Green Plains

Inflation Reduction Act Teach-In

June 2023



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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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Agenda

1. Speaker Introductions
2. Green Plains 2.0 Overview
3. Inflation Reduction Act (IRA) Deep Dive
4. Decarbonization Strategies
5. Sustainable Aviation Fuel (SAF) Update
6. Overall Impact to Green Plains



Introductions & Bios



Todd Becker

President & CEO

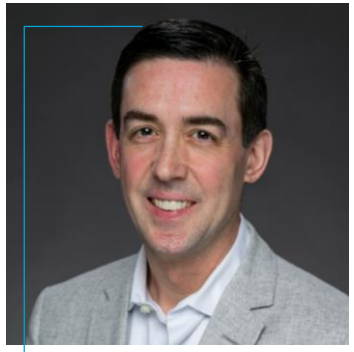
- CEO of Green Plains since 2007
- Serves on the board of Green Plains Inc. and Chairman of the Board of Green Plains Partners
- Over 35 years of experience in risk, supply chain and operations management in numerous commodity processing businesses



Phil Boggs

EVP,
Investor Relations

- Joined Green Plains in 2009
- Leads Investor Relations
- Over 25 years of experience in Finance, Treasury & Investor Relations in energy, manufacturing and agriculture industries



Anthony Reed

Partner,
FGS Global

- Joined FGS Global in 2022
- Previously served as VP of Federal Government Affairs at ADM for 14 years
- Previously served at U.S. EPA and on Capitol Hill for 11 years, primarily with former Speaker of the House Dennis Hastert



Devin Mogler

SVP,
Government Relations

- Joined Green Plains in 2018
- Leads Government Relations and Sustainability
- 15 years of experience in the agriculture industry, including 3 years in the U.S. Senate advising on ag, renewable fuels, energy and environmental policy



Jordan Sunderman, CFA

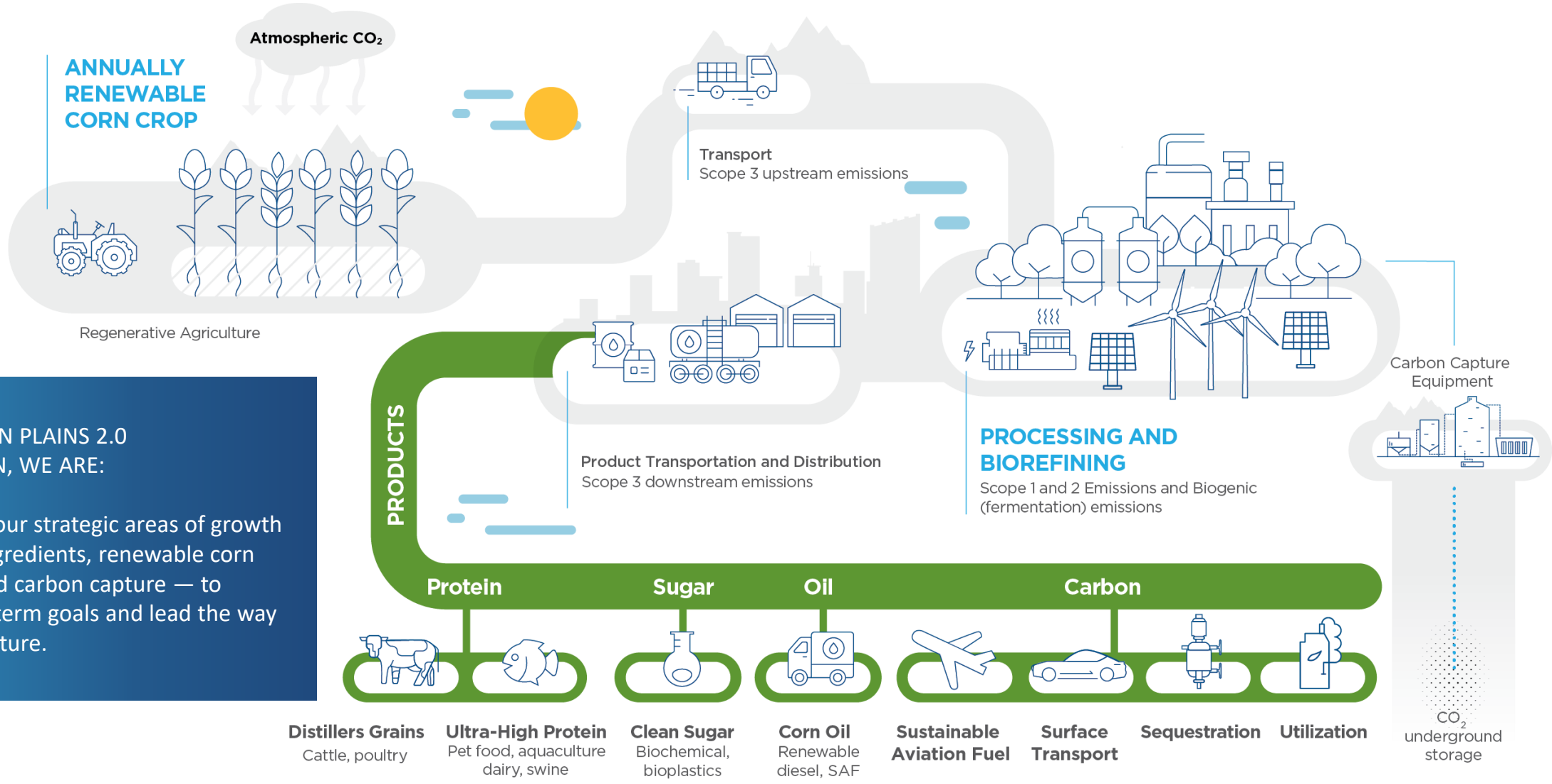
Director,
Strategy & Development

- Joined Green Plains in 2017
- Leads carbon strategy
- 8 years of experience in the energy industry executing on multiple M&A opportunities and leading strategic initiatives



Green Plains 2.0

We are transforming our assets for a low-carbon future

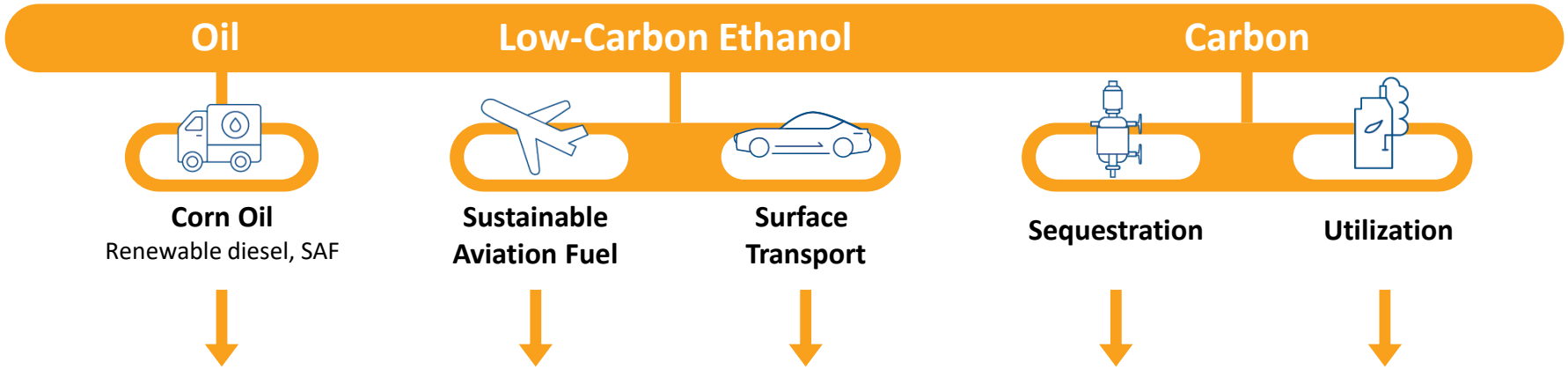


UNDER OUR GREEN PLAINS 2.0 TRANSFORMATION, WE ARE:

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.

