Structure – ESG and Climate Change Governance, <a href="#">pages 58-59</a></p>
<b>Strategy: Disclose the actual and potential impacts of climate-related risks and opportunities on the organization’s businesses, strategy, and financial planning where such information is material.</b>	<p>a. Describe the climate-related risks and opportunities the organization has identified over the short, medium, and long term.</p> <p>b. Describe the impact of climate-related risks and opportunities on the organization’s businesses, strategy, and financial planning.</p> <p>c. Describe the resilience of the organization’s strategy, taking into consideration different climate-related scenarios, including a 2°C or lower scenario.</p>	<p>2021 Sustainability Report: Environmental – Our Climate Change Strategy, <a href="#">pages 26-29</a></p> <p>2021 Sustainability Report: Environmental – Our Climate Change Strategy, <a href="#">pages 26-29</a></p> <p>Under review</p>
<b>Risk Management: Disclose how the organization identifies, assesses, and manages climate-related risks.</b>	<p>a. Describe the organization’s processes for identifying and assessing climate-related risks.</p> <p>b. Describe the organization’s processes for managing climate-related risks.</p> <p>c. Describe how processes for identifying, assessing, and managing climate-related risks are integrated into the organization’s overall risk management.</p>	<p>2021 Sustainability Report: Environmental – Our Climate Change Strategy, <a href="#">pages 26-29</a></p> <p>2021 Sustainability Report: Environmental – Our Climate Change Strategy, <a href="#">pages 26-29</a></p> <p>2021 Sustainability Report: Environmental – Our Climate Change Strategy, <a href="#">pages 26-29</a>; Governance – Board Composition and Structure – ESG and Climate Change Governance, <a href="#">pages 58-59</a></p>
<b>Metrics and Targets: Disclose the metrics and targets used to assess and manage relevant climate-related risks and opportunities where such information is material.</b>	<p>a. Disclose the metrics used by the organization to assess climate-related risks and opportunities in line with its strategy and risk management process.</p> <p>b. Disclose Scope 1, Scope 2 and, if appropriate, Scope 3 greenhouse gas (GHG) emissions, and the related risks.</p> <p>c. Describe the targets used by the organization to manage climate-related risks and opportunities and performance against targets.</p>	<p>2021 Sustainability Report: Environmental – Our Climate Change Strategy – Metrics and Targets, <a href="#">page 28</a></p> <p>2021 Sustainability Report: Environmental – Our Climate Change Strategy, <a href="#">pages 26-29</a></p> <p>2021 Sustainability Report: Environmental – Our Climate Change Strategy, <a href="#">pages 26-29</a></p>

# Other Information

## Index of Defined Terms

AD&D - Accidental Death and Dismemberment	IDNR - Illinois Department of Natural Resources	RAS - Recirculating Aquaculture Systems
ANSI - American National Standards Institute	ISS - Information Security Standard	RD - Renewable Diesel
API - American Petroleum Institute	IT - Information Technology	RFS - Renewable Fuel Standard
CAPA - Corrective Action and Preventative Action	JSA - Job Safety Analysis	RO - Reverse Osmosis
CCS - Carbon Capture and Sequestration	KPI - Key Performance Indicators	RTO - Regenerative Thermal Oxidizer
CEMS - Continuous Emissions Monitoring System	KWh - Kilowatt Hours	S&P - Standard and Poor's
CFR - Code of Federal Regulations	LCFS - Low Carbon Fuel Standard	SASB - Sustainability Accounting Standards Board
CI - Carbon Intensity	LDAR - Leak Detection and Repair	SBTi - Science-Based Targets Initiative
CLAO - Chief Legal and Administration Officer	LMS - Learning Management System	SCS - Summit Carbon Solutions
CO <sub>2</sub> - Carbon Dioxide	LPG - Liquefied Petroleum Gas	SDS - Safety Data Sheets
CO <sub>2e</sub> - Carbon Dioxide Equivalent	LTI - Lost Time Injury	SLT - Senior Leadership Team
COA - Certificate of Analysis	LUC - Land Use Change	SO <sub>2</sub> - Sulfur Dioxide
CST™ - Clean Sugar Technology	MBE - Minority Owned Business Enterprise	SO <sub>x</sub> - Sulfur Oxide
DAFW - Days Away From Work	MDH - Minnesota Department of Health	STI - Steel Tank Institute
DEI/DE&I - Diversity, Equity and Inclusion	MMBtu - Metric Million British Thermal Unit	SVP - Senior Vice President
DHHS - Department of Health and Human Services	MNDNR - Minnesota Department of Natural Resources	SWA - Stop Work Authority
EAP - Employee Assistance Plan	MODIS - Moderate Resolution Imaging Spectroradiometer	TCFD - Task Force on Climate-Related Financial Disclosure
EHSS - Environment, Health, Safety and Security	MPCA - Minnesota Pollution Control Agency	TDEC - Tennessee Department of Environment and Conservation
EIPA - European Institute of Public Administration	MSCI™ - Morgan Stanley Capital International	TO - Thermal Oxidizer
EPA - Environmental Protection Agency	MSC™ - Maximized Stillage Co-Products	TRIR - Total Recordable Incident Rate
ESG - Environmental, Social and Governance	MT - Metric Tons	UN SDGs - United Nations Sustainable Development Goals
FAPRI - Food and Agricultural Policy Research Institute	MTBE - Methyl Tertiary Butyl Ether	USD - United States Dollar
FDA - Food and Drug Administration	NDEE - Nebraska Department of Environment and Energy	USDA - United States Department of Agriculture
FIFO - Fish In/Fish Out	NFPA - National Fire Protection Association	VFD - Variable Frequency Drives
FQT - Fluid Quip Technologies	NO <sub>x</sub> - Nitrogen Oxides	VOCs - Volatile Organic Compounds
FSMA - Food Safety Modernization Act	OSHA - Occupational Safety and Health Administration	VOSB - Veteran-Owned Small Business
GDP - Gross Domestic Product	PAC - Political Action Committee	VP - Vice President
GHG - Greenhouse Gas	PEMS - Predictive Emissions Monitoring System	VSQGs - Very Small Quantity Generators
GHS - Globally Harmonized System	PM - Particulate Matter	WBE - Women-Owned Business Enterprise
REET - Greenhouse Gases, Regulated Emissions, and Energy Use in Transportation	PMS - Performance Management System	WIA - Women in Agriculture
GRI - Global Reporting Initiative	PPE - Personal Protective Equipment	
HAPs - Hazardous Air Pollutants	PSM - Process Safety Management	
HBCUs - Historically Black Colleges and Universities	Q&A - Question and Answer	
IDEM - Indiana Department of Environmental Management	QDR - Quality Deviation Report	
	QMS - Quality Management System	

