Green Plains

Ingredients that matter

About Fluid Quip Technologies

January 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.

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.

The Partnership

Ospraie Management, LLC is an independent asset management firm which actively invests in the agribusiness industry.

Green Plains Inc. is a leading biorefining company focused on the development and utilization of fermentation, agricultural and biological technologies in the processing of annually renewable crops into sustainable value-added ingredients.

Fluid Quip Technologies® is a custom fully integrated engineering and technology firm that has commercialized multiple patented and patent-pending technologies to enhance the base corn-to-ethanol dry grind process, create new and novel alternative co-products, and supply the growing need for carbohydrate feed-stocks into the biochemical market.

Overview

- Ospraie and Green Plains have invested in mechanical and biological technologies that can be leveraged in synthetic biology and industrial products, changing the face of the bio-refining industry worldwide.
- Fluid Quip has established proprietary partnerships in separation technologies, enzymatic solutions and strategic end-users that will shift the paradigm of bio-refining and valuations.
- In combination, these evolving technologies will redefine the bio-refining space, creating new, highly efficacious industrial products for use across growing high value markets with persistent CAGRs.
- The development of these technologies provides an opportunity for creating a bio-tech/agri-tech platform leveraging known and evolving IP to create a highly valuable ingredient and IP portfolio.
- Among these technologies is the development of Clean Sugar Technology (“CST”) which converts the carbohydrates available from sustainably farmed crops to glucose and fructose, and MSC technology which isolates yeast and the highest protein value of the corn kernel, neither being available before.

Overview Cont'd

- These industrial sugars, yeasts and proteins can supply a growing gap in the input production needs of bio-tech, synthetic biology, feed and food companies, that are required for feedstocks to create renewable products.
- Fluid Quip owns the know how and patents associated with clean sugar fermentation, Ultra-High Protein production and increased renewable corn oil extraction utilizing dry mill technology.
- The control of this technology coupled with Ospraie's and Green Plains' platform, R&D center and strategic relationships should make a meaningful impact to the valuation of the IP portfolio for the partners.
- A bio/ag tech re-valuation of the related IP, proprietary relationships and physical platform will allow the partners to capture near and long-term strategic value of these assets and Green Plains Inc. in total.

Fluid Quip Technologies/Ospraie/Green Plains Inc.

Strategic	• Technological cornerstone of Green Plains 2.0 transformation strategy • Accelerates push into AgTech – allows the internalization of the IP • Supports shift toward higher protein purities and development of novel ingredients and innovations
Significant IP	• Fluid Quip owns a significant disruptive IP portfolio to add value to several ag processing disciplines • Wide patent portfolio with over 20 patents and 47 additional patents pending • Fluid Quips technology in higher value proteins and clean sugar are “game changers” for Green Plains’ portfolio
Proven and Commercially Viable	• Successful deployment of Fluid Quip based technologies with notable customers has led to consistent revenue and earnings growth • Fluid Quip has several existing engagements that help fund near-term growth • Numerous technologies in commercial trials with key counterparties
High Return Investment	• Impact of Ultra-High Protein using Fluid Quip’s MSC™ technology is a baseline $0.15 - $0.20 per gallon of capacity, with significant upside • Owning a portion of the technology platform results in synergies in deployment and cost • Control of technology enables development and monetization of high value, on trend technologies
Additional Advantages	• Technology and expertise can be applied toward high purity alcohols • Supports further expansion of renewable corn oil production • Potential further reduction operating expenses at Green Plains facilities beyond Project 24 • Clean Sugar Technology – CST™ creates future opportunities to diversify Green Plains’ platform

Who is Fluid Quip Technologies?

