

Green Plains

Ingredients that matter

Investor Presentation

May 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.

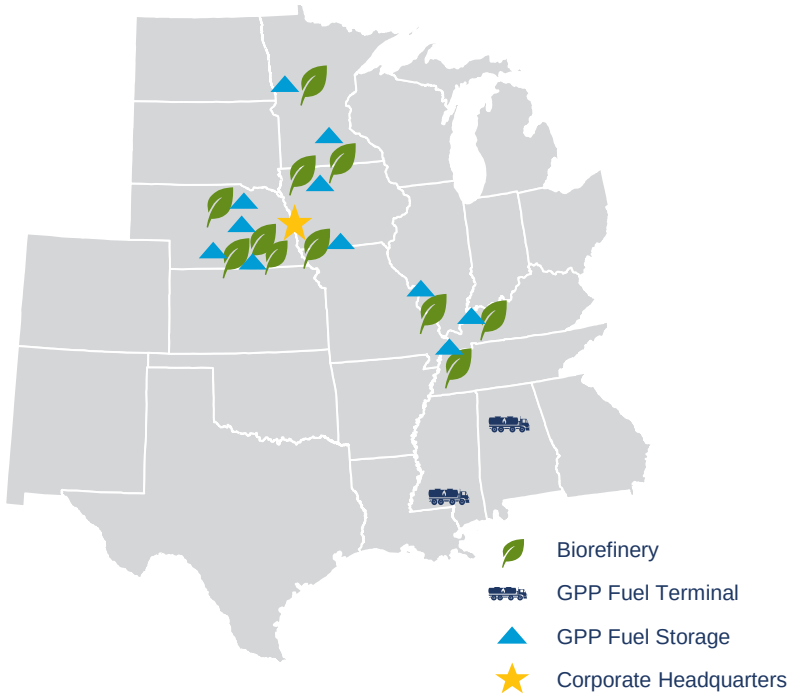
Neither the SEC nor any other regulatory body has passed upon the accuracy or adequacy of this presentation. Any representation to the contrary is a criminal offense. Except as otherwise indicated, this presentation speaks as of the date hereof. The delivery of this presentation shall not, under any 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 Has Multiple Pillars for Growth

Operational Areas

Ethanol Production	Produces **~1Bn gallons** of ethanol annually across **11** biorefineries Produces more than **2MM** of equivalent dried tons in distillers grain annually Processes more than **10MM tons** of corn, originating more than **300MM bushels** of corn annually through more than **5,000** farmer customers
Fluid Quip Technologies(1)	Owns intellectual property driving the growth of MSC™ Ultra-High Protein, DCO Tech™ and CST™; over 40 patents with more pending
Renewable Corn Oil	DCO capacity of **~300MMlbs** today and approaching **~400MMlbs / y** after MSC™ completed at Fairmont and Madison
Ultra-High Protein	Ultra-High Protein capacity of **~330K tons** today, increasing to **~480K tons / y** upon completion of MSC™ at Madison and Fairmont – with upside from higher yields
Clean Sugar Technology	**~200-300 MMlbs / y CST™ capacity under construction**, expandable to **~500MMlbs / y**
Carbon Reduction	Opportunity to remove more than **~2MM metric tons** of CO_2 from the atmosphere through planned carbon pipeline initiatives and potential upside direct inject initiatives with attractive economics
Logistics	Industry leading logistics and storage for ethanol throughput through Green Plains Partners, including a strategic asset in Birmingham, Alabama



Green Plains Today

$2.3Bn Enterprise Value (1)

$301MM Net Debt (1)

$1.9Bn Equity Value (1)

$297MM GPP Equity Value (1)

