

Agenda

- Announcements and updates
- Insetting and the voluntary carbon market – Audrey Barrett Bixler
- Supply chains and carbon intensity assessment – Lauren Miller
- Updates on the Small Landowner Carbon Collaborative Project
- Regulatory updates
- Concluding remarks





Upcoming Events



- Next full group meeting: July 11th, 9 AM CT
- Living Shoreline subcommittee: May 15th, 1 PM CT
- Insurance subcommittee: June 13th, 10 AM CT

To be added to any meeting, please contact Sarah (Sarah.Swackhamer@BCarbon.org)

All meetings held via Zoom.



Katie Kaplan



Founder, Next Wave Carbon LLC

PhD, Applied Ecology, Cornell University,

Dissertation: Marine Protected Areas

Postdoctoral Scholar, UC Davis and California

Department of Fish and Wildlife, Marine protected area monitoring and evaluation plan for the state of California

Meta, Small Business Group, Research Scientist

Spotify, Ad-Machine Learning team, Senior Data Scientist

Website | Google Scholar | LinkedIn



Cornell University.













The opportunity

Corporations are responding to stakeholder environmental demands

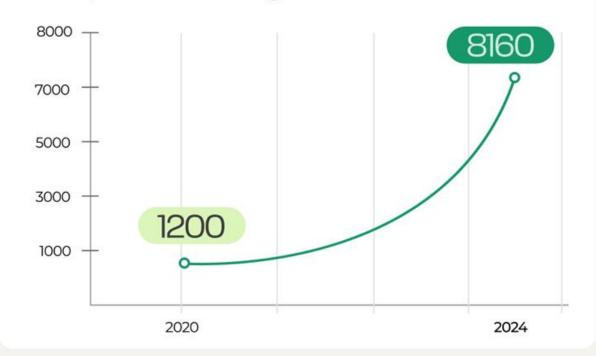


↑ Over **700%** increase since 2020

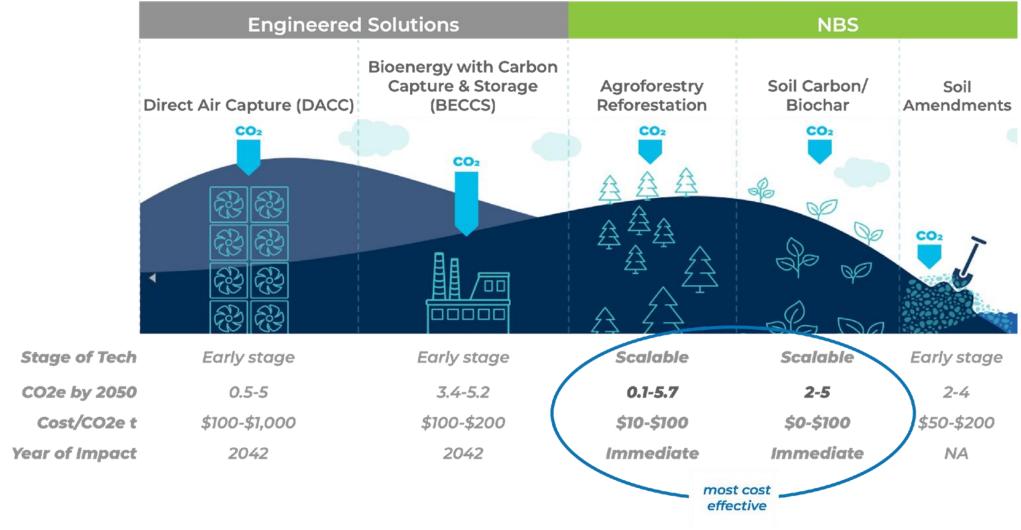




Companies taking action



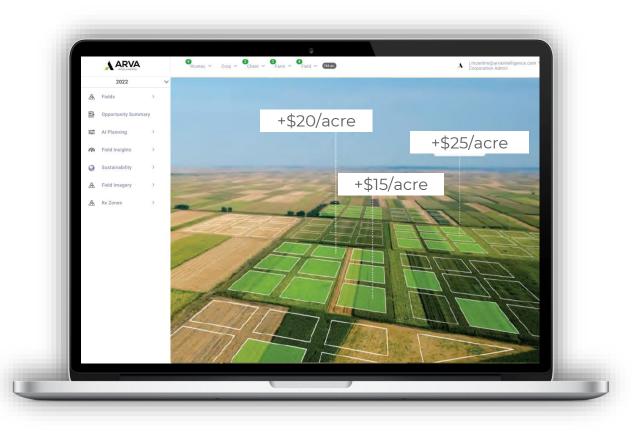
Nature Based Solutions vs Engineered Carbon Removal Solutions







End-to-End Solution for Profitable Sustainability





Aggregate farmer data streams with land management and environmental data



Optimize agronomic practices for sustainability and grower profits



Quantify Scope 3 GHG* claims, carbon offsets, and environmental co-benefits

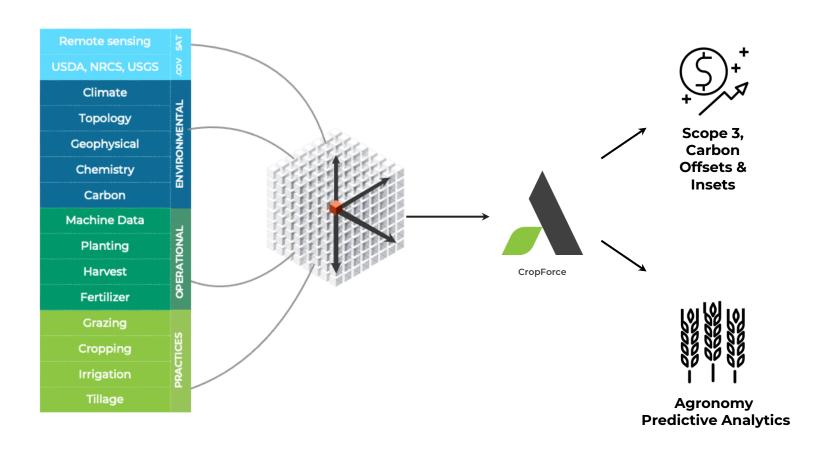
* GHG = Greenhouse Gases (CO_2 , CH_4 , N_2O)



