BEYOND CARBON ACCOUNTING

Turning Carbon Data Into Business Value Across Food & Beverage

WHITE PAPER | 2026

CarbonOne

TABLE OF CONTENTS

EXECUTIVE SUMMARY

The food and beverage industry is entering a new phase of carbon management. Over the last several years, companies across the agri-food value chain have invested heavily in measuring emissions, responding to retailer expectations, preparing for climate disclosure requirements, and building foundational carbon reporting capabilities. That phase remains critically important. Accurate emissions measurement is foundational.

But **the market is now evolving beyond measurement and reporting** alone. Food companies today are simultaneously navigating rising input costs, sourcing volatility, supply chain disruption, evolving regulatory requirements, retailer pressures and increasing expectations around climate transparency. All at the same time.

In this environment, carbon data is becoming something more valuable than a reporting and compliance output. It is becoming **operational business intelligence.** A lens through which sourcing decisions, packaging tradeoffs, supplier performance, logistics exposure, and operational inefficiencies can be identified, evaluated, and acted upon.

Drawing on CarbonOne's experience working with food and beverage companies across the agri-food value chain, this white paper explores what that transition looks like in practice, what operational carbon intelligence means, where it is emerging, and what it will mean competitively for organizations that embrace it earlier than their peers.

The organizations that gain the greatest advantage in the years ahead will not simply be those reporting emissions most effectively, but those using carbon intelligence most effectively across their business.

Carbon data is evolving from a compliance output into operational business intelligence.

This white paper explores what that transition looks like and what it means for the food and beverage industry.

The Evolution of Carbon Management in Food & Beverage

Over the last decade, carbon accounting has evolved rapidly across the global economy. What was **once considered a niche sustainability initiative has increasingly become a mainstream business requirement** driven by regulation, investor expectations, retailer pressure, customer requests, and corporate climate commitments.

Within the food and beverage sector, this evolution has accelerated significantly in recent years. Major retailers, global brands, financial institutions, and regulators have placed growing emphasis on emissions measurement and climate disclosure. As a result, many food companies began investing in carbon accounting initiatives focused primarily on:

- Measuring Scope 1, 2, and 3 emissions
- Preparing annual emissions inventories
- Supporting ESG and climate reporting
- Responding to retailer and customer requests
- Establishing emissions baselines
- Setting reduction targets
- Preparing for future regulatory requirements

Technology platforms have since improved the accessibility and scalability of emissions measurement. Automated calculations, centralized data management, supplier engagement tools, streamlined reporting, utility tracking, and product-level footprinting capabilities have made carbon accounting significantly more practical and cost-effective for organizations of all sizes.

However, while many organizations have now established at least some level of emissions visibility, a new challenge is emerging:

What happens after the data is measured?

Increasingly, companies are recognizing that measurement and reporting alone does not fully capture the potential business value of carbon data.

Businesses cannot manage what they cannot measure, but measuring alone is no longer enough.

