



## Agriculture Can Provide Quality Offsets

Agricultural practices can play a key role in climate change mitigation strategies. It has been estimated that 20% to 40% of targeted greenhouse gas (GHG) emission reductions in the United States could be met by agricultural soil carbon sequestration alone. Not only can agricultural practices rapidly reduce the amount of GHGs in the atmosphere, agricultural offsets can generate

billions of dollars in revenue and lower the cost of compliance to the economy.

*To have real value, offsets must be:*

- Permanent*
- Additional*
- Measured, Monitored and Verifiable*

*These mechanisms ensure that offsets result in real reductions of greenhouse gases.*

But in order for offsets to be attractive to policymakers—and buyers in a cap-and-trade system—they will need to have value as GHG mitigation options. Agricultural practices such as soil carbon sequestration can generate high quality or **value-based offsets** if measures are taken to ensure that offsets result in reductions of GHGs and thus have environmental integrity. This will ensure that the offsets are “real” and therefore have value in the carbon market.

In the current voluntary market in the United States, independent actors can buy offsets from a range of sources and in a range of markets. Some types of offset credits may have a higher or lower value depending on factors such as type, quality and the particular market or trading mechanism. Each market sets their own rules for requirements such as measuring, monitoring and verification and market values are based on complex factors including perceptions of quality.

However, in a regulatory market, offsets must result in verifiable reductions of GHG emissions in order to have value in the market. In order to participate in a regulatory cap-and-trade system, offsets must result in reductions of GHG emissions that meet the requirements of that system. These requirements and standards are likely to be more stringent than the variations found in the



voluntary market, and are put in place to make sure that offsets have environmental integrity by resulting in GHG emissions that are below the level of the regulatory cap each year.

*Agriculture can generate real, value-based offsets.*

**Agricultural offsets can be permanent.**

Some types of agricultural practices, such as methane digestion, have **permanence** by definition as these practices result in the long-term removal of GHG emissions from the environment. Showing the ability of agricultural practices to be permanent will be integral to their widespread adoption as carbon offsets as well as to their value in the market. Biological sequestration techniques, like soil carbon sequestration, are natural processes and permanence is determined by the duration of carbon storage or the risk of reversal.

Sequestration can be reversed, and so the total amount of carbon stored in a sink is defined by the rate of carbon addition and removal over time. If a field is tilled once, the loss of carbon from the soil is not “catastrophic”; that is, evidence suggests that tillage removes carbon at approximately the same rate that it is added during no-till.<sup>1</sup> Depending on the soil type, agricultural soil in the United States reaches saturation (stores all of the carbon that it can store) in 20 to 30 years.<sup>2</sup> It would take years of tilling a field that was saturated with carbon to reduce the level of carbon stored in the soil back to the same level as a field that had not been managed to store carbon.

While the storage of carbon in the soil or vegetation can be reversible – either through a change in practice or a natural event such as a fire – the temporary nature of benefits associated with a given project or activity can be addressed through policies or contracts. For example, carbon credits can be assigned expiration dates or be required to undergo re-verification at intervals. Any future cap-and-trade program should include mechanisms to manage risks, uncertainties and liabilities related to the issue of permanence. Concerns about permanence are not unique to agricultural offsets, and all of these issues can be addressed through reasonable policies and contracting mechanisms.

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<sup>1</sup> Food and Agriculture Organization of the United Nations and Conservation Technology Information Center, Conservation Agriculture Carbon Offset Consultation, 28-30 Oct 2008, Beck Agricultural Center, West Lafayette, IN.

<sup>2</sup> Ibid.



### **Agricultural offsets can be additional.**

In order for offsets to have value as climate change mitigation options, offsets must prove that they are increasing GHG reductions beyond what is already being done if they are going to have value in the cap-and-trade marketplace. That key concept is called **additionality**. This term refers to whether activities or offsets that result in GHG reductions or sequestration are being done in addition to what would have otherwise occurred (or **business as usual**, BAU). The reason that additionality is important is because it identifies projects that represent a real reduction in GHG emissions.