Verify claims and reward farmers



Data Aggregation & Al



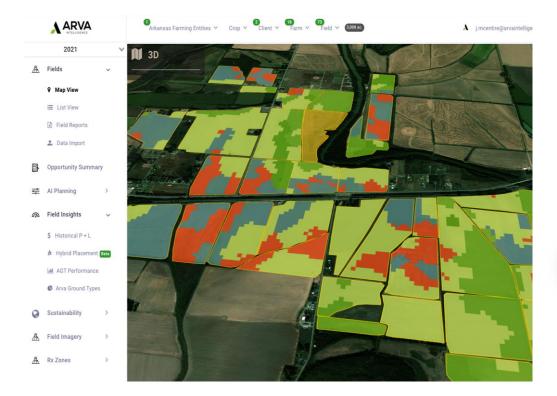
- Data & Scientific backedSustainability, Inset & Offset Claims
- Environmental Co-benefits (water, biodiversity, etc.)

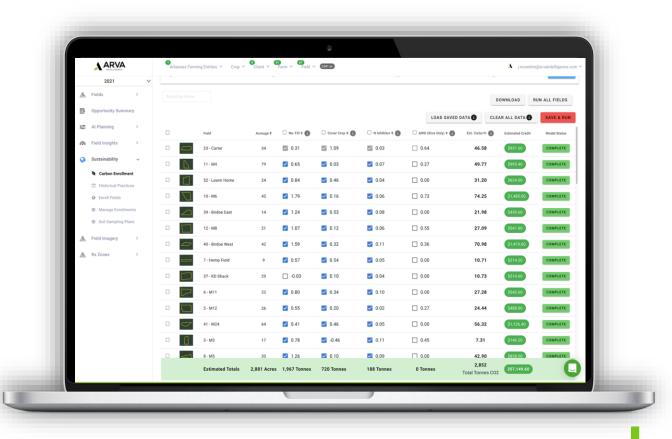
- Optimize profits with genetics & fertility by environment
- Al crop planning to guide optimal land use for a given commodity price and risk profile



Tools to Deliver Agronomic Data

Farmer data, combined with Arva's patented AI soil stratification model, optimize agronomic decisions and offset potential by developing AGTs.



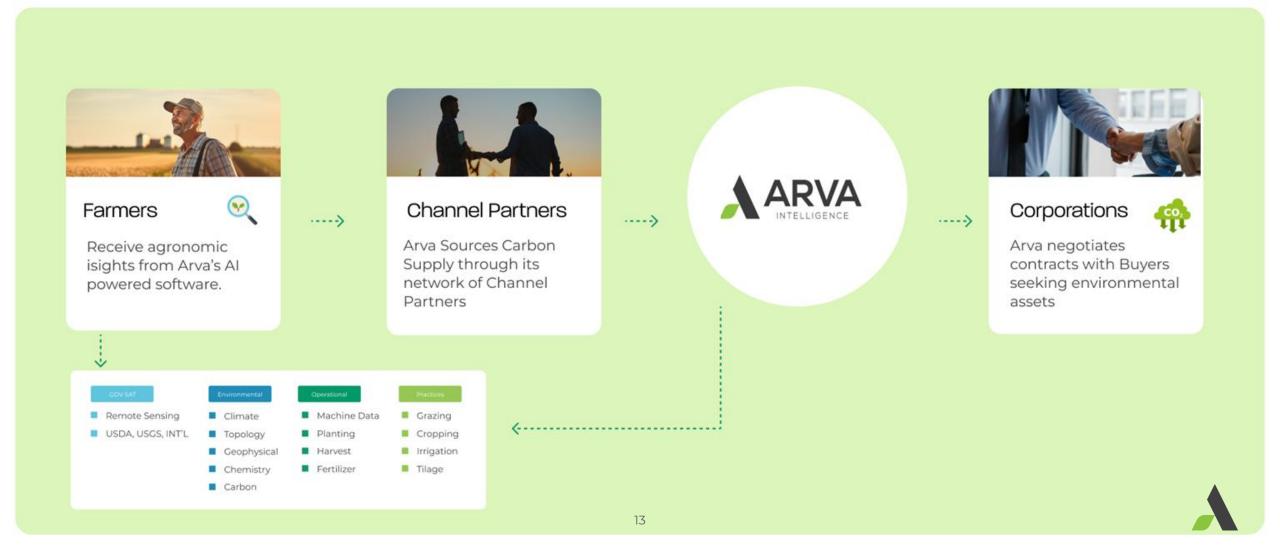


Arva's tool allows farmers to quantify the value of climate-smart practices through scenario planning.





We solved the complex problem of collecting primary farm data.



Our Impact

Arva creates a more profitable, sustainable future for producers.

We make our approach scalable by working within the agricultural supply chain.









\$20M

Paid out to farmers in 2023 for regenerative practices 600+

Farmers enrolled

706K

Acres in 30 US states and Canada 650K

Tonnes of CO₂e reduced and removed

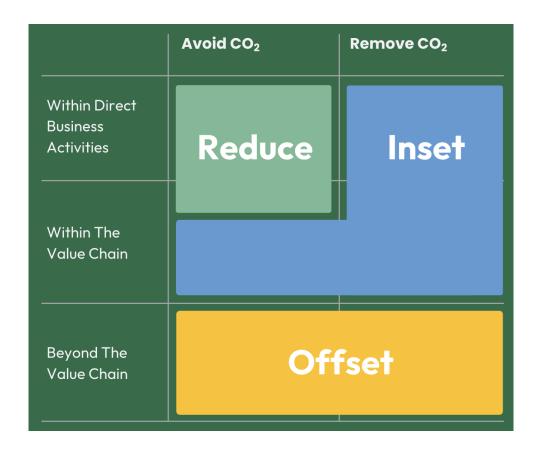


Evolving Landscape of Guidelines

- The Greenhouse Gas Protocol (GHGP) was designed to follow Inventory-based (static) accounting.
 - e.g., a company's GHG emission reduction benefits are tied to specific grain volumes purchased within a supply shed.
 - "Some stakeholders are seeking new or updated objectives to be facilitated by GHGP compared to its original purposes." GHGP Market-based Accounting Survey (April 2024)
- "Market-based GHG accounting allows companies to report their emissions based on the purchase of emission attributes.
 - This practice is widespread for reporting 'scope 2' electricity emissions (e.g., RECs) and is more recently being considered for both 'scope 1' (direct) and 'scope 3' (other value chain) emission sources." (Brander & Bjorn, Aug 2023)
- The SBTi Board of Trustees Statements on April 9 & 12th, 2024, is opening the door for Market-based (dynamic) accounting solutions:
 - "...The use of environmental attribute certificates for abatement purposes on Scope 3
 emissions could function as an additional tool to tackle climate change."
 - SBTi Statement



