

Adapting Additionality for Agricultural Carbon Credits

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**Gardner
Agriculture
Policy
Program**



Bock Program

Roadmap

- Thesis
- Why reduce emissions?
- Why agriculture?
- What are Carbon Markets?
 - Compliance
 - Voluntary
- Current policy and legal landscape
- Additionality in the current registries
- How can we adapt additionality to agriculturally generated credits





Thesis

- Our Paper argues that, in the context of agriculturally generated credits, **additionality should be adapted to account for compliance with existing conservation programs** and other agricultural realities. An adaptable approach to additionality would enable voluntary carbon markets to facilitate emission reductions, whereas the current, **rigid application of additionality risks further industrializing and consolidating agriculture.**

The New York Times

Trump Administration | LIVE Updates 3m ago | Epstein Files | Whistle-Blower Report | TrumpRx | Call to 'Nationalize' Elections | Policy Lawsuits | Tariff Tracker

Trump Allies Near 'Total Victory' in Wiping Out U.S. Climate Regulation

A small group of conservative activists has worked for 16 years to ...

The New York Times

Climate 'Superfund' Bills Spread Nationwide, Despite Legal Battles

The laws aim to force oil companies to help pay for damage from global warming. Industry is gearing up for state-by-state battles.

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Flooding in Vermont in July 2016. Other states have passed similar "superfund" laws.

Green Amendment enshrines rights in constitution. This is popular on all sides. | Opinion

Clean Water Now referendums in 2021 and 2022 showed strong, nonpartisan success when voters were directly asked on their ballots how much they care about Wisconsin's water.

Allison Werner Special to Milwaukee Journal Sentinel
April 22, 2025, 5:03 a.m. CT

State lawmakers bailed on a constitutional climate amendment. Advocates will take it to voters

Environmentalists recently filed a petition to get Oregon voters to guarantee a healthy climate in the state constitution

BY: ALEX BAUMHARDT - JULY 21, 2025 6:00 AM

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U.S. Cold Snap Kills Dozens and Leaves Thousands Without Power

At least 60 million people under National Weather Service warnings, but temperatures forecast to warm in parts of the South

By Joseph De Avila [Follow](#) and Gareth Vipers [Follow](#)
Updated Feb. 3, 2026 2:35 pm ET

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EXCLUSIVE POLICY

Trump to Repeal Landmark Climate Finding in Huge Regulatory Rollback

Move would reverse legal determination that greenhouse gases threaten public health

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Feb. 9, 2026 9:00 pm ET

Soil as a Carbon Sink



- Farmers **can leverage practices** that sequester, reduce, or avoid emissions to generate carbon credits.
 - Potential Practices: No-till or reduced-till, cover cropping, diversified crop rotations, fertilizer use protocols, installing anaerobic digesters, composting, improving on-farm water management, biochar.
- Then sell those credits to various entities seeking to offset their emissions
- **Co-benefits** can increase participation
 - Increase soil fertility, water retention, and avoid erosion

Table 1. EPA Estimated 2019 GHG Emissions and Sequestration in U.S. Agriculture and Land Use, Land Use Change, and Forestry (LULUCF)

