Agritask

Mapping the Journey to Net Zero:

Carbon Management for Food & Beverage Companies

Introduction

The Carbon Costs of Food

NASA clocks July 2023 as the hottest month on record ever since 1880. The urgent need for action by global leadership is increasingly apparent, especially as, despite of global treaties and unequivocal scientific evidence, greenhouse gas emissions are still rising, reaching an all-time peak in 2022.

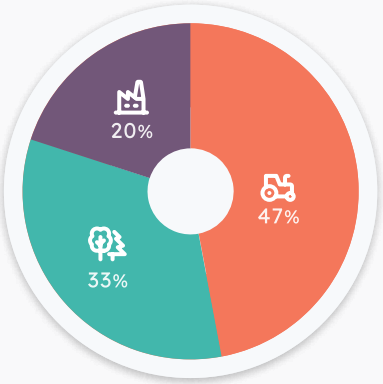
The effort to curb global emissions often concentrates on transport, energy, and manufacturing, overlooking a major emitting factor much harder to tackle by reduced consumption or electrification – food.

According to a report by the United Nations' food and agriculture organization (the FAO), in 2020, global agrifood systems emissions were 16 billion tons of carbon dioxide equivalent (Gt CO2eq), an increase of 9% since 2000.

Globally, the farm gate emissions in 2020 represented nearly 50% of total agrifood systems emissions, pre- and post-production processes contributed 33% and land-use change 20%.

Emission source types according to the FAO:

- **Farm gate:** Crop and livestock production activities
- **Land-use change:** Examples are deforestation and peatland drainage to make room for agriculture
- **Pre- and post-production processes:** Which include food manufacturing, retail, household consumption and food disposal.



Emissions in 2020

Reducing GHG emissions is critical to global food security, as the ripple effect of increased temperatures may significantly impair the ability to grow crops in certain areas. In a recent study it was found that global barley yields will decline between 3–17%, depending on the geographical location, and in many areas of North Africa, the horn of Africa and South America.

The agri-food industry is not just a part of the problem, but a critical part of the solution. Agriculture is, in its core, a carbon-negative industry, capturing and storing more carbon from the air and into the soil than it emits.

According to the intergovernmental panel on climate change (IPCC) 6th assessment report, the global agriculture sector is sequestering ~12.5 gigatons of CO2 per year. After accounting for agriculture and food manufacturing emissions, that leaves a negative carbon balance of ~5.9 gigatons of CO2 per year. Yet that is just the tip of the iceberg. Studies suggest that, while varying according to soil and vegetation characteristics, the potential for carbon sequestration overall is much greater.

Carbon Accounting

Carbon accounting is the act of calculating carbon emissions, capturing & storing (sequestration) across all operations, and tallying up the total operational carbon balance (carbon emitted minus carbon captured). With many companies declaring ambitious Net Zero targets – meaning completely balancing their value chain's carbon emissions and captures – there is a growing urgent need for emissions reduction and sequestration.

There are 2 main approaches to reaching carbon neutrality: offsetting and Insetting.

Carbon Offsetting:

Offsetting refers to utilizing purchased carbon credits to artificially lower the company's overall carbon footprint. Carbon credits are created through reforestation, rewilding, or sustainable infrastructure projects, and are verified through dedicated 3rd parties. The resulting credits can then be sold and used to deduct a specified amount of emissions from the company's carbon balance.

Carbon Insetting:

Insetting refers to the process of reducing emissions or enhancing capturing and sequestration capabilities in one part of the operation and using the resulting negative carbon delta to reduce the company's overall carbon footprint.

The primary goal for businesses should be achieving Net Zero, minimizing reliance on carbon credit purchases. This approach ensures a focus on tangible, in-house reduction efforts. De facto, most companies will likely use both offsetting and insetting to reach neutrality.

Net Zero and Carbon Neutrality – What's the difference?

Net Zero aims to balance the amount of greenhouse gas emissions released into the atmosphere with the amount removed. Achieving Net Zero, as defined by SBTi, involves prioritizing direct action through sequestration and reduction activities. While SBTi discourages reliance on offsets, it allows up to 10% offsetting for validation due to the acknowledged difficulty of complete avoidance.

Carbon Neutrality implies achieving a state where the total carbon emissions associated with the production and supply chain activities are entirely offset or balanced by measures that remove or reduce an equivalent amount of carbon dioxide from the atmosphere.

** "Additionality" refers to the idea that the emission reductions or removals claimed by a project are additional to what would have occurred in a business-as-usual scenario. It assesses whether the project's activities or interventions have caused a net reduction in greenhouse gas emissions that would not have happened without the project's existence.

Measuring Carbon Emissions

As in any industry, calculating a food product's carbon footprint is a complex process, and requires assessing 3 scopes of emissions:

1 **Scope 1:** Direct GHG emissions from company-owned/ controlled sources, say, from food processing machinery, factory waste, or operations equipment.