- Founded in 2012 and based in Cedar Rapids, Iowa
- Custom fully integrated engineering and technology firm for dry/wet corn milling and biochemical facilities
- Full plant design, process optimization, yield improvement technologies, new co-product technologies and turnkey capital projects.
- Full engineering process design and technology development
- Pilot and lab scale development of technology solutions
- Market development and integration capabilities
  - Animal feed, BioChemical, Industrial and Food grade sugars
- Biorefinery plant optimization and design
- 7 new ag technology systems launched over the last 7 years

Engineering Solutions

Process Optimization

Full Project Support

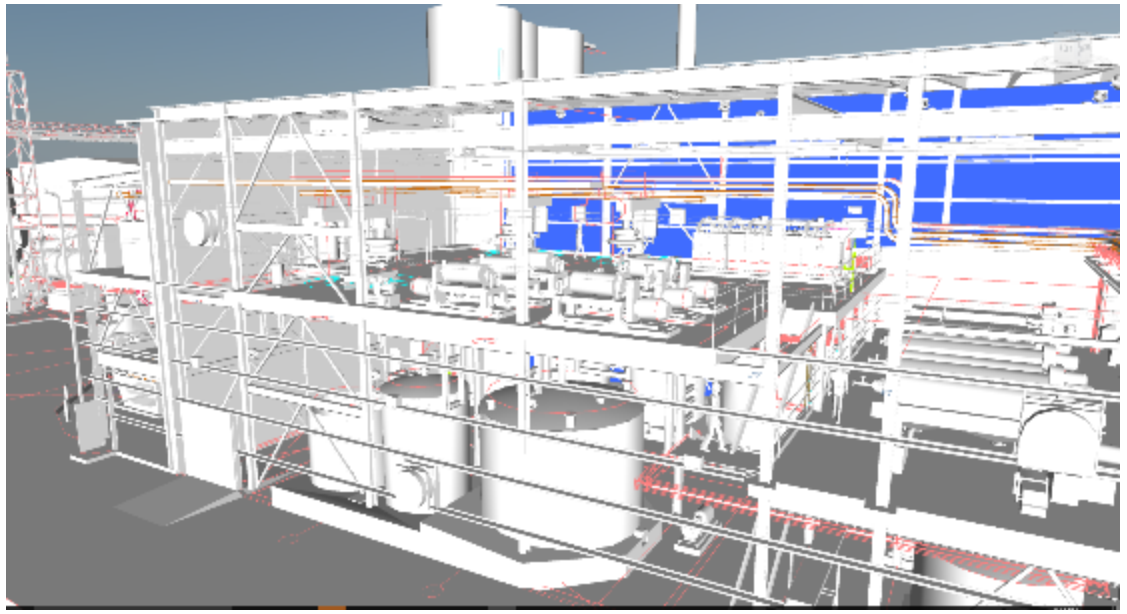
Continuous Innovation

Value-Added Technologies

Dedicated Engineers

Fluid Quip Technologies – Technical Team

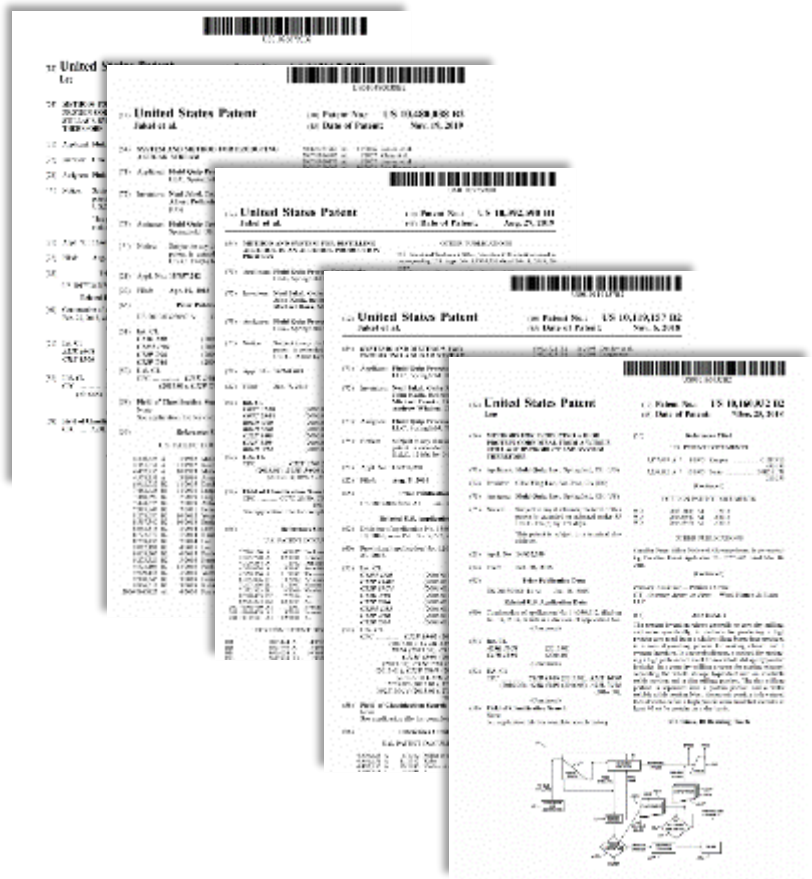
- Over 50 Employees
- 15 Chemical Engineers
- 5 Mechanical Engineers
- Internal CAD Design Department
- Projects Management Group
- R&D and Laboratory Team
- Leading Animal Nutritionist
- Significant Combined Industrial Bio-Based Experience
- Significant Corn Wet Mill / Soybean / Ag Processing Experience
- Biorefinery Plant Operations and Management Experience