Green Plains

Biorefineries

FLUID QUIP TECHNOLOGIES

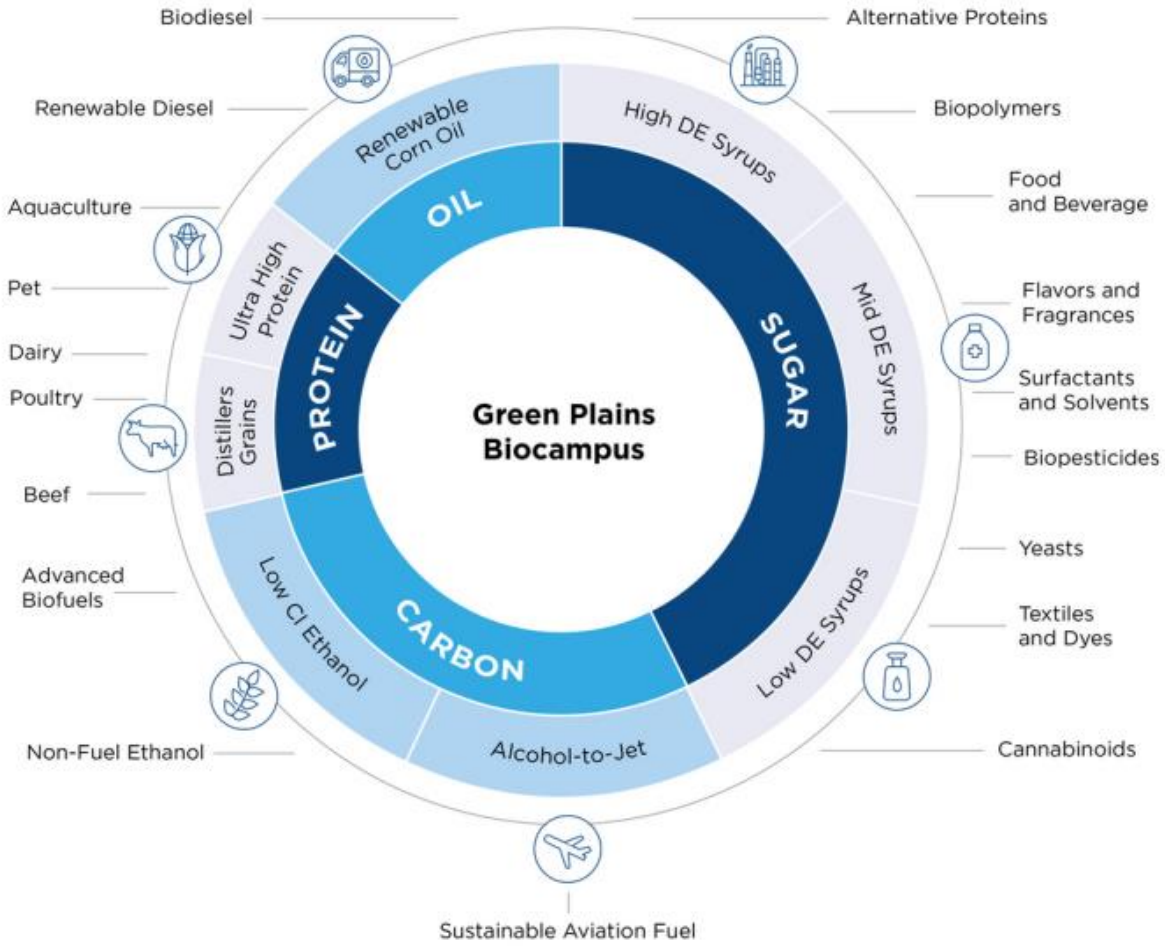
Green Plains PARTNERS LP

[1] Equity values as of May 12, 2023, Balance Sheet values as of March 31, 2023

Transforming Our Business in Four Strategic Areas

Positioned to capitalize on rapidly growing demand

- **Sustainable Ultra-High Protein** – sustainable ingredients for high-value global markets in pet, aquaculture, dairy, swine and poultry industries
- **Renewable Corn Oil** – responsible low carbon feedstock for the high-growth renewable diesel industry
- **Clean Sugar Technology** – low carbon dextrose for a variety of biochem, bioplastics, synthetic biology, and food industries – with 'bio-revolution' driving growth
- **Carbon Capture & Sequestration** – participating in one of the largest carbon capture and storage (CCS) platforms in the world with Summit Carbon Solutions (SCS) – potential for direct injection systems at Obion, Mount Vernon and Madison locations



Green Plains is Harnessing the Power of a Leading Agricultural Technology IP Portfolio That Drives Conversion to the Biorefinery Model

Legacy Businesses

Segments and Existing Capacities

Fuel Ethanol

~958MMgy

(Corn Grind of ~10 MM Tons)

DDG

~2,500K tons / y

Renewable Corn Oil

~300MMlbs / y

transformed through our owned ag technology portfolio…

1

FLUID QUIP TECHNOLOGIES

Proven operational track record and over 40 patents (with more pending)

DCO Tech™ MSC™ CST™

SGT™ Low Carbon / CI Ethanol BOS™

2

Carbon

- Carbon Pipeline
- Direct Inject
- Carbon Offtake

Industry Leading Advanced Biorefinery Platform

Segments and Potential Capacities

Fuel Ethanol

~1,020MMgy (1)

DDG

~2,000K tons / y

Ultra-High Protein

~480K tons / y

Renewable Corn Oil

~400MMlbs / y

Clean Sugar Technology

~500MMlbs / y(2)

Carbon Capture

~2,000K tons / y

[1]with Madison and Mount Vernon operating as 120 mmgy plants
[2]Shenandoah completing CST™ expansion