2 **Scope 2:** Electricity and heat-generated GHG emissions, derived from electricity and heat bought and consumed by the organization

3 **Scope 3:** Indirect GHG emissions that are associated with a company's activities but occur outside its direct operational boundaries. These emissions encompass a broad range of sources, including both upstream – supply chain emissions (production, transportation, and disposal of goods) and downstream – consumer use emissions (energy consumption, product use, and end-of-life disposal of products).

Agriculture falls squarely into scope 3, alongside heavy emitters such as distribution vehicles and vendor emissions. Yet while manufacturing and logistic emissions are relatively easier to account for and calculate, agriculture – the data "black hole" of the value chain, is more complex.

Carbon Reduction Challenges in Agriculture

Agriculture is a natural carbon-capturing industry – orchards, tree farms, farm soil, etc. directly sequester carbon from the air into the ground as part of their natural cycle. In terms of carbon, the industry as a whole has the potential to both emit less and sequester more.

Approximately 90 percent of overall national climate mitigation plans include the agricultural sectors, yet few plans are fully formed and subsidized.

The vicious cycle of industrial agriculture

Industrial farming practices have continued to contribute to carbon emissions.

The simple plowing of single-crop fields releases carbon into the atmosphere. The more a farm is tilled, disturbing the nutrients and microbes found naturally within the soil, the more fertilizer is required, creating a vicious cycle.

Thus, maintenance of those single-crop fields requires more fertilizer, and the irrigation practices create more runoff, releasing the nitrous oxide (N2O) from the fertilizer into the greater ecosystem. Burning crop residue of any type produces both methane and nitrous oxide.

From plowing to harvest to clearing, every stage of the modern farming cycle emits greenhouse gasses. Furthermore, the food system continues to emit even after it reaches the consumer, with food waste, spoilage, and inorganic decomposition in landfills, creating challenges across the entire value chain. One of our customers shared with us that around 20% of the potatoes sent by growers to packers are rejected for various reasons, which essentially means that the emissions associated with those rejected potatoes were wasted.

Regenerative Agriculture as an Insetting Opportunity

Soil stores more carbon than all the world's forests combined, according to the International Union for Conservation of Nature (IUCN).

Humus and organic matter, created when plant and animal matter decay, stores a global total of 1,500 billion tonnes of carbon, three times more carbon than the above-ground biomass consisting of grasses, trees, and shrubs.

Integrating sustainable and regenerative agriculture into "daily" farm practices are active measures farmers can take to reduce carbon emissions and actively sequester carbon, removing it from the atmosphere.

- **Minimizing "interference" in the natural soil (no-till or minimum tillage farming) to avoid disrupting carbon stores.**
- **Implementing multi-crop farming to deepen roots and enrich organic matter stores.**
- **Planting ground cover between rows to reduce soil erosion and minimize runoff.**
- **Implementing permaculture fertilization, such as compost, both minimizes the use of manufactured nitrogen-based fertilizers and avoids methane emissions, created by anaerobic decomposition.**
- **Adopting agroforestry and silvopasture methodologies to integrate and reintegrate carbon-sequestering trees into fields and grazing lands.**

Changes like this are expected to substantially reduce emissions during crop production, which can be used to offset emissions elsewhere in the value chain.

The Challenges Implementing Regenerative Practices at Scale

Overcoming these challenges requires collaboration among farmers, food companies, government agencies, and other stakeholders to provide support, incentives, and resources for the adoption of regenerative practices at scale.

Changing Old Ways

Transitioning from conventional farming practices to regenerative ones often involves changes in equipment, techniques, and timelines. This transition period can be financially and operationally challenging, especially for large-scale operations. In addition, growers need training and knowledge to effectively implement regenerative practices, programs that require time and resources to implement.

Market Demand and Economics

There may be uncertainty about market demand for regeneratively produced food products, and these products may not command a premium price, making it economically challenging for farmers to invest in these practices.

Scale and Risk Management

Scaling up regenerative practices while maintaining quality and consistency can be complex. Standardizing these practices across different regions and crops can also be a challenge. Transitioning to regenerative practices can introduce new risks, such as crop yield variability. Farmers need strategies and tools to manage these risks effectively.

Long-Term Perspective

Regenerative practices often require a longer-term perspective, whereas many food companies operate with short-term profit goals. Shifting to a more sustainable and regenerative approach may require a change in mindset.

Disclosing Emissions

Regulators, investors, and consumers are increasingly demanding that companies disclose their carbon emissions. Bodies such as US SEC (United States Securities and Exchange Committee) and the European Union are going even further, highlighting corporations' accountability for the carbon emissions (and other environmental impacts) produced in their value chain.