Fluid Quip Technologies IP and Patent Portfolio

Worldwide Patents Owned / Licensed

- 21 Granted Patents
  - 8 MSC/Protein
  - 3 Wet Frac
  - 3 CST/Carbohydrates
  - 4 Front End Grind
  - 3 Distillation
- 47 Pending Patents
- MSC™ Protein FTO Review
- CST™ Sugar FTO Review



Fluid Quip Technologies – Bio-refinery – Today and in the Future

Technologies from Fluid Quip

MSC™

Maximized Stillage Co-Products™

- High-Value Protein from Whole Stillage
- Proven Technology Since 2009

*MSC is Protected under U.S. Patents 8,778,433 : 10,160,932 : 10,190,076 : 10,266,790 : 10,233,404 and foreign patents with patents pending

CST™

Clean Sugar Technology™

- Clean, Low Cost Sugar
- Biochem Market Opportunities

*CST is Protected under U.S. Patents 9,777,303 & 10,119,157 and foreign patents with patents pending

Flex Plant ™

Flex Plant Technology™

- Leading technology in S. America
- Corn Ethanol Plant Tied to Sugar Cane Plant - Brazil
- Ability to Run Facility Year-Round

Technologies from Fluid Quip

SGT™

Selective Grind Technology™

- Secondary Milling Step to Increase Ethanol and Oil Yields
- Utilized in >1.7BGY of Ethanol Production

*SGT is Protected under U.S. Patents 9,012,191 & 9,689,009 and foreign patents with patents pending

BOS™

Brix Oil Separation System™

- Recover Oil From Liquefaction
- Total Oil Yield >1.0 #/bu

*BOS is Protected under U.S. Patent 9,732,302 and foreign patents with patents pending

FBP™

Fiber By-Pass™

- Bypass Fiber Around Fermentation
- Capacity Gain of ~5%
- Improves Ethanol Yield

*FBP is Protected under U.S. Patents 9,012,191 & 9,689,009 and foreign patents with patents pending

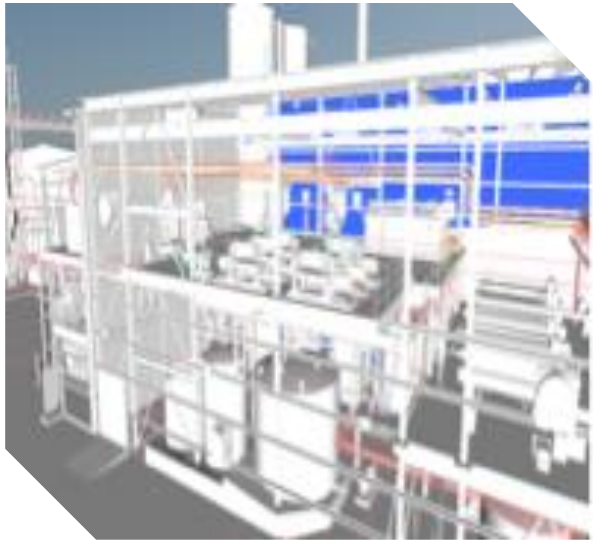
Technologies from Fluid Quip

TSC™

Thin Stillage Clarification™

- Clarifies Thin Stillage Stream, Increases Oil Yield >1.0 #/bu
- Plant Capacity Gain of ~5%