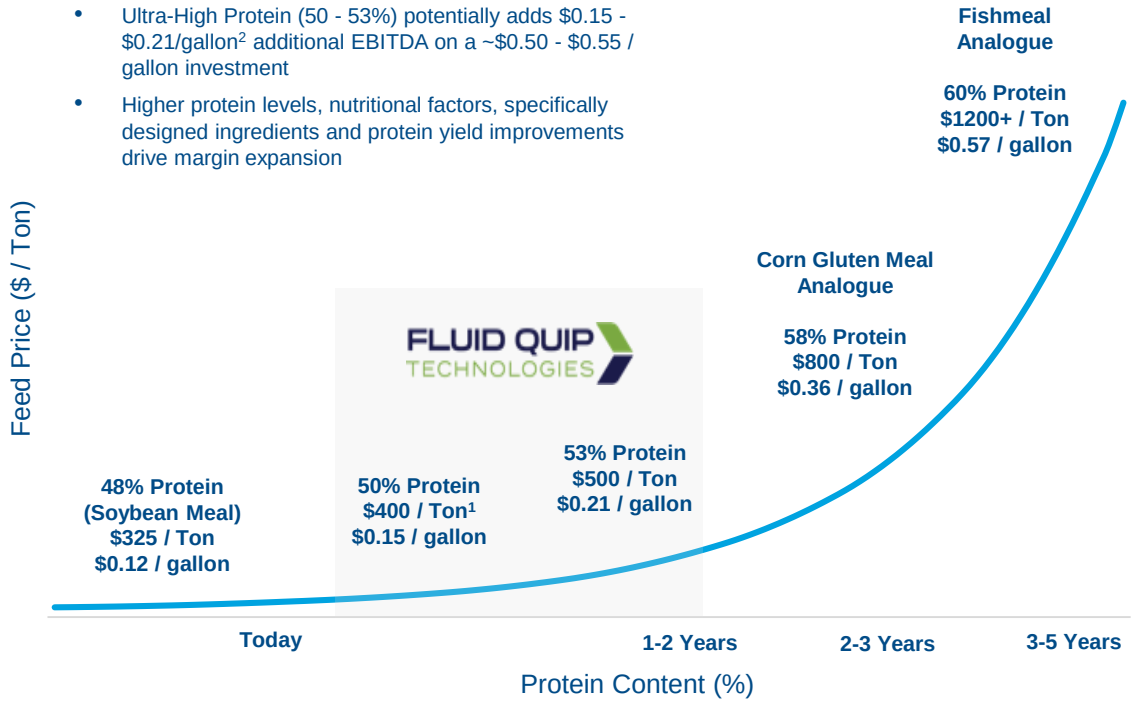
MSC™ Technology Can Significantly Reduce Volatility While Increasing Margins

Biorefinery economics see significant improvement through deployment of MSC™ technology

- **50% uplift in renewable corn oil yields** – the most valuable component of corn today
- **~20% of DDGS mechanically separated into high-value Ultra-High Protein**
- Over 50% of our platform is operational in early 2023, with additional locations planned for 2024 startup
- At capacity, Ultra-High Protein technology **could add over $150 million of additional earnings power by the end of 2024 – or higher as we move up the J-curve**
- Offers an 11 million ton market at conservative inclusion rates with multiple sub-vertical pet and aqua segments to diversify sales domestically and internationally

Increased Protein Upside

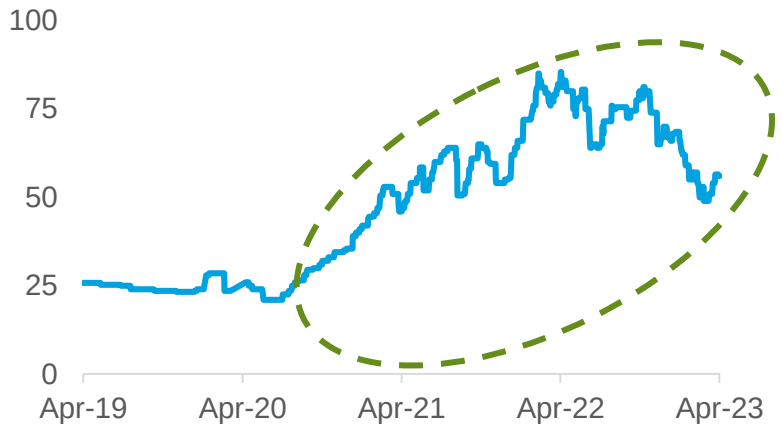
- Ultra-High Protein (50 - 53%) potentially adds $0.15 - $0.21/gallon[2] additional EBITDA on a ~$0.50 - $0.55 / gallon investment
- Higher protein levels, nutritional factors, specifically designed ingredients and protein yield improvements drive margin expansion



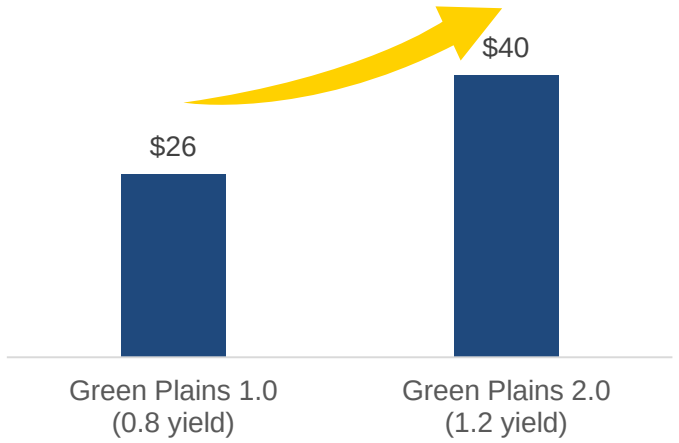
[1]Value per ton of protein is based on underlying Dried Distiller's Grain (DDG) of $150 per ton and should be adjusted based on current DDG values.
[2]Upon reaching redundant scale and moving through commercial contracting year and inclusive of 50% improvement in corn oil yields.