The IRA accelerates our transformation to Green Plains 2.0

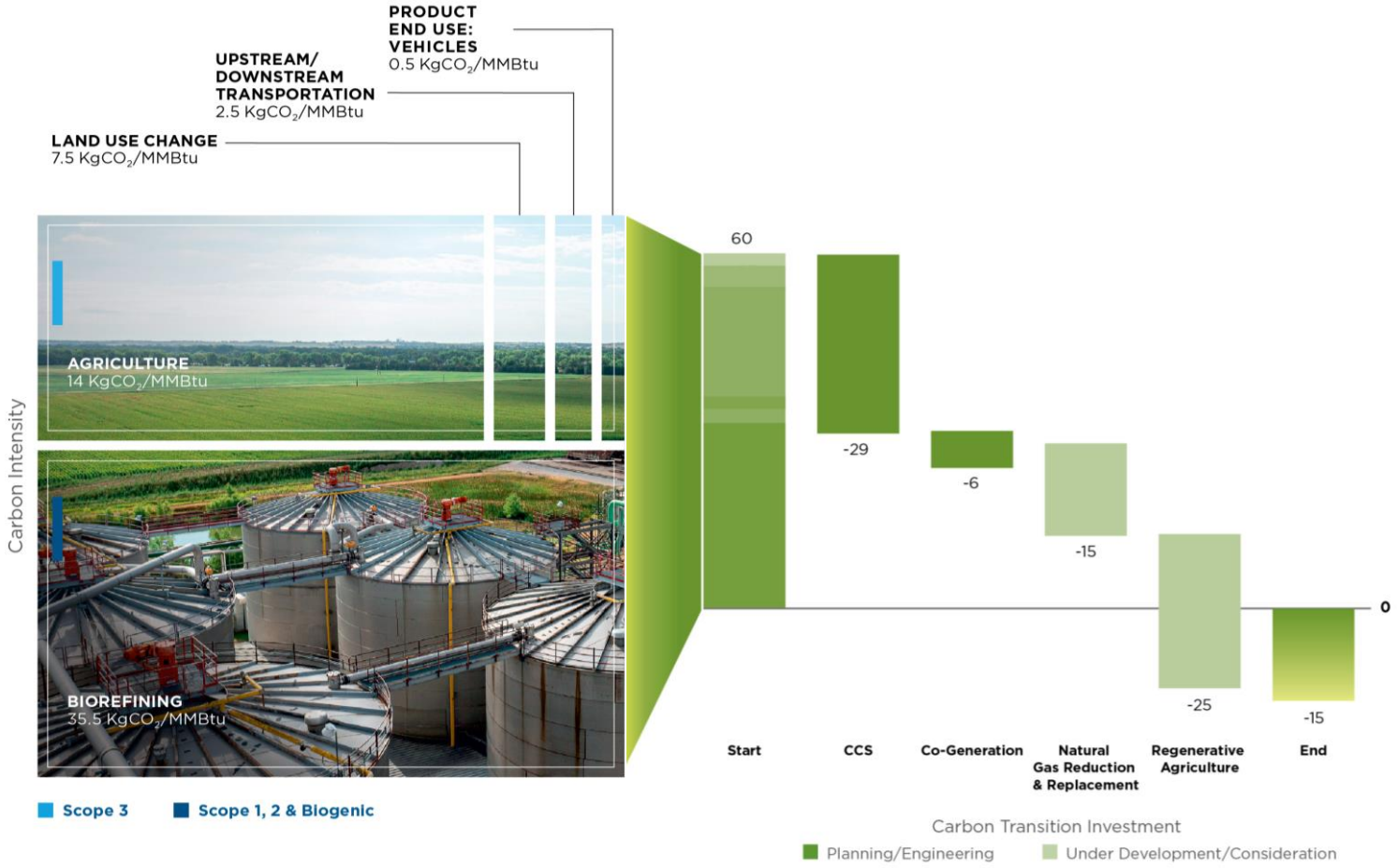
Route to Program Incentives



Carbon-Related Credits	LCFS Markets: CA, OR, WA and Canada	LCFS Markets: CA, OR, WA and Canada	LCFS Markets: CA, OR, WA and Canada	Voluntary Carbon Offset Markets	LCFS Markets: CA, OR, WA and Canada
Federal-Level Tax-Related Credits		45Z Low CI Production Credit		45Q Sequestration Incentive	
		45Z and 45Q are mutually exclusive credits			
State-Level Tax-Related Credits		State Level SAF Credits: IL, MN, WA			

Our assets are able to achieve carbon neutrality and beyond... and 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 gives our shareholders return for their capital
- 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.