Decarbonizing Pathways (Source: Kakariki Capital)



Reduce

- Change practices within direct business activities to avoid CO2
- Or procure lower CO2 energy & inputs

Insets

- Working with supply chain partners to help them to avoid or remove CO2
- Remove CO2 within land or infrastructure controlled by the company

Offsets

Remove or avoid CO2 from beyond a company's value chain

Carbon credits refer to both offsets and insets, as they involve a project-based approach to generate emissions reductions or removals that can be used for compensation purposes.



Benefits to Regenerative Agriculture: Supports All Pathways to Decarbonization

Business Transformation

- Implement regenerative practices
- Build resilient supply chain
- Integrate environmental investment



Social & Economic Impact

- Support local communities
- Boost farmer productivity/resilience
- Secure raw material supply



Environmental Benefits

- Reduce emissions
- Increase carbon sequestration
- Restore ecosystems/biodiversity



Partnerships & Solutions

- Deepen supplier relationships
- Identify shared value opportunities
- Scale nature-based solutions



Team



Jay McEntire

CEO & Co-Founder
Former Fintech software
CEO, bank CFO, & energy
exec. Manager of

Glennoe Farmland

Partners, Successful Exits.



Audrey Barrett Bixler

Director of Environmental Markets

Former Senior Energy Security & Sustainability Analyst for DoD. Helped launch & implement Army Net Zero. MS & MPH from UC Berkeley.



Ariah Mazgajewski

Customer Success Lead

Interdisciplinary environmental science and engineering. B.S. Washington State, formerly Team Lead at Locus Ag Carbon Now, Geospatial Data Analyst AmeriCorps and USDA.



Matt Rohlik

Director of Relationship Management

15 years of Precision Ag Management Experience, National Sales Director of 2 Ag Tech Startups, Farmer and Rancher.



Ben Brown, PhD

Co-Founder, Chief ML Architect

Machine Learning Lead & Head of Molecular Ecosystems at Lawrence Berkeley National Lab.



Russell Naisbitt

CFO/COO

Former tech CFO to numerous startups. Grew up on a dairy farm in New Zealand.



Tom Dye

Chief Technology Officer

CEO / CTO / Co Founder of multiple tech firms with IPOs & acquisitive exits. Inventor of 55 patents for system architecture.



Lacey Pyle, PhD

Director of Soil Science

Soil scientist / data scientist with PhD from Rice University; previously worked with Shell Technology Center.



Jon Madden

Chief Product Officer

Former Product Lead for TIME CO2, Senior Product Manager Twitter, and Product Manager Yelp.



Charles Tate

Chairman of the Board

Former Partner at Hicks, Muse, Tate & Furst, investment banker with Morgan Stanley; CPG & financial sector leader.



Mark Isbell

Board Member & Co-Founder

4th Generation Rice
Farmer. First carbon
trade in Ag with
Microsoft. Board
Member Field to Market
& USA Rice.



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Chief Revenue Officer

Former Fintech software and capital markets executive with Nasdaq, CME Group, GFI Group and 360T. Co-founder of ripe.io an early dMRV, traceability and sustainability start up.



Audrey Barrett Bixler - Director of Environmental Markets a.barrett@arvaintelligence.com

Thank you

Arva Intelligence Reuters Webinar arvaintelligence.com







BCarbon Stakeholder Meeting Verity Differentiated Commodity Concept May 2024

VerityTracking.com



Verity is a division of Gevo, Inc. (NASDAQ: GEVO)





Both of these locations sell retrofitted iPhones. Who do you trust more?







Agenda

- Carbon intensity overview
- Supply chain tracking
- Differentiated commodity concept





The unit given a CI score can be a gallon of fuel, a bushel of corn, or a kilowatt-hour of electricity.

CI scores consider emissions from all stages, including:

- Raw material extraction and processing
- Transportation
- Manufacturing or production processes
- Energy consumption

There's no single universal standard for calculating CI scores yet. Different methods place different weights on different factors.

Farm example: practices influencing CI scores include tillage methods, fertilizer use, and energy sources for irrigation.

A carbon intensity score measures the amount of greenhouse gas emissions released throughout the entire life cycle of producing a unit of product.



CI reductions can be converted to tCO2e

Switching example: a diesel truck switches to run on 100% ethanol



Average CI for one gallon of fossil-fuel diesel: 90

Fuel needs for 1 year: 100K gallons

Annual fuel emissions: 724.5 tCO2e



Average CI for one gallon of ethanol: 50

Fuel needs for 1 year: 160K gallons*

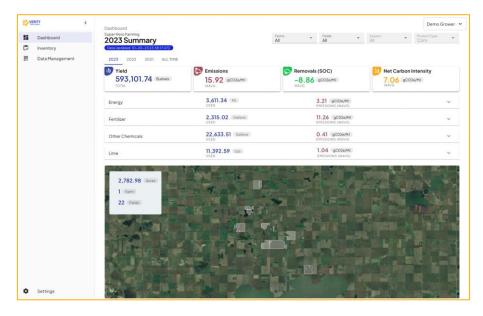
Annual fuel emissions: 644 tCO2e

Fuel emissions savings: 80.5 tCO2e

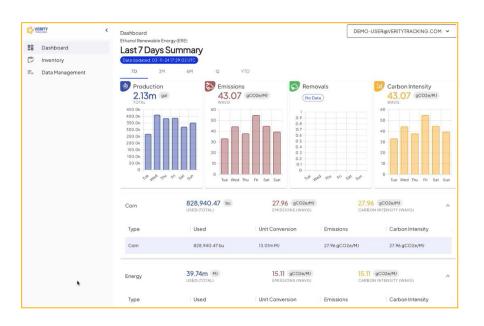




All data points can be captured and adjustments made to CI scores in real-time: we don't need to use less accurate averages or rely on default numbers that may not be accurate