Taking Advantage of the Unique Drivers in Renewable Corn Oil

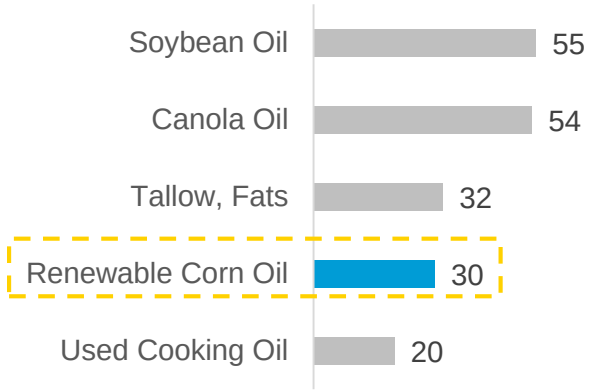
Renewable Corn Oil Price [1]
(Cents per Pound)



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 corn oil yields over Green Plains 1.0 by increasing renewable corn oil yields from 0.8 to 1.2 lbs per bushel
- Renewable corn oil production capacity increases to **~ 400 million lbs** upon completion of MSC™ installations
- Assuming renewable diesel continues to expand in LCFS markets, we believe the low CI value of corn oil will translate into a premium 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

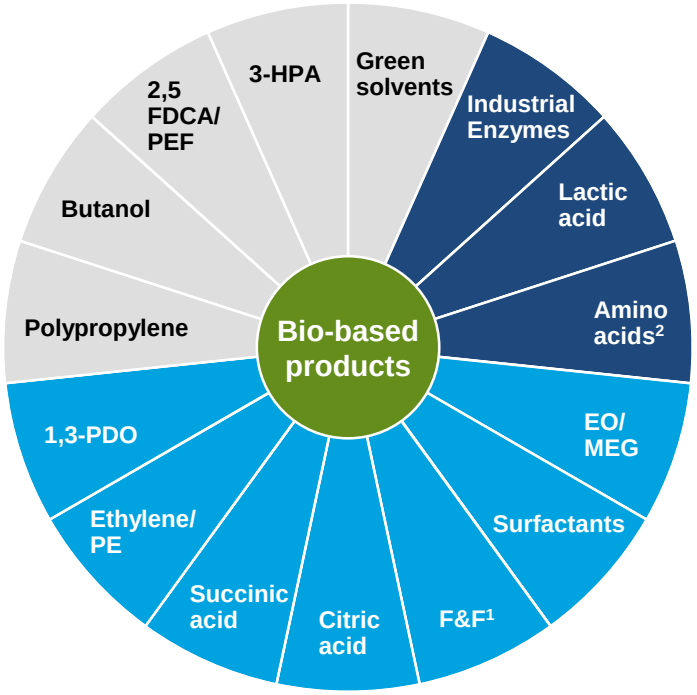
- Green Plains owns and controls Fluid Quip's Clean Sugar Technology (CST™), which is extremely disruptive to the traditional global dextrose and glucose players
- CST has the ability to convert grind (starch) at a traditional gen 1 production facility away from ethanol and into low-carbon dextrose production at a significantly higher "sticky" margin than historic fuel margins
- A CST conversion at our Shenandoah facility is underway, with opportunities to complete additional conversions at other plants



Green Plains York

A semi-works facility in York, NE has been operating since 2021, producing an identical product to what has traditionally only been available through wet milling facilities.

Clean Sugar Technology (CST) Opportunities



- 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

Technology Acquired with Fluid Quip

- Fully scalable commercial CST production facility operating at the Innovation Center at York
- CST produces an equivalent sugar quality to that of a wet corn mill process, with a production cost advantage and up to ~50% reduction in the carbon footprint

Opportunity Update

- ‘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
- Entering commercial discussions for potential co-location opportunities with high growth, commercially viable segments of the synthetic biology, bio-materials and biochemicals markets
- Focused on enhancing full and continuous operation of the Innovation Center at York pilot facility
- **Construction underway for 30,000 bushel per day capacity CST system at Shenandoah, Iowa – on track for early 2024 start up**

