
Green Plains
Ingredients that matter
ROTH Conference
Investor Presentation
March 2021

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.

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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.

Biorefinery of the Future

- Green Plains (Company) continues to transform its business from traditional ethanol into a sustainable biorefinery platform focused on leveraging technologies to produce more sustainable products with higher and more stable cash flows
- Extensive current asset base of biorefineries provides a competitive moat and foundation to upgrade production into high value, high growth, next generation products quickly and cost efficiently
- Transformation into the **Biorefinery of the Future** is well underway with investments in critical technology, infrastructure, and strategic partnerships – further accelerated by existing and newly acquired IP ownership
- **The shifts into highly specialized production aims to meet the world's demand for more sustainably sourced products, low carbon ingredients and cleaner technologies**
- Our recent capital raise supports the following initiatives:

1



Investment in technology to reduce operating expenses and lower the carbon footprint

2



Strategic near-term initiatives to upgrade to sustainable ultra-high protein technology across the current platform

3



Leveraging "clean sugar", to provide industrial sugars for use in agri-tech, bio-tech and synthetic biology markets

4

BLACKROCK

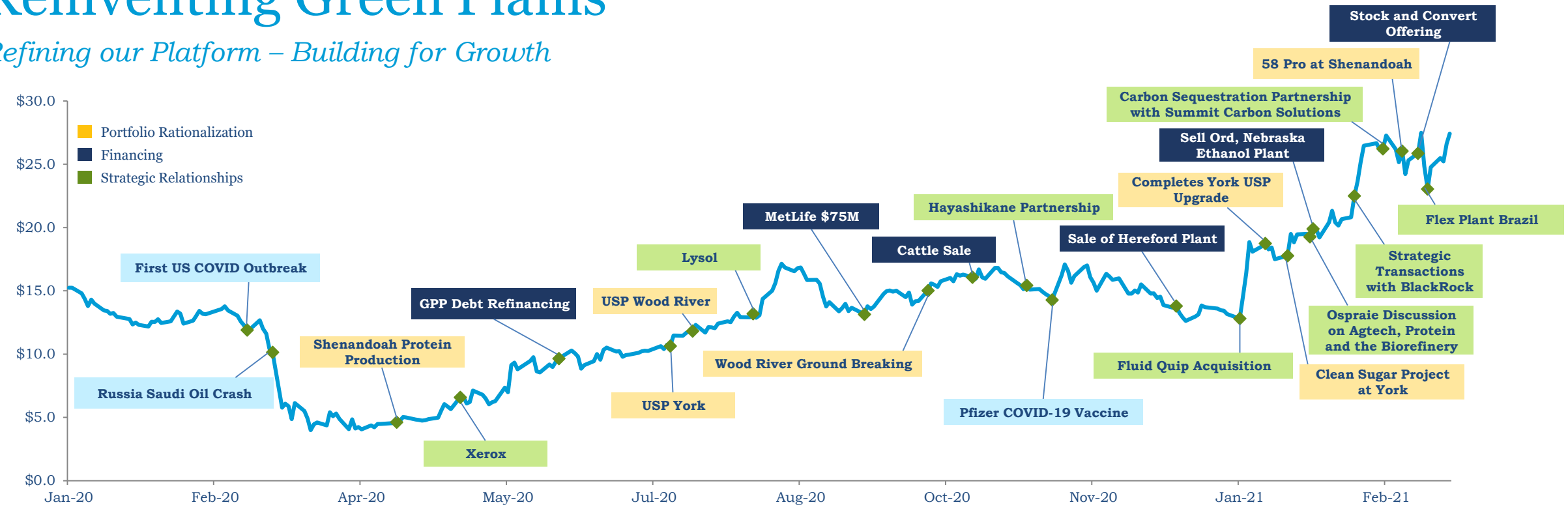
Ospraie MANAGEMENT, LLC

FLUID QUIP TECHNOLOGIES

Exclusive partnerships with Ospraie and BlackRock, along with the acquisition of Fluid Quip Technologies, creates a powerful ag-tech opportunity

Reinventing Green Plains

Refining our Platform – Building for Growth



Portfolio Rationalization: Deleveraging the balance sheet through portfolio optimization including recent sales of the remaining portion of our Cattle JV and the Hereford, Texas facility and the announced sale of our Ord, Nebraska Facility

Financing: Recent project financing with MetLife, BlackRock and stock and convert offering to accelerate our transformation

Strategic Relationships: Assembled an ag-tech powerhouse team with BlackRock and Ospraie to acquire Fluid Quip Technologies. Developed exclusive relationships with Novozymes and Hayashikane to work toward innovations in sustainable Ultra-High Protein and aquaculture

Acceleration of Company Transformation: Utilizing the scope and scale of our existing assets to deploy technology and transform our platform to produce higher value ingredients – sustainable ultra-high protein, renewable corn oil, specialty alcohol and clean sugars while focusing on lowering our carbon footprint through improved operations and carbon sequestration initiatives