What Carbon Tracking Actually Measures

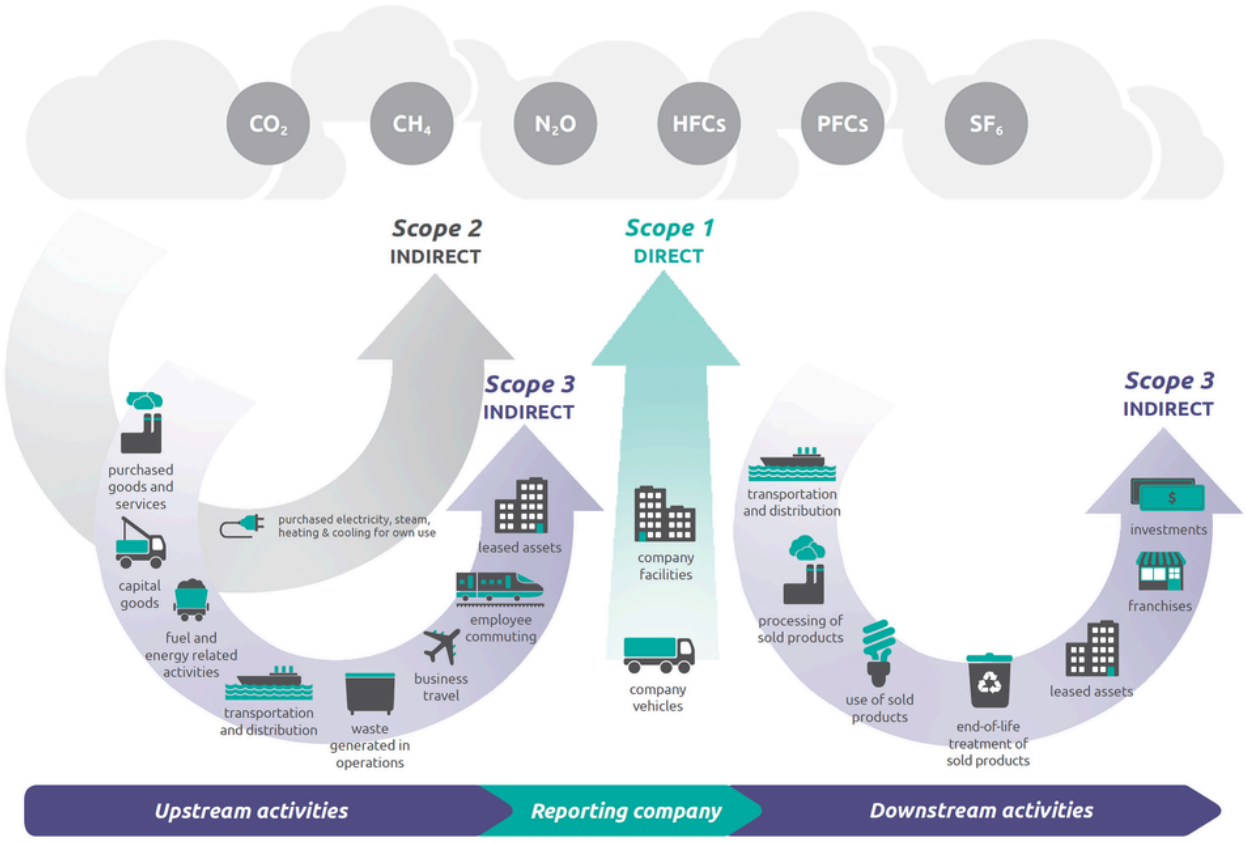
Think of carbon accounting as the climate equivalent of financial accounting, but instead of tracking dollars and cents, it measures and tracks carbon emissions, both direct and indirect, generated by a business.

Scope 1 covers direct emissions from sources such as natural gas and company vehicles.

Scope 2 covers electricity used in processing facilities, warehouses and offices.

Scope 3 encompasses emissions embedded across the entire value chain and typically represents the majority of a food company's total footprint.

Scope 1, 2 & 3 Emissions



Source: WRI/WBCSD Corporate Value Chain (Scope 3) Accounting and Reporting Standard (pdf) (5.9 MB), page 5.

SECTION 2

At a practical level, **carbon emissions are directly tied to business activity**. For food and beverage companies, emissions are influenced by:

- **What ingredients are purchased and where inputs are sourced from**
- **How products move through the supply chain**
- **How efficiently operations are running**
- **How energy and utilities are consumed**
- **How products are packaged and distributed**

In many cases, emissions visibility can reveal operational patterns that were previously difficult to quantify consistently across the value chain. **Higher emissions often refelcts greater material intensity, higher transportation exposure, increased fuel consumption, greater operational inefficiency, or less optimized sourcing decisions.**

Historically, emissions data was often viewed primarily through an environmental or reporting lens. Increasingly, however, organizations are beginning to recognize that **carbon tracking also provides insight into how products, materials, suppliers, and operations behave** across the business.

Carbon data is increasingly becoming a strategic operational input, not just a reporting output.

SECTION 3

Why Reporting Alone Is No Longer Enough

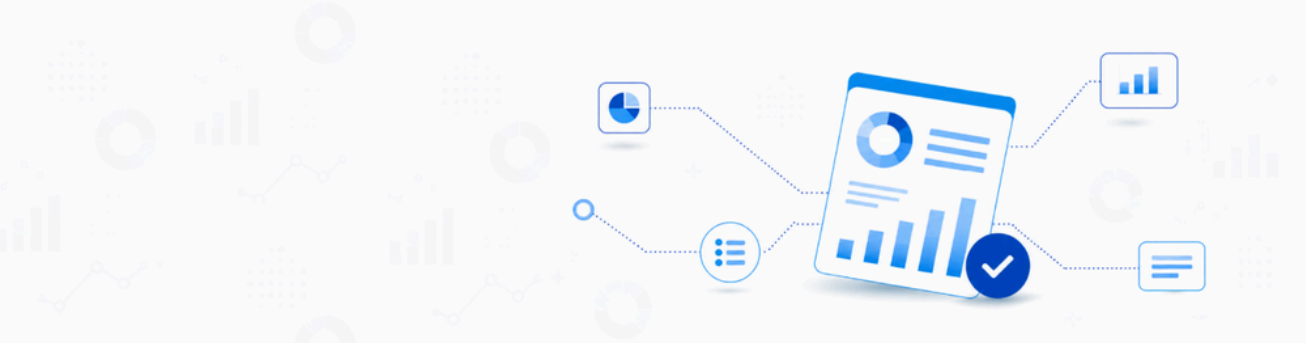
The food and beverage industry is operating in one of the most volatile business environments in decades. Companies across the value chain are navigating rising ingredient costs, packaging inflation, transportation volatility, fuel and energy price exposure, supply chain instability, retailer margin pressure, labour shortages, evolving consumer expectations, and increasing climate-related disruptions.