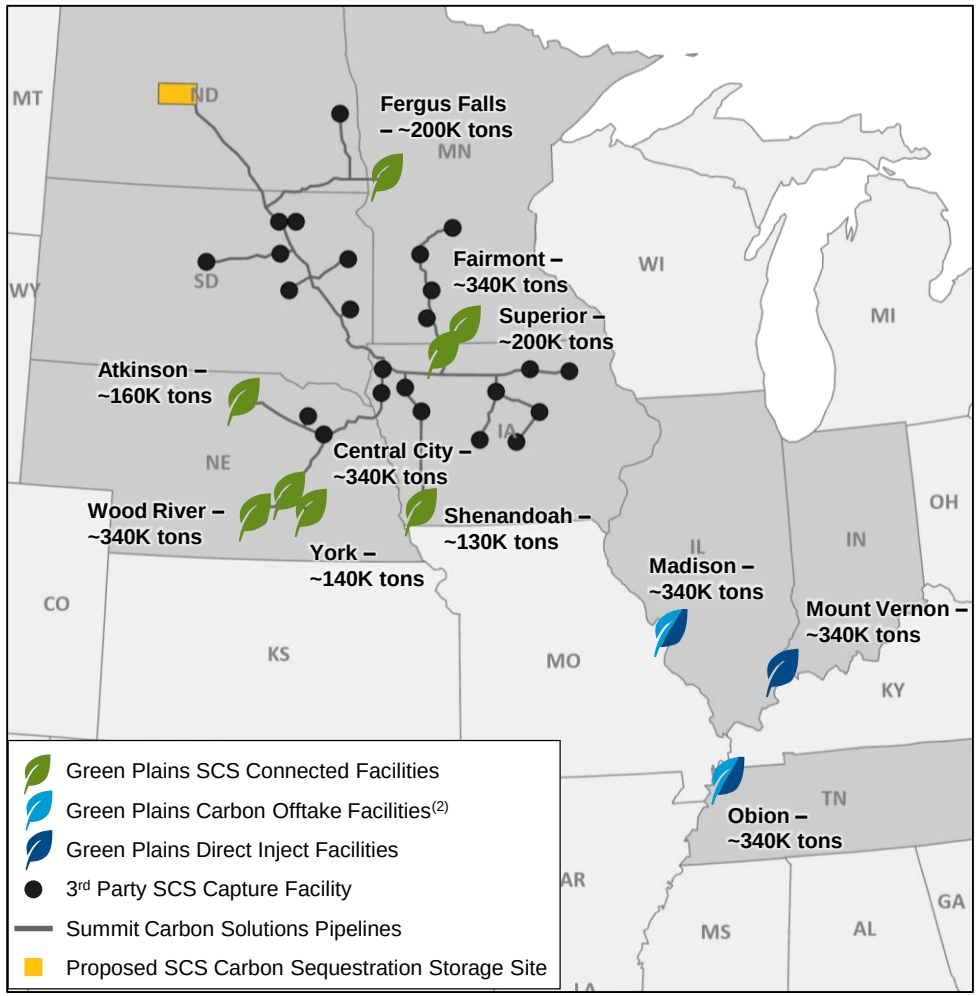
A Substantial Strategic Decarbonization Play

The strategic location of our plants presents a menu of opportunities for carbon reduction operations

Carbon Pipeline

- Green Plains and Summit Carbon Solutions (SCS) entered into long-term carbon offtakes, with ongoing additional opportunities being evaluated, as a part of the carbon capture and sequestration system for deposit into geologic storage
- Atkinson, Central City, Fairmont, Fergus Falls, Shenandoah, Superior, Wood River and York are committed to the SCS system
- Represents **~2.0MM tons of CO2** committed to the SCS system
- SCS is responsible for pipeline construction and operations and has secured easements for more than 60% of the proposed route
- Within the Summit opportunity, we are exploring additional routes to expand our carbon operations

Operational Map(1)



