Green Plains

Investor Presentation

November 2023



Forward-Looking Statements

This presentation 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 ethanol 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 presentation 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.

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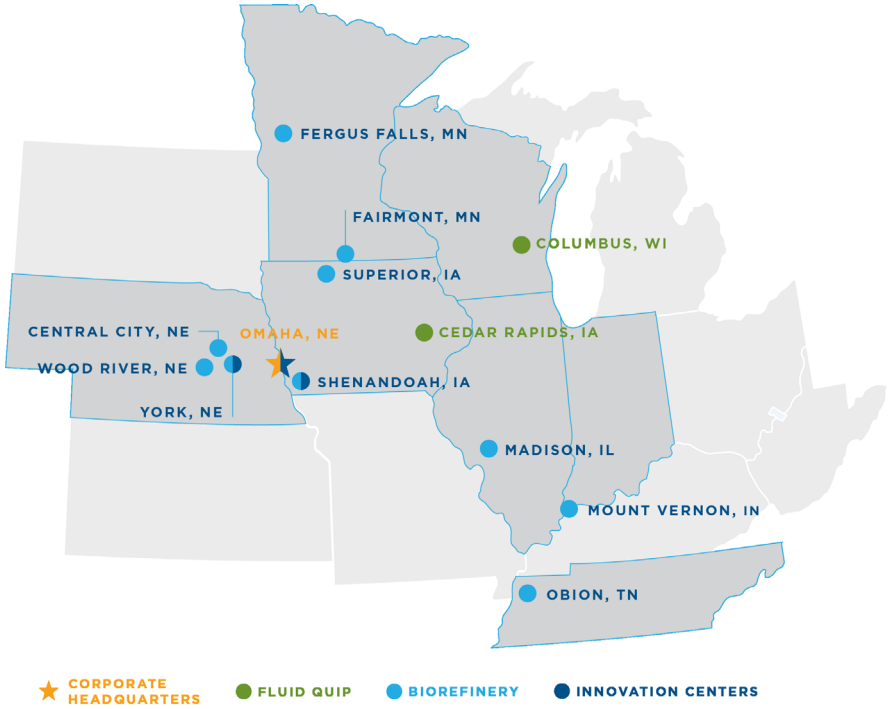
Certain of the information contained herein may be derived from information provided by industry sources. While the company believes that such information is accurate and that the sources from which it has been obtained are reliable, it has not independently verified data from these third-party sources.

Green Plains – A Technology Driven Producer of Low Carbon Ingredients

Operational Areas

Ethanol Production	Produces ~900MM gallons of ethanol annually across 10 biorefineries Produces ~2MM of equivalent dried tons of distillers grain annually Originating more than 300MM bushels of corn annually through more than 5,000 farmer customers
Fluid Quip Technologies	Owns intellectual property driving the growth of DCO Tech™, MSC™ Ultra-High Protein and CST™; with over 40 patents and more pending
Renewable Corn Oil	Renewable corn oil capacity of ~300MM lbs today and targeting higher yields through additional MSC™ installations and corn oil technology
Ultra-High Protein	MSC™ technology deployed at five Green Plains locations with 330K tons of Ultra-high Protein capacity
Clean Sugar Technology	Expect to have over 200MMlbs / y of dextrose capacity beginning early 2024 with opportunity to expand Shenandoah CST™ to 500MM lbs / y
Carbon Reduction	Opportunity to remove ~1.7MM metric tons of CO_2 from the atmosphere through planned carbon pipeline initiatives and potential upside from additional CCUS opportunities



Green Plains Today

$2.1Bn Enterprise Value [1]

$1.5Bn Equity Value [1]