Reinventing Green Plains

Refining our Platform – Building for Growth

Our biorefineries' role in transforming the corn kernel

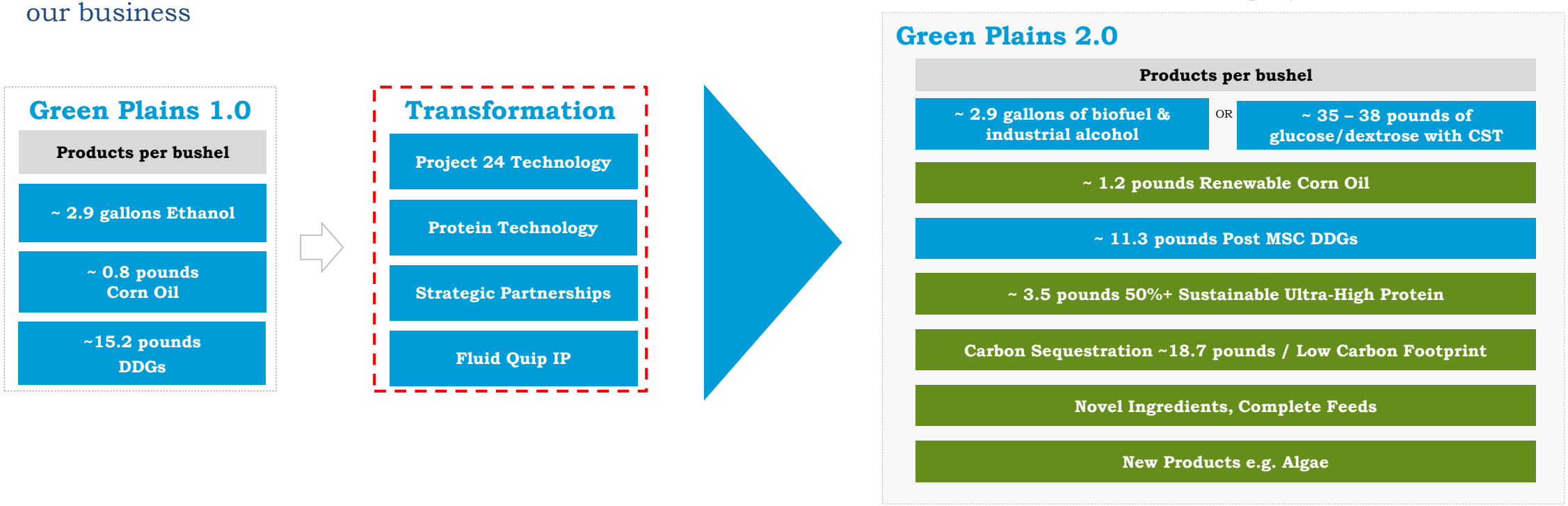
- We use mechanical and enzymatic processes to "crack" a commodity into its most valuable components
- Aligned with key technology players through exclusive partnerships to drive a collaborative transformation of our business

Extracting more value every day

- Lower operating costs
- Reduced carbon footprint
- Production of higher protein
- Better corn oil yields
- Improved distiller's grains
- Optimizing valued components

Carbon Sequestration

- Reduces Carbon Intensity score of biofuel and ingredients
- Provides expanded margin opportunity through LCFS markets
- Option to invest in the carbon pipeline, further benefiting from the project's economics



Strategic Opportunities Across Multiple Products

- **Sustainable Ultra-High Protein** - sustainable ingredients for high-value global markets in pet, aquaculture, dairy and poultry industries
- **Renewable Corn Oil** - low carbon feedstock for high-growth renewable diesel industry
- **Specialty Alcohol** – high purity alcohol for use in cleaners, sanitizers, disinfectants and beverage industries
- **Clean Sugar Technology** – clean glucose and dextrose for a variety of biochem, synthetic biology, and food industries
- **Carbon Capture & Sequestration** – building one of the largest carbon capture and storage (CCS) platforms in the world through the recently announced relationship with Summit Carbon Solutions (SCS)