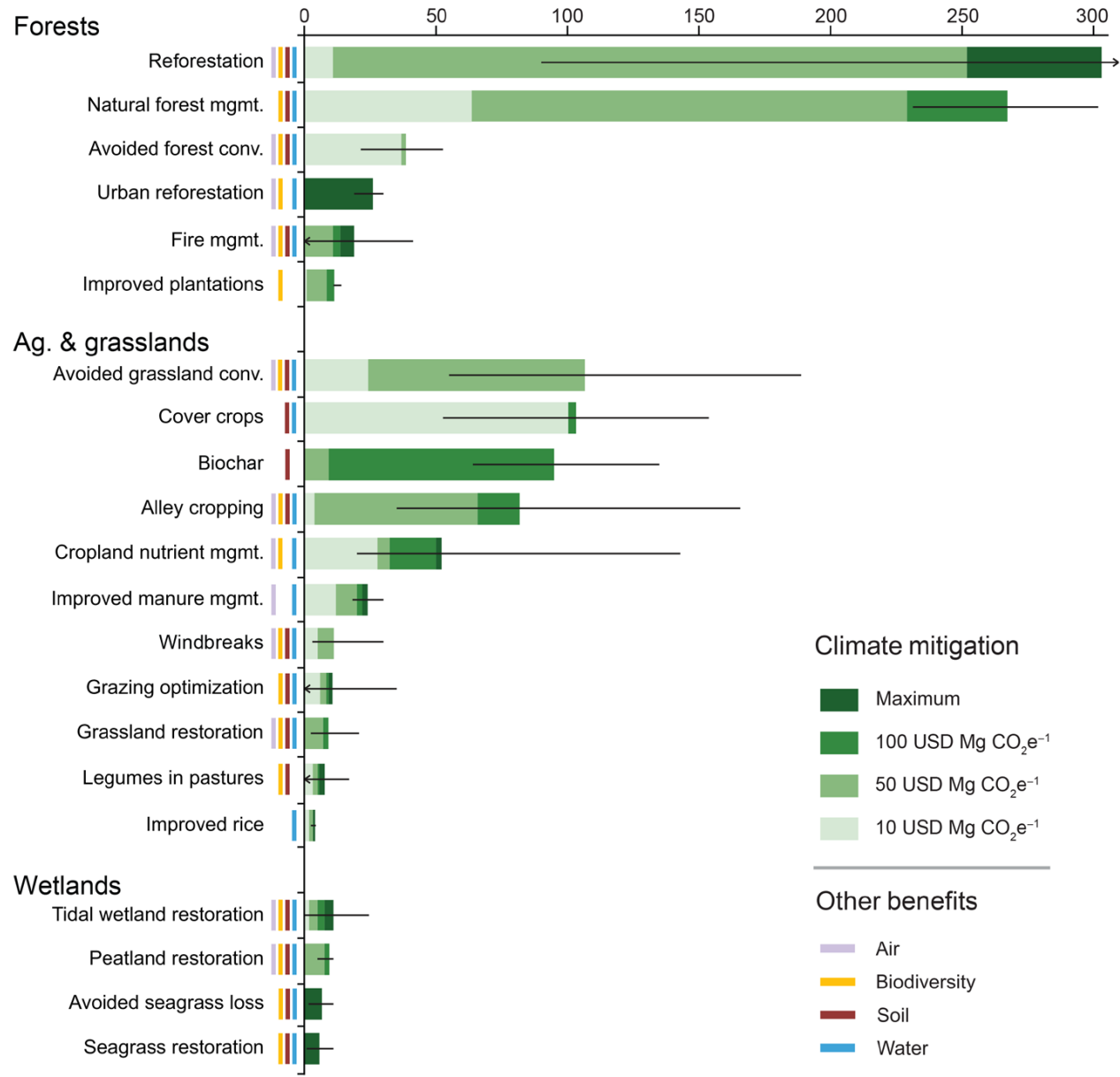
Million Metric Tons of CO₂ Equivalent (MMT CO₂e)

Source	Emissions	Sequestration
Agriculture Activities		
Agriculture soil management (N ₂ O)	345	-
Enteric fermentation (CH ₄)	179	-
Manure management (CH ₄ and N ₂ O)	82	-
Fossil fuel combustion (CO ₂)	40	-
Other agricultural sources	25	-
Total for agriculture sector	670	-
LULUCF		
Forestland remaining forestland	-	676
Land converted to forestland	-	99
Cropland remaining cropland	-	15
Land converted to cropland	54	-
Grassland remaining grassland	15	-
Land converted to grassland	-	23
Wetlands remaining wetlands	-	4
Land converted to wetland	.2	-
Settlements remaining settlements	-	122
Land converted to settlements	79	-
Total LULUCF	149	938
Total U.S. GHG Emissions from All Sources	6,558	-
Net LULUCF	-	789
Total Net U.S. GHG Emissions from All Sources	5,769	-

Source: Prepared by CRS. Data from EPA, *Inventory of U.S. Greenhouse Gas Emissions and Sinks: 1990-2019*, April 2021.

Notes: Other agricultural sources include rice cultivation (16 MMT CO₂e), urea fertilization (5 MMT CO₂e), liming (3 MMT CO₂e), mobile combustion (1 MMT CO₂e), and field burning of agricultural residues (1 MMT CO₂e). Indirect emissions from electricity use at agricultural operations (35 MMT CO₂e in 2019) are not included in this table (EPA Inventory, Table 2-12). LULUCF estimates are from Table 6-1.

