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SCOPE 3 INSETTING IN THE BEEF SUPPLY CHAIN – A DEVELOPING ALTERNATIVE TO OFFSETS

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Overview

In this case study, we will discuss a second option that already exists in the farming/grain sector of production agriculture and is now just beginning to emerge as an option for beef and livestock producers. This is known as Scope 3 or insetting markets. With the announcement from Kateri just a few weeks ago in September 2025, they are looking to enroll cattle producers for a joint Scope 3 project with McDonald's across approximately 3M acres of grasslands. Cow/calf producers, ranchers, and others in the cattle supply chain may be wondering what this is and how the value proposition differs from what many have heard about traditional carbon markets that focus on offsets.

What makes this program distinct from the current offset (Scope 1) projects that are currently being offered by GrassRoots Carbon, Kateri, Native, Agoro, and others is how the carbon footprint is calculated and paid for by the companies interested in these credits. As many companies approach their 2030 sustainability goals, they are aiming to reduce their overall greenhouse gas (GHG) footprint from the food system, particularly from beef production. Companies in this industry are looking to their supply chains to see how they approach these sustainability commitments. These emissions are generated not directly by that company itself, but by its upstream and downstream supply chain activities. For beef producers, Scope 3 emissions can include everything from methane from cattle, production efficiency – both genetics and land management – to fertilizer use in feed production, lifespan of the animal (18 months vs 24 months), transportation of the cattle on its long journey to a meat counter and including the processing of the animal at facilities across the US, even the refridgeration of the meat. Many points can be evaluated to make losses more efficient; however, the primary focus is on the production of these animals during their lifespans.

> **“Insetting programs connect ranch-level stewardship with corporate climate goals—turning responsible production into measurable climate progress.”**

Traditionally, companies looking to address their carbon footprint have focused on reducing or offsetting Scope 1 and 2 emissions, with little attention to Scope 3. Think of Microsoft, Google, Amazon, and others. Their primary emissions are not from agriculture, but from other manufacturing processes, transportation, and electrical usage, among other sources. What makes these Scope 3 credits different is that the companies investing in these insetting programs directly purchase beef to market in their stores – like Costco and Walmart – and in their restaurants – like McDonald's – or in pet food – like Purina. For companies with ag supply chains like those just mentioned, the bulk of their emissions falls within the value "supply" chain, and thus are Scope 3 emissions.

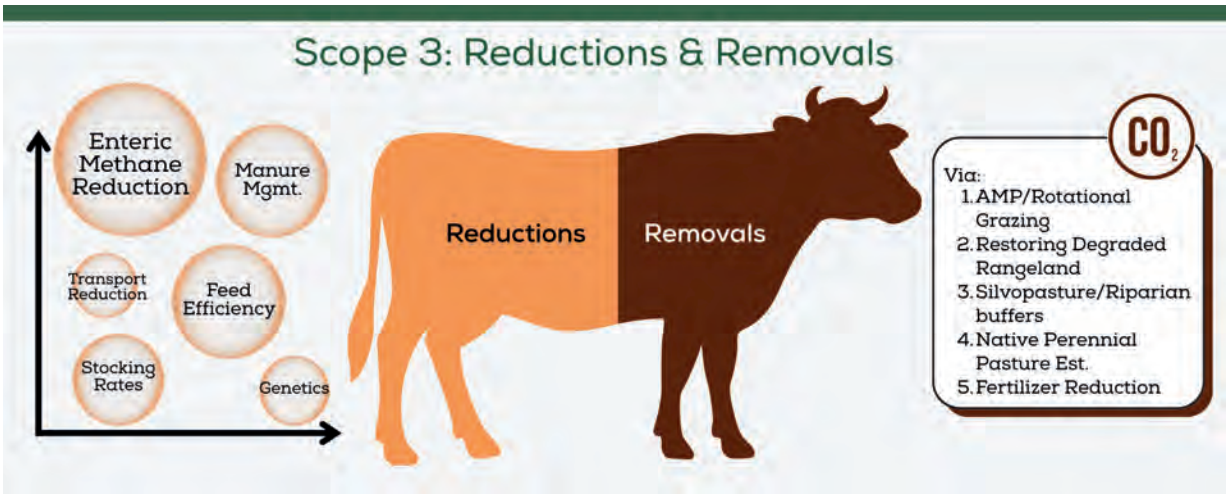
This is where grazing and other managment practices can play a large role. These companies are looking to invest in carbon/sustainability projects that focus solely on grazing management changes that switch to adaptive rotational grazing, replanting native range or croplands to perennial grass, reducing fertilizer inputs, and other such practices that have a positive impact on soil carbon. These practices can be accounted for, and the emissions tabulated for bringing beef to market. A growing number of players in the beef industry are adopting this approach. There are several advantages of this accounting methodology: One is that contracts can have shorter durations than the traditional offset markets. Another is that the look-back period or history of the operation is no longer a main disqualification, as seen in off-sets. Additionally, for Scope 1, there is a required practice change that must occur within a set timeframe; with insetting, this is not the case. Companies purchasing beef want and need the animals they procure to be as efficient as possible. This means that if a rancher has been doing many of these practices for years or even decades (rotational grazing, improving animal efficiency, reducing inputs, etc.), they will qualify for an in-set program. By focusing only on reductions, ranchers and companies are missing out on a huge oppoortunity.