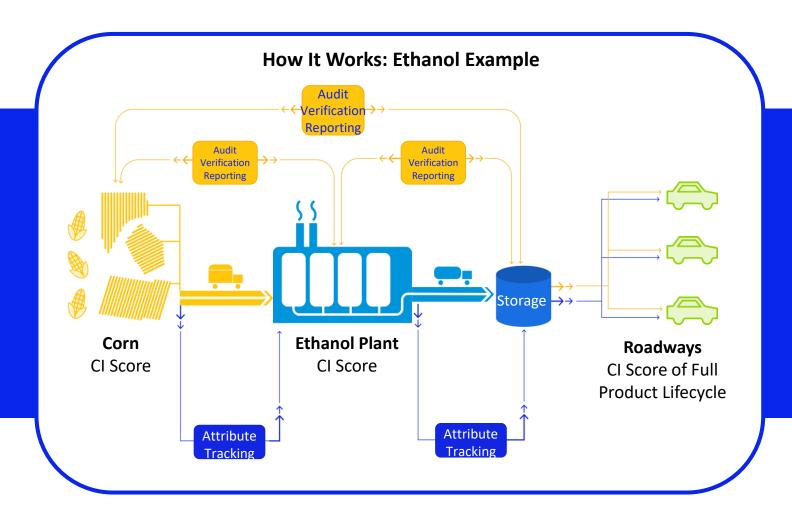
Carbon Intensity can be tracked to the field level and broken down by emissions and soil organic content changes



Biofuel and bioproduct production data can be monitored in real time to make informed decisions and take actions to reduce CI scores



Full traceability identifies areas for reducing supply chain emissions



Field-to-Use End Use Product Examples

Ethanol

Wet distiller grains

Dry distiller grains

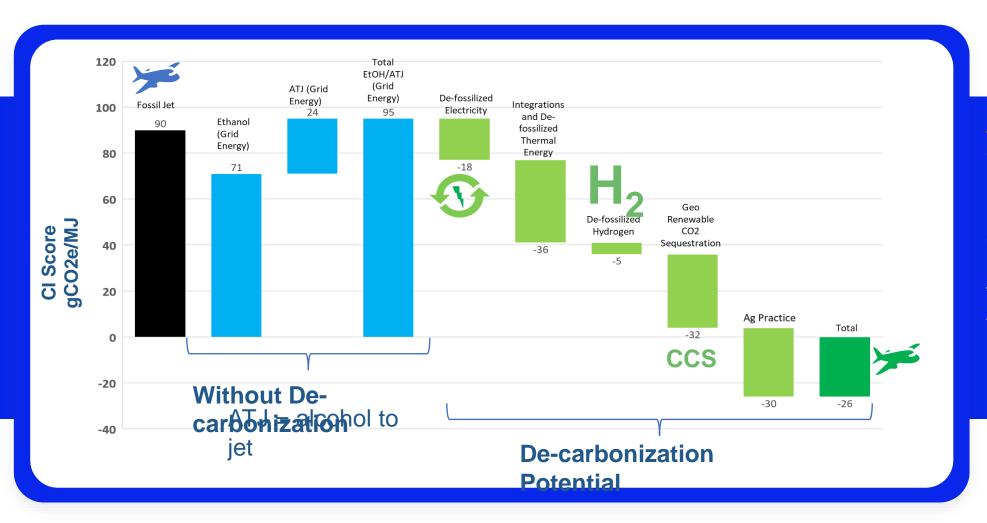
Corn Syrup

Corn Oil



No matter the model, we know the data points for end-toend carbon accounting, traceability and value capture

Example Value Problem: Sustainable Aviation Fuel (SAF) Supply Chain

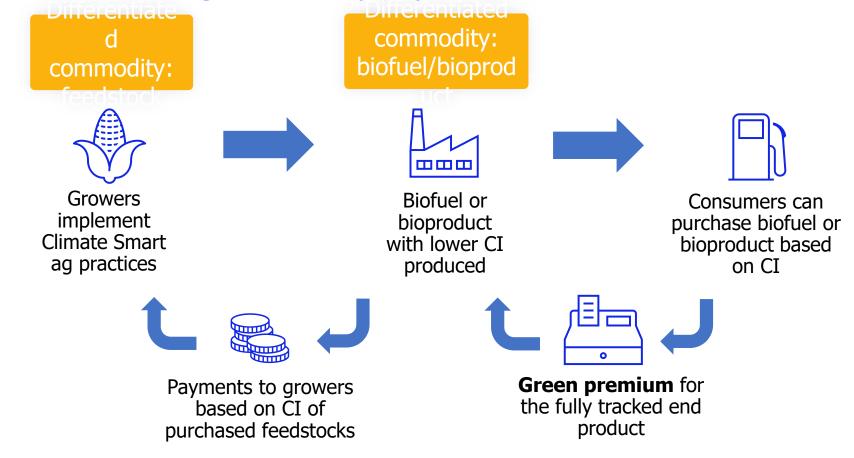


Accounting and Value
Capture of commodity
production and sustainability
attributes across the value
chain.

This environmental attribute tracking applies across biofuels and bioproducts.



The differentiated commodity approach delivers money back through the supply chain to the farm

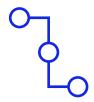


Higher green premiums for lower CIs incentivize producers to reduce their product CIs



What is the difference between a tracked commodity and how we operate today?

Traceability



Know what you're getting:

Actual data is used to calculate CI scores, not defaults, allowing for real measurement of impact, the ability to identify areas for improvement, and reassurance that there is not double-counting.