Climate mitigation potential in 2025 (Tg CO₂e year⁻¹)



Source: Joseph E. Fargione et al., *Natural Climate Solutions for the United States*, 4 SCIENCE ADVANCES 2 (2018)

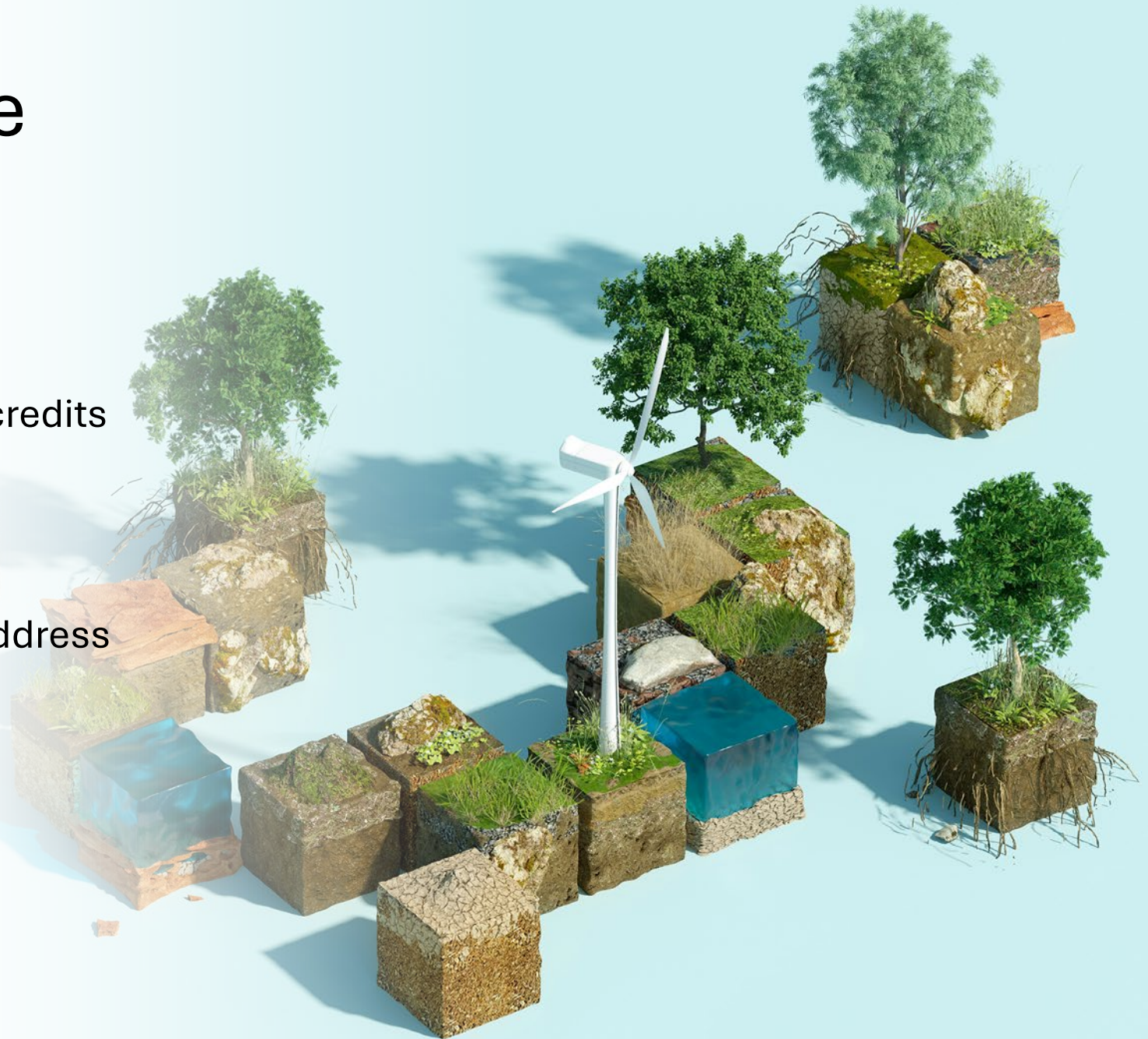


Carbon Markets

- Economic frameworks that foster buying and selling of carbon credits
- Operate in two ways:
 - Compliance – government regulations require GHG emission reductions from “covered entities”
 - Voluntary – no government regulations
- **Farmers participation is always voluntary even in compliance markets**

One Credit = One Metric Ton CO2 Equivalent

- “A ton is a ton” ... but are all credits the same quality?
- Registries establish quality assurance mechanisms to address accounting risks:
 - Leakage
 - Permanence
 - Additionality



Carbon Registries

- Roles:
 - Develop and approve protocols for credit generation for **both compliance and voluntary markets**
 - Verify adherence to standards – using third-party verifiers
 - Operate registry systems that issue, transfer, and retire credits
- Four registries in the United States
 - **Climate Action Reserve (CAR)**
 - **Verra**
 - American Carbon Registry
 - The Gold Standard