To maintain confidence in the integrity of offsets and promote a high price for carbon, it is critical for offsets to represent real, additional reductions in GHG emissions if companies are going to buy them. So, what are some possibilities?

Project-Specific Additionality: Many of the current systems, including the Kyoto Protocol, determine additionality by assessing a combination of factors on a **project-specific basis**. The system establishes whether a particular project is additional, and if it is, the system specifies a separate method for determining the baseline.

Performance Standards: Conducting additionality assessments on a project-by-project basis can be time-consuming and costly, and in some cases can make the offset investment impractical. In today's voluntary market, **performance standards** are used to account for additionality. Performance standards are a way of accounting for additionality as compared to a benchmark.

Proportional Additionality: Creating and designing measurement plans and quantifying true land-based offsets is becoming the widely accepted practice and could be the new standard under a mandatory market. Processes such as **proportional additionality** evaluate both the baseline and the additional carbon simultaneously. The concept of this process is, in short, to select similar lands or projects and to compare the proportional change in carbon stocks that occurs at the project site versus the comparison site during the timeframe of the project.

Proportional additionality could allow all participants to qualify for selling offsets no matter when they started the offset-generating practice by applying a **discount** on all offset credit corresponding



to the number of existing projects in a particular industry. In this way, the system is accounting for “business as usual” but it is also including all those early actors who showed initiative and changed their operations prior to the climate law.

Assuming that the marketplace and public policymakers do not wish to discriminate against **early actors**, what are key concepts that might be paired with additionality in order to make climate policy most effective?

- Avoided emissions. This policy would develop mechanisms where farmers may receive compensation for avoiding GHG emissions that could be generated by plowing up previously no-tilled fields or releasing methane into the air if they have methane capture systems.
- Direct payments for conservation practices. Under previous legislation, such as the Lieberman-Warner bill introduced in 2008, farmers would be able to tap funds for conservation friendly practices. This would allow producers who do not meet additionality requirements in an offset market to still capture value for GHG storage or mitigation on their farm.

**Agricultural offsets can be measured, monitored and verified.**

Vital to the acceptance of agricultural offsets as a means to mitigate GHG emissions is the existence of a fast, economic, and proven method for the measuring, monitoring, and verification (MMV) of the ability to reduce levels of carbon emissions. Practices such as methane digestion are easily measured, monitored and verified; for example, by measuring the flow rate and methane content of the digester system.

For practices such as soil carbon sequestration, MMV is more complex because the process is taking place in the ground. Currently, the most reliable way to test a field’s ability to sequester carbon dioxide is by taking numerous field samples and submitting them for lab testing. While proven, this method is neither fast nor economic and would considerably reduce the overall profit associated with soil carbon offsets if each project required this type of MMV.



One promising method for meeting standards to include carbon soil sequestration in cap-and-trade legislation is the combination of soil sample testing and the use of models to predict the carbon content of soils. The CENTURY model, for example, is what is used by the U.S. government to estimate soil carbon content and would compliment soil testing as a way to reduce the costs involved with MMV. Soil testing could prove to be a valuable addition to these types of models, as collected soil data is added to the system to improve the database for future modeling. Regardless of the final system put in place, it is necessary that standards are developed for how agricultural practices are to be measured, monitored and verified.

For more on the details of **additionality**, **permanence**, and **measuring, monitoring and verification**, check out these resources:

- Nicholas Institute for Environmental Policy Solutions at [www.nicholas.duke.edu/institute/](http://www.nicholas.duke.edu/institute/)
- 21<sup>st</sup> Century Agriculture Project initiated by the Bipartisan Policy Center at [www.21stcenturyag.org](http://www.21stcenturyag.org)

*Agriculture can affirm the value of agricultural offsets as greenhouse gas reductions by ensuring that offsets are:*

- *Permanent*
- *Additional*
- *Measured, Monitored and Verifiable*



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