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

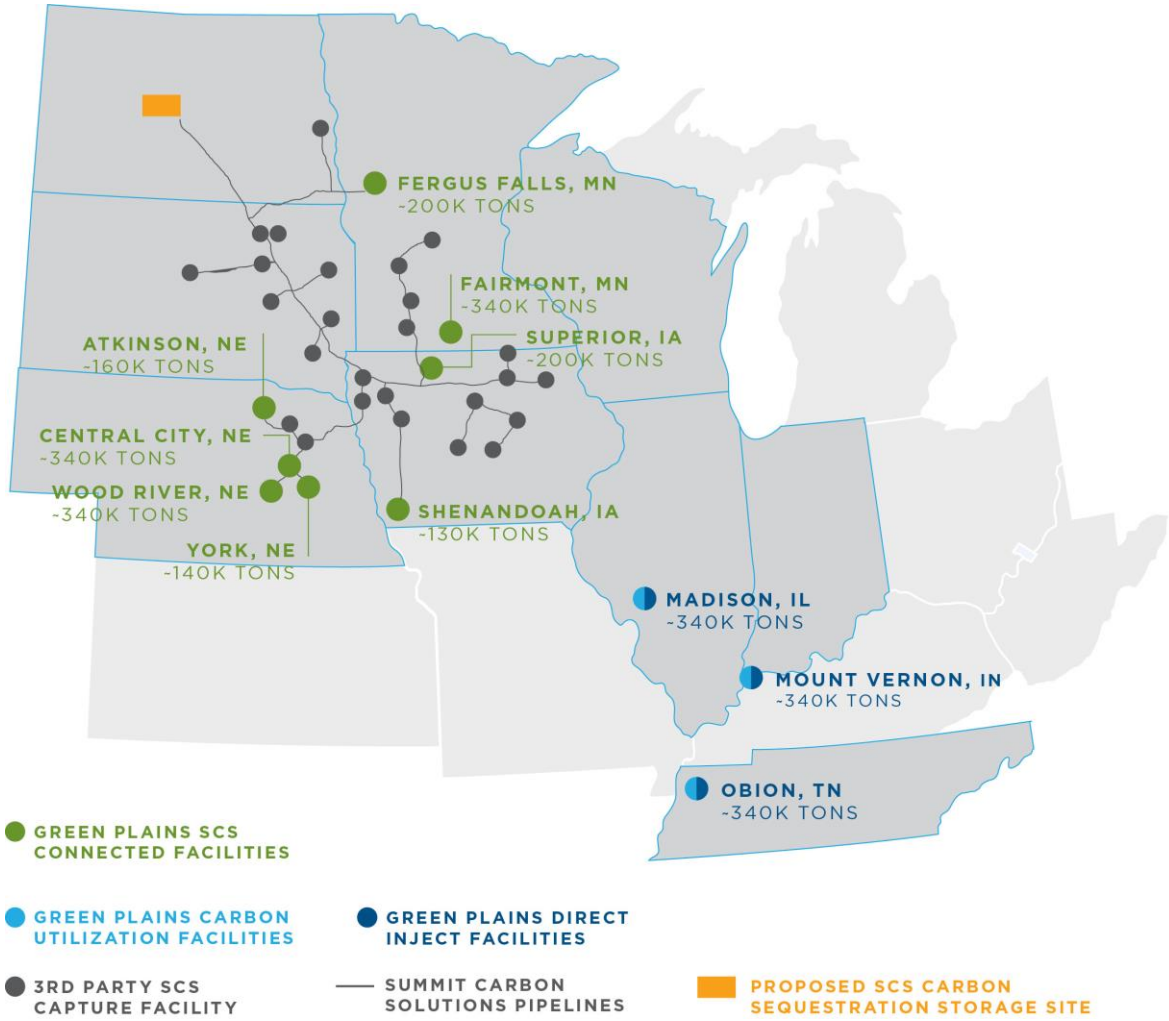
Our existing platform represents ~3 million tons of biogenic carbon capture opportunities between pipeline commitments, direct injection and commercial utilization, which is equivalent to:

~ 668 thousand
Cars Removed from the Road per Year

~ 378 thousand
Homes Powered per Year

~ 7 million
Barrels of oil

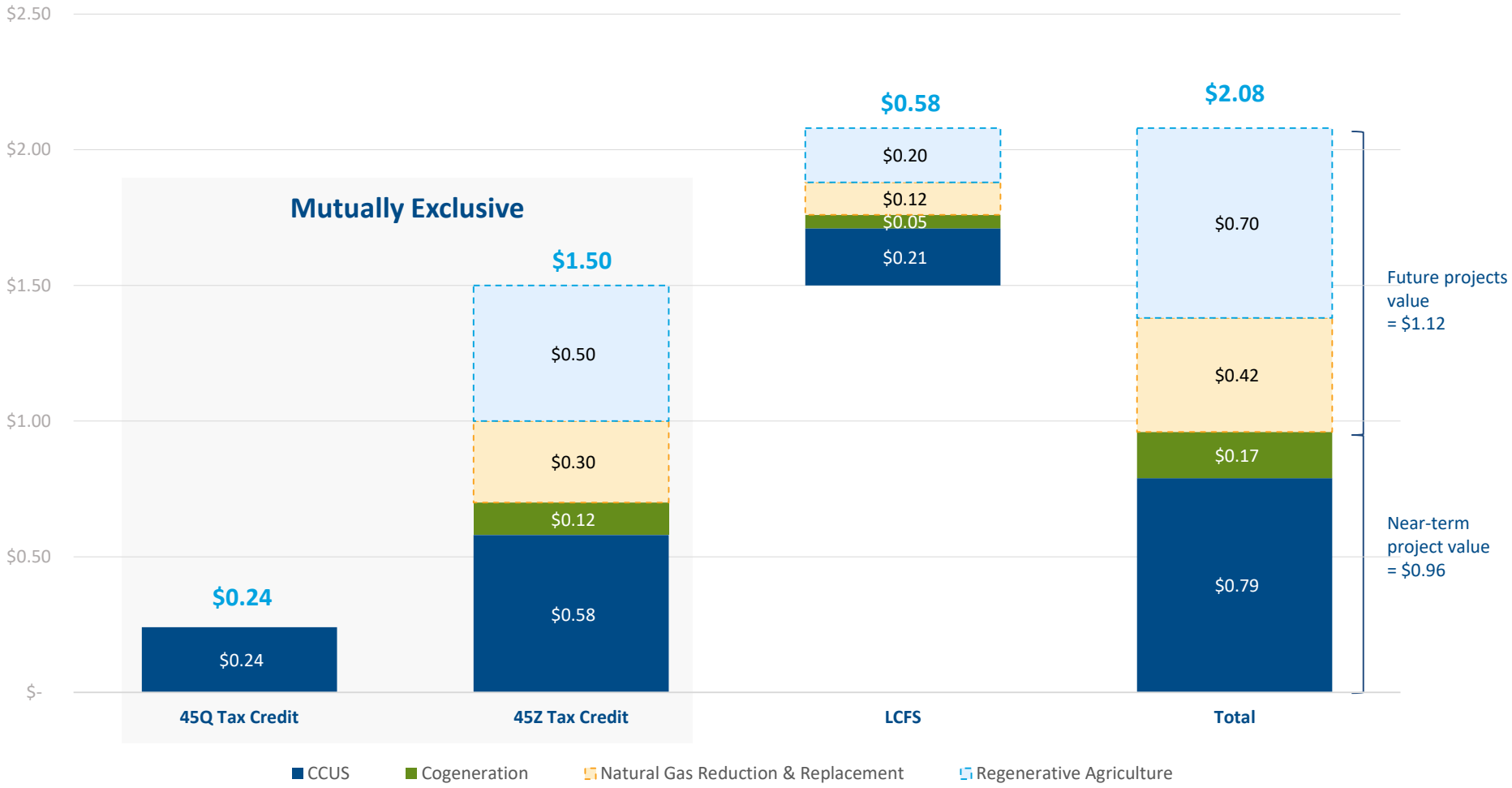
~ 4 million
Acres of Forest per Year



Greenhouse Gas Equivalencies Calculator | US EPA

45Q, 45Z and LCFS programs present significant upside for every gallon of ethanol we produce

Incremental Opportunity by Program under 50 CI points
($ per gallon)