# Assurance Letter

## INDEPENDENT LIMITED ASSURANCE STATEMENT



To: The Stakeholders of Green Plains Inc.

### Introduction and Objectives of Work

Apex Companies, LLC (Apex) has been engaged by Green Plains Inc. to provide limited assurance of its 2021 Health and Safety, Production, Energy, GHG Emissions (Scope 1, Scope 2 [location-based], Scope 3 [Purchased Goods and Services, Upstream Transportation and Distribution, Employee Commuting, Downstream Transportation and Distribution], Biogenic), Air Pollutants, Water Withdrawals, Water Discharge, and Social data listed in the following tables. This assurance statement applies to the Subject Matter included within the scope of work described below.

This information and its presentation are the sole responsibility of the management of Green Plains Inc. Our sole responsibility was to provide independent assurance on the accuracy of the Subject Matter.

### Scope of Work

The scope of our work was limited to assurance of Health and Safety, Production, Energy, GHG Emissions (Scope 1, Scope 2 [location-based], Scope 3 [Purchased Goods and Services, Upstream Transportation and Distribution, Employee Commuting, Downstream Transportation and Distribution], Biogenic), Air Pollutants, Water Withdrawals, Water Discharge, and Social data for the period January 1, 2021 to December 31, 2021 (the 'Subject Matter'). The metrics assured by Apex are included in the attached table.

Data and information supporting Health and Safety, Production, Energy, GHG Emissions (Scope 1, Scope 2 [location-based], Biogenic), Air Pollutants, Water Withdrawals, Water Discharge, and Social data were mostly historical in nature. Data and information supporting Scope 3 GHG Emissions were in some cases estimated.

### Reporting Boundaries

The following are the boundaries used by Green Plains Inc. for reporting sustainability data:

- Operational Control
- United States

### Reporting Criteria

The Subject Matter needs to be read and understood together with the 2016 GRI Standards.

### Limitations and Exclusions

Excluded from the scope of our work is any assurance of information relating to:

- Activities outside the defined assurance period;
- Material outside the scope of work.

This limited assurance engagement relies on a risk based selected sample of sustainability data and the associated limitations that this entails. The reliability of the reported data is dependent on the accuracy of metering and other production measurement arrangements employed at site level, not addressed as part of this assurance. This independent statement should not be relied upon to detect all errors, omissions or misstatements that may exist.

### Responsibilities

The preparation and presentation of the Subject Matter are the sole responsibility of the management of Green Plains Inc.

Apex was not involved in the development of the Subject Matter or of the Reporting Criteria. Our responsibilities were to:

- obtain limited assurance about whether the Subject Matter has been prepared in accordance with the Reporting Criteria;

- form an independent conclusion based on the assurance procedures performed and evidence obtained; and
- report our conclusions to the Stakeholders of Green Plains Inc.

