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CANZA
Canadian Alliance for Net-Zero Agri-food

Growing a net-zero food system

An open-source framework for climate-smart agri-food products in Canada

Our commitment

Our future depends on building healthy and resilient agriculture and food systems in Canada that promote scaling sustainable practices across the value chain. To get there, we need a common framework to measure, report, and verify emissions reductions that is trusted by farmers, companies, and consumers alike. This report delivers an open-source framework that builds the foundation to catalyze meaningful climate action.

Nathan Steeghs
National Climate Lead
Sustainability & Climate
Deloitte Canada

A standardized approach for measurement, reporting, and verification (MRV) of emissions is a critical step toward achieving our shared vision of net-zero agri-food systems for Canada. This collaboration with Deloitte on an open-source framework builds off our ongoing efforts to bring credible and scalable ways to measure the outcomes of climate-smart practices across the value chain. We look forward to our continued collaboration on the implementation of this framework.

Nick Betts
Managing Director
Canadian Alliance for Net-Zero Agri-food (CANZA)

Our open-source framework for Canadian agri-food commodities creates the opportunity to drive systemic change and take meaningful climate action.

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Executive summary

Canada is already ahead in sustainable food production. Agricultural commodities, particularly field crops (e.g., wheat, canola, and lentils), include some of the least carbon-intensive agri-food products in the world.[1] Climate-smart practices such as cover cropping, nutrient management, livestock and grazing management, low-till or no-till methods, and agroforestry are being used in farming and livestock production to increase carbon sequestration in soils and reduce greenhouse gas (GHG) emissions. This also helps create a more resilient and regenerative food system and—when practices are driven by farmers—a more equitable one.

The rising stakes

As the global population increases, so does demand for Canada's food commodities. This puts pressure on the agriculture industry, which creates 8.1% of total GHG emissions in Canada, not including related emission sources such as transportation, waste from food processing, and land use and land-use change.[2] Agriculture and food systems are particularly high contributors to methane and nitrous oxide emissions, which should compel us to act quickly. An increasing share of Canadian companies in the food and agriculture sector have set science-based targets. These organizations now require credible ways to decarbonize their supply chain and fulfill their corporate commitments.

While value chain participants have a clear desire to find solutions and support Canada's climate goals, there's no uniform measurement, reporting, and verification (MRV) approach for GHG reductions and removals. **Canada needs a standardized MRV approach to enable the commercialization of climate-smart commodities, build consumer trust, and increase the adoption of climate-smart agricultural practices.** Without one, the emissions from Canadian agriculture and food systems could actually increase by more than a quarter by 2050.[3] To attain a healthy, affordable, and sustainable food supply, urgent action is needed to reduce emissions, enhance productivity, and optimize food production.

Proven solutions

For Canada to reach its net-zero commitments and limit global temperature rise to 1.5°C, all sectors of the economy need to rapidly decarbonize. Many Canadian companies are already advancing innovative solutions. Yet the players we engaged with for this report shared a number of challenges to implementing and accounting for climate-smart practices. The challenges relating to data are particularly critical, including trust, data ownership, access to farm-level data, traceability across the value chain, cost of implementation, and ensuring that data needs do not impose a burden on farmers. Consumers faced with inflationary pressures and high food prices are reaching for the most affordable products. An overabundance of sustainability claims and greenwashing leaves consumers skeptical, making it even more crucial for any climate-smart product label to build trust and offer clarity while balancing affordability.

Objectives for the value chain

Deloitte launched the climate-smart agriculture initiative in August 2023. Building on the Canadian Alliance for Net-Zero Agri-food's (CANZA) Soil Carbon MRV Blueprint, we engaged with participants across the full value chain, including input providers, growers, producers, processors, and retailers, as well as academia, government, and non-government organizations (NGOs).[4] We had four objectives for this initiative:

There are a number of challenges companies face in implementing and accounting for climate-smart practices.