Process



Process Optimization Projects

- 70+ Optimization Projects to Improve Yield and Throughput

Greenfield

New Plant Design

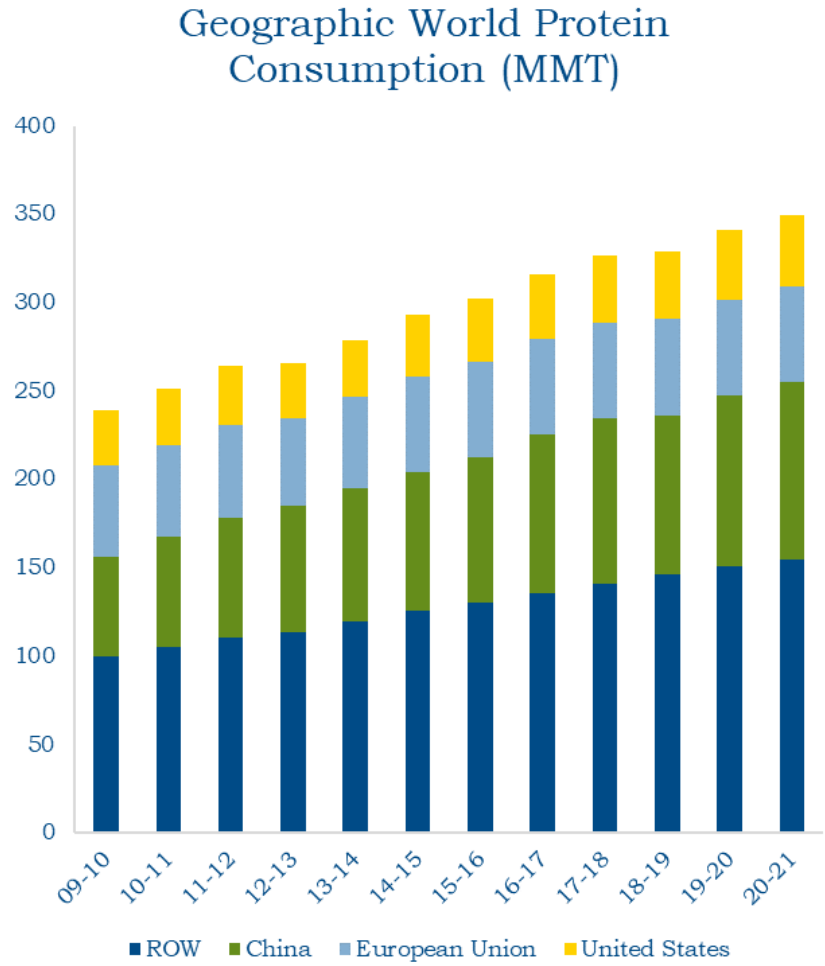
- Greenfield Full Bio-refinery Design
- Expansion Integration

MSC™ Technology – Not Just for Corn

- Proprietary separation technology applied with multiple cereals and grains
- Multiple products and configurations