The SEC's climate disclosures, formally titled "Enhancement and Standardization of Climate-Related Disclosures for Investors", require companies to report on their scope 1,2 and 3 emissions, and their climate risks as a part of their annual report to shareholders. Similar to the EU's Corporate Sustainability Reporting Directive (CSRD), the SEC climate disclosures aim to provide investors with the information they need to make sustainable investment decisions.

With many prominent financial players publicly stating their commitment to "green finance", companies are encouraged to present meticulous carbon metrics and set ambitious sustainability goals, creating a growing demand for carbon accounting, insetting, and offsetting.

How Food Corporations can Impact their Upstream Emissions

Food and beverage companies are in a unique position to impact GHG emitting practices – and capitalize on the savings.

Regulators and policymakers are increasingly holding multinational corporations and their suppliers responsible for the environmental impact and social conduct in their value chains. According to new regulations like EUDR and CSRD, corporations are expected to leverage their influence over the value chain to drive positive change. Corporate players are well-positioned to solve some of the cultural and behavioral deterrents keeping growers from pursuing more carbon-efficient methods by incentivizing cooperative growers, providing access to agronomic advisory and technologies, and subsidizing less carbon-intensive inputs.

Food and beverage companies can act as enablers, utilizing their resources to facilitate the transformation to sustainable and regenerative practices in their value chain. Insetting the reduced agricultural carbon emissions will serve to lower the entire value chain's carbon balance, improving the company's positioning in the eyes of investors and consumers, while also enhancing the resilience of crop supply production in the face of climate risks.

Effective Steps for Food & Beverage Companies to Transform their Value Chain:

The commitment of food and beverage companies to sustainable practices holds the potential to set off a positive chain reaction throughout the supply chain, triggering transformative impacts.

Supplier Engagement:

By fostering partnerships that prioritize carbon-sequestering practices, companies can not only align their supply chain with their sustainability goals but also create a ripple effect of positive change. One effective strategy is to offer incentives for suppliers to adopt and implement sustainable methods. These incentives could range from financial rewards to long-term partnerships that support the adoption of practices aimed at carbon neutrality.

Educational Initiatives:

By organizing workshops and training programs for farmers, food and beverage companies can impart valuable insights into crop-focused carbon sequestration techniques. These initiatives provide farmers with practical tools to enhance their farming methods, leading to increased carbon capture and retention. The effects of education go beyond individual farms—by igniting a movement toward sustainable practices, companies contribute to the broader adoption of environmentally responsible methods.

Certification and Labeling:

By setting stringent standards for suppliers and ingredients, companies signal a clear commitment to environmental responsibility. Certifying products with a "Low Carbon" label not only assures consumers of a product's eco-friendly attributes, but also encourages them to make choices that align with their values. This labeling initiative has the power to drive demand for sustainably produced goods, thereby shifting market dynamics in favor of carbon-sequestering practices.

Investment in Research:

By dedicating resources to exploration and experimentation, companies can uncover novel techniques to enhance carbon capture and retention. These research outcomes not only benefit the company's bottom line through improved efficiency but also have far-reaching impacts. Findings from such projects can influence industry standards, shape policies, and even contribute to the development of groundbreaking practices with potential global implications.

What gets measured, gets managed.

Carbon accounting is the first, critical step toward reducing the value chain's carbon footprint. However, in order to avoid the complexity of agricultural supply chains, some companies prefer to simply use industry averages for their raw materials, ignoring the potential for measurable reductions and overall insetting. While complex and multifaceted, carbon accounting in agriculture is far from impossible and can provide valuable insights into reduction opportunities. Calculating carbon emissions in the crop supply array can detect disparities between suppliers or regions, allowing corporations to make carbon-smart sourcing decisions. It can also highlight the overuse of agricultural inputs or inappropriate waste disposal practices, allowing companies to tackle emissions through training programs and subsidies.

All of this is possible only with accurate data collection, advanced analytics tools and an effective grower engagement strategy.

Agritask's Carbon Management

Reducing Scope 3 emissions in the agricultural value chain

Drive Environmental Responsibility, Resilient Supply Chains, and Streamlined Reporting
Calculating crop carbon emissions revolves largely around cultivation practices – valuable information held by farmers in distributed value chains. Carbon accounting in agriculture is, therefore, less about adding numbers, and more about securing collaborations and trust.

Agritask's Carbon Management Solution builds on Agritask's experience in cross-value chain collaboration, deep agronomic background, and tested protocols.
Address the substantial emission reduction potential of Scope 3 emissions in the agricultural value chain by facilitating value chain collaboration and simplifying emission reporting and calculations – paving the path for reducing your carbon footprint.

- **Reduce carbon footprint:** Address the largest potential for emission reduction across the agricultural value chain
- **Optimize operations:** Collaborate with suppliers, streamline operations, and identify areas for improvement
- **Streamline carbon reporting:** Simplify regulatory compliance to improve operational efficiency.

Carbon Management Process

Carbon accounting dashboard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