1. **Standardize GHG accounting approaches** to measure the impact of climate-smart agriculture practices.
2. **Provide considerations for future labelling and certifications** of climate-smart products.
3. **Explore commercialization pathways** for climate-smart products.
4. **Foster an ecosystem of committed participants** who will continue to drive and implement this work.

With the guidance and advice of participants, we developed this Deloitte-led *open-source framework*. Our aim is to enable value chain participants to credibly measure the emissions reductions and removals associated with climate-smart practices and help drive commercialization and implementation. The commercialization of climate-smart commodities will create incentives for implementing these agricultural practices.

While the focus of this *open-source framework* is on GHG accounting, we have laid out criteria for a product certification program and considerations for how to activate and govern it. In the future, it could be used to help create a climate-smart certification program and governance structure, and the considerations herein can support organizations looking to scale climate-smart products. To supplement the *open-source framework*, we developed a standalone *measurement methodology* with technical GHG accounting practices. It can be used by industry associations, financial institutions, or industry players to support GHG accounting and measurement in existing product labels and certification schemes, life cycle analysis processes, sustainable finance frameworks, or inventory accounting for key commodities.

In developing the *measurement methodology*, we selected four commodities with the highest climate impact in Canada: beef, dairy, pork, and poultry, as well as their respective feed including barley, maize, soy, canola, and wheat. These have the greatest potential to scale emissions reductions and removals across the country's agriculture and food systems.

The *open-source framework* articulates key considerations to ensure that future climate-smart product certifications are true to their claims, credible, and trustworthy, and that they ultimately contribute to enabling the agri-food value chain to reduce emissions on a net-zero-aligned pathway. It includes a variety of approaches value chain participants can use to start investing in climate-smart practices that keep emissions reductions and removals within the value chain. These commercialization pathways will continue to evolve as accounting guidance does. A standardized MRV approach would enable organizations to create consistency among climate-smart practices and associated claims, as well as work toward the certification. It would also empower them to commercialize climate-smart products and to better measure and account for the climate impacts.

Our vision is for Canada's agriculture and food systems, enabled by meaningful climate action throughout the value chain, to be the most sustainable and competitive in the world while providing healthy, affordable food for all Canadians.

Our vision is for sustainable and competitive agriculture and food systems in Canada, enabled by meaningful climate action.

Actions to scale climate-smart practices, commodities, and products	**Considerations for the value chain**
Measure GHG emissions impact of climate-smart practices	Use a standardized MRV approach to account for the impact of climate-smart practices within GHG inventories.
Label and certify climate-smart products	Support organizations in creating climate-smart product labels and a standardized certification process. Provide advice, build relationships and trust with industry organizations, and advance products through the future certification scheme.
Commercialize GHG reductions within the value chain	Prioritize an inventory accounting approach to keep emissions reductions and removals within the value chain.[5] Invest in climate-smart practices and align to evolving guidance so that climate impacts can be accounted for by all value chain participants.

PART 1

A vision for climate-smart food products

Canada's opportunity to create a sustainable, competitive food system

Driving climate finance toward transforming agri-food systems and achieving food security can help the country meet its net-zero commitments.[6] Under the Paris Agreement, Canada's nationally determined contribution (NDC) is to reduce gross GHG emissions—which include agricultural emissions—to 40%–45% below 2005 levels by 2030.[7] Up to 40% of its expected 2050 agriculture and food sector emissions can be avoided by implementing climate-smart practices.[8] Halting deforestation and land conversion, reducing peat-burning and forest degradation, decreasing agricultural emissions,[9] shifting diets,[10] and minimizing food loss and waste can all contribute. Alongside these levers, forests, grasslands, and soils provide crucial sinks that can be enhanced to remove more carbon from the atmosphere.

