A GUIDE TO

Understanding Carbon Markets for the Dairy Sector

KEY TAKEAWAYS

Companies are interested in reducing emissions and different types of carbon markets are developing to support these efforts.

High quality carbon credits should consider a robust process of measuring, reporting and verification, as well as a carbon project's additionality and permanence, among other factors.

There are evolving opportunities for dairy farms to participate in carbon markets, but more standardization is needed to facilitate scale.

TYPES OF EMISSIONS: SCOPE 1, 2, AND 3

When accounting for a company or organization's emissions, scopes are used to classify the different types of direct and indirect emissions. Scope categorization varies based on company perspective - to a milk processor, on-farm emissions are scope 3, but to a farm those emissions are scope 1 and 2.

Scope 1: Emissions that occur by the company directly

An example of scope 1 emissions for a milk processor includes the tailpipe emissions from fuel combusted by milk trucks during milk transport, assuming the processor owns or controls the truck fleet.

Scope 2: Emissions that occur elsewhere but that a company has operational control over, generally referring to the purchase of energy and similar products

An example of scope 2 emissions for a milk processor includes the emissions associated with producing and transmitting the energy (i.e., electricity, heat and steam) used to light their building and power their machines. The generation of energy for their buildings creates emissions at other sites, but the company directly controls the amount of energy consumed by their operation.

Scope 3: All other indirect emissions not covered by Scope 2, upstream or downstream in the value chain

An example of scope 3 emissions for a milk processor includes all the on-farm emissions from the production of the raw milk, including emissions from manure management and storage, enteric fermentation from cows, growing, fertilizing and harvesting crops, and energy consumption.

INTRODUCTION TO CARBON MARKETS

Carbon markets generally refer to the buying and selling of **carbon credits** that represent one ton of GHG emission reduction, measured in carbon dioxide equivalent (CO_2e). Carbon markets can be created by regional, state or national governments, co-ops, companies, or environmental NGOs. These markets support climate change related goals by providing a key mechanism for companies to invest in mitigating GHG emissions.

CO_2e is a unit expressing the impact of various greenhouse gases in terms of the amount of CO_2 that would have the same global warming effect.

Carbon markets exist in two forms:

Compliance markets (sometimes called cap-and-trade) typically support a program or regulation that requires industries or businesses to cap their GHG emissions at a certain amount. Companies that cut their emissions below the cap can sell their remaining allowance of emissions to other companies that are less able, or operate in "hard-to-abate" sectors, to reduce their emissions.

Voluntary markets give businesses, organizations, and individuals that are not regulated in terms of GHG emissions the opportunity to participate in carbon markets. Voluntary markets, in combination with other climate actions, can support environmental goals by enabling a company to offset emissions that are difficult to mitigate or remove internally, and ultimately work toward "net zero" emissions.

UNDERSTANDING CARBON MARKETS

There are several terms and concepts that are important to understanding why businesses might participate in carbon markets and what goes into a carbon project to produce quality carbon credits.

Types of Carbon Credits: Carbon Insets and Offsets

Carbon Insets refer to emissions reductions within a company's value chain. This is a more integrated approach, improving the system they are part of. An example of a carbon inset might be a food company investing in a project to reduce enteric methane emissions on a farm in their supply chain, and buying the associated carbon credits.

Carbon Offsets compensate for a company's unavoidable emissions by funding equivalent GHG reductions or removals elsewhere. An example of this might be a shipping company purchasing carbon credits generated through a methane digester on a dairy farm in order to offset its scope 1 emissions.

MMRV (Measurement, Monitoring, Reporting, Verification)

Measurement, monitoring, reporting, and verification are essential for carbon programs and markets to ensure credibility and transparency for carbon credits. Different carbon markets may have different requirements for how carbon credits are measured, reported, and verified.

- Measurement and monitoring are completed directly through methods like soil testing, or gas collection, and indirectly through technology like modeling, benchmarking, and remote sensing.
- Reporting refers to compiling and sharing this information in standardized formats that are aligned with accepted and recognized standards and frameworks, making it accessible to stakeholders.
- Verification follows reporting, in which a reviewer (ideally a third-party reviewer) audits the reported measurements to make sure they're accurate and proper procedures were employed.

Quality

Other elements of quality carbon credits are additionality, permanence, and avoidance of double counting.

Additionality refers to the actions being taken to generate the credit being additive to what would have been happening already (i.e., the carbon reduction or removal would not have occurred without the project).

Permanence refers to the lasting impact of the carbon credit. Some carbon programs will specify how long producers are required to maintain their carbon reduction/storage practices to prevent carbon from being released back into the environment (leakage). Agricultural and land-based removals typically sequester carbon for several decades, whereas geologic storage sequesters carbon for thousands of years. Therefore, it is particularly important to monitor for carbon leakage in land-based dairy GHG removal projects.

OPPORTUNITIES FOR DAIRY FARMERS IN CARBON MARKETS

Low Carbon Fuel Standard (LCFS) and Digester Markets	The LCFS requires that the carbon intensity of transportation fuels be reduced. Digesters are one option that both allows for a reduction in emissions on-farm through the capture of gases released from manure storage (which can be sold as carbon credits), as well as the creation of biofuel that can then be used as an alternative fuel.
Carbon Sequestration Markets	These markets are still emerging but hold potential as an opportunity to support carbon sequestration through practices like rotational grazing, tree planting, or improved land use practices.
Feed Additives	There are emerging opportunities in reducing enteric methane emissions through feed additives. It should always be confirmed that an additive is authorized and registered to mitigate methane emissions before feeding it for that purpose.
Other	Other markets may develop around water management and biodiversity, with new opportunities for dairy farmers.

WHERE DO WE GO FROM HERE?

- There are several ongoing efforts to improve technological advancements related to carbon markets (e.g., improved modeling methods) and practices for carbon reduction and sequestration.
- Accounting guidance continues to evolve following target setting. Policy developments and regulatory changes continue to impact carbon pricing and market participation as new compliance markets and standards come into effect, such as Voluntary Carbon Markets Joint Policy Statement and Principles, and Integrity Council for Voluntary Carbon Market's Core Carbon Principles.

THE BOTTOM LINE

Although carbon markets have existed for many years, they are now more important than ever, as they are a key tool to facilitate investment in decarbonization. Organizations, businesses, and individuals looking to participate should ensure they understand where they might participate in markets and stay informed about evolving market trends. Carbon markets have opportunities for farmers to contribute quality carbon credits, reducing carbon emissions inside and outside of their value chain.