

Carbon Credits in Row Crop Agriculture

We are initiating coverage on carbon credits as a viable income generator for row crop farm operators with a neutral outlook. Long-term climate forecasts and the status of agriculture as both a carbon emitter and possible carbon sink have raised the possibility of carbon credits becoming a significant source of income for farmers; however, at today's U.S. market price for a metric ton of carbon, a clear cost benefit for row crop farmer participation in carbon markets is not evident.

Carbon marketplaces sell credits to offset Greenhouse Gas (GhG) emissions, measured in metric tons (mT). Farmers may receive payments for carbon credits generated as a result of carbon-sinking practices implemented on their farms. Credit buyers are often corporations working to offset emissions from their business operations. The markets are additionally influenced by organizations that certify offset practices, platforms to buy/sell credits, integrators (intermediaries that buy/sell credits between buyers/farmers), and government organizations that set related policy and allocate funds. As this is a developing market, several key variables for the future viability of carbon markets currently lack industry consensus:

- **Additionality:** Are practices funded by carbon credits restricted to new implementation? Would those practices not have been implemented otherwise, resulting in a net positive impact?
- **Permanence:** Carbon stored in the soil due to conservation practices could potentially be released through operational changes upon exiting a credit program, thus releasing the carbon the credits paid to store. How should market makers manage long-term storage of carbon offsets?

Tailwinds

Major: Federal and Private Carbon Neutrality Pledges Over the past decade, both the U.S. government and several major companies have pledged to become carbon neutral; for example, Amazon has committed to becoming carbon neutral by 2040, and the federal government has set a similar 2050 net zero goal. The unlikelihood that pledges can be achieved without substantial changes to the status quo bolsters potential demand for credits to offset emissions. Tesla Motors selling carbon credits to other automakers serves as a relevant example within the auto industry.

Major: Increased Federal Involvement in Climate Policy The USDA has committed \$1 billion to encourage the introduction of cover crops, with a stated goal of doubling the amount of cover crops in the U.S. to 30 million acres by 2030. As financial incentive programs for offset practices increase, their results can be used to form the basis of more concrete future policy. Since 2019 there have been 15 carbon tax acts introduced in Congress as well as several larger climate bills, most notably the Growing Climate Solutions Act, which would standardize quality criteria for voluntary carbon markets (similar to USDA organic certification). While none have been enacted to date, it is reasonable to expect a continued push for policy action as awareness of, and calls for action around, climate change grow.

Minor: Increased Access to Carbon Markets In the absence of a national standardized carbon market, there are multifarious private companies offering services to measure, issue, and transact in the carbon market, which presents farmers with a variety of options for getting involved. A breakdown of several current carbon markets can be found [here](#), along with 2021 costs and benefits.

Risks

Major: Offset Practices are not Financially Viable at Present At present, the immediate costs of implementing and measuring farming methods that meet carbon offset program standards, such as cover cropping, no till, etc.

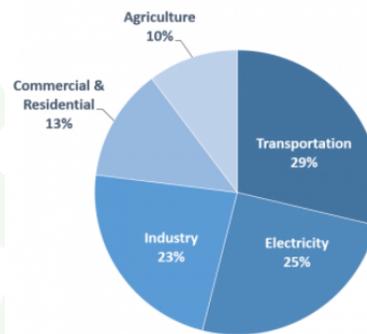
- **Leakage:** A farm operator could receive credits to implement conservation practices on one property but enact countermeasures on another property they otherwise would not have to offset implementation costs. How can the market ensure that carbon offset implementation efforts don't result in GhG release in another domain, potentially creating a net zero positive impact?
- **Verification:** How should the amount of carbon stored be measured, and how often is it verified?
- **Data Security:** What information are farm operators asked to provide for offset verification, and how is that information stored and protected?

Research Team

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Total U.S. Greenhouse Gas Emissions
by Economic Sector in 2019



<https://www.epa.gov/ghgemissions/sources-greenhouse-gas-emissions>

outweigh the financial benefits of selling carbon credits. The science on how much these practices benefit the land and its profitability long-term are still up for debate and thus farmers face significantly more risk, intensive labor, and cost in implementing these practices. Any government certification program would need to be cost effective as well, an issue which caused headaches in the early development of organic markets.

The problem for a farm operator comes in assessing the value of the credit on the carbon market versus the cost of implementing and measuring offset practices, in tandem with the lost revenue from reductions in output (i.e. using less fertilizer may reduce yield, or changing farming practices may increase labor/fuel costs). Current carbon markets peg the cost of a mT of carbon between \$10 - \$35; however, net profit may be lower as integrators and verification will take a percentage of payment and often withhold a portion for several years to defend permanence. A [breakdown](#) of the breakeven (net \$0 to producer) for different carbon sequestration practices from the University of Illinois demonstrates the struggle farmers today have in justifying integrating carbon sequestration into their operations.

Major: Lack of Effective Government Support Recent government messaging and funding allocations seem to indicate increased focus on developing carbon markets, though there is bipartisan emphasis on those markets remaining voluntary/incentive based to avoid any compliance mandates around carbon emissions. CRP is a significant example of the potential impact of federal action, but nothing similar has been enacted to incentivize operators to adopt practices that are seen to reduce emissions. While there have been 15 carbon tax acts written across the 116/117th Congress, none have meaningful support. Currently there is no standardized method of certifying carbon offsets from agriculture, leaving a myriad of companies each with their own certifications, contract terms, and payouts.