The decarbonization of our food system requires a significant shift in the ways we produce, distribute, and consume food, which involve complex and interconnected systems. Agriculture plays an important role in the economy and, as the demand for Canadian food continues to grow, decarbonizing the food system will require innovative and collaborative solutions. Food production may need to increase by 50%, so the agricultural practices across the entire sector will need to advance to meet Canada's climate targets and create a more holistic food system.[11]

Driving such systemic change requires balancing a diverse set of objectives, including climate risks, food access and affordability, biodiversity, farmer livelihoods, and food security for a growing population. Investing in proven and new sustainable agricultural practices and technologies effectively and at scale could advance these diverse objectives by improving multiple aspects of the current system. Although this *open-source framework* focuses on decarbonizing agriculture, actions to do so need to support broader ecological and social objectives. It also aims to support value chain participants in commercializing climate-smart product claims, which are critical to incentivizing adoption and speeding the transition to a low-carbon food system.

The need for standardized, credible product claims

We need to cut global agriculture emissions by 30.3% by 2030 to maintain a science-based pathway to net-zero.[12] To get there, leading organizations in the agri-food sector are introducing initiatives to reduce GHG emissions throughout the value chain, leading to agricultural commodities with a lower climate impact. These climate-smart commodities are produced through upstream practices—cover cropping, nutrient management, livestock and grazing management, low-till or no-till methods, agroforestry, etc.—that reduce GHG emissions or remove carbon from the atmosphere. Implementing climate-smart practices often brings a multitude of other benefits, such as protecting biodiversity, preventing soil erosion, and enhancing water quality. Advancing these solutions in a way that will drive demand within the value chain is imperative to support the scaling of climate-smart commodities in Canada.

What we learned from consumer focus groups

We conducted focus groups with consumers from across Canada, grouped by age range, who had recently purchased a product labelled as sustainable. We asked them several questions about the labelling for us to understand:

- What types of language and terminology resonate with consumers
- What types of information consumers seek to evaluate the credibility of a sustainability claim

Increasingly, consumers are making sustainability a factor in their food choices. One US survey revealed that nearly half of consumers examine labels specifically for data on sustainability (45%), and half are willing to pay an average premium of 30% for sustainable food products (50%).[13] And 62% of Canadians show a willingness to pay a premium of 20% or more, according to a recent Deloitte survey.[14] Despite the growing number of sustainable food product claims, there's no real alignment on the definitions. Many consumers exhibit heightened skepticism toward brands making such claims, largely due to the

prevalence of greenwashing. More than half of Canadians express doubts about the "green" or sustainable claims brands make (57%);[15] in our consumer focus groups, most described the process of evaluating them as "frustrating" and "complex" due to the unclear and inconsistent jargon brands use.

The abundance of divergent sustainability claims has muddled consumer understanding and intensified their scrutiny—consumers are seeking greater transparency.[16] Members of our focus groups say that transparency is a critical condition to gaining their trust in sustainable claims. A global Deloitte survey on consumer trust indicated that grocers and retailers have the most room for improvement in this area.[17] Clearly sharing straightforward information about who produces a product, how it's produced, how the product label is governed, and what the verification process entails are all valued by consumers. As climate-smart products are adopted throughout the food sector, standardized labelling claims will play a crucial role in promoting transparency and building consumer trust.

Regulators can work to prevent greenwashing

Governments are taking action to address the greenwashing of claims and help clarify the environmental performance of products and companies. For example, the European Union has proposed a new law for green claims that aims to build trust among consumers and help them make more informed purchasing decisions.[18] Although Canada's federal government has provided guidance for environmental labels and claims, they are not regulated. Current regulations should be expanded to include them.[19]

Consumer demand for transparently labelled, sustainable products combined with the emergence of climate-smart commodities presents an opportunity for ecosystem actors to collaborate to drive down scope 3, or value chain, emissions. Companies that attempt to design their own product labels are often accused of greenwashing, forcing honest actors to allocate resources toward combatting disinformation—or making them reluctant to take any action at all. Greenwashing and reputational risks can be mitigated through a standardized MRV approach that provides a reliable baseline, communicates climate impacts honestly, and has been developed by a range of organizations, including those outside of the industry. More value chain players would adopt a trusted, common approach and, through action and competition, drive progress toward their climate targets. This *open-source framework* takes a value chain approach to a common methodology that companies can leverage to account for and procure low-carbon products, reduce scope 3 emissions, meet net-zero and science-based targets, and build trust with consumers.