### Assessment Standards

- We performed our work in accordance with Apex's standard procedures and guidelines for external Assurance of Sustainability Reports and International Standard on Assurance Engagements (ISAE) 3000 Revised, Assurance Engagements Other than Audits or Reviews of Historical Financial Information (effective for assurance reports dated on or after Dec. 15, 2015), issued by the International Auditing and Assurance Standards Board. A materiality threshold of ±5-percent was set for the assurance process.
- ISO 14064-3 Second Edition 2019-04: Greenhouse gases -- Part 3: Specification with guidance for the verification and validation of greenhouse gas statements.

### Summary of Work Performed

As part of our independent assurance, our work included:

1. Assessing the appropriateness of the Reporting Criteria for the Subject Matter;
2. Queried information and data related to the Subject Matter from relevant personnel;
3. Reviewing the data collection and consolidation processes used to compile Subject Matter, including assessing assumptions made, and the data scope and reporting boundaries;
4. Reviewing documentary evidence provided by relevant personnel; and,
5. Agreeing a selection of the Subject Matter to the corresponding source documentation.

**Conclusion**

On the basis of our methodology and the activities described above:

- Nothing has come to our attention to indicate that the Subject Matter is not fairly stated in all material respects; and,
- It is our opinion that Green Plains Inc. has established appropriate systems for the collection, aggregation and analysis of quantitative data.

**Statement of Independence, Integrity and Competence**

Apex is an independent professional services company that specializes in Health, Safety, Social and Environmental management services including assurance with over 30 years history in providing these services.

Apex has implemented a Code of Ethics across the business to maintain high ethical standards among staff in their day-to-day business activities.

No member of the assurance team has a business relationship with Green Plains Inc., its Directors or Managers beyond that required of this assignment. We have conducted this verification independently, and there has been no conflict of interest.

The assurance team has extensive experience in conducting assurance over environmental, social, ethical and health and safety information, systems and processes, and has over 20 years combined experience in this field and an excellent understanding of Apex's standard methodology for the assurance of sustainability data.



Project Manager  
Apex Companies, LLC  
Lakewood, CO

April 11, 2022



Trevor Donaghy, Technical Reviewer  
Program Manager  
Apex Companies, LLC  
Pleasant Hill, CA

Green Plains Inc.	Units	2021
<b>GHG Emissions – Scope 1 and 2*</b>		
Scope 1	Thousand tCO2e	1,098
Scope 2	Thousand tCO2e	338
Biogenic	Thousand tCO2e	2,101
Total Operating GHG Emissions	Thousand tCO2e	3,536
Total Operating GHG Emissions Intensity	tCO2e/ton of raw material	0.536
<b>GHG Emissions – Scope 3*</b>		
Category 1: Purchased Goods and Services	Thousand tCO2e	1,751
Category 4: Upstream Transportation and Distribution	Thousand tCO2e	45
Category 7: Employee Commuting	Thousand tCO2e	2.4
Category 9: Downstream Transportation and Distribution	Thousand tCO2e	87
<b>Production</b>		
Corn Bushels	Metric Tons	6,598,916
Corn Oil Yield	Lbs per bushel	0.846
<b>Air Emissions</b>		
Sulfur Dioxide	Thousand Metric Tons	0.087
Nitrogen Oxides	Thousand Metric Tons	0.482
Volatile Organic Compounds	Thousand Metric Tons	0.649
Carbon Monoxide	Thousand Metric Tons	0.341
Particulate Matter	Thousand Metric Tons	0.329
<b>Electricity Usage*</b>		
Electricity Usage	Thousand MWh	650
Electricity Use Intensity	kWh/ton of raw material	98.438
<b>Natural Gas Usage*</b>		
Natural Gas Usage	MMBTU	20,662,819
Natural Gas Use Intensity	MMBTU/ton of raw material	3.125
<b>Water Usage</b>		
Groundwater Withdrawals	Thousand m <sup>3</sup>	9,182
Municipal Water Withdrawals	Thousand m <sup>3</sup>	759
Reclaimed Water Withdrawals	Thousand m <sup>3</sup>	288
Salt Water Withdrawals	Thousand m <sup>3</sup>	0
Surface Water Withdrawals	Thousand m <sup>3</sup>	0
Total Water Withdrawals	Thousand m <sup>3</sup>	10,229
Total Water Discharged	Thousand m <sup>3</sup>	3,546
Total Water Usage	Thousand m <sup>3</sup>	6,683
Total Water Use Intensity	m <sup>3</sup> /ton of raw material	1.013
<b>Environmental Compliance</b>		
Number of Sites	Count	12
Number of Reportable Spills	Count	1
Volume of Reportable Spills	Liters	1,210
Number of Environmental Fines	Count	1
Amount of Environmental Fines	USD	\$13,992