CLIMATE
ACTION
RESERVE



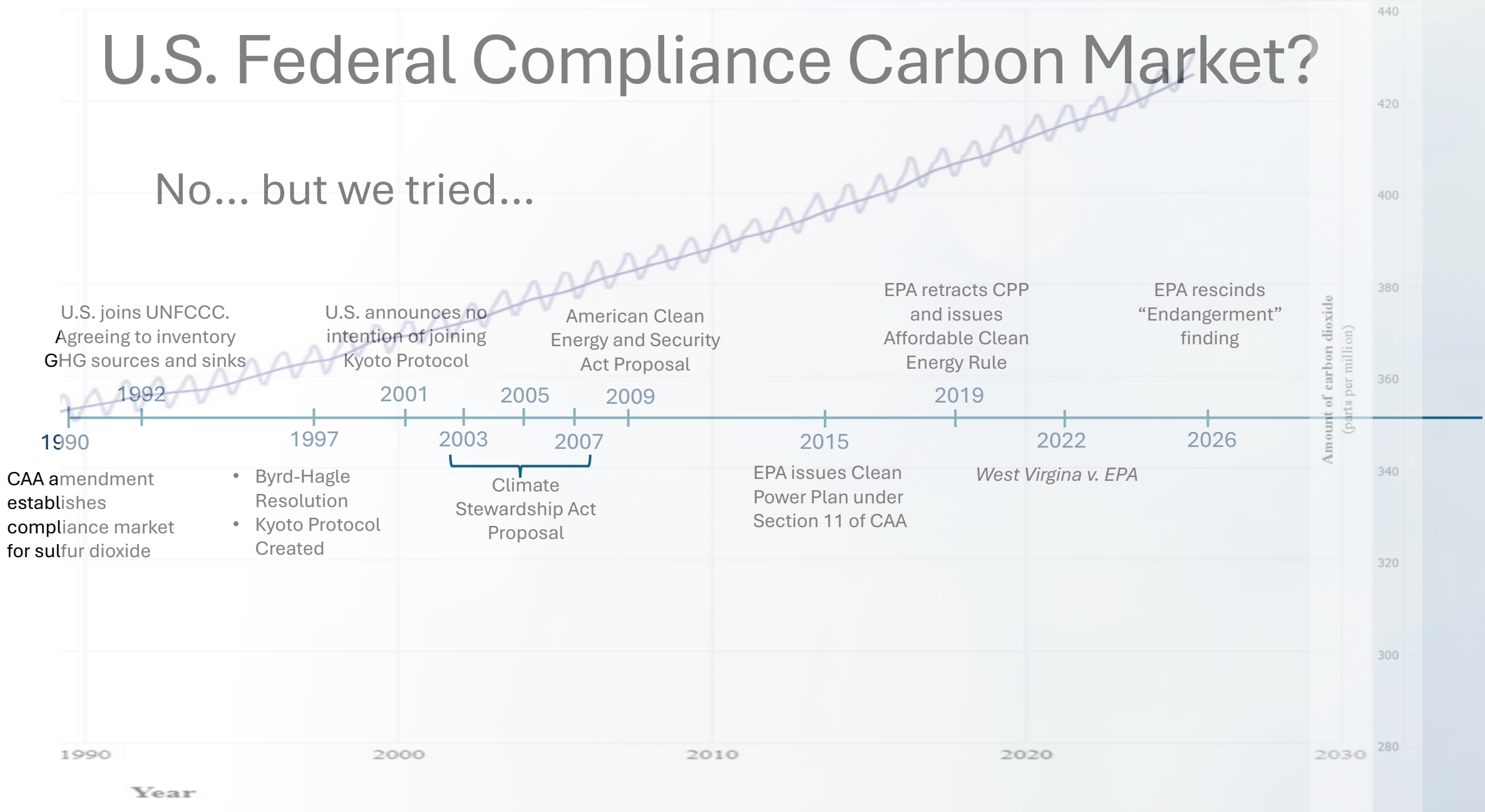
Gold Standard[®]
for the **Global Goals**



AT WINROCK INTERNATIONAL

U.S. Federal Compliance Carbon Market?

No... but we tried...