Carbon Reductions



Market incentive:

Higher green premium for lower CI product through the supply chain encourages efforts to reduce emissions in the production process (using both avoidance and removal efforts)



Challenges of traditional carbon credits for biofuels

- How do we speak the language of this market? Biofuels work in CI, rather than tCO2e. Conversion is feasible, but challenging when discussions are focused on a per-gallon basis
- What is the appropriate timing for a project to generate credits? Biofuels/bioproducts are being manufactured and shipped out constantly and there is considerable variation in carbon intensity (CI) scores throughout the year.
- How do we guarantee permanence? Farmers may work the same land for decades, but are operating under single-year or single-season leases.



A CI-focused field-level strategy is farmer-friendly



Early adopters are not prohibited from benefiting from their good practices



Eliminating multi-year or multi-season agreements facilitates indigenous participation



Known payments for practice improvements allows growers to invest in new technology and practices



Technical support eliminates knowledge barriers







Data. Not Defaults.

Learn more at VerityTracking.com

Lauren Miller
Director of Voluntary Carbon Markets
LMiller@Gevo.com



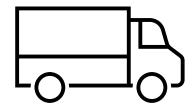
Supplemental Information





At just \$0.005/CI point/gallon, there are financial benefits to decarbonization for all parties

Switching example: a diesel truck switches to run on 100% ethanol





	Fossil-fuel diesel truck	100% ethanol truck
Average fuel CI score	90	50
Fuel needs for 1 year	100,000 gallons	160,000 gallons
Average price/gallon for fuel*	\$4.02	\$2.36 \$2.16 spot price + green premium
Annual fuel cost	\$402,000	\$377,600
Emissions for 1 year	724.5 tCO2e	644 tCO2e

Fuel emissions savings:

80.5 tCO2e

Fuel cost savings:

\$24,400

^{*}Source: US Energy Information Association



Supplemental Insights: Stacking Benefits

Incentivizing and supporting carbon intensity reductions are not the only benefit of Verity Certified Biofuels.

A variety of co-benefits encourage good practices and can help you to meet other ESG goals.

Other Ecosystem Services Benefits

Other environmental attributes

Biodiversity

Nature

Water systems

Community benefits

DEI

Excellent stewardship

Indigenous populations



Regenerative agriculture delivers food, fuel, plasticalternative products and sequesters carbon

Roughly 50% of cropland uses low-till or no-till. With 100% implementation, croplands could sequester 2% of total US GHG emissions⁽²⁾.

With further advances in soil science and other climatesmart practices, even more is possible.

We plan to reward growers for their contributions to CI reduction while improving soil health.



Baseline Conventional Till



Reduced Till leads to a -27 CI reduction or better⁽¹⁾



No-Till leads to a -33 CI reduction or better⁽¹⁾

Combination of practices, soil amendments and microbial solutions have potential to increase soil carbon storage by



Data, not defaults: It all starts with measuring, reporting, and verifying farm data

Field Overview	
Entity	Confidential
Farm	Confidential
Grower	Confidential
Field	Field 150
Field ID	#001565
Acres	151.5
Season	2021
Yield (bushel /acre)	210.6
Bushels	31.906 (810t)
CI from emissions	14.3 gCO2e/MJ
CI including SOC	-15 gCO2e/MJ
Total potential CI contribution from feedstock	-0.7gCO2e/MJ
National Corn Average Cl	30.1gCO2e/MJ

Data Input Sources	
Granular Software	Fertilizer, Lime, Tillage, Herbicide, Insecticides, Yield, Moisture, Cover Crops
Fertilizer Suppliers	Chemical composition
MyJohnDeere Platform	Diesel, Gasoline
Declarative	Electricity, Nitrogen Management
Laboratories/ Supplier Reports	Manure, Soil sampling, Custom Applications, LPG
Google Earth	GIS Practice verifications, Land Use Change check
Certification	RSB Farm verified

Real field-level results showing potential -31 CI reductions in SAF with precision ag, cover crops and conservation tillage

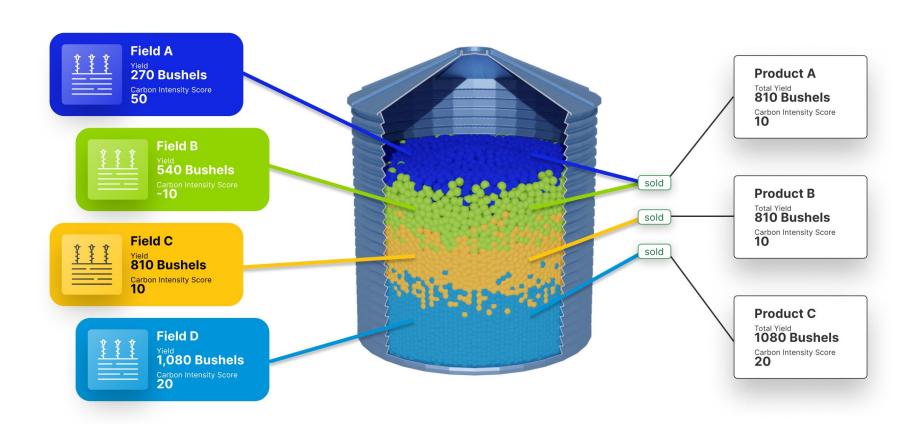
Now: Developing fully integrated and automated system for biofuels from field to gallon.





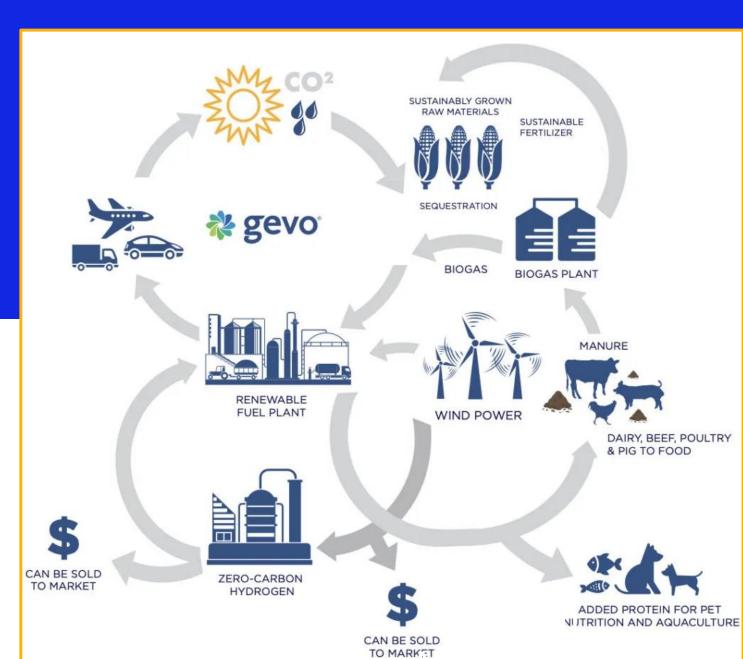


Disclaimer: Verity uses a mass balanced (rather than identity-preserved) approach