Employee Retention			
Full-Time (Male)	Count		676
Part-Time (Male)	Count		4
Total (Male)	Count		680
Full-Time (Female)	Count		161
Part-Time (Female)	Count		6
Total (Female)	Count		167
Employee Turnover			
All	%		24
Male	%		76
Female	%		24
Under 30	%		23
30-50	%		51
Over 50	%		26
Employee Compensation			
Ratio of average entry-level wage to the federal minimum wage	Ratio		5.51
Diversity*			
Male	Total Number (%)		680 (80.3)
Female	Total Number (%)		167 (19.7)
Under 30	Total Number (%)		162 (19.1)
30-50	Total Number (%)		415 (48.9)
Over 50	Total Number (%)		270 (31.8)
Caucasian/White	Total Number (%)		788 (93.0)
Hispanic/Latin American	Total Number (%)		18 (2.1)
American Indian/Alaskan Native	Total Number (%)		4 (0.5)
Asian	Total Number (%)		8 (0.9)
Black or African American	Total Number (%)		23 (2.7)
Two or More Races	Total Number (%)		4 (0.5)
Unspecified	Total Number (%)		2 (0.2)
Training and Education			
Male	Average hours/employee		25
Female	Average hours/employee		25
Production	Average hours/employee		25
Corporate	Average hours/employee		0
Health and Safety			
Fatalities	Total Number		0
Lost Time Incidents	Total Number		2
Lost Time Incident Rate	Incidents per 200,000 hours worked		0.24
Recordable Incidents	Total Number		22
Recordable Incident Rate	Incidents per 200,000 hours worked		2.66
Hours Worked	Total Number		1,656,538

Production Systems		
Number of Maximized Stillage Co-products (MSC™) systems in operation at production facilities	Count	2

\*These values may be impacted by rounding

# Forward-Looking Statements

This sustainability report includes forward-looking statements that reflect management's current views of company performance, industry conditions and future economic environment. These statements are based on assumptions and various factors that are subject to risks and uncertainties. Green Plains has provided additional information about such risks and uncertainties that could cause actual results to differ materially from those expressed or implied in its reports filed with the Securities and Exchange Commission. Forward-looking statements are made in accordance with safe harbor provisions of the Private Securities Litigation Reform Act of 1995. These statements are based on current expectations which involve a number of risks and uncertainties and do not relate strictly to historical or current facts, but rather to plans and objectives for future operations. These statements include words such as "anticipate," "believe," "continue," "estimate," "expect," "intend," "outlook," "plan," "predict," "may," "could," "should," "will" and similar words and phrases as well as statements regarding future operating or financial performance or guidance, business strategy, environment, key trends and benefits of actual or planned acquisitions. Factors that could cause actual results to differ from those expressed or implied are discussed in this report under "Risk Factors" or incorporated by reference. Specifically, we may experience fluctuations in future operating results due to a number of economic conditions, including: disruption caused by health epidemics, such as the COVID-19 outbreak; competition in the biofuel industry and other industries in which we operate; commodity market risks, including those that may result from weather conditions; financial market risks; counterparty risks; risks associated with changes to government policy or regulation, including changes to tax laws; risks related to acquisitions and disposition activities and achieving anticipated results; risks associated with merchant trading; risks related to our equity method investees and other factors detailed in reports filed with the SEC. We believe our expectations regarding future events are based on reasonable assumptions; however, these assumptions may not be accurate or account for all risks and uncertainties. Consequently, forward-looking statements are not guaranteed. Actual results may vary materially from those expressed or implied in our forward-looking statements. In addition, we are not obligated and do not intend to update our forward-looking statements as a result of new information unless it is required by applicable securities laws. We caution investors not to place undue reliance on forward-looking statements, which represent management's views as of the date of this report or documents incorporated by reference. This sustainability report also includes estimated projections of future operating results. This information is not fact and should not be relied upon as being necessarily indicative of future results; the projections were prepared in good faith by management and are based on numerous assumptions that may prove to be wrong. Important factors that may affect actual results and cause the projections to not be achieved include, but are not limited to, risks and uncertainties relating to the company and other factors described under "Risk Factors" sections of the Company's Annual Report on Form 10-K. Actual results may differ materially from those contained in the estimates. Accordingly, there can be no assurance that the estimates will be realized. Neither the SEC nor any other regulatory body has passed upon the accuracy or adequacy of this sustainability report. Any representation to the contrary is a criminal offense. Except as otherwise indicated, this sustainability report speaks as of the date hereof. The delivery of this sustainability report shall not, under any circumstances, create any implication that there has been no change in the affairs of the company after the date hereof. Certain of the information contained herein may be derived from information provided by industry sources. While the company believes that such information is accurate and that the sources from which it has been obtained are reliable, it has not independently verified data from these third-party sources.



Green Plains

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