What is Scope 3 Insetting?

Insetting refers to **emissions reduction projects that take place within a company's own value chain**. For the beef industry, this could mean:

- Supporting regenerative grazing practices on supplier ranches
- Installing methane digesters or feed additives that reduce livestock emissions
- Improving manure management or fertilizer use on feed crop farms
- Supporting silvopasture systems that combine trees and livestock for sequestration benefits

These actions are embedded within the company's own supply chain. The resulting carbon reductions are accounted for as part of the company's Scope 3 emissions mitigation.



Why Insetting Makes Sense for the Beef Industry

The beef industry has a significant emissions footprint in the agriculture sector, with methane from enteric fermentation and manure as major contributors[1]. Yes, it is true that the Methane-Carbon cycle is a closed loop when compared to the emissions from coal and other oil-consuming industries. However, if a company invests in the insetting market can reduce overall methane emissions, accounting can be used to calculate the reduction in emissions for their supply chain. In-setting allows companies to directly improve their own supply chain's performance, support supplier resilience and sustainability, build trust with consumers demanding transparency and accountability, and align with the Science-Based Targets initiative (SBTi). Instead of buying carbon credits in an offset program like the one mentioned above, industries that use beef can invest directly in the ranchers and suppliers they already work with by purchasing beef at a premium, creating a cycle of sustainability and supply chain resilience. The perceived drawback is that this can require establishing a chain of custody across all segments of the supply chain, meaning animal tracking from the cow/calf producer to the endpoint is typically necessary. This requires participants to keep track of their management records for both cattle and the practices used on the landscape throughout the animal's life. They will also need to form partnerships with other cattlemen and feedlots to source beef and reliably provide that data to end users. These developments are already in the works and being adopted in the marketplace with tools like RFID tags, AgriWebb, PastureMap, Breedr web-based tools, CERES ear tags, and likely even GPS collar systems in the future. Several Co-op-like organizations are developing around this concept. One such group would be the Ranchers' Sustainable Angus Alliance (RSAA). Here, a cohort of ranchers with a singular vision is looking to provide beef in sufficient quantities for end users, like those mentioned above. They even have a calf-back program where, if another rancher buys a bull from one of the ranches in this group, they can sell the calf back at a premium. These options will continue to develop and be refined over time as these companies hone in on their needed metrics to meet their sustainability goals.

> **"Unlike offsets, insetting rewards the producers already in the supply chain—those raising efficient, low-impact cattle."**

[1] *The EAT–Lancet Commission on healthy, sustainable, and just food systems Johan Rockström, Shakuntala Haraksingh, Thilsted Walter C., Willett Line J., Gordon Mario, Herrero Christina C., Hickset al. The Lancet Vol. 406No. 10512P1625-1700*

Insetting vs. Offsetting: Pros and Cons

Feature	Insetting	Offsetting
Location of Impact	Within the supply chain	External to the supply chain
GHG Accounting	Counts toward scope 3 reduction	Often used for "neutralization' or compensation
Co-benefits	Enhances supplier relationships, resilience, and traceability	May support biodiversity, renewable energy, etc.
Credibility & Consumer Trust	Higher when tied to own operations	Increasingly under scrutiny for lack of transparency
Cost	Potentially higher upfront, but strategic ROI	Can be cheaper per ton of CO_2e depending on practice
Contract Length	Much shorter durations - can be annual and renewed yearly	Long contract duration - 10 to 40-year contractss
Verification Complexity	More difficult to standardize and certify, and can be difficult to scale	Easier with established crediting bodies

Market Size & Trajectory: Offsetting vs. Insetting

To be sure, the carbon offset market is established, has momentum, is far more developed, and has a substantial backing from large entities with solid growth potential, as discussed in a previous EarthOptics Blog by James Clement. Current projections for these two markets are substantially different at times, with the global carbon offset/credit market projected to reach USD 2,850 billion by 2030 from about USD 414 billion in 2023 (implying an Annual Growth Rate of ~31.7% GlobeNewswire+1). Another source from Fortune Business Insights estimates the global carbon offsets market was USD 1,065 billion in 2023, and will increase to USD 3,230 billion by 2032 (Fortune Business Insights+1).