Based on $85 per metric ton 45Q tax credit , $0.02 per CI point per gallon 45Z tax credit, and $100 per metric ton carbon credit price
Certain credits would be shared, and regenerative agriculture assumes 100% participation from farmers



IRA Deep Dive

Inflation Reduction Act Overview

The IRA has game-changing potential for Green Plains' decarbonization strategy

Signed into law on August 16, 2022

Directs new federal spending toward reducing carbon emissions, lowering healthcare costs, funding the Internal Revenue Service and improving taxpayer compliance

$1 trillion projected to go towards energy programs over 10 years[1]

Existing programs were expanded and extended including:

- BTC - $1.00/gallon blender credit for biodiesel and renewable diesel (RD) extended through 2024
- Advanced Biofuel Credit - $1.01/gallon producer credit extended through 2024
- 45Q CCS – expanded to $85/ton of carbon for geologic sequestration

New programs were introduced including:

- 40(b) SAF producer credit — $1.25-$1.75/gallon 2023–2024
- 45Z Clean Fuel Production Credit (CFPC) — "technology neutral" tax credit from 2025–2027 for production of any biofuel that can meet a 50 CI threshold. $0.02/gallon per point of CI below 50, and $0.035/gallon for SAF

[1] Penn Wharton Budget Estimates

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 over 10 years 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



Expectations for Regulatory Action

Timing and outcomes/implications

Actions To Date

- Treasury requested comments on 45Q, 45Z and 40B Tax Credits
- Guidance issued on SAF Tax Credit, except for alternative GHG modeling options

Regulatory Timing

- Transferability and Direct Pay guidance issued June 14th
- SAF credit guidance expected late Q3 2023
- 45Z Proposed Regulation Q4 2023 / Final Rule Q2 2024

Key Outstanding Issues

- SAF GHG modeling
- Facility-specific petitions
- Applicability of low-CI feedstocks
- Interaction between 45Q and 45Z Tax Credits

2022

Jan. 1, 2022
40A Biodiesel Tax Credit Extension Effective Date Until 2025

Nov. 3, 2022
45Q CCS Credit Comments Requested
45Z Clean Fuel Production Credit Comments Requested

Dec. 19, 2022
40B SAF Credit Guidance Issued / GHG Modeling Comments Requested

2023

Jan. 1, 2023
40B SAF Credit Effective Date
45Q CCS Credit Effective Date

Expected Regulatory Timing

Third Quarter
SAF Credit GHG Modeling Guidance Expected

Fourth Quarter
Clean Fuel Production Credit Proposed Regulation Expected

2024-2025

Second Quarter 2024
Clean Fuel Production Credit Final Regulation Expected

Jan. 1, 2025
45Z Clean Fuel Production Credit Effective Date

Tax Credit Extension / Permanence Scenarios

Likelihood of future action

2023–2024

- IRA clean energy credits very unlikely to be modified
  - Debt ceiling debate
- Treasury regulations more “permanent” than guidance

2025 and Beyond

- 2024 elections and reconciliation
- “Extenders” cheaper than permanence in a budget constrained world
- Congress very likely to consider a major tax bill before the end of 2025 due to Tax Cuts and Jobs Act (TCJA) expirations
- 45Z expires 5 years before most IRA provisions

Expiring Tax Provisions Which Could Provide “Extender” Opportunities

December 31, 2021

- Expansion of Child Tax Credit
- R&D Amortization

December 31, 2022

- 100% Bonus Depreciation

December 31, 2025

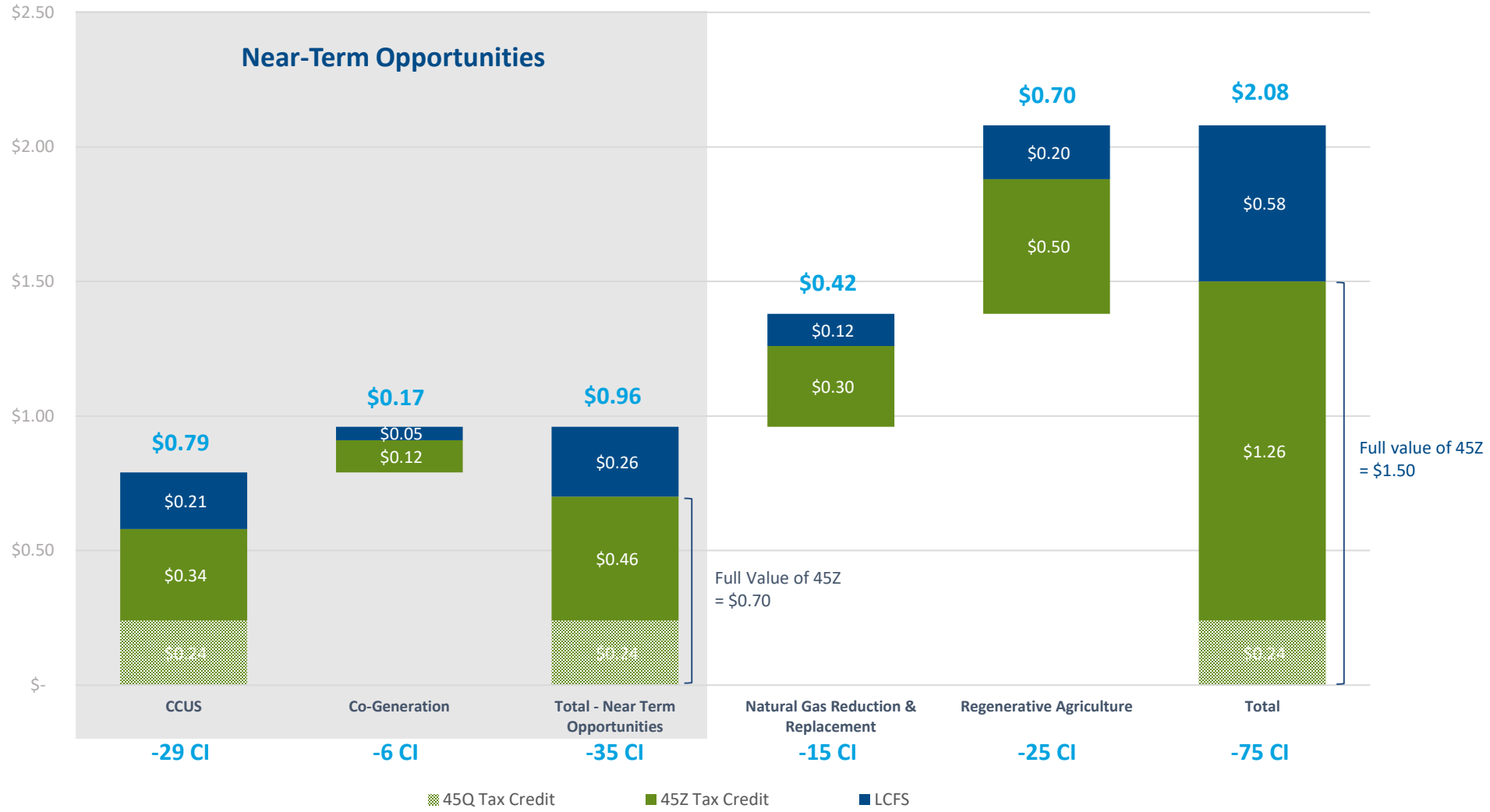
- Individual Income Tax Cuts
- Increased AMT Exemption
- Increased Standard Deduction
- Section 199A Business Income Deduction
- Increased Estate Tax Exclusion