3 Innovation Centers

Own and Control Disruptive Ag-Tech IP Portfolio

Green Plains

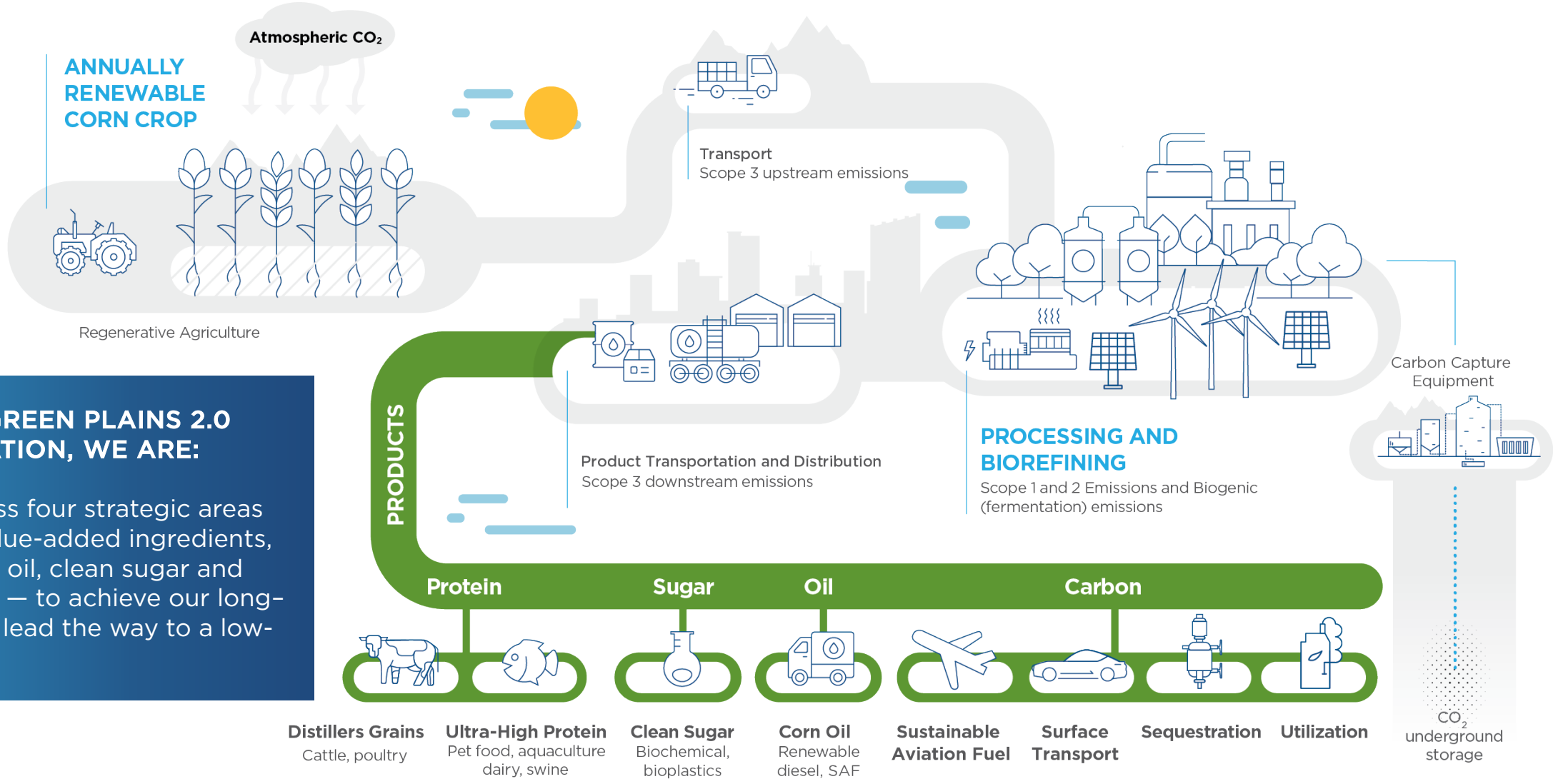
Biorefineries

FLUID QUIP TECHNOLOGIES

Green Plains PARTNERS LP

[1] Equity values as of Nov 11, 2023, Balance Sheet values as of Sep 30, 2023

We are transforming our assets for a low-carbon future

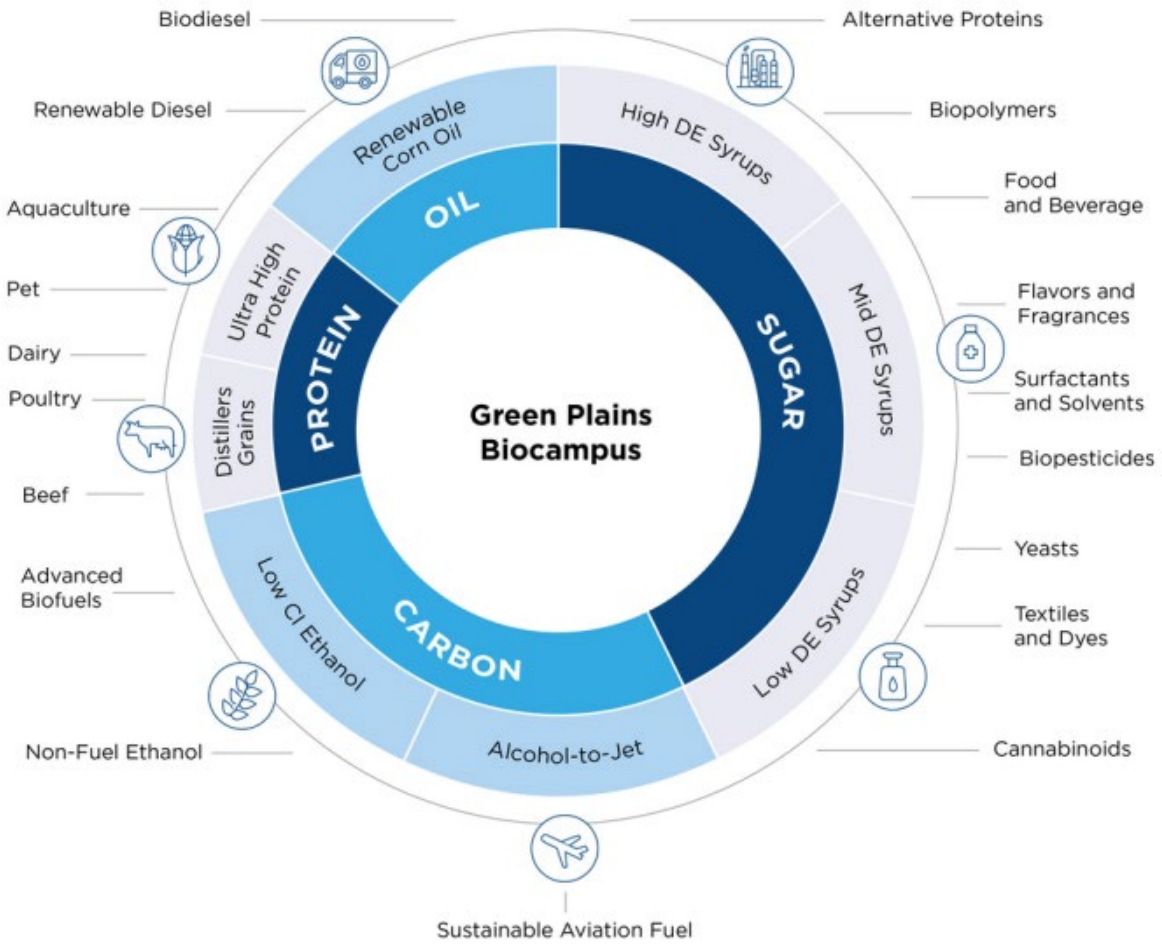


UNDER OUR GREEN PLAINS 2.0 TRANSFORMATION, WE ARE:

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.