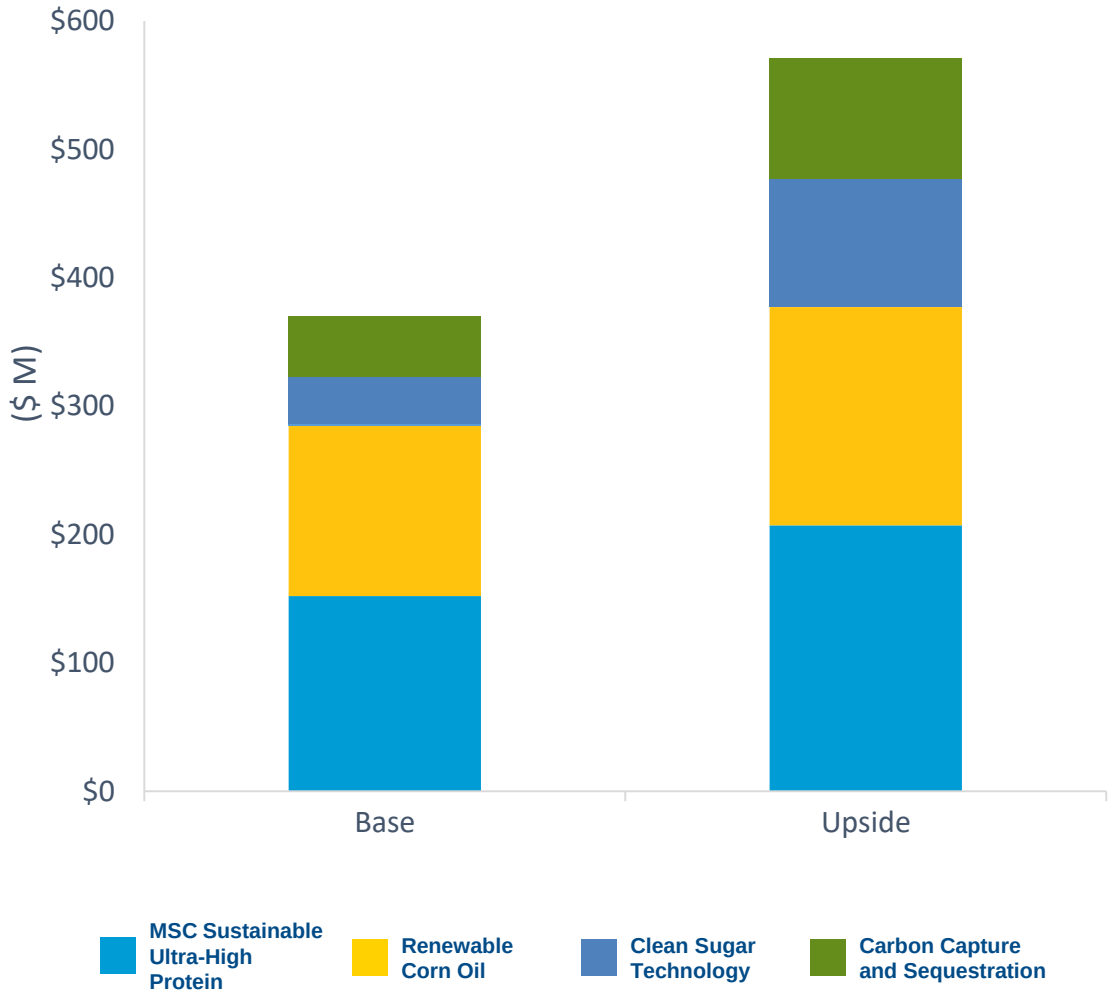
Direct Injection

- Pursuing a standalone direct injection project at Mount Vernon via an experienced CCS developer
- Represents an additional **~340K tons of CO2 capacity**

Carbon Offtake

- Exploring opportunity to sell CO2 from Madison and Obion facilities under a long term offtake
- CO2 would be combined with H2 to create Synthetic Natural Gas (SNG) and ultimately sold to Osaka Gas for use in Japan
- Represents additional **~680K tons of CO2 capacity**
- Madison and Obion have additional opportunities for direct injection as well

Assumptions for 2025 Run-Rate EBITDA



Assumptions

- Assets operate at 95% of capacity
- Excludes 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 ~400 million pounds

Clean Sugar Technology

- Capital investment of ~ $1.00 per gallon of capacity converted
- 55 MGY to 150 MGY converted to CST with $0.67 per gallon margin uplift

Carbon Capture and Sequestration

- **Assumed to begin in 2025**, CO_2 offtake of 658 MGY of capacity with SCS lowering carbon footprint of facilities; potential margin of $0.15 per gallon, net, due to lower CI
- Base assumes 50% online in 2025
- Excludes potential opportunities at 3 Eastern plants and potential upsides from IRA bill

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

Opportunities 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 and storage
- **Blending infrastructure** – allocates $500 million over 10 years to increase offerings to consumers at the pump
- **Sustainable aviation fuel** – helps 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
- **45Z - Clean fuel production credit** – most promising development since the start of the renewable fuels sector – any renewable fuel under the 50 CI threshold can qualify for $0.02/gal for each point of CI reduction from 2025 to 2027