SUSTAINABLE ULTRA-HIGH PROTEIN



RENEWABLE CORN OIL



SPECIALTY ALCOHOL



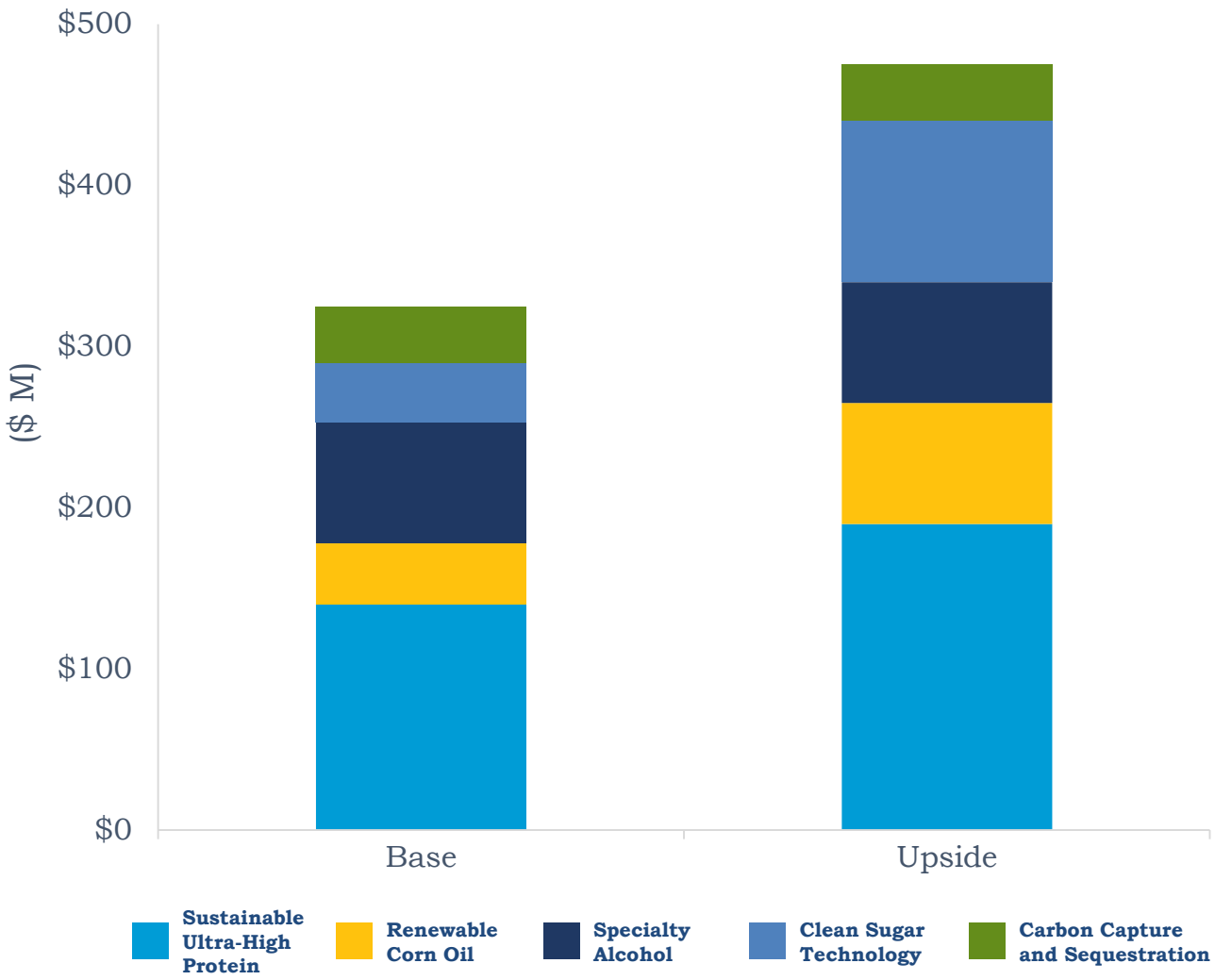
CLEAN SUGAR



CARBON CAPTURE & SEQUESTRATION



2024E Run-Rate EBITDA



Assumptions

- Assets produce at 95% of capacity on 958 MGY of capacity[(1)]
- Potential contributions from fuel ethanol business excluded

Sustainable Ultra-High Protein

- Protein capital investment of ~$400M based on 11 ethanol plants, with ~$345M remaining to be spent
- Protein crush margin uplift for base of $0.15 per gallon for 50% pro and upside of $0.21 per gallon for 53% pro, with potential to go higher

Renewable Corn Oil

- Pricing increase for base of $0.10 per pound and upside of $0.20 per pound, with potential to go higher
- Renewable Corn oil capacity increased by 50% to ~396 million pounds through deployment of sustainable ultra-high protein technology

Specialty Alcohol

- Premiums to fuel ethanol of ~ $1.00 per gallon for base and upside with potential to be higher on 75 MGY of combined USP and GNS

Clean Sugar Technology

- Clean Sugar Technology capital investment of ~ $1.00 per gallon of capacity converted
- Base assumes 55 MGY of capacity converted to CST with $0.67 per gallon uplift
- Upside assumes 150 MGY converted to CST with $0.67 per gallon uplift

Carbon Capture and Sequestration

- Beginning in 2025, CO_2 offtake of 234 MGY of capacity with Summit Carbon Solutions pipeline at $0.15 per gallon before carbon credits
- Opportunity to increase participation in carbon sequestration through the addition of other Green Plains' facilities, with the right to invest directly in the development company, resulting in potential additional upside

(1) Pro forma for our anticipated closing of the announced sale of Ord

An Ag-tech Powerhouse – Fluid Quip Technologies (FQT)

Partnership and acquisition accelerate technology deployment

Green Plains

BlackRock / Ospraie MANAGEMENT, LLC

- The partnership forms a powerful ag tech alliance between BlackRock, Ospraie, Fluid Quip and Green Plains that has the ability to focus on innovation, value-added opportunities and sustainability
- Drives acceleration of transformation through access to new strategic partnerships and customers on a global scale
- Leverages Green Plains' scope and scale to create value-added opportunities in key ingredients, redefining investment in biorefining industry world-wide
- Provides further validation of Green Plains' strategy and helps to accelerate sustainable ultra-high protein and clean sugar technology deployment

FLUID QUIP TECHNOLOGIES

- The company owns significant intellectual property and is one of the only commercially proven sustainable ultra-high protein technologies for dry mill production facilities
- Successful operational track record: proven deployment of technologies with notable existing engagements has led to consistent growth
- Enables Green Plains to accelerate their transformation and allows the Company to focus on higher value proteins and clean sugars
- Supported by a wide patent portfolio with 40 patents, with more pending

MSC™	CST™	Flex Plant™	BOS™
			
Maximized Stillage Co-Products™	Clean Sugar Technology™	Flex Plant Technology™	Brix Oil Separation System™

Introduction to Protein Initiative

Sustainable
Ultra-High Protein

Product Advantages

- Flexible protein concentration starting at 50%
- Animal free source: vegetable (75%) and fungal (25%)
- Cornerstone ingredient for developing new feed rations, freedom of formulation
- High digestibility and additional species-specific benefits improving animal health and performance



Continuous Product Development and Partnership Advantages

- Improved product characteristics through yeast enhancement
- Ongoing targeted removal of anti-nutritional factors
- Direct application into specialty feeds and premixes through innovative aquafeed solutions
- Value multiplier through combinations with other proprietary technologies developed through Optimal Aquafeed and strategic partnerships like Hayashikane