At the same time, expectations around carbon transparency continue to grow. Retailers are requesting supplier emissions data. Customers increasingly expect product-level carbon visibility. Regulators are advancing disclosure requirements. In this environment, **carbon data is becoming increasingly connected to broader operational realities:**

- **Packaging choices affect both emissions and cost structures**
- **Logistics decisions influence fuel exposure and operational risk**
- **Ingredient sourcing impacts emissions, supply risks, and procurement costs**
- **Utility consumption affects efficiency, costs and long-term energy exposure**
- **Product carbon footprints impact customer targets and commitments**

As a result, many organizations are beginning to recognize that carbon management cannot exist solely within annual reporting cycles. The **operational and commercial implications are becoming too significant.**

This does not mean emissions measurement and reporting is no longer important. Accurate measurement remains foundational. However, the role of carbon data is evolving. Increasingly, the industry is beginning to shift from measuring emissions for reporting toward using carbon intelligence to support business operations.



The Emergence of Operational Carbon Intelligence

As carbon management matures, a new operational layer is beginning to emerge across the food and beverage industry. This next phase can be described as **operational carbon intelligence.**

Operational carbon intelligence is carbon data put to work. Not captured once a year for a report, but **integrated into the operational and commercial decisions** that food companies make every day including sourcing, procurement, product development, logistics, supplier engagement, and customer responsiveness.

Rather than treating emissions data solely as a compliance output, organizations are beginning to **integrate carbon data into day-to-day operational conversations** throughout the value chain. Operational carbon intelligence does not replace traditional procurement, sourcing, or operational decision-making processes. Rather, it adds carbon visibility alongside existing variables such as cost, availability, quality, transportation exposure, supplier reliability, and operational efficiency. Increasingly, organizations are beginning to evaluate these variables together rather than independently.

T**he business value emerging from this visibility generally falls into three broad areas:**

1. Informing Operational & Supply Chain Decision-Making

Organizations are increasingly using carbon visibility to support sourcing and procurement decisions, packaging tradeoffs, transportation planning, supplier evaluation, product formulation, and broader operational planning helping them better understand where exposure exists, how sourcing decisions impact emissions and cost, and where operational tradeoffs occur.

2. Unlocking Operational Efficiency & Cost Reduction

Organizations are also beginning to use operational carbon visibility to identify energy inefficiencies, operational hotspots, transportation exposure, resource utilization opportunities, food loss and waste reduction opportunities, and broader operational inefficiencies impacting both emissions, efficiency and margins.

3. Supporting Customer & Retailer Requirements

Retailers, foodservice organizations, and enterprise customers are increasingly requesting supplier emissions data, product carbon footprints, Scope 3 data, and measurable reductions and broader supply chain emissions visibility making carbon data increasingly part of commercial requirements and responsiveness across the food value chain.

SECTION 5

Operational Applications Across the Food Value Chain

Operational carbon intelligence is beginning to emerge across several core functional areas within food and beverage organizations.

Sourcing & Procurement

Organizations are beginning to use carbon visibility to:

- compare supplier emissions and performance
- identify sourcing inefficiencies
- evaluate transportation exposure
- optimize ingredient and packaging procurement
- benchmark supplier and category performance
- improve sourcing resilience and visibility

Increasingly, sourcing teams are evaluating carbon visibility alongside cost, quality, supplier reliability, transportation exposure, and operational feasibility to support more informed procurement decisions.