Decarbonization Strategies



Green Plains' carbon strategy is complemented by federal and state programs

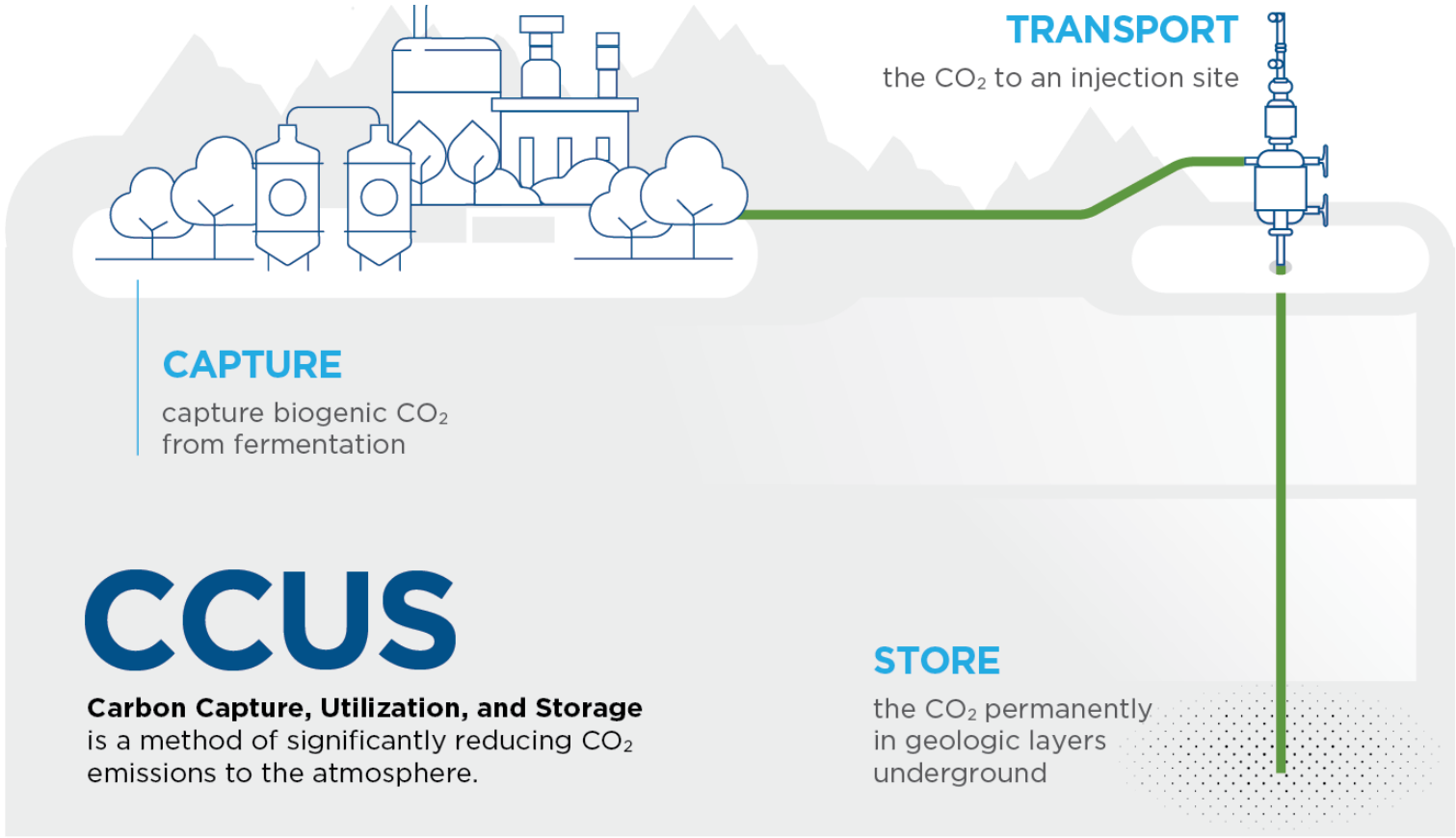
Incremental Opportunity by Strategy
($ per gallon under 50 CI points)



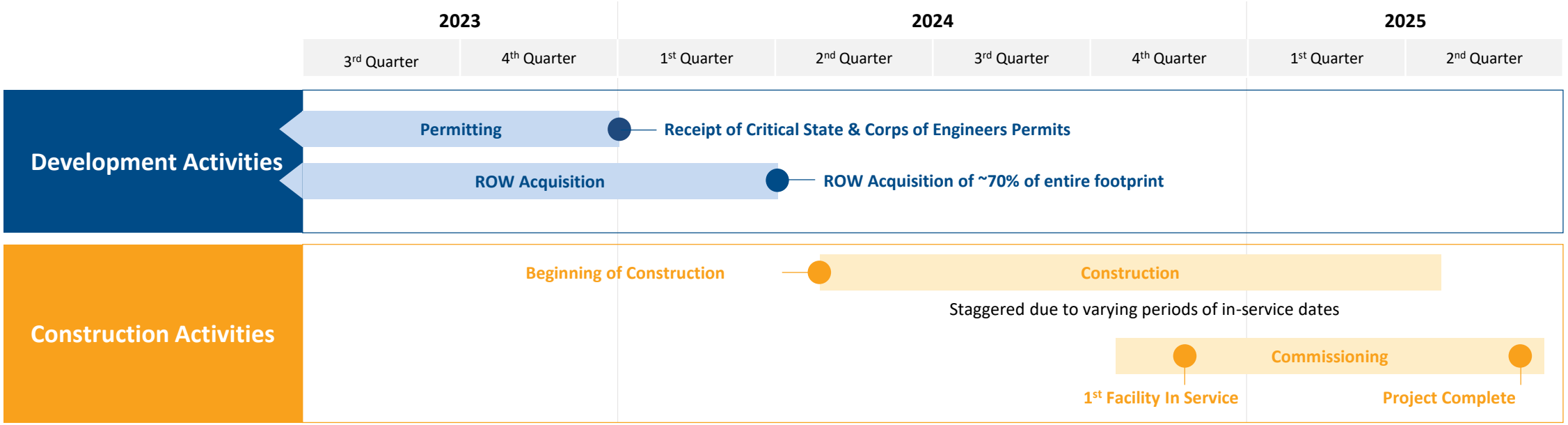
45Q and 45Z are mutually exclusive
Based on $85 per metric ton 45Q tax credit, $0.02 per CI point per gallon 45Z tax credit, and $100 per metric ton carbon credit price
Certain credits would be shared, and regenerative agriculture assumes 100% participation from farmers