Building confidence in consumers

Corporate commitments to climate targets are largely driven by the changing responsibilities and roles of companies in society. A recent Deloitte survey found that 94% of consumers believe it's a brand's responsibility to create products that are not harmful to the planet. The implication: consumers want companies to make sustainability integral to their business and their purpose. Through climate-smart product labels and certifications, food products could be labelled with a set of standardized climate metrics and consistent claim language. If standardized metrics were adopted at scale, climate-conscious consumers would have a clearer understanding of the environmental impact of food products. Value chain players can implement and incentivize climate-smart products by advancing commercialization pathways and supporting product certification measures.

Food processors, manufacturers, grocers, and retailers can collaborate with upstream value chain actors on strategies to meet their scope 3 decarbonization targets and develop transparent product claims that build trust with consumers. Upstream growers, producers, and suppliers could charge a premium for low-carbon commodities, while retailers and grocers could procure and sell climate-smart products that have measurable and verifiable claims.

This *open-source framework* focuses on levers related to land sector and removals emissions, including carbon sequestration, land-use change, and low-carbon farming practices that increase carbon removals and storage in soil while reducing GHG emissions associated with production. Selected commodities should include beef, dairy, pork, and poultry as well as feed such as barley, maize, soy, canola, and wheat due to the scale and impact of their emissions in Canada's agri-food sector.

The Science Based Targets initiative's (SBTi) Forest, Land, and Agriculture (FLAG) Guidance offers a common, robust understanding of how much and how quickly a company needs to cut its land-related emissions to align with the Paris Agreement's goal to limit global temperature increase to 1.5°C.[20] In alignment with Intergovernmental Panel on Climate Change (IPCC) resources, it also provides commodity pathways with GHG reduction targets to reach that goal. This *open-source framework* advises that climate-smart commodities must demonstrate a carbon intensity that meets the 1.5°C commodity pathway to achieve "climate-smart certification."

This *open-source framework* is designed to provide a point of view on how agri-food companies can take action to measure, report on, and verify the emissions reductions and removals associated with climate-smart practices. Businesses looking to scale climate-smart products can use the *measurement methodology* to consistently account for scope 3 GHG reductions and science-based product claims across the value chain. It includes details on approach, scope, and value chain nodes, measurement methodologies for each emission source, and an overview of emission sources and interventions. This guidance can serve as a foundation to enable consumer packaged goods companies, retailers, and food processors to scale climate-smart products in a way that is transparent, grounded in science, and trusted by consumers.