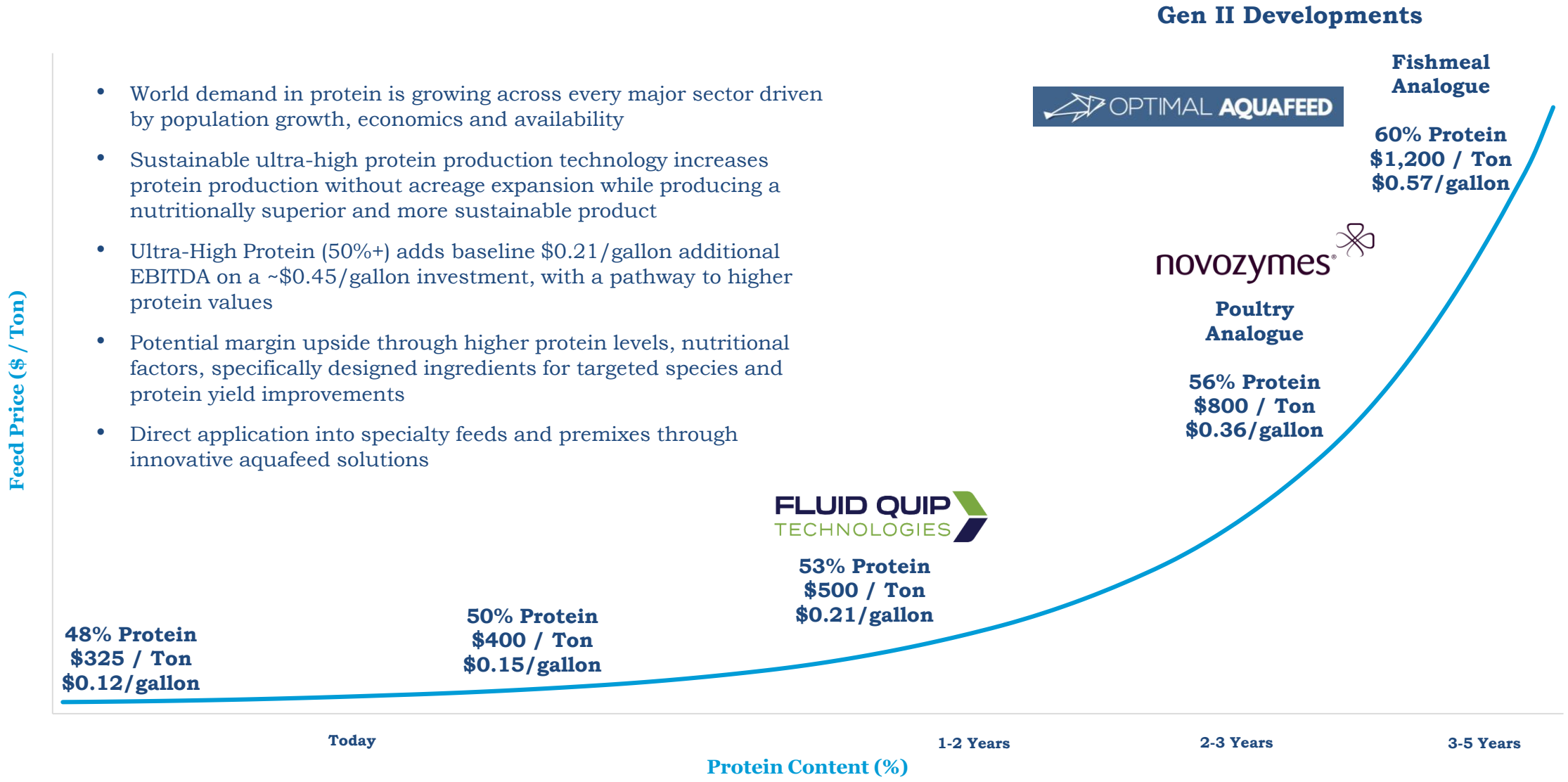


Strategic Partnerships Drive Continuing Innovation

Sustainable
Ultra-High Protein

J-Curve of Protein Opportunity

- World demand in protein is growing across every major sector driven by population growth, economics and availability
- Sustainable ultra-high protein production technology increases protein production without acreage expansion while producing a nutritionally superior and more sustainable product
- Ultra-High Protein (50%+) adds baseline $0.21/gallon additional EBITDA on a ~$0.45/gallon investment, with a pathway to higher protein values
- Potential margin upside through higher protein levels, nutritional factors, specifically designed ingredients for targeted species and protein yield improvements
- Direct application into specialty feeds and premixes through innovative aquafeed solutions



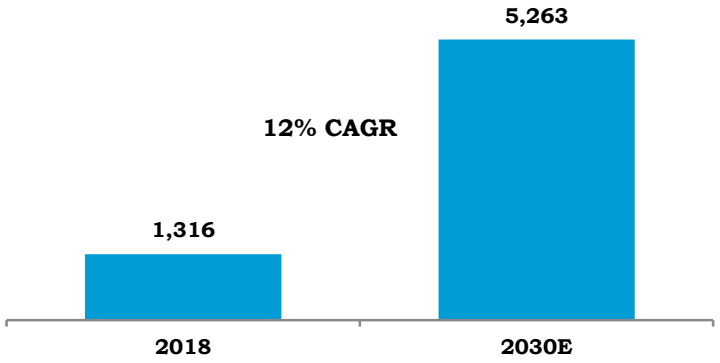
Note: Value per ton of protein is based on underlying Dried Distiller's Grain (DDG) of $150 per ton and should be adjusted based on current DDG values.