Compliance Markets at Regional/State/Industry Levels

Northeast Regional Greenhouse Gas Initiative

Washington Cap-and-Invest Program

California Cap-and-Trade program

Carbon Offset Reduction Scheme for International Aviation
(CORSIA)

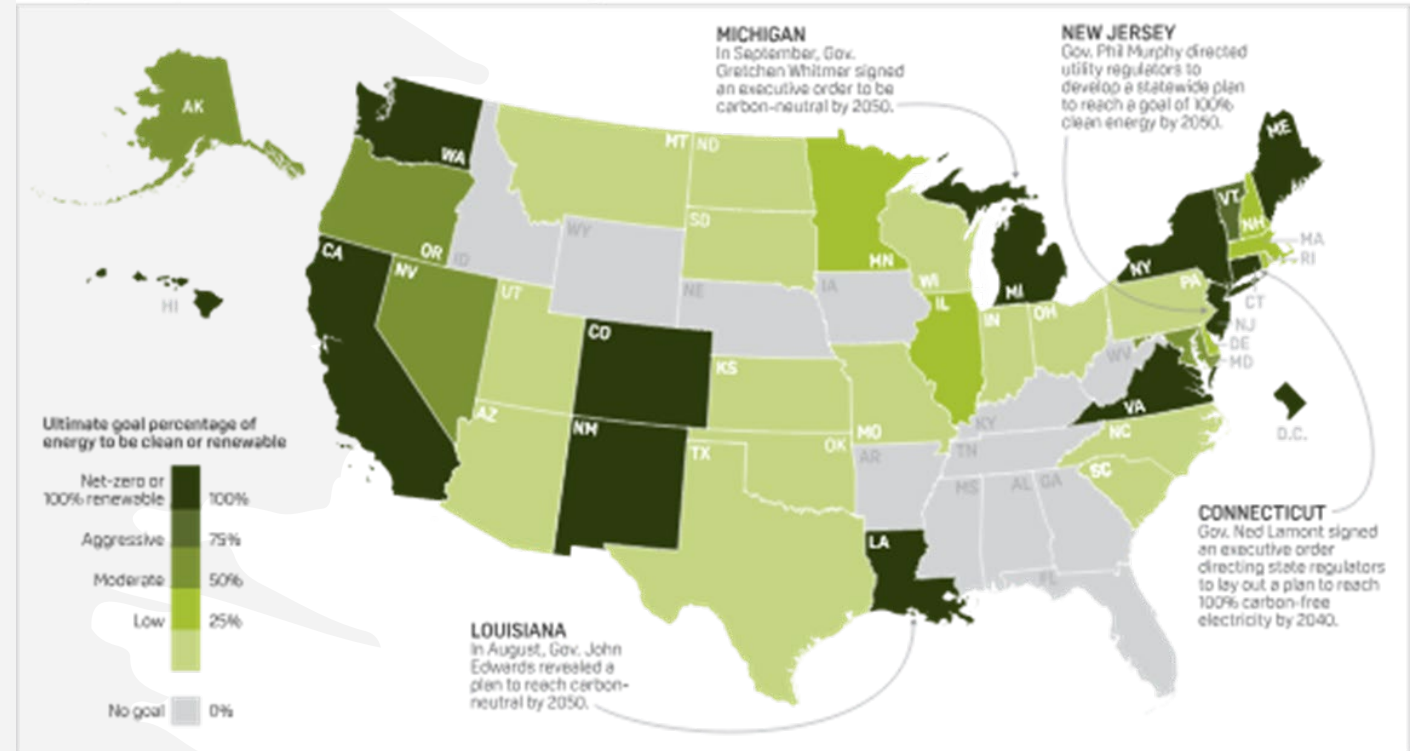
No Government Regulations = Voluntary Market

- Corporate Pledges
- Third-party initiatives
- Consumer pressure
- State & Local Government Net-Zero Goals



GROWING NUMBER OF US STATES RACE TO NET-ZERO EMISSIONS, 100% RENEWABLE POWER

There are now 12 states, plus Washington DC, with 100% renewable generation or net-zero carbon emission goals or aspirations in the coming decades. The latest to join the energy transition to clean power are Louisiana, Michigan, Connecticut and New Jersey where governors announced plans or signed executive orders. They follow Colorado, which made the move in late 2019, and Virginia, which announced the change earlier this year. While many Southeast states do not have official goals, many utilities have set their own net-zero emission targets.