Transformation in Biofuels is Happening Today

- Technologies, such as those provided by Fluid Quip Technologies, are driving the transition to a biocampus model
  - Low-carbon intensity proteins
  - Low-carbon intensity renewable corn oil
  - Low-carbon intensity dextrose syrups
  - Low-carbon intensity biofuels
- Biofuel is lowering its carbon intensity and is incentivized by provisions in the IRA to pursue
  - CCUS
  - Cogeneration / combined heat and power
  - Renewable energy sources
  - Regenerative farming
- Low-carbon intensity biofuels can serve as crucial feedstocks in the development of Sustainable Aviation Fuels



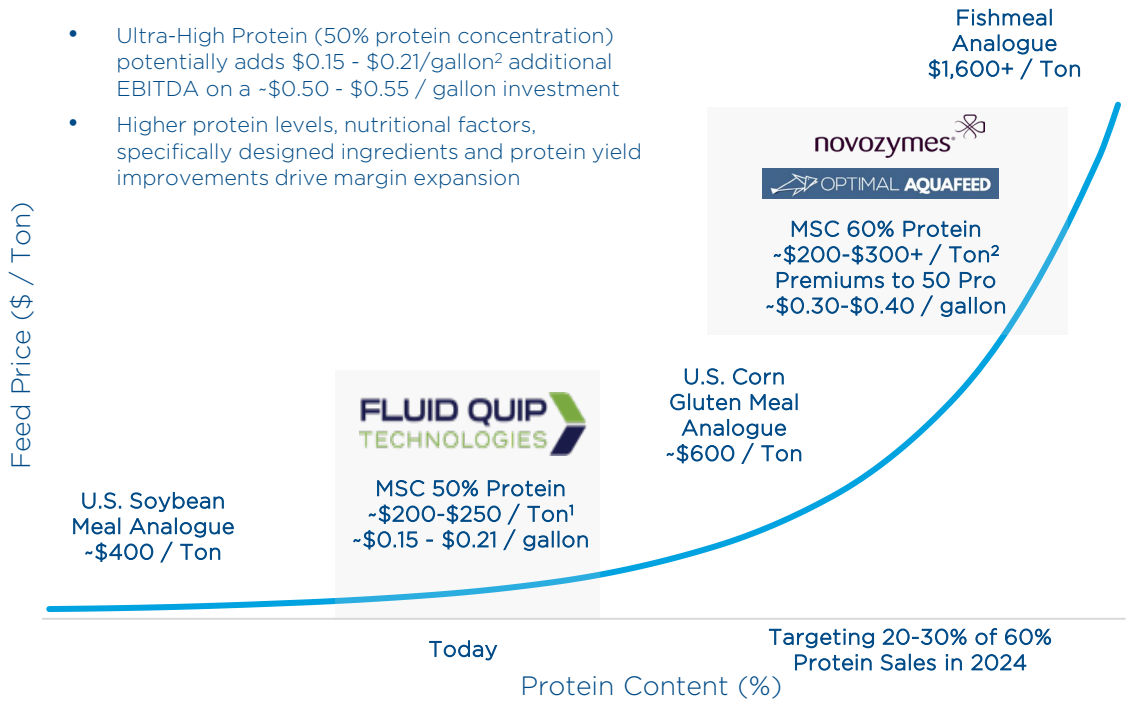
MSC™ Technology Can Significantly Reduce Volatility While Increasing Margins

Biorefinery economics see significant improvement through deployment of MSC™ technology

- **Five Green Plains locations operating MSC™ technology**, with additional locations planned pending receipt of necessary permitting
  - **Increases yields of renewable corn oil** – the most valuable component of corn today
  - Mechanically separates distillers grains into high-value Ultra-High Protein at 50% protein concentration
  - Up to **40% lower carbon intensity** compared to corn gluten meal globally
- Offers an **11 million ton market** at conservative inclusion rates with multiple sub-vertical pet, poultry, swine and aqua segments to diversify sales domestically and internationally
- **Commercial production of 60% protein concentration** in 3Q 2023
- Targeting commercialization of **20-30% of platform capacity as 60% protein** for 2024
- At capacity, Ultra-High Protein technology **could contribute over $150 million of earnings power with upside as we move up the "J-curve"**

Increased Protein Upside

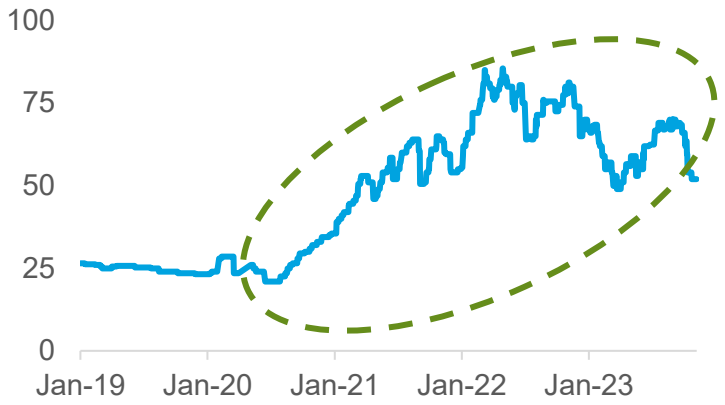
- Ultra-High Protein (50% protein concentration) potentially adds $0.15 - $0.21/gallon[2] additional EBITDA on a ~$0.50 - $0.55 / gallon investment
- Higher protein levels, nutritional factors, specifically designed ingredients and protein yield improvements drive margin expansion