By comparison, insetting does not yet have a well-established global market number. Instead, we can look at proxy signals and potential ceilings. Conservation International and Climate Focus estimate that natural climate solutions in agricultural commodity supply chains have a mitigation potential of ~4 billion tonnes CO_2e per year; about one-third (~1.3 billion tonnes) could be addressed via corporate insetting today within

supply chains (Conservation International). Overall, In-setting growth will depend heavily on adoption by major corporations, alignment of standards, and advances in MMRV (measurement, monitoring, reporting, and verification). Additionally, insetting tends to have geographic and commodity constraints; it will not (and should not) substitute for all offset activity, especially in sectors or geographies where insetting is difficult to implement.

Below is a hypothetical progression showing how offset markets might grow vs. how insetting might scale, particularly in agriculture/beef supply chains.

Year	Approx Offset/Credit Market Size *(USD, global)*	Illustrative Insetting Market "Slice" *(USD, Across ag/supply chain)*	Insetting as % of Offset Market *(for illustration)*
2025	**666.8 billion** (per CMI forecast) Coherent Market Insights	**20-30 billion** (speculative)	~3-5%
2026	**2,850 billion** (Coherent) GlobeNews wire+1	**100-150 billion** (if scaling aggressively)	~3.5-5%

Notes/Caveats: The offset market numbers are from published analyses; the insetting numbers are speculative, meant to reflect what might happen if insetting scales from a low base.

Final Thoughts: A Long-Term Investment in Real Impact

The current offset/credit market is already massive and projected to scale further while insetting, although currently small, has the potential to capture a meaningful share of climate mitigation—particularly in beef supply chains. As methodologies improve and verification becomes more standardized, insetting is poised to become not just a buzzword but a core sustainability practice in the beef industry. From a strategic perspective, insetting offers deeper alignment with supply chain resilience, stakeholder trust, and environmental co-benefits. However, this comes with greater complexity and the potential downside of controversial beef animal tracking or herds.

Scope 3 insetting is not a silver bullet or a quick fix. It requires investment, trust-building across the different beef segments, and, often, a transformation in how supply chain relationships operate. But for companies serious about **their sustainability goals**, insetting represents a critical shift from outsourcing climate action in offsets to **embedding it in the core of their operations**. As more corporates adopt Science-Based Targets, insetting will function as an essential part of many companies' strategies for beef and other agricultural commodities.

Insetting Growth Risks / Barriers

- High transaction costs, complexity, and scaling challenges.
- MRV is difficult—especially for enteric methane, soil carbon, grazing practices, etc.
- Not all supply chains can easily support insetting (e.g., highly fragmented suppliers or geographies with limited capacity).
- Without standardized protocols and market mechanisms, insetting may struggle to compete or be accepted in corporate accounting regimes.

Given those trade-offs, a realistic evolution is that companies will adopt **hybrid strategies**—deep insetting where feasible, and offsets for residual emissions elsewhere.

Natural leverage points for beef companies wanting to reduce upstream Scope 3 emissions.

- Scale matters: in a global beef supply chain, many suppliers may be in different countries with differing regulatory, fiscal, and capacity conditions.
- When you have strong supplier relationships or direct control
- For parts of your Scope 3 that are local, high-leverage, or hard to replace
- In jurisdictions or customer markets with high scrutiny on net-zero claims
- When you want to lock in co-benefits (ecosystem services, community health, resilience)

When offsets remain useful:

- To cover residual emissions that you cannot decarbonize
- In sectors or geographies where insetting is infeasible
- When you need flexibility or fungibility in emissions accounting
- As a transitional measure while insetting infrastructure/capacity scales

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About EarthOptics

Headquartered in Minneapolis, Minnesota, EarthOptics harnesses advances in soil-sensing technologies, genomics, and data science to provide farmers and ranchers with deep, actionable insights into their soil's chemical, physical, and biological properties. By blending cutting-edge laboratory analysis with industry-leading field-based sensors, we deliver powerful predictive insights that enable producers to optimize input use, improve soil health, increase yields, and unlock new opportunities in sustainable agriculture.

EarthOptics is also the leading carbon measurement company in the U.S., supporting the growth of carbon markets with accurate, verifiable soil data. The company has offices in Raleigh, North Carolina; Emeryville, California; Blacksburg, Virginia; and Fayetteville, Arkansas, with laboratories in Emeryville, California, and Memphis, Tennessee. Learn more at www.EarthOptics.com.