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 plans to **utilize a combination of pipelines, direct injection and carbon utilization** to decarbonize our platform



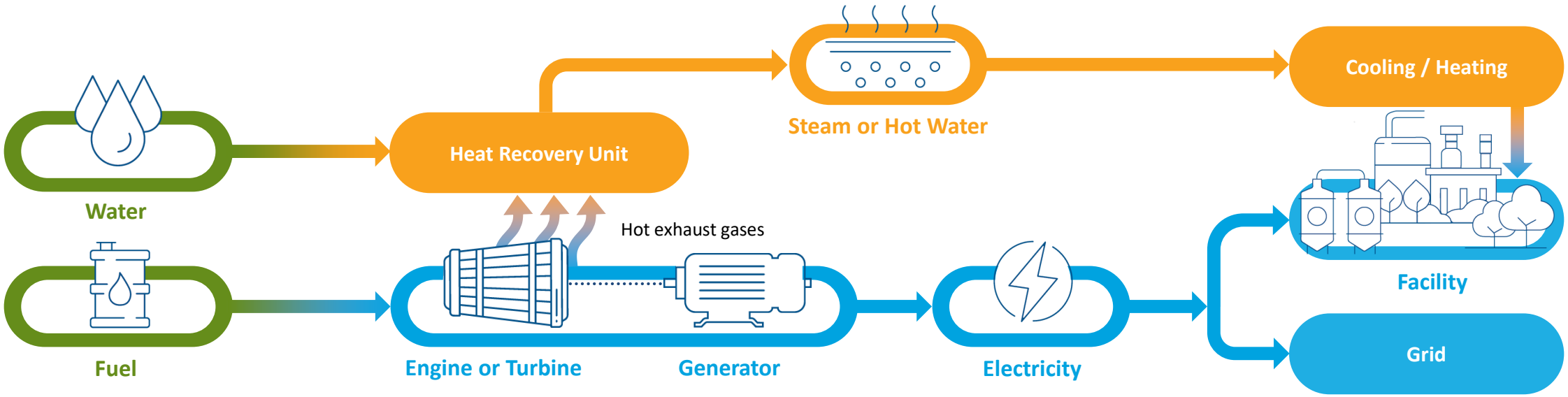
Our partnership with Summit Carbon Solutions allows us to rapidly execute on our carbon strategy across multiple assets



Capture Facilities	• Capture equipment has been ordered • Approximately 9M tons of contracted CO_2
Transportation Infrastructure	• Acquired 70% of Right of Way for 2,000+ miles of transportation infrastructure • Ability to add pump stations to significantly increase capacity, up to 18 MTPA • Diameters range from 4" - 24“
Sequestration	• Leased >130k acres of Pore Space (80%+) • Secured access to a fully permitted Class VI storage well • Filed additional Class VI permits with the North Dakota Industrial Commission

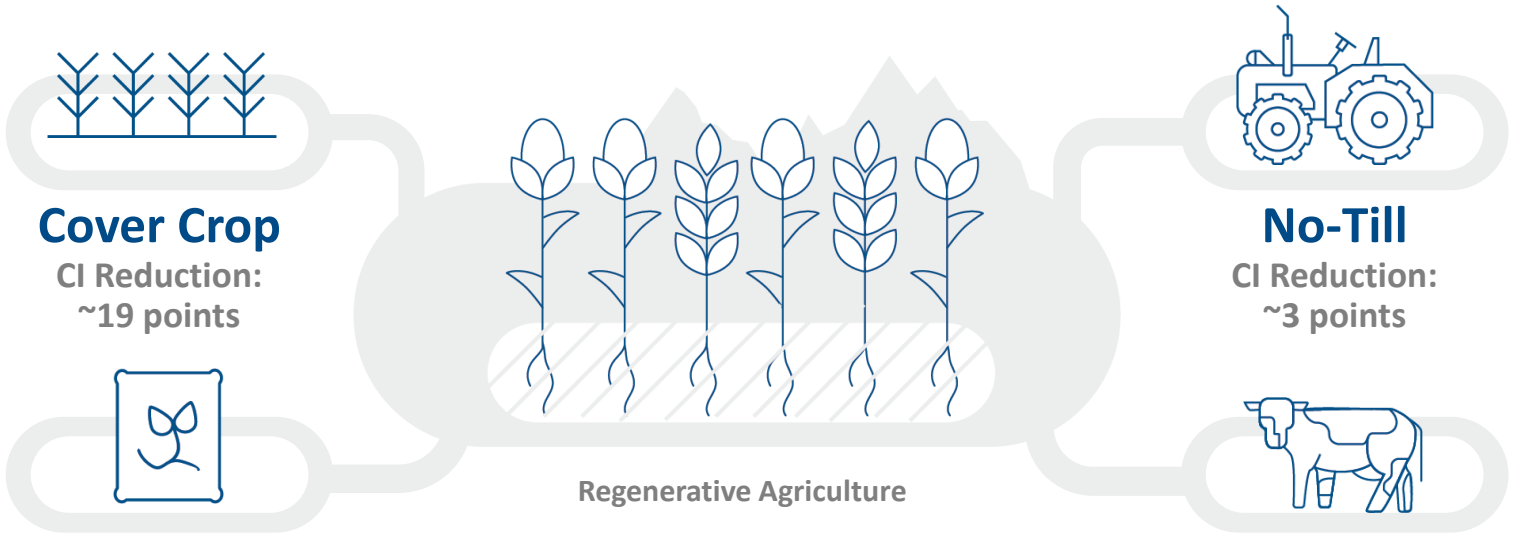
Cogeneration offers an opportunity to further reduce CI

- Ability for our biorefineries to reach **high levels of energy efficiency**
- **Increases our energy reliability** and resilience
- Estimated to lower carbon intensity by ~**6 CI points**
- Potential to use alternative fuel types (hydrogen, biogas) to **further reduce our carbon footprint**
- **Capital-light** strategies available



Potential for farmers to adopt regenerative agriculture practices and further lower our CI is another "capital light" opportunity

- Regenerative agriculture and sustainable on-farm practices can lower the carbon intensity of biofuel production
- Requires coordination and co-operation with farmers providing our feedstock