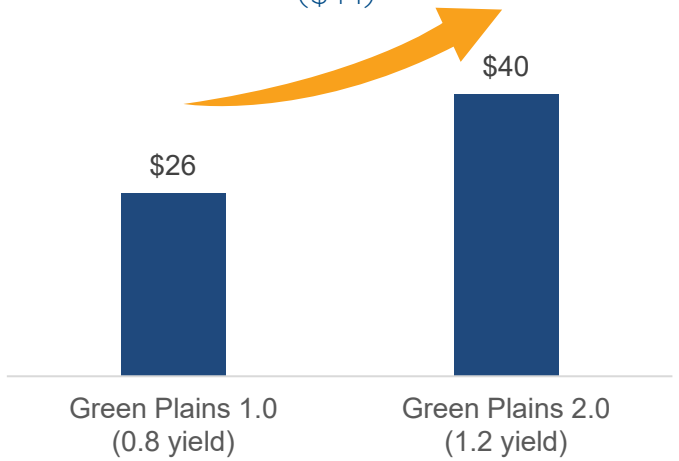
[1]Incremental value per ton of 50% protein is shown as premiums to underlying distillers grains per ton pricing and should be adjusted based on current DDG values
[2]Upon reaching redundant scale and moving through commercial contracting year and inclusive of 50% improvement in corn oil yields.

Taking Advantage of the Unique Drivers in Renewable Corn Oil

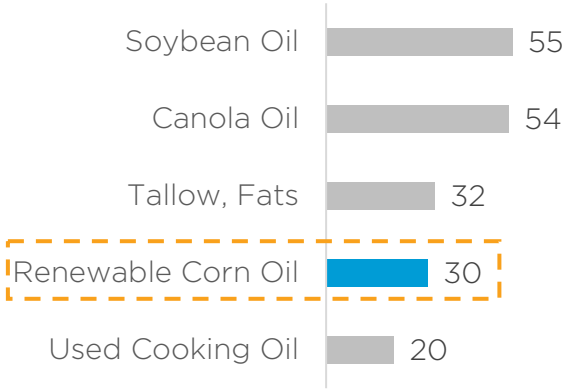
Renewable Corn Oil Price [1]
(Cents per Pound)



Potential Renewable Corn Oil Margin Increase
Per $0.10 per pound increase
($ M)



Average CI Pathways for Biodiesel and Renewable Diesel Feedstock [2]



~1.8 lbs of renewable corn oil exist in every bushel of corn – we are continuing to target further increases in yields to maximize the opportunity of this strategic low carbon feedstock

- MSC™ technology delivers a **sustainable structural advantage** in renewable corn oil yields over Green Plains 1.0 by increasing renewable corn oil yields from 0.8 to 1.2 pounds per bushel
- Renewable corn oil production capacity increases to **~ 375 million pounds** upon completion of MSC™ installations
- With continued demand from renewable diesel, and new demand from SAF, we believe **the low CI value of renewable corn oil will expand beyond current LCFS premiums with 45Z implementation in 2025** compared to competing vegetable oils

[1] Source: Jacobsen
[2] Source: California Air Resources Board and company analysis of CARB pathways

The Moonshot – A Sugar High – Upending the Traditional Ethanol Model

CST – the reason we bought FQT – has the ability to upend traditional ethanol economics and increase margins significantly

Opportunity Overview

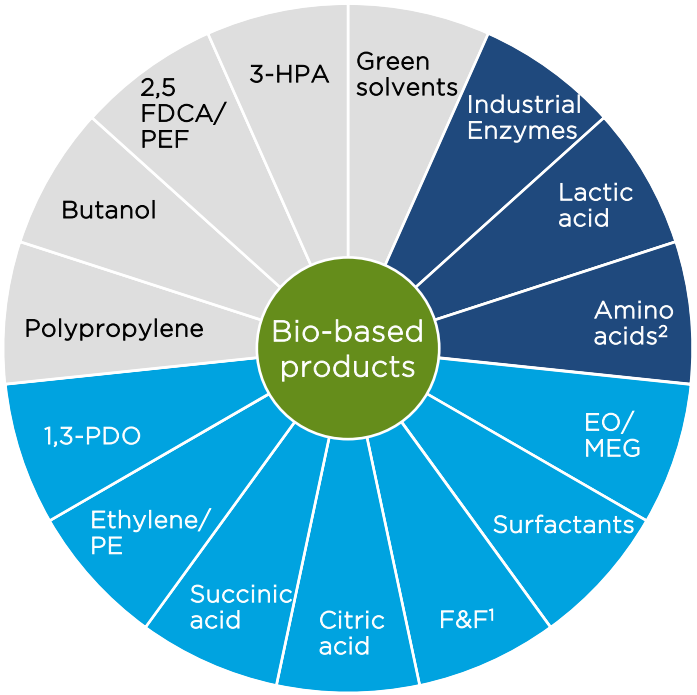
- Green Plains owns and controls Fluid Quip's Clean Sugar Technology (CST™), which is extremely disruptive to the traditional global dextrose and glucose players
- CST has the ability to convert grind (starch) at a traditional gen 1 production facility away from ethanol and into low-carbon intensity dextrose production at a significantly higher "sticky" margin than historic fuel margins
- Construction of 200 – 300 million pound CST system at Shenandoah, Iowa **on track for early 2024 start up**, expandable to up to 500 million pounds annually