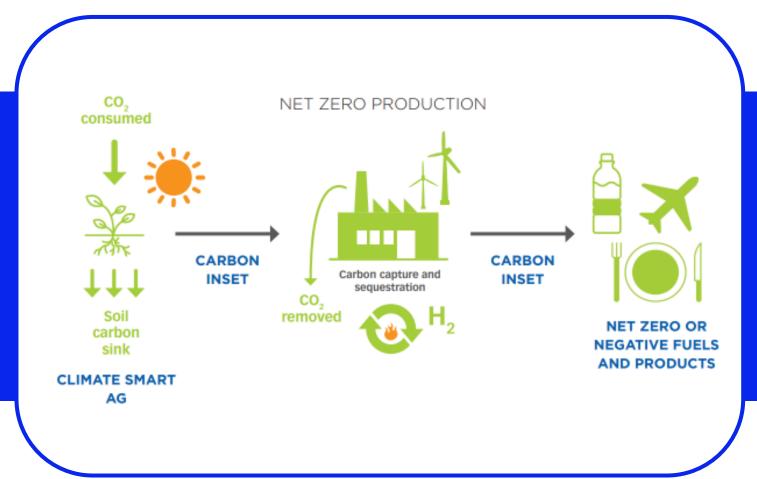


Gevo's circular business model





Verity allows you to track the carbon intensity of your supply chain and identify areas to reduce it further



Don't lose the value of your carbon reductions.

No regional averages: The actual carbon intensity of your supply chain.

Important Note: Verity uses a **mass balance** approach. For example, instead of tracking each individual kernel of corn as it becomes ethanol, Verity can track what goes into a silo vs. what comes out



Growing Markets Requiring Carbon Accounting Solutions



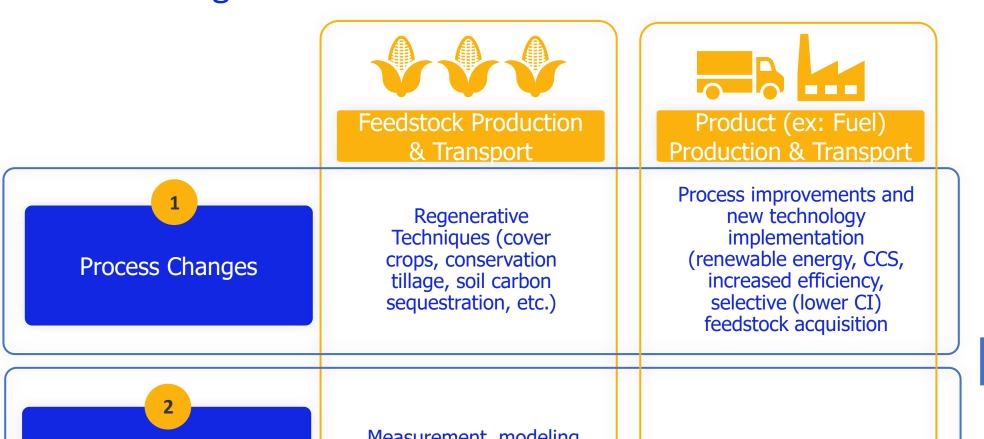




Gevo is actively commercializing solutions from feedstocks to biofuels and SAF



Avoid double-counting, be confident in ecosystem benefits, and capture all carbon value while supporting the regenerative agriculture transition





Auditable improvement in CI via Verity



Reduced supply chain emissions



Quantifiable support to American farmers

Quantification

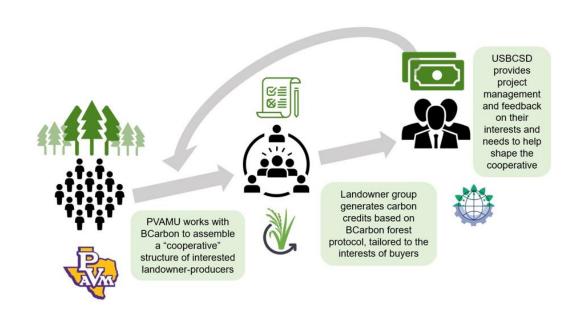
Measurement, modeling, & verification of carbon/ecosystem improvements

Measurement of process improvements



Introduction

- Partnership between BCarbon, Prairie View A&M Extension, and the US Business Council for Sustainable Development
- Seeking to develop a co-op of small-acreage forest landowners
- Landowner outreach, education, and methodological + legal research





Historical Context

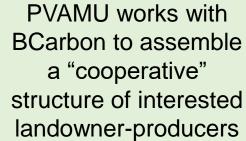


- Smallholders are losing land rapidly and pervasively
- In East Texas, concentrated among African American landowners
- Widespread barriers to entry into ecosystem markets for small landowners
- Co-op as a bridge to market participation



Initial project concept















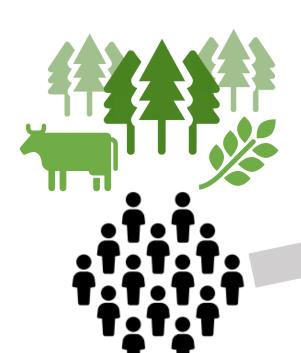
USBCSD provides project management and feedback on their interests and needs to help shape the cooperative

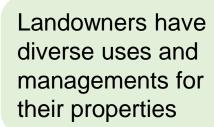
Landowner group generates carbon credits based on BCarbon forest protocol, tailored to the interests of buyers





Current thinking









Philanthropic support from buyers allows them to "walk beside" the project



Education on carbon market and co-op structure is key and takes time







Beginning collaboration this summer!