Cover Crop
CI Reduction:
~19 points

No-Till
CI Reduction:
~3 points

Green Ammonia
CI Reduction:
~6 points

Manure & Other Practices
CI Reduction:
~5–15 points



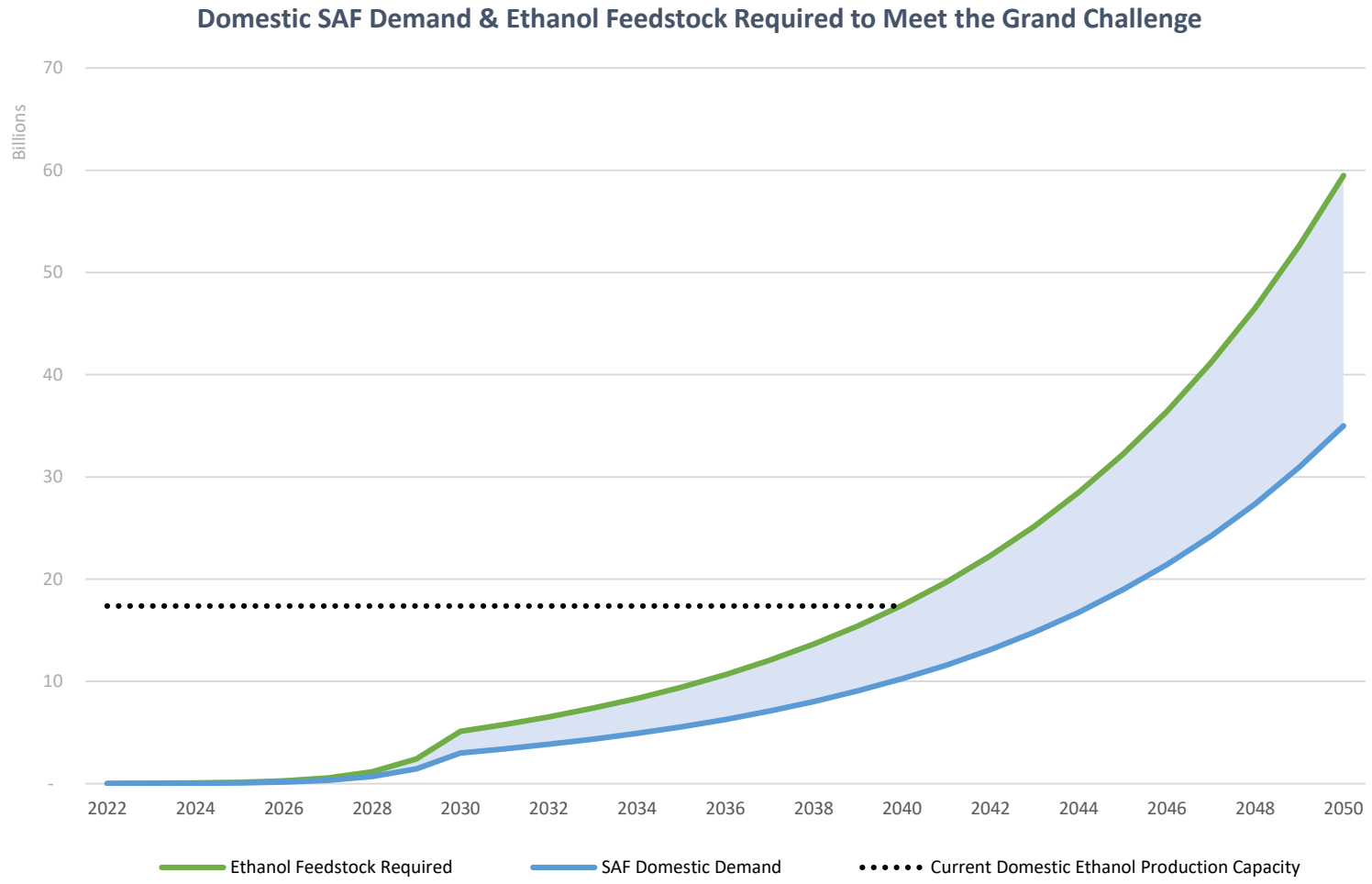
Reductions assume 100% adoption from farmers
Values are measured from Argonne GREET model Feedstock CI Calculator SL Version 2022 assuming default corn inputs



Alcohol to Jet SAF

Massive Potential for Sustainable Aviation Fuel (SAF)

- Grand Challenge SAF targets 3 billion gallons of production per year by 2030 and ~35 billion gallons per year by 2050[1]
- Global demand for aviation fuel is projected to grow from 106 billion gallons to 230 billion gallons by 2050[2]
- Countries are introducing SAF blending mandates, and more airlines are announcing net-zero targets
- 98% of airlines' Scopes 1 and 2 emissions are from burning fossil jet fuel — they need SAF to meet their climate goals
- Ethanol is an advantaged feedstock for SAF and available at scale today



- One gallon of SAF produced through an Ethanol to SAF process requires ~1.7 gallons of ethanol as feedstock.
- Assumes SAF demand grows a steady CAGR from 2022 actual SAF demand to 2030 target of 3 billion gallons of SAF, and steady CAGR from 2030 target of 3 billion gallons of SAF to 2050 target of 35 billion gallons

[1]The White House FACT SHEET
[2]U.S. Energy Information Administration

Ethanol & DCO to SAF

Our renewable corn oil (DCO) is advantaged vs soybean oil (SBO) under 45Z

- ~30 CI RD feedstock vs ~50 CI for SBO translates to $0.70/gal or $0.09/lb of DCO
- Additional value from LCFS programs — low-CI value further advantaged

Decarbonized corn ethanol could qualify for conversion to ATJ SAF

- Guidance may allow for SAF producer to claim 45Z, while the ethanol producer claims 45Q for CCS — which is $85/ton or ~$0.24/gal of ethanol equivalent

IRA stipulates that Treasury provide an alternative LCA model besides CORSIA ICAO

- CORSIA ICAO disadvantages corn and soy feedstocks — has a higher indirect land use change (ILUC) penalty, does not count CCS as reduction, and does not give credit for on farm production practices
- GREET is our preferred model — ~29 point CI reduction from CCS, reduced ILUC penalty and opportunity for on farm practices to further lower CI of feedstock

Without crop-based feedstocks, SAF is unlikely to take off

- Congress intended for the legislation to promote regenerative agriculture, and Treasury is contemplating versions of GREET that incorporate on farm practices with potential additional sustainability factors borrowed from ICAO