CST Construction at Green Plains Shenandoah
November 2023

Clean Sugar Technology (CST) Opportunities

Disruptive Ag Technology Fueling the Growth of Bioproducts with Low Carbon Intensity Dextrose



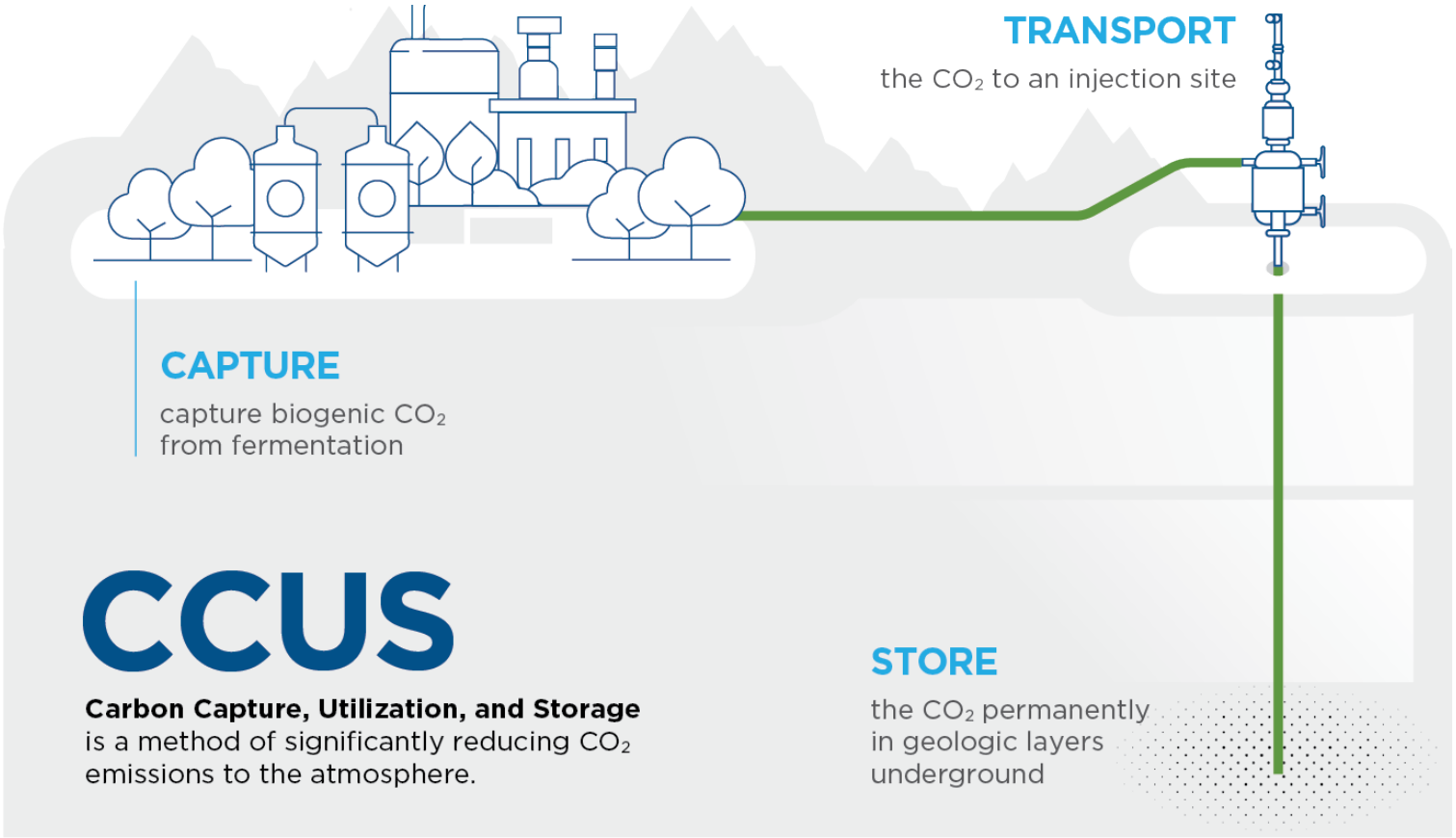
- Currently commercially produced in bio-based method – largest growth opportunity
- Existing commercial markets, but at small scale – emerging growth opportunity
- Not yet commercial – future growth opportunity

1 Flavors and fragrances - E.g., vanillin, nootkatone, patchoulol, valencene 2 E.g., glutamate and lysine
SOURCE: Expert interviews; press search, company websites, annual reports

- FQT's proven, commercialized technology transforms Green Plains from a Gen 1 ethanol producer to an integrated biorefinery with multiple sustainable technologies, including exclusive Clean Sugar Technology
- Fully scalable commercial CST production facility operating at the Innovation Center at York
- Produces an equivalent sugar quality to that of a wet corn mill process, with a production cost advantage and up to **~40% reduction in the carbon footprint**
- 'Bio-revolution' use of fermentation to produce a variety of products without petroleum additives requires dextrose/glucose, **driving potential growth of 7-14 billion pounds in demand**
- Strong commercial interest from biochemical, biomaterials, synthetic biology and food and beverage industries with multiple ongoing counterparty discussions for first year production capacity

Carbon Capture, Utilization and Storage (CCUS) is the single largest opportunity for CI reduction