Source: S&P Global Platts, National Conference of State Legislatures, ERCOT, Cal-ISO, other associated sources for individual states and territories

Corporate Goals Driving the Voluntary Market:

Name	Annual Revenue (billions)	Scope 1 & 2 Emissions (MMT CO2e)	Scope 3 Emissions	Target Year	Target Type
Walmart	\$681	15.65	636.57	2040	Zero Emissions
United Health	\$410	0.46	17.97	2035	Net Zero
Apple	\$396	0.67	14.5	2030	Carbon Neutral
CVS Health	\$373	0.85	11.09	2050	Net Zero
Alphabet	\$359	3.13	12.05	2030	Net Zero

Sources: zerotracker.net; voluntary corporate ESG reporting

Litigation over carbon claims

- Apple: “Carbon Neutral”



Apple's first carbon neutral product is here.

Through ongoing innovations in materials, clean energy, and low-carbon shipping, Apple Watch is available in case and band combinations that are carbon neutral.

[Learn how](#)

- Tyson: “Climate Friendly Beef”



Brazen Beef, a new Tyson Foods brand with packaging that uses the language “climate friendly.”

Apple Class Action Lawsuit

19 67. As detailed below, Apple’s carbon neutrality claims are false and misleading because the two
20 offset projects upon which Apple relies for Products sold in FY 2023—the Chyulu Hills Project and the
21 Guinan Project—fail to provide genuine, additional carbon reductions. Instead, these projects are ineffective
22 and redundant, representing neither real carbon offset value nor legitimate environmental benefits.

1 74. However, despite Apple’s reliance on carbon credits from the Chyulu Project, the Project fails
2 to meet the fundamental requirement of additionality because a significant portion of the project area,
3 particularly the area responsible for carbon stock production, has been under legal protection since 1983.
4 Specifically, about 18% (74,000 Ha) of the total project area lies within Chyulu Hills National Park, which
5 was established as a national park in 1983 and has been managed by the Kenya Wildlife Service ever since.

this analysis shows no
ta show a steady decline
d largely unchanged or
areas.

17 99. Indeed, a focused spatial analysis that compared tree cover pixels across 2010, 2015, and 2020
18 demonstrated that not a single pixel in the 2020 dataset indicated new tree cover that had not already existed
19 in 2015 or 2010. In other words, there was no detectable increase in tree cover anywhere in the project
20 boundaries during the period when planting was reportedly being carried out. This strongly suggests that *no*
21 *new afforestation occurred*. In short, the project has resulted in *no* additional, legitimate carbon reductions.
22

Regulations Related to Voluntary Carbon Markets

- Partnerships for Climate-Smart Commodities (PCSC) started in 2022 and expanded with Inflation Reduction Act money
 - Helped facilitate the sale of ecosystem benefits
 - In less than three years, the PCSC enrolled over 21,000 farms representing over 5.2 million acres and ~~550,000~~ **metric tons of carbon sequestered**
 - A drop in the bucket, but “Agencies, like legislatures, do not generally resolve massive problems in one fell regulatory swoop. They instead whittle away at them over time, refining their preferred approach as circumstances change and as they develop a more nuanced understanding of how best to proceed.” *Mass. v. EPA*



Growing Climate Solutions Act

Introduced in the Senate in 2021 – passed with a vote of 92-8 – indicating broad bipartisan support

Congress wrapped the text of the Growing Climate Solutions Act of 2021 into the Consolidated Appropriations Act, 2023, and passed it in December of 2022.

“Authorizes the Secretary of Agriculture to develop a program to reduce barriers to entry for farmers . . . in certain voluntary markets.”

Directs the Secretary to establish an advisory council and sets parameters for those appointments

USDA Actions Under the Growing Climate Solutions Act

USDA published Report
assessing the role of agriculture
and forestry in carbon markets

Then USDA published its “Intent
to Establish the Greenhouse Gas
Technical Assistance Provider
and Third-Party Verifier Program”
with four objectives:

facilitate participation in
voluntary carbon markets

facilitate the provision of
technical assistance to
overcome barriers to entry into
voluntary carbon markets

to ensure that participants
receive a fair distribution of
revenues derived from the sale of
a generated credit

increase access to resources
relating to existing voluntary
carbon markets, including
information about the various
qualifications