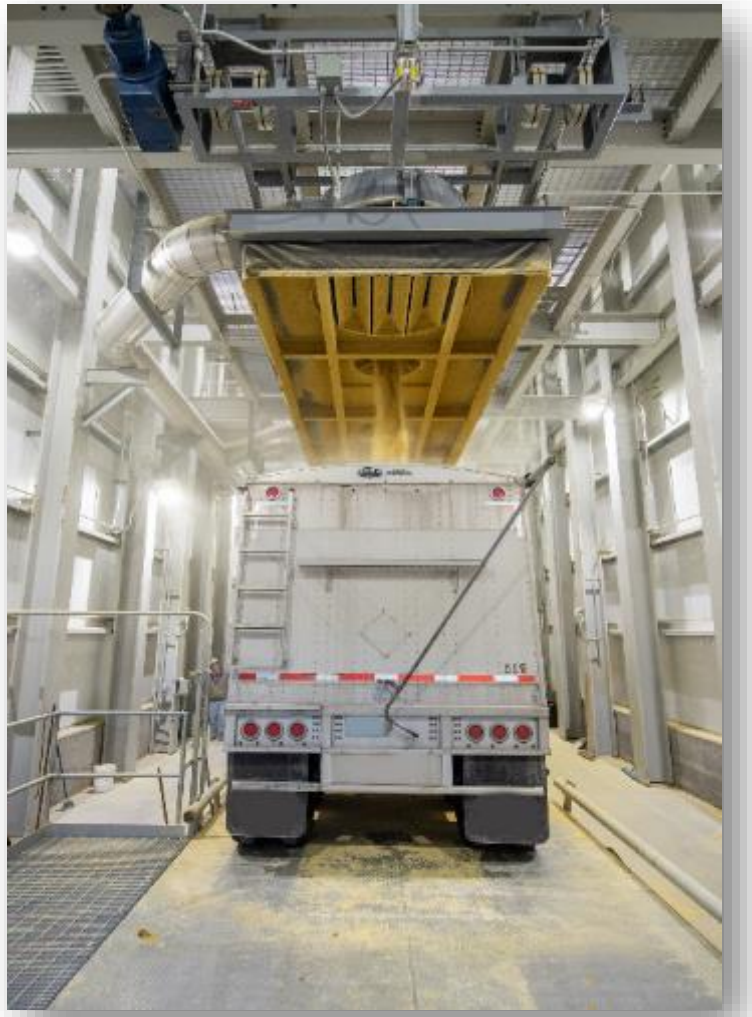
Global Protein Demand is Growing

- World demand in protein is growing across every major sector driven by population growth, economics and availability
- Fluid Quip helps feed the world with better proteins in both the US and Brazil
- Increase protein production without acreage expansion
- Produces 50+% protein animal feed ingredients from at least 20% of distillers grains produced today



Source – USDA World Protein Report
MMT is defined as million metric tons

High Protein Technology, High Value, High Quality



Strategic ingredient in use today

- Ultra-High Protein is a proven 50%+ protein co-product
- Ultra-High Protein is an optimal ingredient for aquaculture, dairy, poultry, swine and companion animal diets
- Currently being used in the pet, dairy, poultry and aquafeed diet/rations
- Adds baseline $0.15 - $0.20/gallon additional EBITDA on a ~$0.40/gallon investment
- Greater than 50% renewable corn oil yield increase – an important feedstock for the growing renewable diesel industry

Proteins & Ingredients

Nutritional advantage

- 50%+ protein concentration combining high-value components, becoming a strategic ingredient with vegetable and fungal properties
- Cornerstone ingredient for developing new feed rations
- Contains positive nutritional qualities which promotes health in aquaculture and companion animals and is highly digestible