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

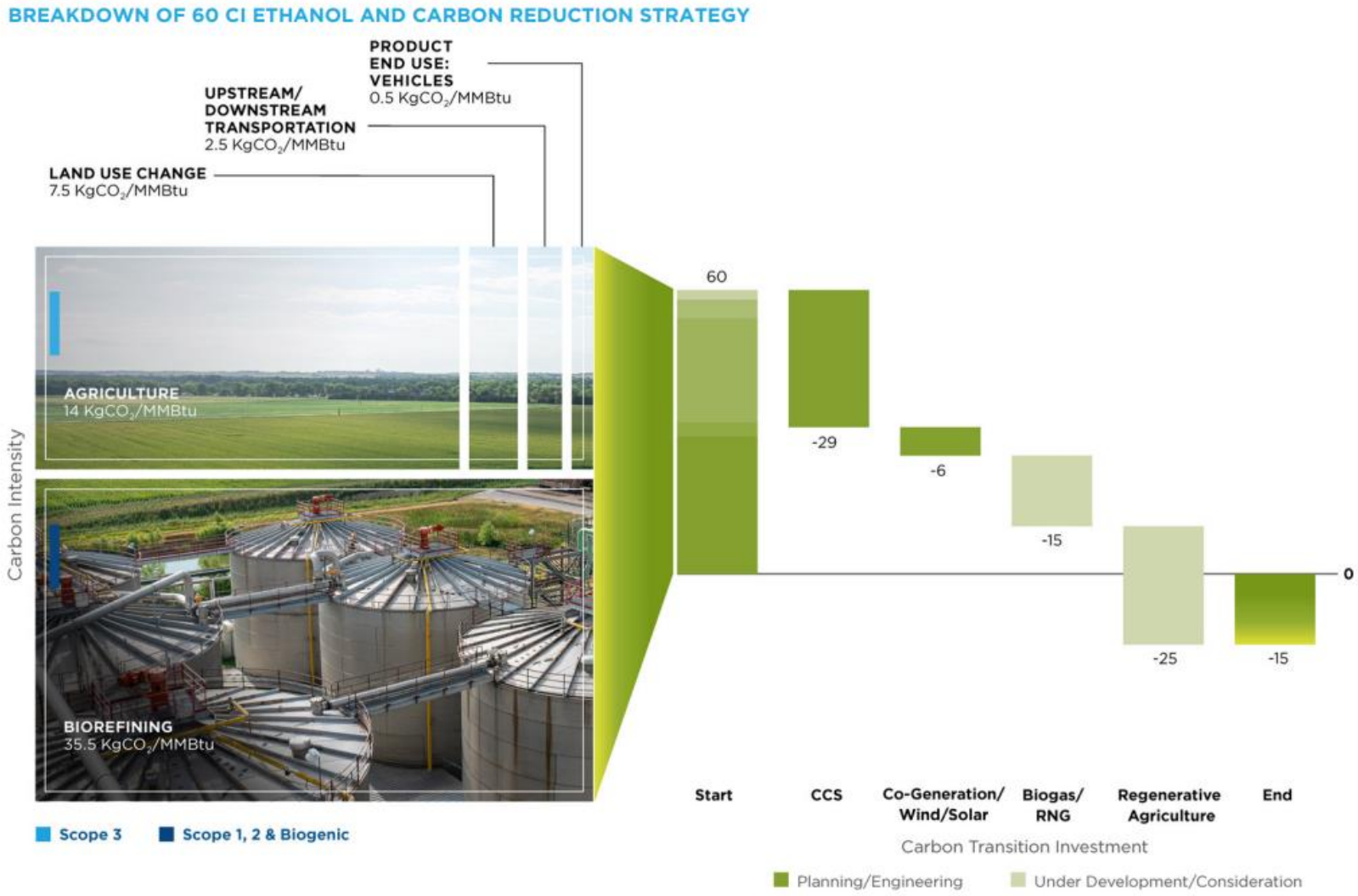
SASB

GRI



Our Path to a Low-Carbon Future

- Targeting 50% reduction in operational GHG emissions from 2018 baseline by 2030 and 100% reduction by 2050
- CCS is the single largest opportunity to reduce ~ 30 CI points
- Renewable energy, biogas, co-generation, etc… ~ 20 CI points
- Evaluating initiatives to reduce our Scope 3 emissions
- Reducing energy use and increasing efficiency across our platform
- MSC™ increases our low-carbon renewable corn oil capacity by ~50%
- Our biofuel has a 46% lower GHG profile on average than petroleum-based gasoline
- Biofuel produced from locally sourced, renewable feedstock



Source: Green Plains 2022 Sustainability Report

Why Green Plains?

Game-changing ag-technology, diversifying product offering of higher-margin ingredients into high-growth markets

- Implementing MSC™ protein technology and DCO Technology™ to create diverse, non-cyclical, high margin products
- 50% uplift in corn oil yields, a low-CI feedstock for the growing renewable diesel industry
- Clean Sugar Technology™ provides competitive advantage in $450 billion specialty chemical and material markets requiring glucose / dextrose

Commercialization well underway

- 25% increase in the pet food vertical for sales of Ultra-High Protein in 2023
- Achieved contracted and anticipated recurring customer sales of ~ 75% of platform capacity for 2023 across numerous species and high-value markets
- Negotiating and executing commercial agreements in aquaculture, swine and poultry; growing interest across species

Focused on sustainability with ESG embedded in our DNA

- Transition into highly specialized production aims to meet the world's demand for sustainably sourced products, low carbon ingredients and cleaner technologies
- CCS project supports lower carbon intensity for biorefinery platform; IRA bill provides additional upside
- Investing in efficiency of our plants to lower the consumption of natural resources and our carbon footprint

Strong balance sheet and ample liquidity to drive growth

- MSC commercialization fully funded, with over 50% of our platform completed in early 2023

Strategic partnerships and innovation to drive value-creation across our platform

- Ultra-High Protein with a "J-curve" opportunity for higher margins
- Turnkey initiative to expand access to protein capacity without adding ethanol
- Long term SAF opportunity supported by joint venture with United Airlines and Tallgrass to develop and commercialize a novel SAF technology using low-carbon ethanol as a feedstock