Conservation Programs Overview

Reserve Programs

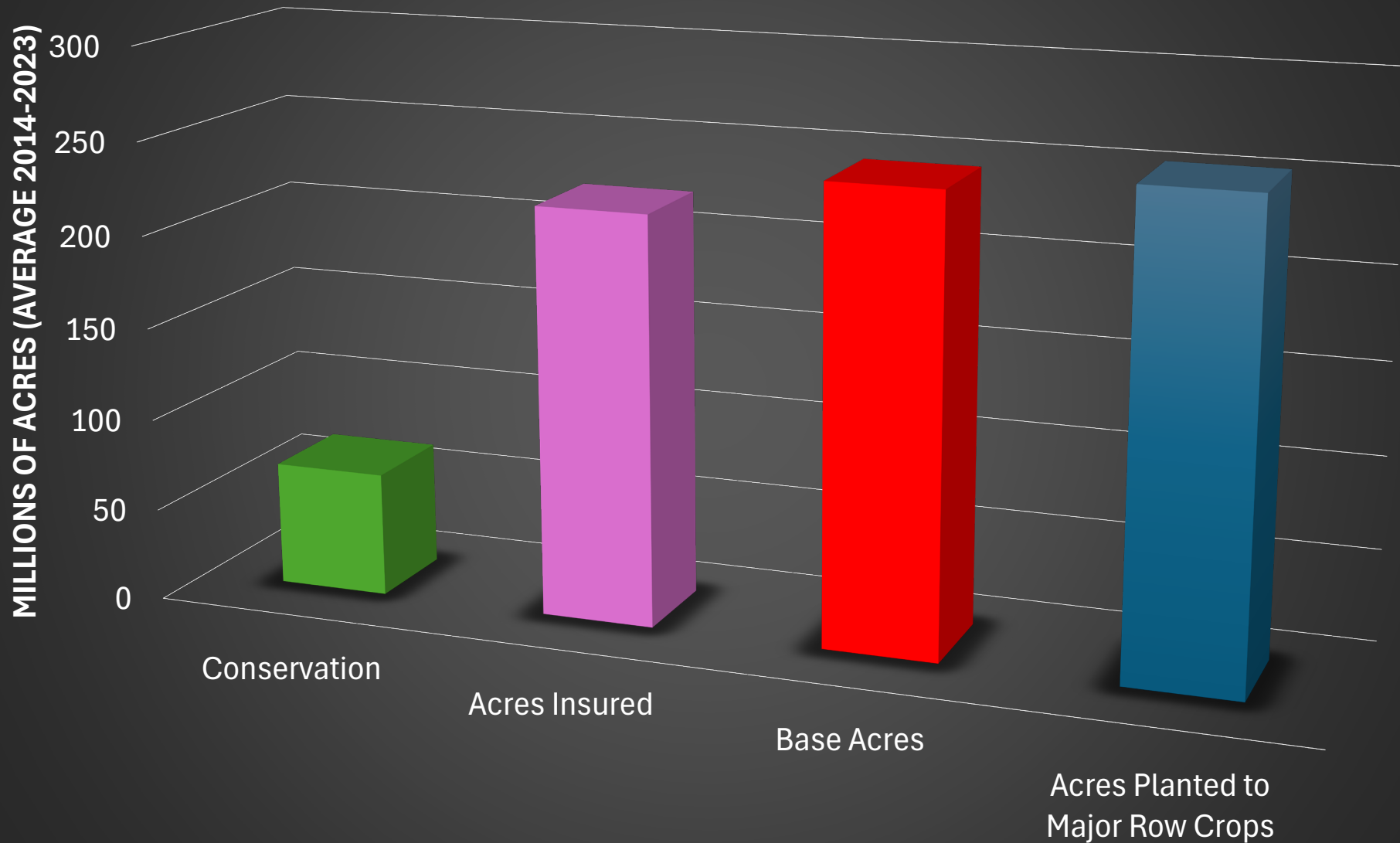
- Conservation Reserve Program (CRP)
 - Traditional acreage reserve; 10-year contracts to remove land from production.
 - General (whole field) and Continuous (partial fields); Grasslands
- Agricultural Conservation Easement Program (ACEP)
 - Legal easement to protect land, such as to restore and maintain wetlands or to preserve land for farming.

Working Lands Programs

- Environmental Quality Incentives Program (EQIP)
 - Financial assistance for implementing a practice on land or farm
- Conservation Stewardship Program (CSP)
 - Five-year annual payments for improving conservation on entire farm
- Regional Conservation Partnership Program (RCPP)
 - Combined authorities with regional focus and private partnership contributions

Conservation Program Overview

Comparison of Policy Acres: Conservation, Insurance, Base and Planted





Conservation Compliance

- Mandatory
- Sodbuster – highly erodible land
- Swampbuster – wetlands
- Ties farm payments to conservation

Additionality

- Beyond business as usual
- Above baseline emissions
- Three Tests Created by CAR and Verra:
 - Regulatory Surplus/Legal Requirements
 - Common Practice
 - Barriers
- **Must pass all three tests**