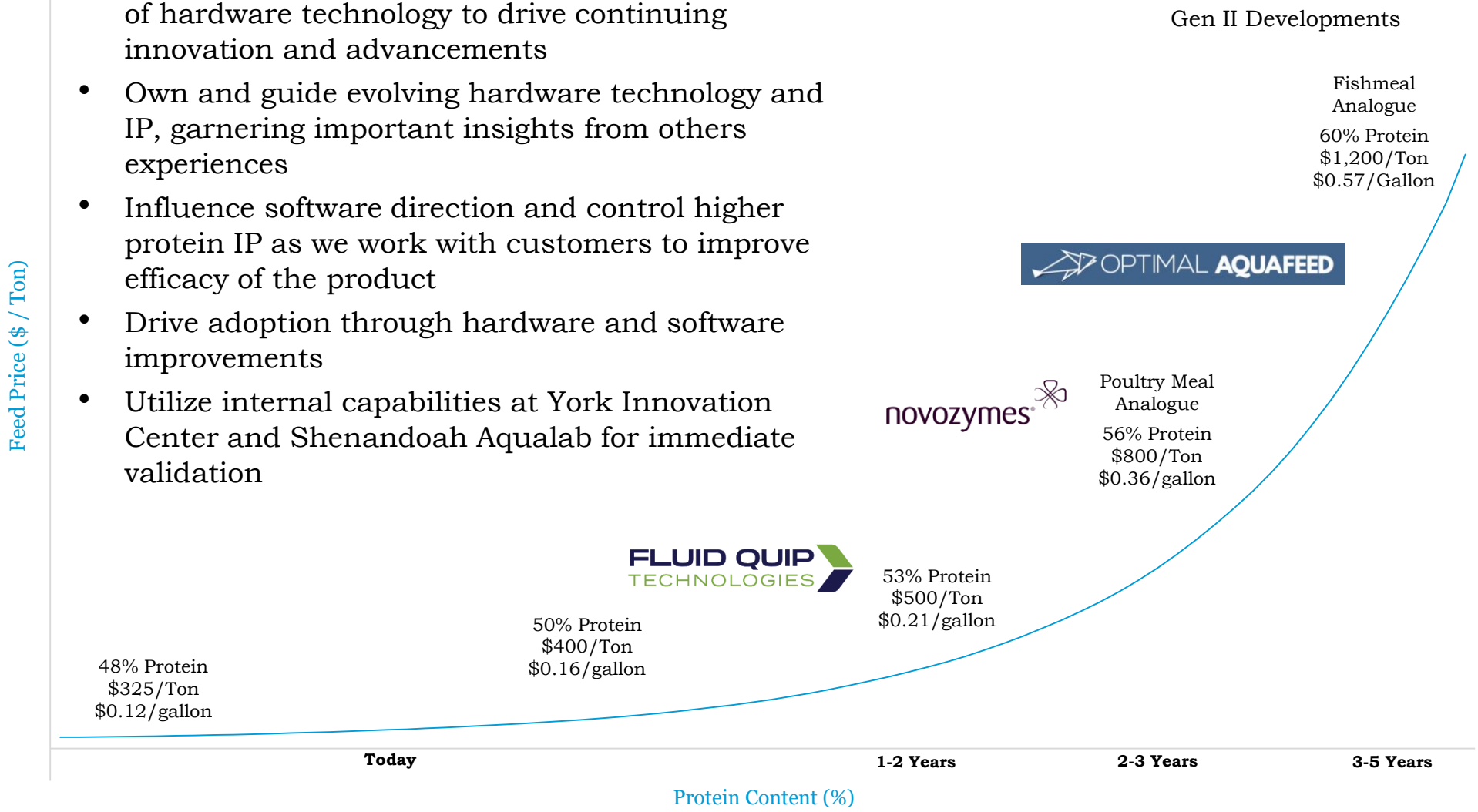
Strategic partnerships enhance product

- Application into specialty feeds and premixes through innovative aquafeed development provides additional uplift through Optimal Aquafeed and Hayashikane partnerships
- Combined with these strategic partnerships with a focus on increasing protein concentrations and nutritional and digestibility profiles, there are multiple opportunities for further margin expansion

Protein Opportunity with Fluid Quip Ag Tech

- Combination of strategic partnerships and control of hardware technology to drive continuing innovation and advancements
- Own and guide evolving hardware technology and IP, garnering important insights from others experiences
- Influence software direction and control higher protein IP as we work with customers to improve efficacy of the product
- Drive adoption through hardware and software improvements
- Utilize internal capabilities at York Innovation Center and Shenandoah Aqualab for immediate validation

J-Curve of Protein Opportunity



Company Analysis. Values are estimates we believe achievable based on consistent production.