Renewable Corn Oil

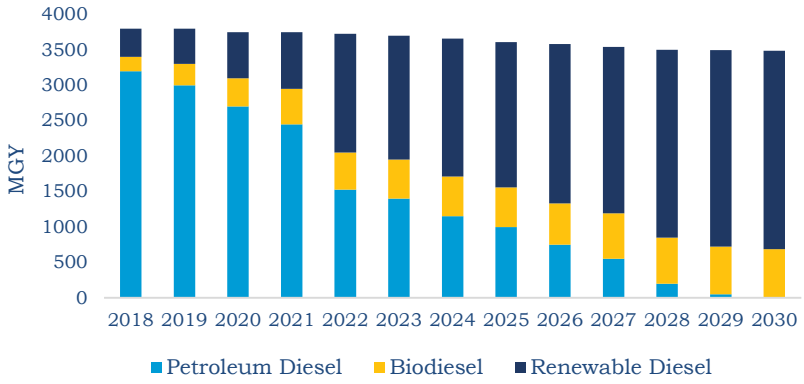
Renewable Corn Oil Demand Growth

Driven by sustainability initiatives, renewable corn oil volumes are growing exponentially with renewable diesel

Global Renewable Diesel Demand (MGY)



California Annual Diesel Demand Forecast



Source: California Advanced Biofuels Alliance, Wood Mackenzie

Taking Advantage of the Unique Drivers in Renewable Corn Oil

Renewable Corn Oil Price (Cents per Pound)



Renewable Corn Oil Margin Increase

Per $0.10 per pound increase
($ M)



- Increase in renewable corn oil pricing driven by growth in renewable diesel production
- Each $0.10 per lb. increase in renewable corn oil price represents a lockstep ~$40M renewable corn oil EBITDA increase with planned production capacity expansion to 1.2 lbs. / bu.
- Application of additional technologies in the future could result in renewable corn oil capacity expansion to 1.8 lbs. / bu.
- Green Plains expects to increase renewable corn oil production per bushel once the sustainable ultra-high protein technology is implemented across the platform
- The expanded renewable corn oil production capability is part of the new sustainable ultra-high protein production process which is expected to increase renewable corn oil capacity by more than 130M pounds
- Upside to renewable corn oil pricing is 100% incremental margin as it is part of the core product process in ethanol production
- Acquisition of Fluid Quip has enabled implementing new technology that could further increase yields, thereby enhancing margins without additional capital investments

Premium High-Purity, Specialty Alcohol

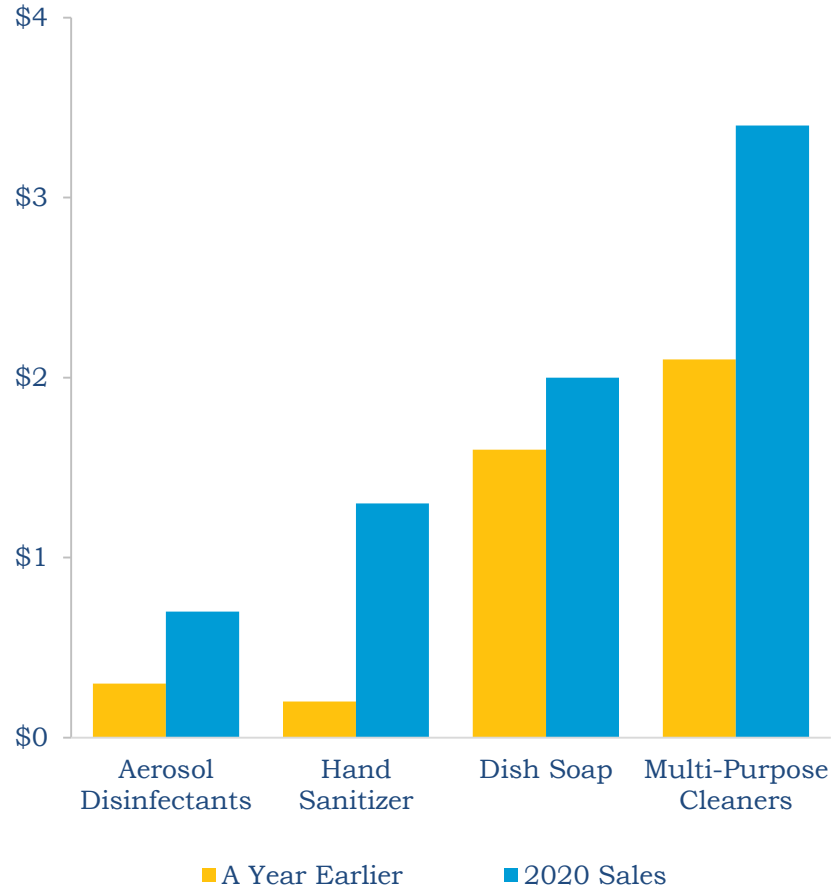
Industry Update

- Consumer demand for sanitizers and disinfectants has vastly accelerated with the ongoing COVID-19 pandemic and heightened consumer awareness of infection prevention
- Specialty alcohol demands are more sustainable and expected to be more permanent as increased cleaning and hand sanitizer use becomes increasingly normal

Green Plains Initiatives

- Green Plains expects specialty alcohol to provide stable free cash flow due to positive underlying trends
- York now produces United States Pharmacopeia (USP) grade alcohol with an annual capacity of 50 MGY, and Wood River will produce Grain Neutral Spirits (GNS) in 2021 with an annual capacity of 25 MGY
- Alcohol production at York will be GNS, enabling use in both pharmacy grade alcohol and beverage alcohol
- Long term trend, customers will be selective in quality leading to a sustainable advantage for Green Plains
- Historical premiums for USP grade alcohol or GNS alcohol have been $1.00 to $1.50 per gallon

US Annual Sales of Cleaning Products ($bn)