Carbon market barriers

- Lack of widespread market knowledge
- Cost barriers to entry (sampling in particular)
- Isolation and accessibility

Co-op solutions

- Community of practice and collective knowledge
- Aggregation of sites to reduce sampling costs and decrease isolation



Landowner Outreach

Women in Ag Day

Ag Day on the Hill

Site Visits

Weekly Landowner Meetings

Other Landowner Organizations









Education

Carbon Markets 101: 5 Part Course

- 1. The Context: Carbon and Climate
- 2. The Basics: What is a carbon credit?
- 3. The Methods: How does nature-based carbon sequestration
- 4. The Rules: What are Protocols and Registries?
- 5. The Importance: Why do people want to buy carbon credits?

Widespread overview of carbon market Newsletter with in-depth explanation of concepts and terms



Buyer demand for carbon credits

A message from the Small Landowner Carbon Collaborative

Hi Emmanuel,

Happy Friday! Today we're releasing the final video in our education series - "What is a Carbon Credit?" Here's the link: https://youtu.be/3f9CMheSNm8

You can find a written overview of the video content below.

We'd love to hear your comments. Let us know what you think!

What's Next?

Tomorrow is Prairie View's Ag Day on the Hill, where we'll be tabling for the Small Landowner Carbon Collaborative Project from 8:00 AM - 4:00 PM. We'd love to see you in person there!

Key Concepts: Demand for carbon credits

The main source of demand for carbon credits comes from companies, government entities, and other organizations seeking to compensate for, or **offset**, their emissions. By purchasing carbon credits, these groups can subtract from their overall emissions the amount of CO2 represented by the carbon credit. If they buy enough credits to cancel out their overall emissions, they can achieve **net zero emissions**. However, it's important to note that offsetting is a supplement to, not a replacement for, direct emissions reductions through things like improving efficiency and using clean energy.



Looking Ahead to End Year 1

- Continuing Site Visits
 - Round 1 December 2023
 - Round 2 April 2024
 - Round 3 Late May/June 2024

December 2023
3 interested landowners
195 acres

February 2023
34 interested, 15 landowners
422 acres

April 2023
57 interested, 25 landowners
Over 500 acres



Looking Ahead to End Year 1

- MOOC Participation
 - HEC Montreal Case Study
- Other events + partnership cultivation
 - Federation of Southern Co-Operatives
 - NACFLA Nacogdoches-Angelina County Forest Landowners' Association
 - TASFR Texas Agroforestry Small Farmers and Ranchers





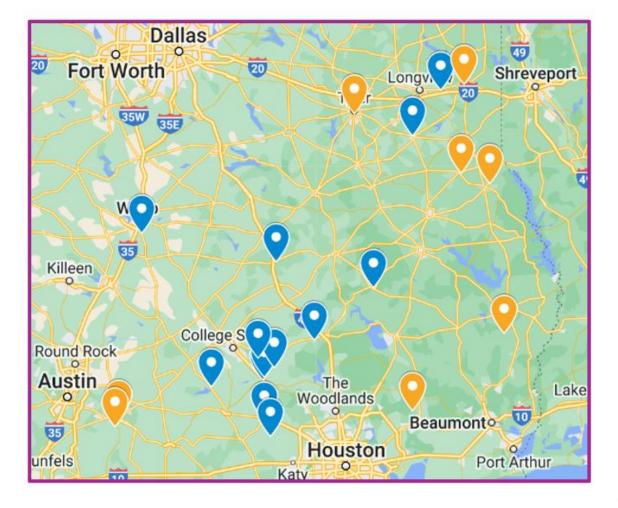




Year 2 proposal: "focus group" to pilot co-op formation concept

The pilot landowners will be *paid for participation* to cover the cost of:

- 1. Time in the pilot program
- 2. Any MRV on their property
- 3. Sustainable land management practices





Year 2 objectives

a) answer key questions

- 1. Costs of aggregating these small sites?
- 2. Challenges and opportunities in the process of drafting co-op bylaws for this type of organization?
- 3. How much does aggregation help to overcome the barriers faced by these landowners?
- 4. Will buyer demand for these smallholder credits be sufficient to meet the landowners' needs and turn a profit?

b) increase educational outreach opportunities



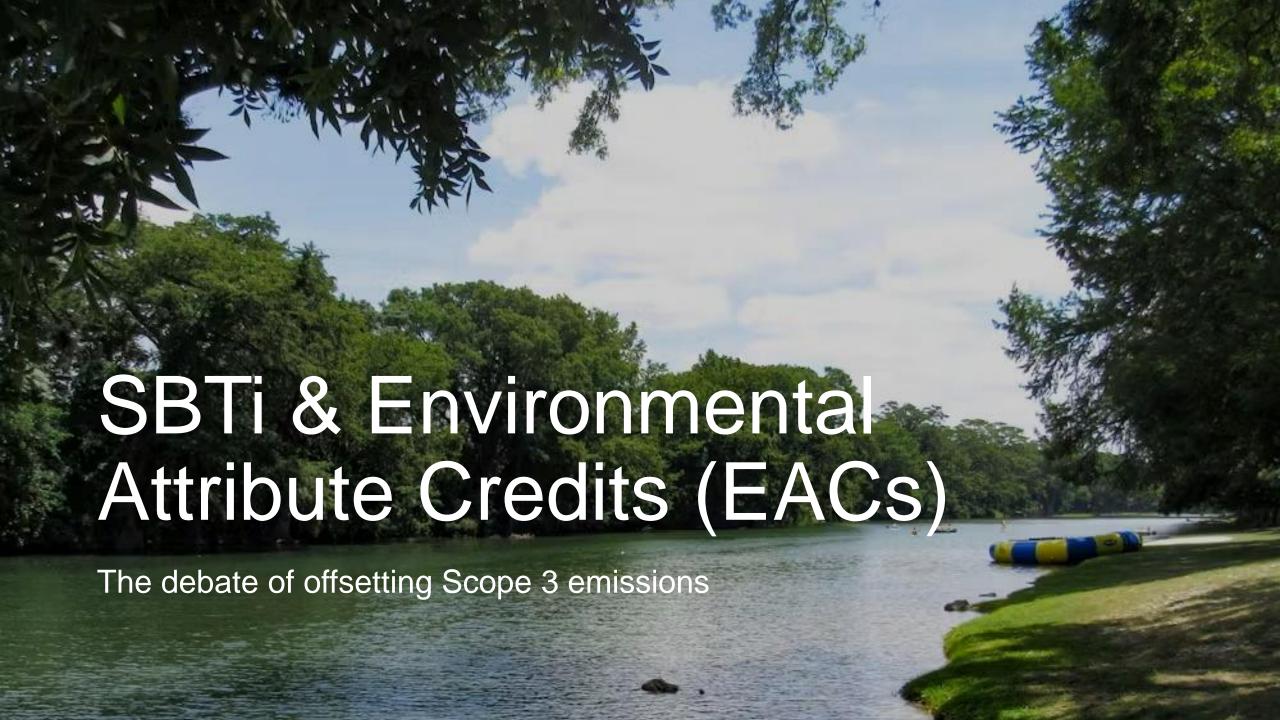
How you can help!