CST™ System Overview – Disruptive Ag Tech

Clean Sugar Technology™

- Potential game changer for the Green Plains portfolio
- Produce low cost, high quality sugars from a dry grind process
- Pull slip stream off base ethanol plant or fully convert whole plant to sugar production to significantly diversify revenue stream
- Up to 50% lower cost sugars than wet mill – both industrial and food grade capabilities
- Customer interest and sample requests have outpaced our current lab capabilities

CST™

150+
Target customers identified

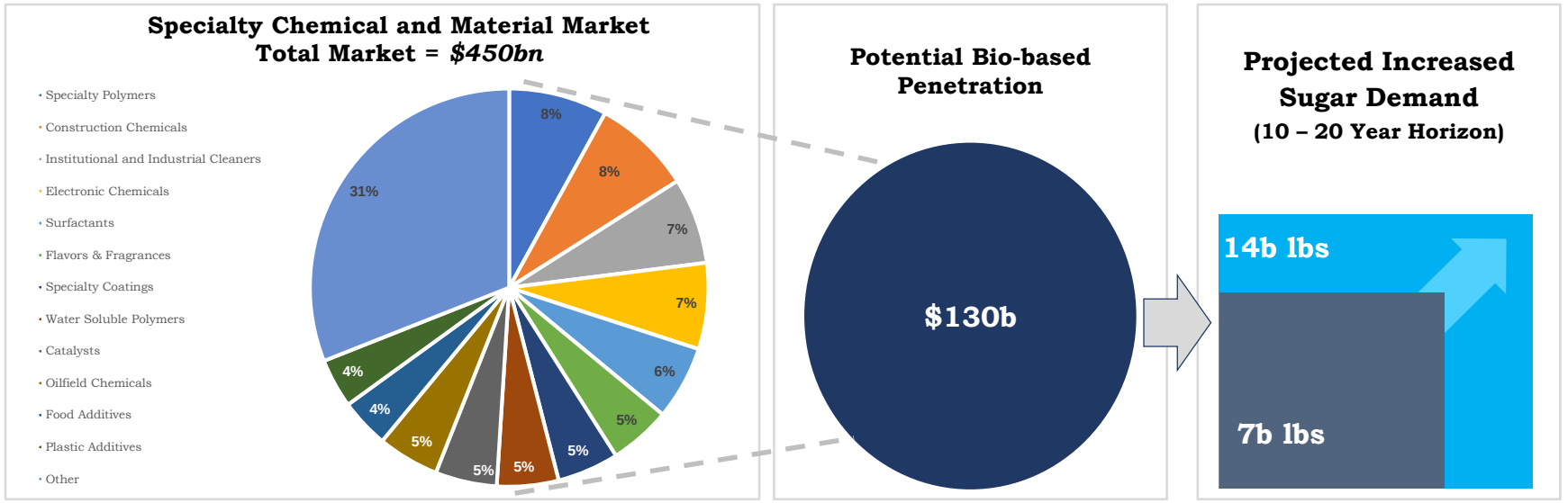
50+
Clean sugar samples sent to customers

20+
Active customers dialogues

250+
Pounds of lab samples provided for customer trials

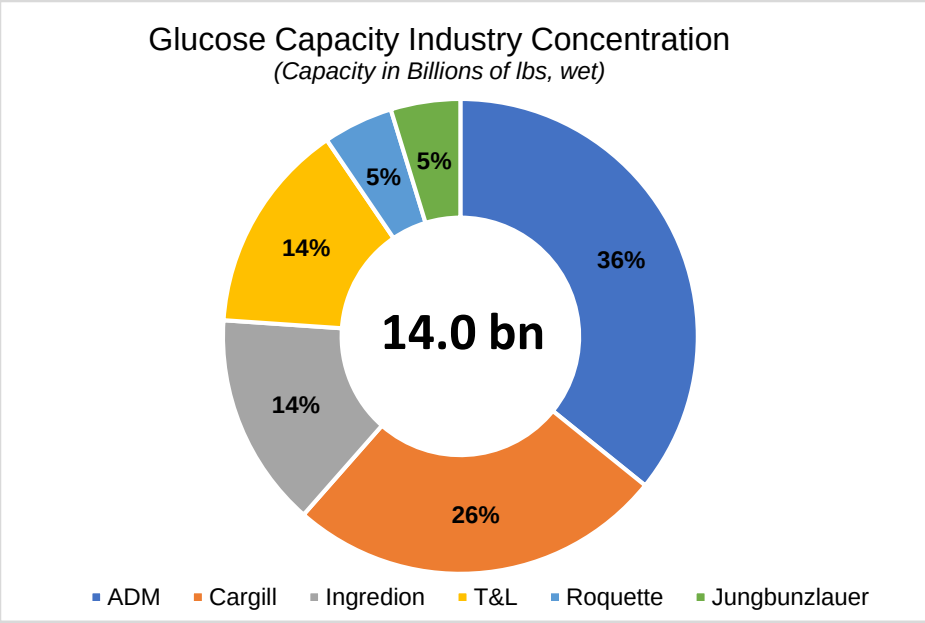
CST – Fuels the Growth of Bio-Renewable Products