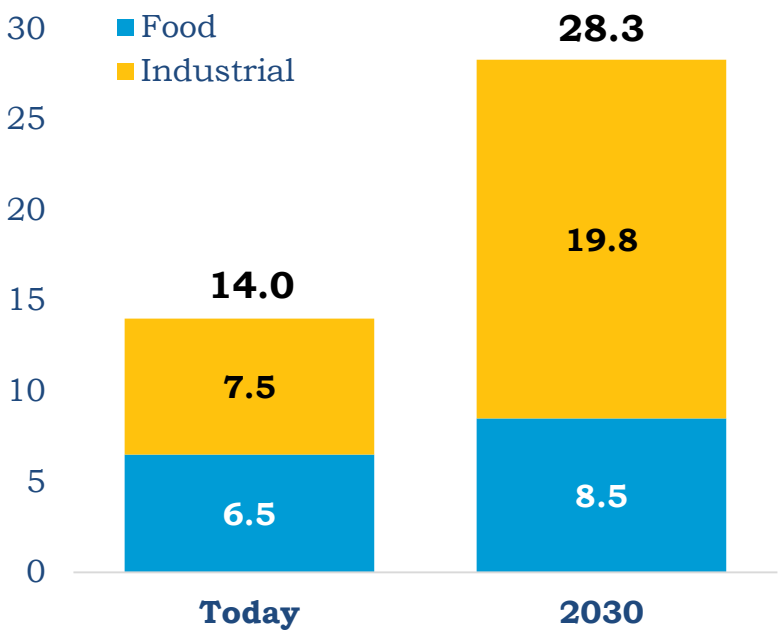
Source: Nielsen

Clean Sugar Opportunity

- New sugar demand growth is being driven by biologic focused companies who use sugar as a feedstock for their bio-processes
  - Increased penetration of bio-based processes drives additional 'sugar' needs of 7-14 billion pounds
  - Growing demand for fermentation to produce a variety of products without petroleum additives requires dextrose / glucose
- FQT is engineering and constructing a fully scalable commercial CST production facility at the York Innovation center
- CST uses proprietary separation equipment and systems to produce multiple specification, purity sugars to meet any customer's needs
  - 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
  - Able to expand industrial glucose capabilities at a fraction of building a new wet mill and produce at lower operating costs

Projected Glucose Demand

(billions lbs., wet)



Specialty Chemical and Material Markets Requiring Glucose / Dextrose

Total Addressable Market of $450 billion



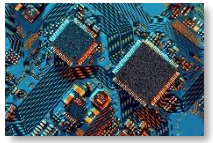
Specialty Polymers
~8% of market



Construction
~8% of market



Ind. Cleaners
~7% of market



Electronics
~7% of market



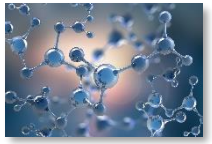
Surfactants
~6% of market



Flavors / Fragrances
~5% of market



Specialty Coating
~5% of market



Water Soluble Polymers
~5% of market



Catalysts
~5% of market



Oilfield Chemicals
~5% of market



Food Additives
~4% of market



Plastic Additives
~4% of market

Source: SynBioBeta, FQT analysis

Carbon Sequestration Initiative

Carbon Capture and Sequestration

Green Plains

SUMMIT AGRICULTURAL GROUP

*Opportunity to **increase margins by $0.15 / gallon** with **no capital required** from the ethanol facilities, **in addition to potential for carbon credits, 45Q tax incentives and direct returns** on investments in the pipeline and Summit Carbon Solutions (SCS)*

Partnership	• Green Plains provides SCS with plant carbon dioxide for 12 years for an estimated ~234 MGY of capacity • SCS is responsible for pipeline construction, operation, carbon dioxide sequestration and all reporting requirements
Details	• Pipeline expected to begin operation in late 2024 • CCS should result in attractive low CI ingredients, furthering the sustainability appeal of renewable corn oil, sustainable ultra-high protein and clean sugars produced at these locations • Additional margin opportunity exists with the potential addition of other Green Plains' biorefineries to the SCS pipeline project • Green Plains has the option to acquire additional ownership in the development company, resulting in a pro-rata incremental return on all carbon dioxide contributed to the pipeline from other facilities

Biorefinery of the Future - Single 100 MGY Plant Unit Economics

~$100M incremental run-rate EBITDA uplift for MSC technology implementation and full conversion of a 100 MGY biorefinery