PART 2

Product label claims and certifications

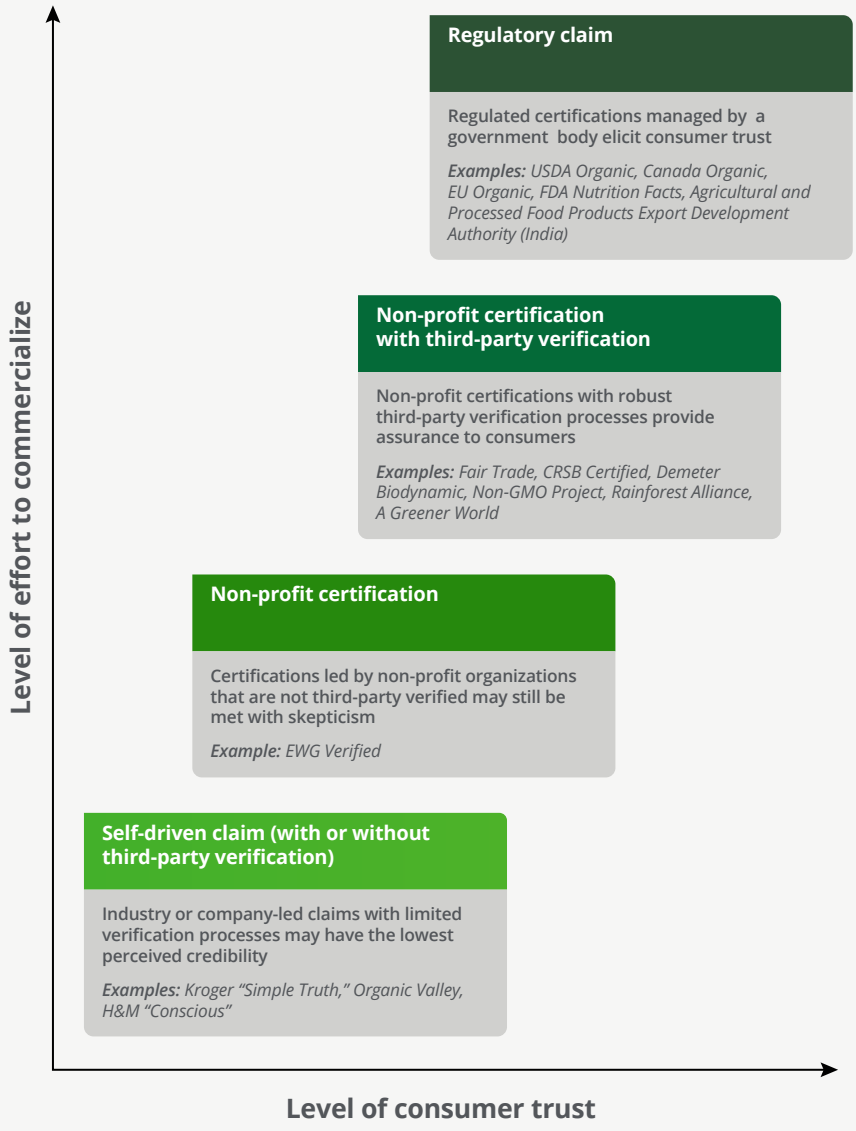
Certifying climate impact

To enable the broad scale of climate-smart products, value chain participants are taking a variety of approaches to product claims. Where certification schemes do not yet exist, they're taking action to implement their own claims. There's a landscape of pathways to product label claims and certifications (see Figure 1). From any of these pathways, there are a variety of ways to drive GHG reduction opportunities within the value chain.

This section outlines the various approaches based on the level of effort to commercialize each one and the level of consumer trust each elicits, though there may be exceptions where claims require a higher level of effort.

Value chain participants are taking a variety of approaches to product claims to enable the broad scale of climate-smart products.

Figure 1 | **Pathways to climate-smart commodity claims and certifications**



Self-driven company or industry-led claims require a lower level of effort to activate compared to non-profit certification with third-party verification or regulatory claims. And while they have become increasingly prevalent in response to heightened consumer priorities around sustainability, regulatory claims and certifications with third-party verification outweigh self-driven or industry-led claims in terms of consumers' perception of credibility. Companies are trying to get ahead of these concerns by securing third-party verification that supports the integrity and validity of their self-driven claims.

Although food product labels are subject to Canada's regulations around false, misleading, or deceptive labelling, industry- or company-led claims with limited verification processes may be viewed by consumers as less authentic or rigorous.[21] When it comes to climate-related claims, evolving guidance and leading practices may put companies using self-driven claims at risk of suspicion of greenwashing.

Non-profit certifications require greater effort to commercialize, as they involve having a non-profit organization govern certification and validate that users meet its requirements. The Environmental Working Group (EWG), for example, is an American non-profit that approves the use of an "EWG Verified" label for sustainable products, which is audited by EWG itself. These certifications foster more trust than self-driven claims; however, since they do not include third-party verification, the labels may still be met with some skepticism.