- Our biorefineries **generate a pure stream of biogenic CO_2** emissions from fermentation that we plan to capture
- Carbon capture and storage **reduces the carbon footprint of our biorefinery by ~50%** or **~29 CI points**
- Green Plains is **utilizing a diversified strategy** of pipelines, CCUS and other initiatives to decarbonize our platform



We are pursuing a diverse set of opportunities to reduce CI and add value to each of our assets

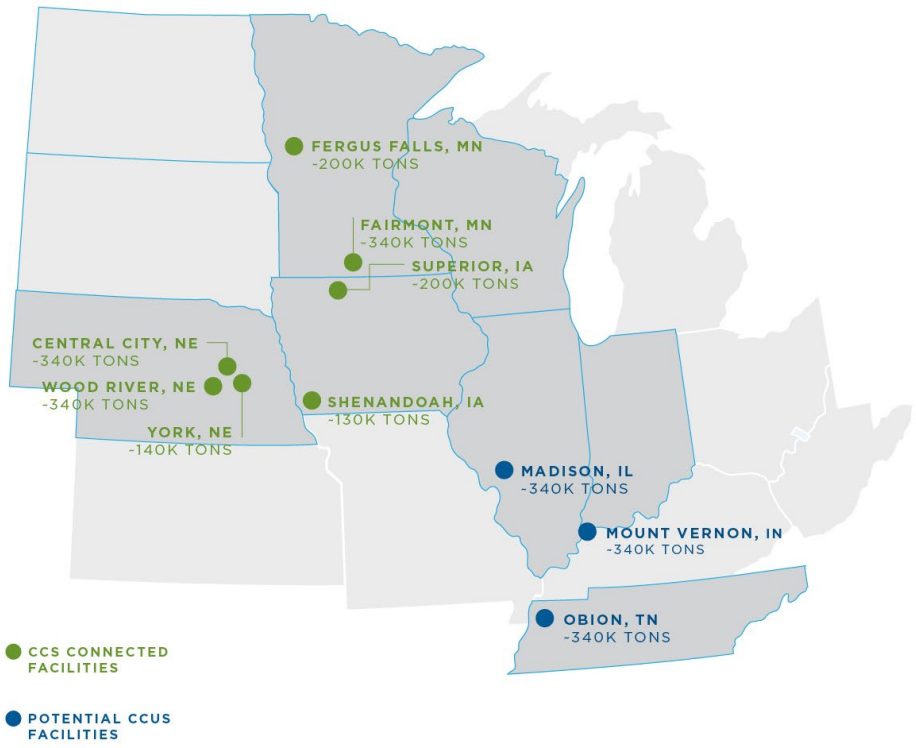
Our existing platform represents ~2.6 million tons of biogenic carbon capture opportunities between pipeline commitments and CCUS opportunities which is equivalent to:

~ 583 thousand
Cars Removed from the Road per Year

~ 330 thousand
Homes Powered per Year

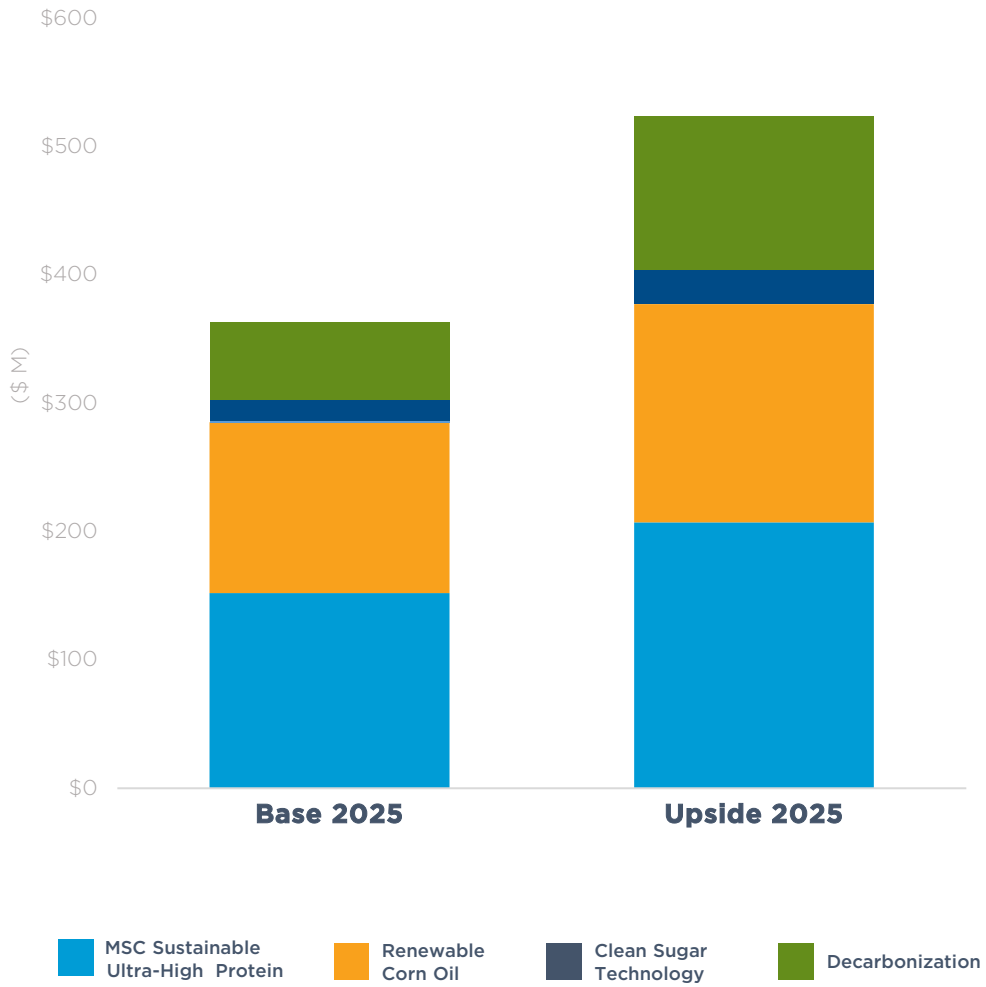
~ 6 million
Barrels of oil

~ 3 million
Acres of Forest per Year



 Greenhouse Gas Equivalencies Calculator | US EPA

Assumptions for 2025 Run-Rate EBITDA



Assumptions

- Assets operate at 95% of capacity
- Excludes gen 1 fuel ethanol, specialty alcohol, ancillary businesses and corporate overhead