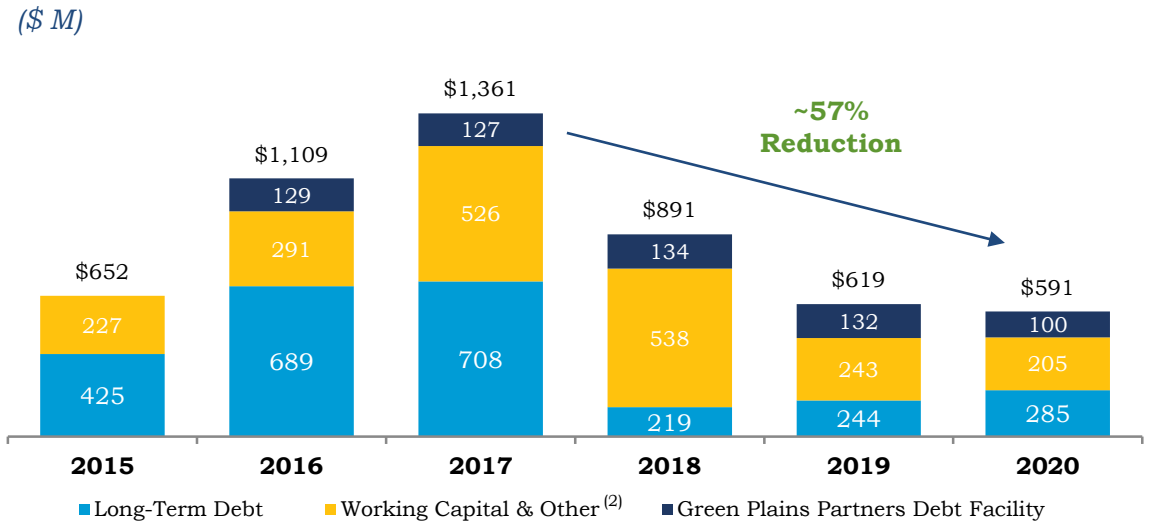
Plant Economics[1]	Single Plant GP 1.0	With Technology GP 2.0[2]	Increase/ (Decrease)
Product Yield per Bushel			
Ethanol (gallons)	2.87	-	(2.87)
Distillers Renewable Corn Oil (pounds)	0.8	1.2	0.4
Dried Distillers Grains (pounds)	14.4	10.5	(3.9)
MSC High Protein Feed (pounds)	-	3.5	3.5
CST Sugar (pounds)	-	35.0	35.0
Product Selling Price[3]			
Ethanol (gallon)	$1.65	$1.65	$0.00
Distillers Renewable Corn Oil (pound)	$0.40	$0.75	$0.35
Dried Distillers Grains (ton)	$225	$225	$0
MSC High Protein Feed (ton)	-	$550	$550
CST Sugar (pound)	-	$0.15	$0.15
EBITDA Uplift ($ M)			
MSC High Protein Feed	-	$19.5	$19.5
CST Sugar	-	63.7	63.7
Renewable Corn Oil Value	-	16.4	16.4
EBITDA Uplift	**$0.0**	**$99.6**	**$99.6**

(1) 100M gallon plant processing 33.1M bushels per year (2.87 gallons per bushel).
(2) Illustrative numbers assuming full technological conversion of a 100 MGY biorefinery
(3) Prospective product pricing based on changing market factors

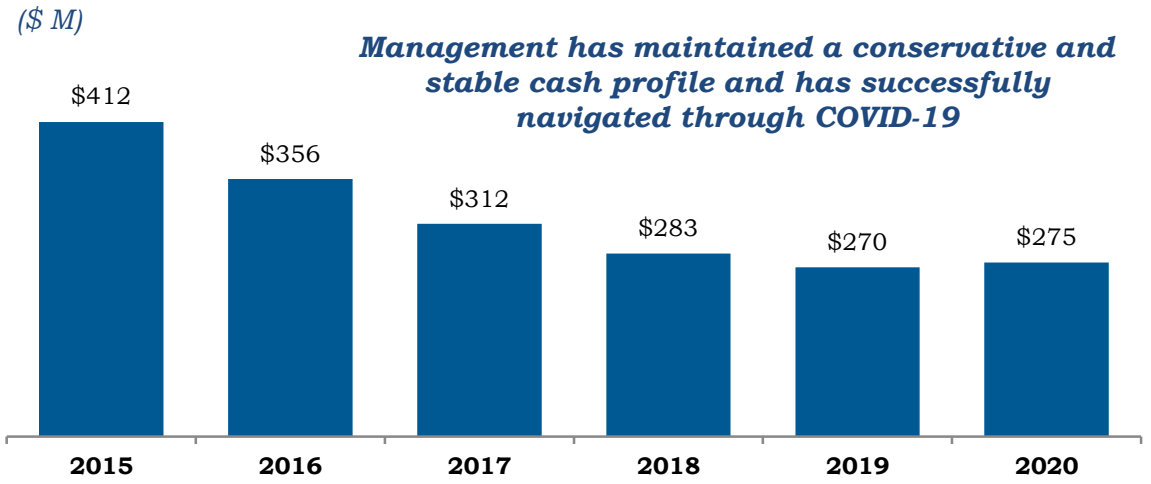
- **MSC at $0.21 per gallon of EBITDA**
  - MSC process filters the Dried Distillers Grains' stream to produce a sustainable ultra-high protein feed ingredient
  - MSC process estimated to yield 3.50 pounds of high protein product per bushel; opportunity to increase yield over time up to 5.0 lbs./bu.
  - High protein product forecasted to sell for a $325 per ton premium over dried distillers grains values, or $500/ton equals to $0.21/gallon; upside potential of $0.57/gallon or $1,200/ton
  - Margin has potential to increase substantially as higher protein content and nutritional factors are achieved
  - MSC will increase distillers renewable corn oil yield by 0.2 pounds per bushel
- **CST assuming $0.67 per gallon of EBITDA**
  - CST will produce sugar from the starch in the corn kernel replacing ethanol
  - Full CST sugar yield is estimated to be 35 pounds per bushel
  - Price and margin for sugar is estimated to be $0.15 and $0.055 per pound respectively, based on current price levels
- **Renewable Corn Oil assuming $0.17 per gallon of EBITDA**
  - Renewable corn oil price increase of $0.35 per pound driven by increasing renewable diesel demand
  - Further improvement to renewable corn oil extraction expected to increase yield to 1.2 pounds per bushel
  - Potential for additional improvements to renewable corn oil yield up to 1.8 pounds per bushel through additional technologies
  - Annual renewable corn oil production for 100 MGY biorefinery forecasted to be ~40M pounds after technology conversion

Leverage and Liquidity

Annual Historical Total Debt[1]



Annual Cash Balance[2]



- Green Plains capital structure has been materially simplified with only a few tranches of long-term debt remaining, representing a ~57% reduction in total debt from previous 2017 levels
- Consistently strong liquidity position with 2020 cash balance of $275M and $332M available under committed credit facilities
  - Average cash balance since 2015 of ~$318M
- In 2018, proceeds from Green Plains' ethanol plant sales and Fleischmann's Vinegar were used to repay remaining outstanding balance of the Company's $500M Term Loan B
- Even as the Company reduces its exposure to the ethanol business, it maintains a strong liquidity position to manage potential volatility in crush spreads related to industry dynamics

(1) Represents long-term debt, inclusive of unamortized debt issuance costs, current portion of long-term debt, working capital, operating leases and other short-term and long-term debt. Green Plains Partners debt facility is non-recourse to Green Plains Inc.
(2) Includes working capital, long-term and short-term operating leases and other short-term debt.
(3) Cash balance includes restricted cash.