Non-profit certifications with third-party verification take a similar approach to governance, but applications, including any data, are reviewed and approved by a third party. This process can be particularly valuable for certifications that involve substantial data requirements, as external verification adds a level of robustness. Third-party certifications have different processes and requirements. Fairtrade requires that FLOCERT, a third party, verifies all products before certification. Similarly, Non-GMO Project conducts all testing through external accredited laboratories. The Canadian Roundtable for Sustainable Beef's CRSB Certified program requires operations to be audited to its standards by third-party certification bodies, which are themselves audited and approved by the program's external oversight body. Use of third-party verification increases the effort associated with acquiring certification, but it substantiates product claims and builds credibility and trust with consumers. It also supports risk management by putting the responsibility for quality on the certifying body.

Industry or company-led claims may be viewed as less authentic. Evolving guidance may put companies using self-driven claims at risk of greenwashing.

Regulatory claims are governed by either a non-profit or government body, in alignment with government regulations, and are often viewed as substantiated and trustworthy. These claims generally require the most effort to commercialize and align to requirements, but government oversight and compliance add a layer of legitimacy, assuring consumers that the product claims are backed by stringent standards.

Regulatory claims or non-profit industry certifications with third-party verification do require substantial effort due to robust verification and assurance processes, but they also build the most consumer trust due to their transparency and credibility. They also help to mitigate the risk of greenwashing perceptions. Future certifications could be governed by a third-party organization, rather than presented by the brand itself. Developing the visual identity of certifications on the packaging will be as important as developing their narratives. Visuals can be tested among consumers to ensure that they resonate and generate interest to learn more.

Third-party certifications seen as more credible

Equally important to the language used in sustainable claims is the actual source of the claim itself. Nearly half of Canadian consumers (49%) favour third-party certification seals such as Fairtrade as a cue for a product's sustainability—and that number increases to 55% for third-party seals related to a global standard.[22] This was validated by our focus group participants; when asked to evaluate two methods of presenting a sustainable claim—a third-party seal (i.e., a non-profit certification) and a claim made by the brand producing the product—they ranked non-profit certifications far higher in terms of perceived credibility. When probed, participants explained that they assumed that brands make their own claims as a mechanism for profit. They also preferred the presence of a QR code next to the non-profit certification in case they wished to learn more.

PART 3

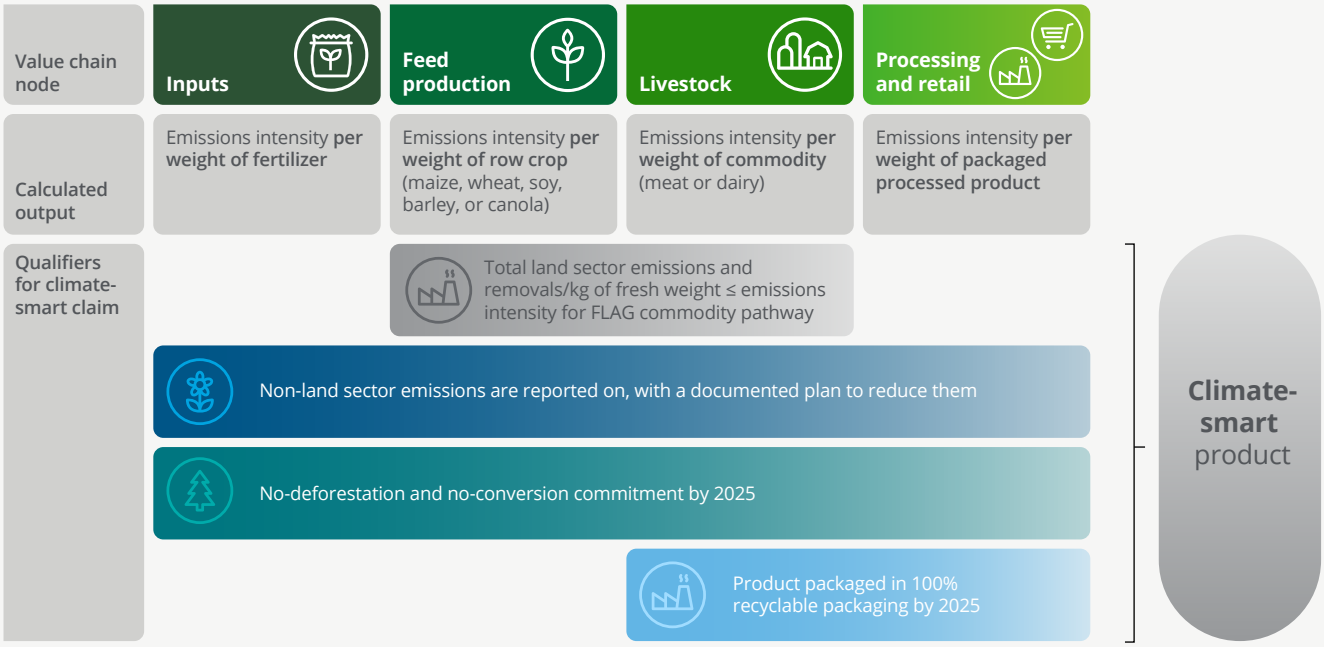
Proposed qualifiers for climate-smart products