MSC Sustainable Ultra-High Protein and Turnkey Initiatives

- Protein margin uplift across 7 Green Plains MSC™ facilities + Tharaldson JV
- Higher renewable corn oil yields are part of structural advantage of MSC technology and included in protein uplift

Renewable Corn Oil

- Assumes gross price of $0.70 to $0.80 per pound, ($0.55 to $0.65, net)
- Renewable corn oil capacity increased by 50% to ~375 million pounds

Clean Sugar Technology

- For 2025, Shenandoah at 300 to 500 million pounds or 25 MGY to 40 MGY converted to CST with $0.67 per gallon margin uplift
- Opportunity to expand to additional sites in future years

Decarbonization

- Carbon Capture & Storage pipelines assumed to begin in 2025 & 2026
- Base assumes 50% of annualized amounts in 2025
- Excludes potential opportunities at 3 Eastern plants and potential benefits from additional decarbonization initiatives

Assumes 45Z for decarbonization segment
Assumes $100 per ton carbon credit value for decarbonization

Opportunities For Green Plains Under Inflation Reduction Act

- **Biodiesel tax credit**
  ensures continued growth of biodiesel and renewable diesel industries
- **Advanced biofuels credit**
  benefits cellulosic ethanol
- **45Q**
  provides an $85 per-ton tax credit for carbon capture utilization and sequestration (CCUS)
- **Blending infrastructure**
  allocates $500 million to increase offerings to consumers at the pump
- **45Z — Clean fuel production credit**
  most promising development since the start of the renewable fuels sector — any fuel under a 50 CI threshold can qualify for $0.02/gal for each point of CI reduction from 2025 to 2027
- **Sustainable aviation fuel**
  new tax credits to reduce the carbon footprint of the aviation industry using alcohol-to-jet technologies
- **CI-reducing opportunities for farmers**
  Green Plains is working with farmer customers to help them determine requirements for measuring and reducing on-farm emissions



Sustainability Embedded in our DNA



- Medium-term target **validated by SBTi** to reduce Scopes 1 and 2 emissions 37.8% and Scope 3 emissions 22.5% by 2030 compared to a 2021 baseline
- Alignment with the **Task Force on Climate-related Financial Disclosures** (TCFD)
- Increased focus on **natural capital, biodiversity and land stewardship**
- **46% decrease** in OSHA Total Recordable Incident Rate from 2020
- **Sustainability-linked credit facility**, replacing other debt
- **Materiality assessment** completed to align ESG goals with stakeholders' priorities
- Completed **board refreshment initiative**