A Real ESG Story

Project 24

- ***Lower Energy*** - Installation of Project 24 technology reduces gas use by 20% and power use by 20%
- ***Higher Efficiency*** - Lowers overall operating cost in terms of chemical use by 15%, water requirements by 10%, and increases renewable corn oil recovery by 10%

MSC Technology

- ***Lower Carbon*** - Increased Distillers Corn Oil (DCO) recovery –feedstock for production of biodiesel and renewable diesel
- ***Lower Transportation Costs*** - Shipping a concentrated corn protein end- product vs whole kernel or traditional DDGS reduces shipping costs and carbon footprint
- ***Lower Land Use*** - Corn-based protein solutions reduces deforestation – no need to plant additional acres
- ***Reduce Stress of Oceans*** - Reduce reliance on fishmeal in aquaculture diets, lowering stress on ocean ecosystems
- ***Lower Emissions*** - Reduced BTUs per gallon of ethanol produced
- ***Further Sustainability*** - Zero Carbon Intensity (CI) high protein production possible by reclaiming ring dryer vapors

CST

- ***Lower Carbon*** - Reduced CI to produce sugar from dry mill relative to a wet mill
- ***Lower GHG*** - Sugars can be used in protein production such as plant-based burgers, eliminating GHG impact of livestock production
- ***Sustainable and Renewable*** - Carbon used in green chemical production is derived from sustainable corn sugars vs carbon from petroleum

Carbon Sequestration

- ***As one of the largest CO_2 projects in the world; Green Plains can participate at DevCo. level***
- ***Zero Carbon Footprint*** – Since all carbon will be metered and sequestered, Green Plains should meet the "gold standard" headed towards having a zero-carbon footprint
- ***LCFS Programs*** – Expanded LCFS programs in other states will drive demand for low CI fuels
- ***Lower Carbon Ingredients*** – Reduces carbon footprint of production, enhancing value of ingredients
- ***Lower CI Scores*** – Will make biofuels from sequestered plants comparable to other low CI fuels such as renewable diesel and Brazilian sugar cane

Measuring Our Global Impact

- Provide less expensive, renewable biofuel alternatives to regular gasoline for consumers
- Meet the world's growing food and dietary protein demands with ultra-high protein, plant-based feeds
- Reduce the need to feed animals to animals and overfish our oceans
- Improve the food system to be more secure with healthier livestock and aquacultures
- Reduce need to further deforest land for agricultural purposes by using corn sustainably farmed and sourced locally





Investment Highlights: Why Green Plains?

Proven Track Record	• Seasoned management team with proven track record of managing risk and allocating capital in various cycles with the ability to execute on key strategic initiatives to grow value
Platform Scope and Scale	• Tremendous asset base developed over the past 13 years which is nearly impossible to duplicate and serves as the foundation for building Green Plains 2.0 • Scope and scale of the existing platform is the key to accelerating the use of proven and developing technologies and IP to create value-added ingredients the world needs now
Financial Flexibility	• Strong balance sheet with ample liquidity and levers available to execute our strategy • Implementing Project 24 across platform to drive operating costs to at or below $0.24 per gallon, making the company a low-cost operator while consistently reducing our carbon footprint
Significant IP	• Fluid Quip owns a significant disruptive IP portfolio that adds value to several ag processing disciplines • Technology in higher value proteins and clean sugar are “game changers” for Green Plains’ portfolio
ESG Focused	• Transforming to be a world class provider of sustainable ultra-high protein, renewable corn oil and novel feed ingredients, and closed loop and sustainable biofuels with a focus on lowering the carbon footprint
Value Added Opportunities	• Impact of sustainable ultra-high protein using Fluid Quip’s MSC technology is a baseline $0.15 - $0.20 per gallon of capacity, with upside to higher margins through protein content and yield improvements • Control of technology enables development and monetization of high value, on trend technologies • Cultivating strategic partnerships to drive additional value across our platform
Innovation and Advantages	• Diversify products into more stable and valuable margin streams • York Innovation Center and Shenandoah Aquaculture Center allow for development and validation of new solutions with key customers and continued creation of game changing IP • Further opportunities to expand renewable corn oil production through protein development • Enhancements to sustainable ultra-high protein and game-changing Clean Sugar Technology – CST™ create future opportunities to diversify Green Plains’ platform and reduce reliance on biofuels


Green Plains
Ingredients that matter
www.gpreinc.com

Glossary

- **BOS** – Brix Oil Separation System
- **CCS –** Carbon Capture and Storage
- **CI –** Carbon Intensity
- **CST** – Clean Sugar Technology
- **DDG** – Dried Distillers Grains
- **FQT** – Fluid Quip Technologies
- **GPRE** – Green Plains Inc.
- **GNS** – Grain Neutral Spirits
- **GPP** – Green Plains Partners
- **LCFS** – Low Carbon Fuel Standard
- **MGY** – Million Gallons per Year
- **MSC** – Maximized Stillage Co-Products
- **SCS** – Summit Carbon Solutions
- **USP** – United States Pharmacopeia