Regulatory Surplus/Legal Requirements Test

- Verra: asks whether “an existing law, regulation, statute, legal ruling, or other regulatory framework in effect as of the project start date [] mandates and enforces the project activity”
- CAR: “other legally binding mandate”

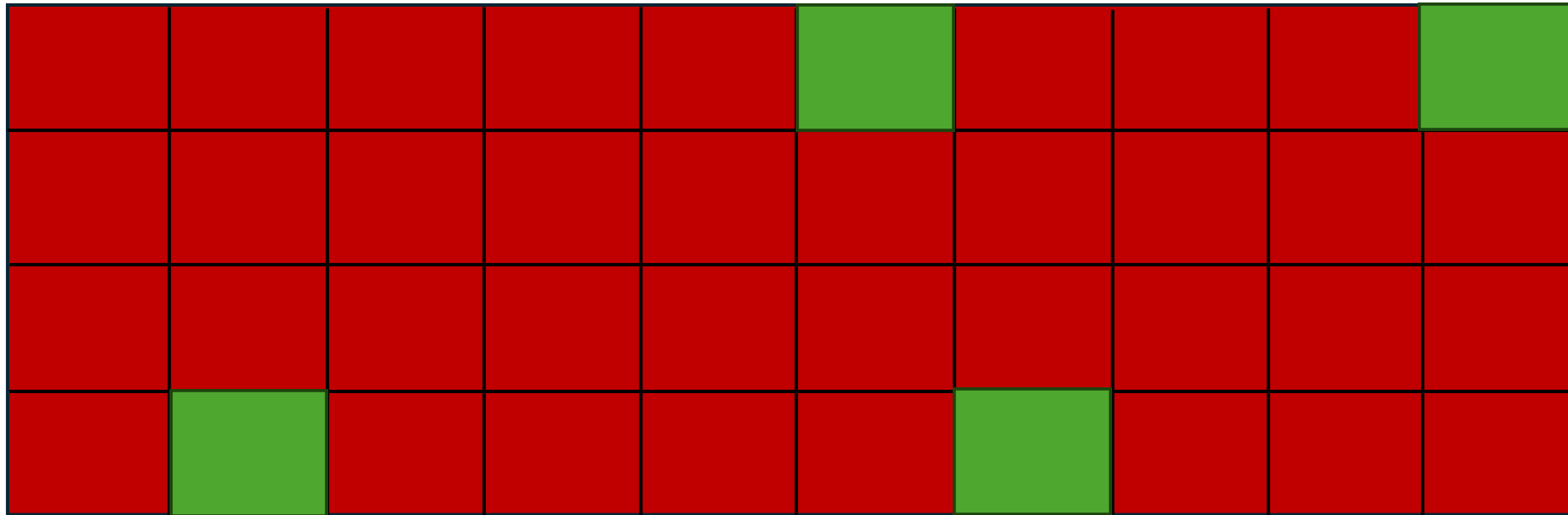
Additionality for Working Lands

- 7 C.F.R. § 1466.56(a) : “A participant in EQIP may achieve environmental benefits that may qualify for environmental credits under an environmental credit-trading program. NRCS asserts no direct or indirect interest on these credits”
- 7 C.F.R. § 1470.37(a): “CSP participation may create environmental benefits that qualify for environmental credits under an environmental credit-trading program”



Common Practice Test

- Verra sets threshold at greater than 20% adoption in the region
- CAR sets its threshold at 50% of the total cropland acres



Barriers Test

- Does the **practice** face any financial, technical, or institutional barriers to implementation?
- If yes, does the carbon crediting **program** help overcome the barrier?



Defining the Baseline

- Under Verra: “The **continuation of pre-project ALM practices** is determined to be the most plausible baseline scenario
- Under CAR: “The baseline scenario assumes the **continuation of pre-project agricultural management practices.**”





Additionality trap

- Registries need to verify quality credit
 - Customer confidence
- Penalizes early adoption AND late adoption through common practice thresholds
- Encourages reversion
- Leads to litigation – see Apple

Opportunities to Adapt Additionality

- Change the baseline – look at good management requirements for crop insurance
- Timing issue - Look-back period - farmers who adopted an eligible mitigation activity within a specified timeframe could still generate credits in future years if they agree to maintain the activity (Verra, 2023a)
- Assurance comes from widespread adoption



Looking Forward

- Land-use as environmental law
- Conservation policy – trying to do too much with too little – limiting what agricultural conservation programs can accomplish
- How does a “reasonable consumer” understand climate claims