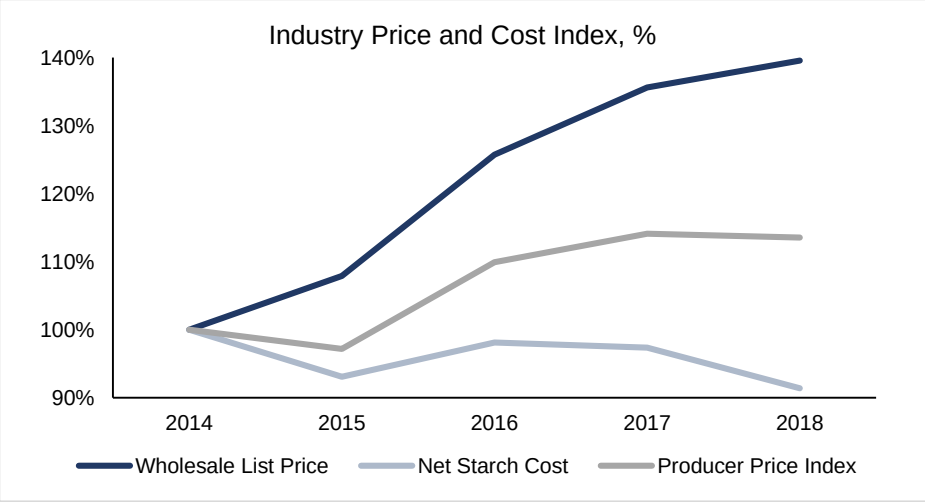
- Investments in synthetic biology start-ups has grown significantly over the last 5 years
- **Bio Revolution' is driving a $130 billion opportunity in the specialty chemical and materials market**
- This gives CST™ 'sugar' an opportunity to expand alongside bio-renewable technologies as they continue to develop biological solutions to meet industrial and consumer needs
- **The increased penetration of bio-based processes translates into additional 'sugar' needs of 7-14 billion pounds**



Notes: [1] Assumes 20-50% penetration for specialty chemical/additives and 10% penetration for more commodity products
Source: SynBioBeta, FQT analysis

CST – Disruptive IP Allows Participation in High Value Products Margins





- Growth in demand has raised profitability of wet mills, the main producer of sugar in the Midwest
- The current wet mill industry is highly consolidated with 6 companies producing 100% of the 14bn pound glucose market
- High concentration has led to a disconnect between production costs and market price of glucose syrups
- Building a new wet mill requires high capital costs and is the main barrier to entry into the market
- This restrained wet mill supply has also resulted in elevated pricing for sugars as a feedstock
- There is a large opportunity to capture high margins by producing an equivalent sugar feedstock with reduced operating expenses using Fluid Quip IP

Source: McKeaney Flavell, FQT analysis.

Flex Plant Technology – More Disruptive IP

Flex Plant Technology™

- Leading proprietary technology combining corn ethanol production with cane ethanol production
- Utilizes multiple FQT technologies in a bolt-on configuration
- Can lead to non-gmo proteins which are in high demand globally
- Currently installed in 3 South American locations

Flex Plant ™

Improved Sustainability and ESG Impact

MSC Technology

- ***Lower Carbon*** - Increased Distillers Corn Oil (DCO) recovery, an important 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


Green Plains
Ingredients that matter
www.ospraie.com
www.gpreinc.com
www.fluidquiptechnologies.com