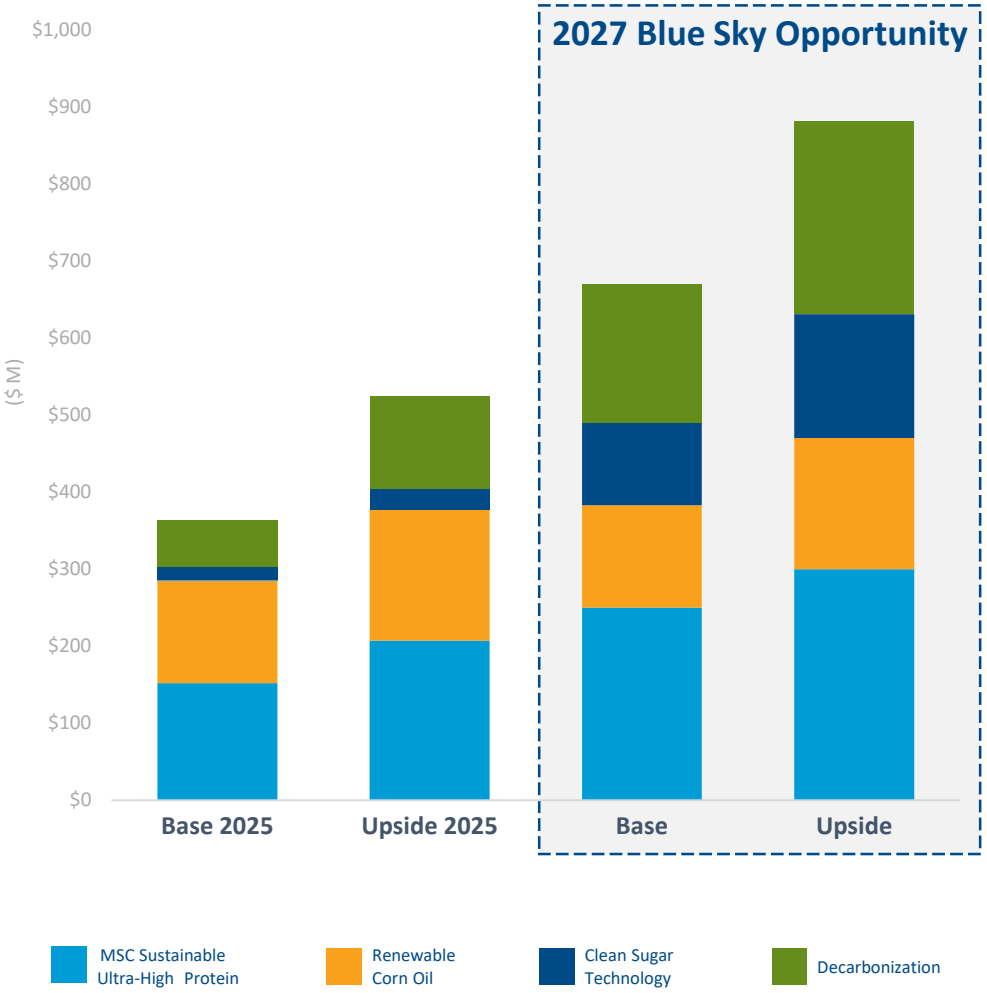


Our platform has significant upside . . .

Investment Opportunities	Capital Investment	Potential Annualized Uplift	Anticipated In-Service
Cogeneration	**Pursuing capital-light options**	**$50 million – $75 million**	**2025 – 2026**
Direct CCUS	**$35 million – $45 million** per site	**~$40 million**	**2027**
Clean Sugar	**$135 million – $200 million**	**$100 million – $160 million**	**2025 – 2026**
60 Pro	N/A	**~$160 million**	**2027**
		Total: $350 million – $435 million	

Assumes 45Z for cogeneration and direct inject
Assumes $100 per ton carbon credit value for cogeneration and direct inject

. . . With Substantial EBITDA Growth Opportunities Beyond 2025



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
- 2027 blue sky opportunity to achieve 100% 60 Pro – shown as an incremental $300 per ton premium

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

- 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
- 2 – 3 billion pounds by 2027 – or 160 – 240 MGY by 2027 with $0.67 per gallon margin uplift
- Capital investment of ~ $1.00 per gallon of capacity converted by 2027

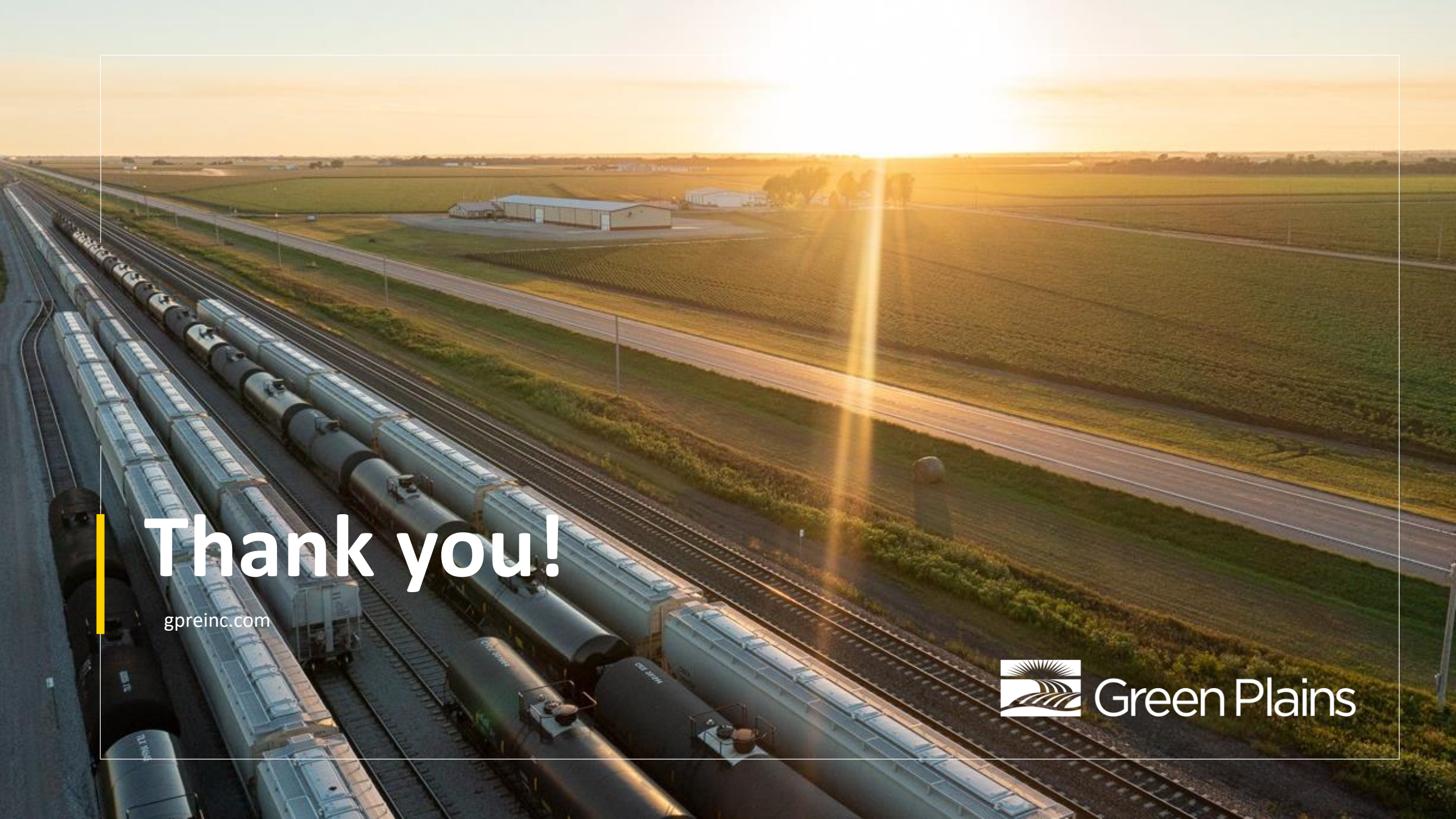
Decarbonization

- Summit Carbon Solutions assumed to begin in 2025 – No capex from Green Plains required
- Base assumes 50% of annualized amounts in 2025
- 2027 includes direct injection and cogeneration benefitting from 45Z

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

Q&A





Thank you!

gpreinc.com

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