SCIENCE BASED TARGETS
DRIVING AMBITIOUS CORPORATE CLIMATE ACTION

SUSTAINABLE DEVELOPMENT GOALS

SASB

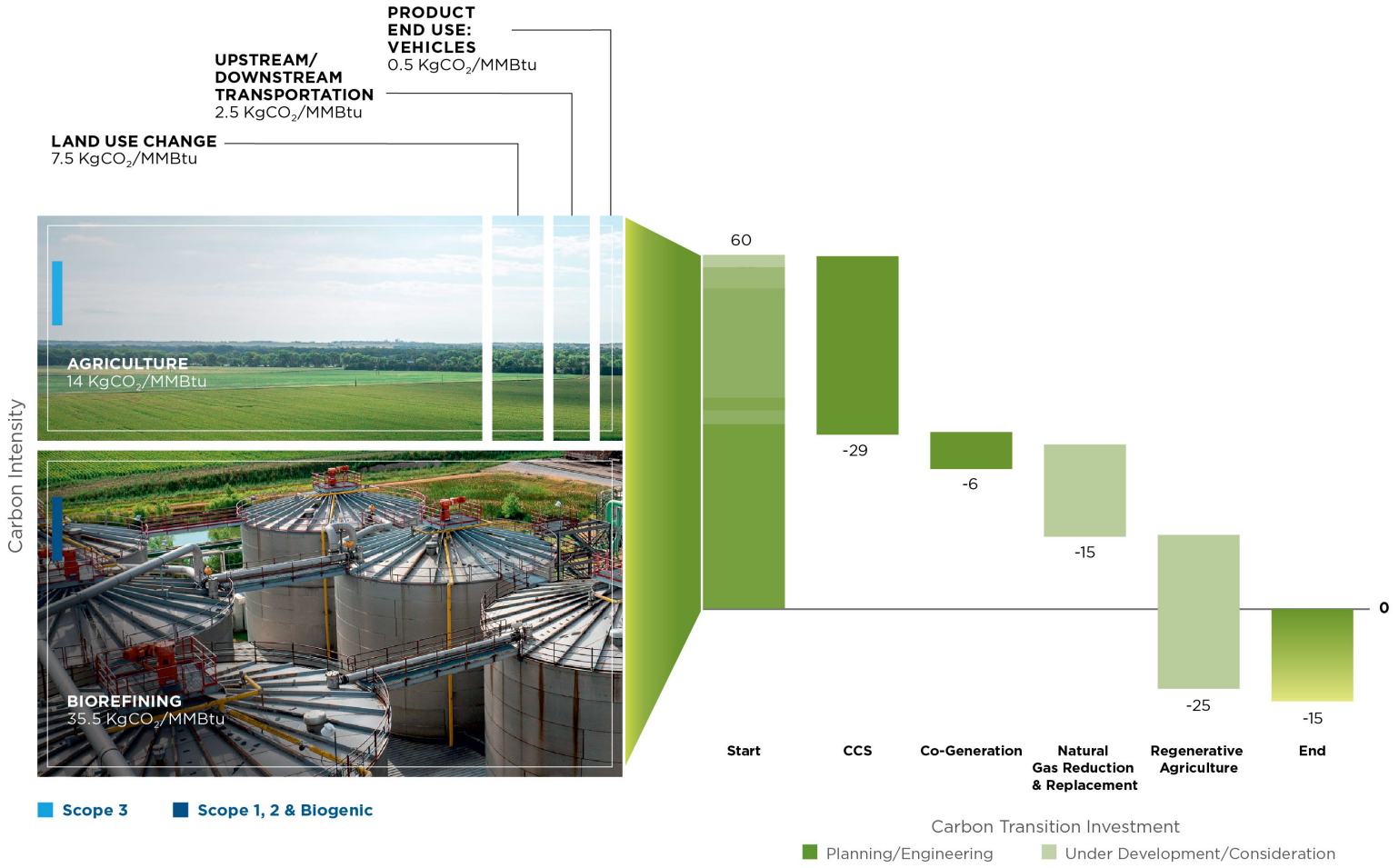
GRI



Our assets are able to achieve carbon neutrality and beyond…

Every point of Carbon Intensity (CI) reduction now has a definitive value

Breakdown of 60 CI Ethanol and Carbon Reduction Strategy



- Investing in the decarbonization of our platform is good for the planet and customers
- We are on track to have more than 70% lower carbon intensity compared to gasoline by 2030 utilizing technologies that already exist today

Carbon intensity (CI) scores are measured in kgCO2e/MMBtu and based on the most recent Argonne GREET model.

Developing SAF Technology Using Ethanol as Feedstock

Green Plains, Tallgrass, and United will invest up to a combined $50 million in the joint venture – Blue Blade Energy – to develop the technology

Joint Venture – Blue Blade Energy

Green Plains + TALLGRASS ENERGY + UNITED AIRLINES

Transformation

- Blue Blade Energy formed for the purpose of developing and then commercializing a novel SAF technology using ethanol as its feedstock
- If the technology is successful, Blue Blade is expected to proceed with the construction of a pilot facility in 2024, followed by a full-scale facility that could begin commercial operations by 2028
- The offtake agreement could provide for enough SAF to fly more than 50,000 flights annually between United's hub airports in Chicago and Denver

Game-changing Impact

- Transition to a decarbonized biorefinery model helps customers and partners reduce the carbon intensity of their products including decarbonized ethanol as a feedstock to produce SAF
- This partnership points to the untapped potential that lies in the Green Plains low-carbon platform
- The project is colossal for U.S. agriculture, centered on the alignment of a strong farm economy and a robust aviation transport industry

Unique Industry Expertise

- Green Plains will supply the low-carbon ethanol feedstock and use its ethanol industry expertise to manage operations at pilot and commercial facilities
- Tallgrass will manage research and development of the technology, including pilot plant development, and will manage the construction of the production facility
- United Airlines will assist with SAF development, fuel certification and into-wing logistics, and has also agreed to purchase up to 2.7 billion gallons of SAF produced from the joint venture

Why Green Plains?

Five locations with MSC™ technology producing high value animal nutrition driving higher margins with a flexible portfolio of ingredients

World's first Clean Sugar Technology™ facility commissioning in early 2024, providing a game changing opportunity to supply low CI dextrose feedstocks to diversified existing and growing end markets while increasing margins significantly

Executing a robust carbon capture utilization and storage strategy with first locations anticipated to begin CCS in 2025



Appendix

Reference Units - Operational Metrics

Products	Purchase / Sale Transaction Units	GP 1.0 (per bushel)	GP 2.0 (per bushel)	GP 2.0 (per gallon)	GPRE 2.0 Annual Production Capacity *
Corn	Bushels	56 pounds per bushel	56 pounds per bushel	19.3 pounds per gallon	**311 million bushels**
Ethanol	Gallons	2.9 gallons per bushel	2.9 gallons per bushel	-	**903 million gallons**
Clean Sugar – Glucose/Dextrose	Pounds	-	36 pounds per bushel	~12.4 pounds per equivalent gallon of capacity	**For every 10 million gallons of ethanol capacity converted to CST results in ~ 124 million pounds of dextrose capacity**
Dried distillers grains	Tons	15.2 pounds per bushel	11.3 pounds per bushel	3.9 pounds per gallon	**1.9 million tons**
Renewable Corn Oil	Pounds	0.8 pounds per bushel	1.2 pounds per bushel	0.414 pounds per gallon	**375 million pounds**
Ultra-High Protein	Tons	-	3.5 pounds per bushel	1.2 pounds per gallon	**480 thousand tons**

* Excludes Green Plains Atkinson's 55 MMGY. MSC™ Ultra-High Protein deployed at 7 Green Plains locations, but excludes MSC capacity at the Tharaldson JV



Thank you

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