Manufacturing & Operations

Carbon visibility is increasingly helping organizations:

- identify operational inefficiencies
- reduce energy and utility consumption
- minimize food loss and waste
- improve resource utilization
- identify emissions hotspots
- uncover operational cost reduction opportunities

In many cases, the operational inefficiencies driving emissions also contribute directly to increased costs, resource consumption, and margin pressure.

SECTION 5

Product Development & Packaging

Product-level carbon visibility can support:

- formulation evaluations
- packaging tradeoff analysis
- supplier comparisons
- packaging optimization
- sourcing evaluations
- reformulation initiatives
- product transparency programs

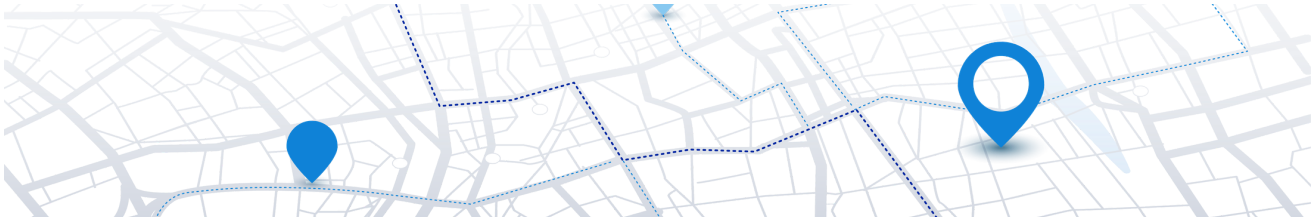
Organizations are increasingly evaluating packaging and formulation decisions across emissions, cost, transportation exposure, shelf life, recyclability, and operational feasibility simultaneously to improve product development and operational decision-making.

Logistics & Distribution

Organizations are increasingly using carbon visibility to:

- identify transportation hotspots
- evaluate fuel and freight exposure
- optimize distribution pathways
- improve freight efficiency
- assess cold-chain impacts
- reduce logistics-related operational risk

Transportation and distribution decisions increasingly influence both operational cost structures and emissions intensity across the supply chain.



SECTION 5

Customer & Retail Requirements

Carbon visibility is increasingly supporting:

- retailer and customer reporting
- supplier and vendor evaluations
- customer sustainability initiatives
- Scope 3 disclosure requests
- product transparency requirements
- RFP and procurement responses
- broader customer decarbonization expectations

Carbon data is increasingly becoming part of broader commercial responsiveness, supplier competitiveness, and customer readiness across the food value chain.

From Product-Level Carbon Data to Operational Decisions

One of the most important shifts occurring within the food industry is the growing use of product-level carbon visibility to support operational and commercial decision-making. Historically, Product Carbon Footprints (PCFs) were primarily viewed as reporting outputs or customer-facing sustainability metrics.

Increasingly, **product-level carbon data is being used to better understand** sourcing impacts, packaging tradeoffs, supplier variability, operational efficiency, and product development opportunities. In many cases, relatively small sourcing or formulation changes can materially influence product emissions while having minimal, and in many cases positive, impact, on cost or customer experience.

One recent product-level analysis conducted across a mid-market packaged food product confirmed how **emissions can often be concentrated within a surprisingly small number of inputs** across the value chain:

- Two primary ingredients accounted for approximately 78% of total product emissions
- Packaging represented a smaller, but still meaningful, portion of the overall footprint
- An alternative supply pathway modestly reduced ingredient cost but increased overall emissions due to transportation and regional production differences, **a tradeoff that would have been invisible without carbon visibility**

This type of analysis allows organizations to better quantify tradeoffs between cost, sourcing decisions, transportation exposure, emissions intensity, and supply chain performance and to apply this thinking systematically across broader operational workflows.

Increasingly, organizations are beginning to apply product-level visibility across sourcing evaluations, supplier engagement discussions, packaging optimization, and product development or reformulation initiatives.

The objective is not necessarily to optimize exclusively for lowest emissions. The value comes from improving visibility so organizations can make more informed operational decisions with a clearer understanding of both carbon and commercial implications.

Carbon Data in Commercial Relationships

Carbon transparency is increasingly becoming part of commercial responsiveness across the food value chain. Retailers, foodservice organizations, procurement teams, enterprise customers, and private label relationships are increasingly requesting Scope 3 emissions data, product carbon footprints, supplier transparency, climate-related disclosures, and emissions reduction progress.

As a result, **carbon data is increasingly influencing customer conversations**, RFP responses, procurement discussions, retailer relationships, and product positioning. In some cases, product-level emissions visibility can become commercially differentiating.