Appendix



Reference Units - Operational Metrics

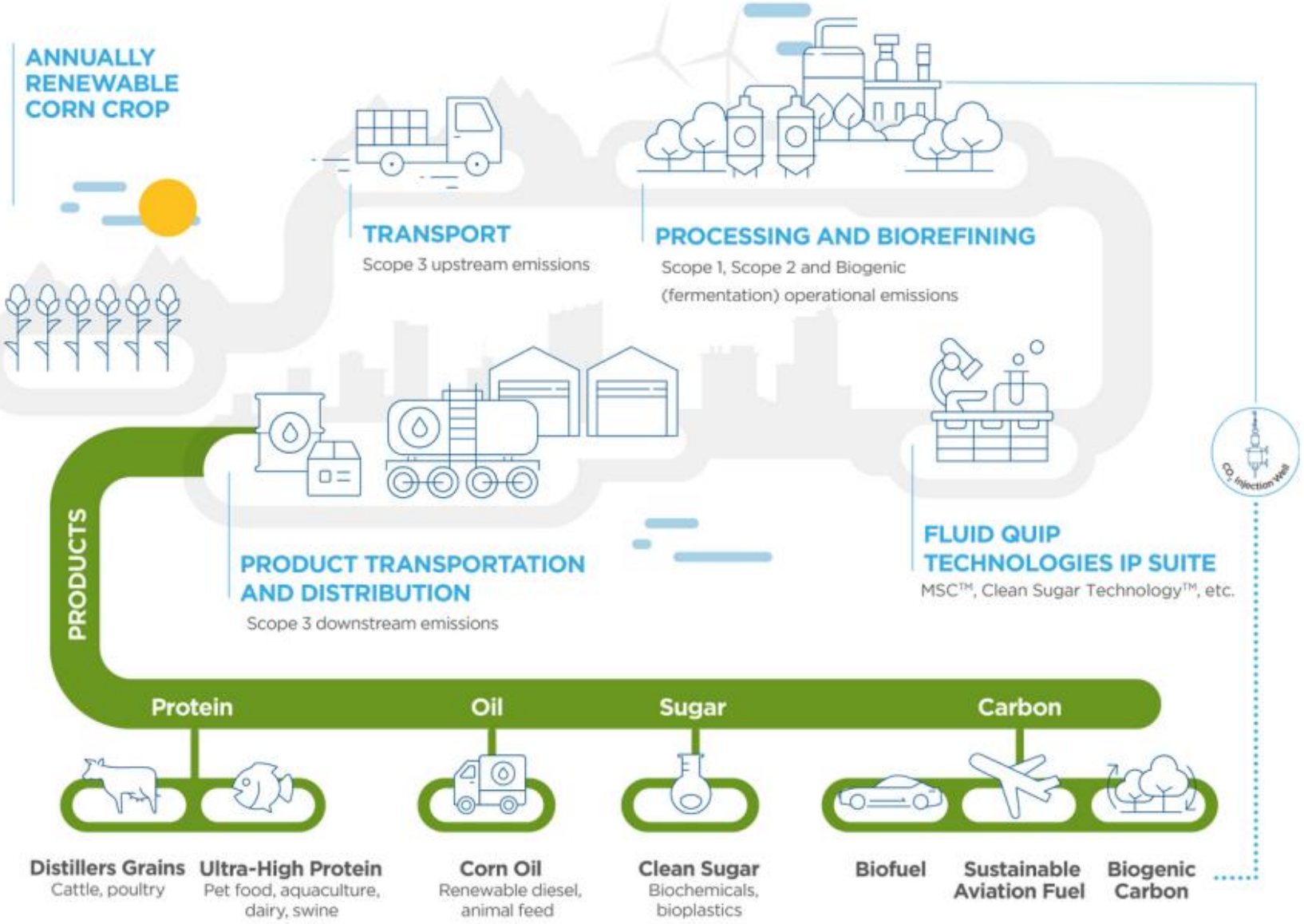
Products	Purchase / Sale Transaction Units	GP 1.0 (per bushel)	GP 2.0 (per bushel)	GP 2.0 (per gallon)	GPRE 2.0 Annual Production Capacity *
Corn	Bushels	56 pounds per bushel	56 pounds per bushel	19.3 pounds per gallon	**330 million bushels**
Ethanol	Gallons	2.9 gallons per bushel	2.9 gallons per bushel	-	**958 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	**396 thousand pounds**
Ultra-High Protein	Tons	-	3.5 pounds per bushel	1.2 pounds per gallon	**578 thousand tons**

* Indicative annual capacity assuming every location deploys MSC and, excludes Thararldson JV

Value Chain Transformation

UNDER OUR GREEN PLAINS 2.0 TRANSFORMATION, WE ARE:

Executing across four strategic areas of growth — value-added protein ingredients, renewable corn oil, clean sugar and carbon capture — to achieve our long-term goals and lead the way to a low-carbon future.



Green Plains

Thank you

gpreinc.com