- Donate to support the case study/pilot project
- Contact us with interest to get involved and buy credits from the project down the road









Science-Based Targets Initiative

- Founded as collaboration between the CDP (aka Carbon Disclosure Project), the UN Global Compact, the World Resources Institute, and the World Wildlife Fund
- Leading global corporate climate initiative with core funding from
 - Bezos Earth Fund & IKEA Foundation
- 5,321 companies with SBTi-approved targets / 7,826 companies taking action
- What does SBTi do?
 - Define/promote best emissions reductions practices
 - Develop tools and guidelines to aid in constructing science-based targets
 - Validate companies' targets as science-based
- "Gold standard" for companies looking to reduce emissions due to their backing by big organizations/companies -Who's who of Fortune 500
- Has seen US congressional pushback via hearings and expert testimony (Fall 2023)



Current SBTi Guidelines

Science-Based targets: "Corporate targets to mitigate GHG emissions that are in line with what the latest climate science says is necessary to meet the goals of the Paris Agreement – to pursue efforts to limit warming to 1.5°C."

- Scope 1 and 2 emissions must be covered
- Scope 3 must be covered if 40+% of total emissions

CURRENT POLICY: No use of offsets permitted to reduce emissions/meet targets -> "The use of carbon credits must not be counted as emission reductions toward the progress of companies' near- or long-term science-based targets."



Assessing and Validating Targets

- Target Validation Team assesses submitted target's compliance with SBTi criteria
 - Target boundaries, GHG coverage (all 7 major GHGs), scope coverage, nearterm target methodology validation, accounting requirements, ambition (aligned with sub-1.5°C IPCC goal), sector-specific guideline/requirements
 - Separate processes/requirements for small/medium sized firms and financial institutions
- If targets align -> published on dashboard as "targets set"
- If targets fail to align -> returned to company for amendments
- Companies with existing emissions targets will be validated with SBTi Criteria Assessment Indicators for near-term (5-10 years), net-zero, GHG accounting, and sector-specific targets



SBTi's Environmental Attribute Credits (EACs)

- SBTi definition of EAC
 - "Instruments used to quantify, verify and track the environmental benefits associated with climate mitigation activities or projects."
- Can be RECs, Credits, other Green Energy Certs, low-carbon, or green products such as "Green Steel"



Recent Developments and Backlash

- SBTi <u>September 2023</u> call for evidence and public comments regarding the use of carbon offsets and EACs
 - Desire of SBTi Board and upper management to determine the feasibility, verifiability, and scientific basis for the potential use of EACs
- Recent <u>statement</u> regarding EACs for Scope 3
 - "SBTi has decided to extend [EAC] use for the purpose of abatement of Scope 3 related emissions beyond the current limits. This will entail the definition by SBTi of specific guardrails and thresholds as well as the rules to be applied for these certificates to be considered valid for Scope 3 emissions abatement purposes respecting the principles of mitigation hierarchy."
 - Reasoning -> companies struggling to reduce Scope 3 emissions -> EACs make some change and funnel money into green projects



SBTi Staff Opinions and Management Responses

- Staff backlash against CEO and Board of Directors
 - Concerns of greenwashing and loss of science-based foundation
 - Staff promotes measured reductions in corporate emissions within the supply chain, not credits/offsets/attributes
 - Staff claimed Board and management violated Standard Operating Procedures for internal decisions and public notices -> news came out of nowhere
- Long story short: Response statement that nothing is currently happening->
 - SBTi will aim to issue a draft of basic rules, thresholds, and guardrails for the potential use of EACs by July 2024.



Shifting Perceptions and Opinions

- Industry sentiments regarding EACs -> which is also stakeholder sentiments because SBTi is largely funded by industry/economic leaders
 - Many corporations <u>like the idea</u>
 - Opens more firms up to the SBTi "gold standard"
 - Helps reduce Scope 3 emissions, which is proving difficult for corporations
 - Most of the **carbon credit 'industry' is ecstatic** project developers, MRV providers, etc. More 'legitimacy' to their efforts and big tailwind.
 - Split across NGOs and green leaders on whether this is great for funneling new funding into green projects or is enhancing corporate greenwashing or just a policy about-face



Dept. of Interior – Bureau of Land Management "Conservation" Rule

- Proposed BLM Rule Spring 2023 (via agency rule-making process)
 - Agency mission is to "manage public landscapes to support multiple uses and the sustained yield, or longterm health and sustainability, of their natural resources."
 - Owns approx. 250 million acres across American west
 - Significant pushback from western grazing and livestock organizations
 - Proposed "Conservation" and new Recreation uses on par with mining, oil & gas development, grazing, mineral leases, etc.
- Final Rule published April 2024
 - 'Compensatory Mitigation' Leasing Provision- impact of development mitigated via habitation restoration
 - Restoration Leasing Provision- allow for consideration of market-based solutions that improve ecological health
 - Special designation process for "Areas of Critical Environmental Concern"
- WEST Act passed the House, in Senate will nullify the Final Rule if passed.