One particularly important development is the growing role of supplier-specific product data within retailer Scope 3 reporting initiatives. Historically, many retailers have relied heavily on spend-based methodologies to estimate supplier emissions. While these approaches provide directional visibility, they often lack product-level granularity and can materially overstate emissions relative to supplier-specific product carbon footprint data.

In CarbonOne's experience working across the agri-food value chain, analysis has consistently identified **notable differences between generalized spend-based estimates and supplier-specific product-level emissions dat**a, differences that can meaningfully affect how suppliers are perceived and evaluated within retailer sustainability programs.

As retailers continue expanding Scope 3 visibility requirements across supplier networks, more accurate supplier-specific product data may increasingly support improved retailer emissions visibility, supplier benchmarking, customer reporting and procurement evaluations.

Structured carbon data is increasingly becoming part of customer responsiveness, commercial readiness, supplier competitiveness, and market access.

Benchmarking & Operational Visibility

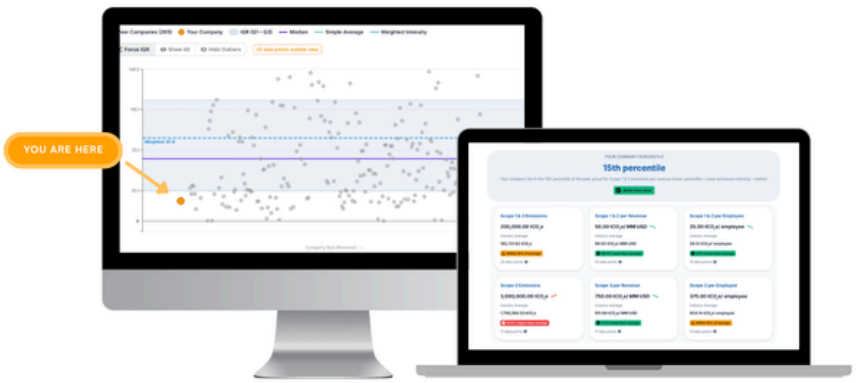
As emissions visibility improves across the food industry, benchmarking is becoming increasingly valuable. Historically, benchmarking was viewed primarily as a reporting or disclosure exercise. Increasingly, however, **organizations are beginning to use benchmarking to support operational visibility and efficiency.**

Benchmarking can help organizations answer questions such as:

- Where do we stand relative to peers?
- Are we operating efficiently relative to our category?
- Which operational areas create the greatest emissions impact?
- Where should operational attention be focused first?

Significant emissions variation often exists between companies of similar size and category. At the operational level, Scope 1 and 2 benchmarking can help organizations better understand facility performance, utility intensity, and resource utilization relative to peers - identifying facilities with unusually high energy intensity and areas where emissions intensity may also correlate with increased cost exposure or operational inefficiency.

At the supply chain level, Scope 3 benchmarking can provide visibility into sourcing pathways, packaging intensity, transportation exposure, supplier variability, and broader procurement performance across products and categories.



As operational carbon visibility improves, benchmarking increasingly becomes less about reporting alone and more about identifying where meaningful operational leverage exists across the business.

From Annual Reporting to Continuous Visibility

Historically, carbon accounting largely operated as a periodic reporting exercise focused on annual disclosures, spreadsheets, fragmented data collection, and retrospective emissions analysis.

Over time, however, **both technology and operational workflows have matured significantly.** Automated calculations, centralized data infrastructure, supplier engagement systems, utility tracking, and product-level carbon visibility are making continuous operational carbon visibility increasingly achievable across the food value chain.

As a result, **organizations are beginning to shift from static annual reporting toward more integrated and continuous carbon visibility** embedded within operational workflows. This includes:

- Ongoing utility and operational tracking
- Supplier data collection systems
- Integrated operational data management
- Product-level carbon visibility
- Continuous monitoring of emissions hotspots
- Centralized carbon data infrastructure

This transition is important because operational decisions occur continuously, not once per year. Packaging changes, sourcing decisions, logistics adjustments, supplier evaluations, and operational improvements happen regularly across the business. Increasingly, organizations require carbon visibility that aligns more closely with operational timelines.

At the same time, simplifying the data collection process itself is becoming increasingly important. Many internal sustainability and operations teams remain heavily burdened by manual data gathering, supplier follow-up, spreadsheet management, and disconnected reporting processes. Reducing this administrative burden is becoming a critical operational priority.

The next evolution of carbon management will depend less on reporting outputs alone and more on building scalable systems for ongoing operational carbon visibility.

The New Competitive Advantage

The role of carbon within the food industry is continuing to evolve. What began primarily as a reporting and compliance exercise is increasingly intersecting with broader operational, commercial, and strategic priorities. **This shift has important competitive implications.**

Organizations that develop stronger carbon visibility across sourcing, packaging, logistics, supplier networks, and operations may gain meaningful advantages over time through:

- Improved operational visibility
- Better understanding of supply chain exposure
- Stronger retailer and customer relationships
- More informed sourcing decisions
- Increased preparedness for regulatory changes
- Greater operational efficiency
- Enhanced supply chain resilience amid volatility
- Improved responsiveness to customer requests

Importantly, this evolution is not solely about emissions reduction. It is increasingly about operational visibility, commercial responsiveness, supply chain intelligence, and business resilience.

Companies that operationalize carbon data earlier will gain structural advantages as carbon increasingly intersects with procurement, cost management, supply chain strategy, retailer expectations, product transparency, and operational decision-making.

Organizations that continue treating carbon solely as an isolated reporting requirement may struggle competitively as expectations expand across the value chain.

What Food Companies Should Do Now

As the industry evolves, food and beverage companies do not need to solve everything immediately. However, organizations that begin building operational carbon capabilities today will likely be better positioned commercially, operationally, and competitively than those who wait for external pressure to force the issue.

1. Build a Credible Emissions Baseline

Accurate measurement remains the essential starting point. Without a credible, consistent baseline across Scope 1, 2, and 3, organizations cannot meaningfully manage emissions, respond to retailer or customer requests, or identify where operational leverage exists. The quality of the foundation determines the quality of everything built on top of it.

2. Simplify and Systematize Data Collection

The administrative burden of carbon data collection is a significant barrier organizations face when measuring emissions. Moving from fragmented, manual, annual processes toward more automated, integrated, and continuous data collection is not just an efficiency improvement, it is what makes operational carbon intelligence practically achievable.

3. Integrate Carbon Into Operational Conversations

Carbon data should not live in a sustainability silo. The most forward-looking food companies are beginning to bring emissions visibility into sourcing meetings, procurement reviews, packaging decisions, and logistics planning. This integration does not require perfection, it requires a deliberate shift in how carbon data is shared and used across the organization.

4. Focus on Practical Business Value

Organizations should prioritize carbon initiatives against a clear business case such as cost savings, supply chain performance, customer impact, or operational efficiency. The most successful implementations connect carbon visibility directly to operational decisions with measurable commercial implications, rather than treating carbon as a standalone sustainability program.

5. Start Now, The Window Is Narrowing

Retailer requirements, regulatory timelines, and customer expectations are converging faster than most organizations anticipate. The companies building operational carbon capabilities today will be significantly better positioned than those waiting for external pressure to force action. The cost of early investment is far lower than the cost of catching up.

CONCLUSION

The food and beverage industry is entering a new phase of carbon management.

Measurement and reporting will remain critically important as climate disclosure requirements, retailer expectations, and supply chain transparency continue to expand.

However, reporting alone is increasingly insufficient for organizations navigating rising costs, operational volatility, and growing pressure across the value chain. **Carbon data is evolving from a compliance output into operational business intelligence.** This evolution is still emerging, but moving rapidly and the direction is increasingly clear.

The organizations that succeed in the years ahead will not simply be those measuring emissions most effectively. They will be those integrating carbon intelligence most effectively into the operational and commercial decisions that drive their business forward.

Carbon measurement and reporting will remain foundational. But increasingly, carbon data is becoming a strategic operational input, not just a reporting output.

For food and beverage organizations ready to begin that transition, the practical steps are within reach. The data infrastructure, operational workflows, technology, and industry expertise exist today to make operational carbon intelligence a reality, not a future ambition.

CarbonOne

ABOUT US

CarbonOne is a Canadian based climate technology company focused on the food and beverage industry.

CarbonOne helps organizations streamline data collection, measure emissions, and turn carbon data into actionable operational and supply chain insights.

CarbonOne works with food manufacturers, processors, retailers, ingredient suppliers, farmers and broader agri-food organizations to support emissions measurement, Product Carbon Footprints, Scope 3 visibility, operational carbon intelligence, and decarbonization initiatives across the food value chain.

CarbonOne is also the developer of the Agri-Food Carbon Benchmarking Index, an industry initiative focused on improving benchmarking visibility and operational carbon intelligence across the agri-food sector.

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