Building integrity into a standardized climate-smart claim

There are four proposed qualifiers, or criteria, for a standardized "climate-smart" claim. The *measurement methodology* encompasses value chain processes for food products from cradle to processing gate, including emissions from nutrient input to packaged product; the processing gate is the point in a product's life cycle when it would be packaged, labelled, and deemed eligible for a climate-smart claim. For completeness, the methodology includes both land sector emission sources and removals, and non-land sector emission sources. Users of the *open-source framework* would need to meet all four qualifiers to be eligible to use a climate-smart claim.

Users would need to meet all four qualifiers to be eligible to use a climate-smart claim.

Figure 2 | **Value chain of proposed qualifiers for a climate-smart food product**



1. Emissions intensity

As the goal is to support broad emissions reductions and removals in agriculture and food, the primary qualifier is alignment to a science-based GHG reduction pathway for the commodities. To be eligible for product certification, users of the *open-source framework* can demonstrate that their commodity's land sector emissions intensity (per tonne of fresh product) aligns with a science-based emissions pathway for the 1.5°C scenario. Users can determine emissions intensity for a product they aim to certify by using the *measurement methodology* to quantify the relevant GHG emissions at each node along the value chain.

The following emissions intensities for climate-smart commodities (see Figures 3 to 6) are defined by using an applicable baseline and leveraging the SBTi FLAG target-setting tool to measure baseline intensity.[23] The Canadian Roundtable for Sustainable Beef's 2021 life cycle assessment was used as the baseline for beef while the Canadian 2021 emissions intensity in SBTi's commodity data was used for pork, dairy, and poultry. The Canadian beef advisors' goal is to reduce emissions from primary production by 33% by 2030, which is aligned to the net-zero pathway for beef outlined below. For all commodities, the baseline intensity was inputted in the target-setting tool to arrive at the annual contraction rates and annual qualifying intensity. Note that the emissions intensities are not being directly compared across commodities as they each have different baseline emissions intensities.

The methodology includes both land sector emission sources and removals, and non-land sector emission sources.

Figure 3 | **Net-zero emissions reduction pathway for beef**

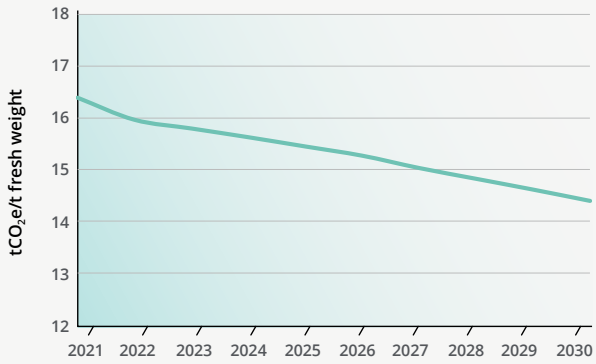


Figure 5 | **Net-zero emissions reduction pathway for pork**

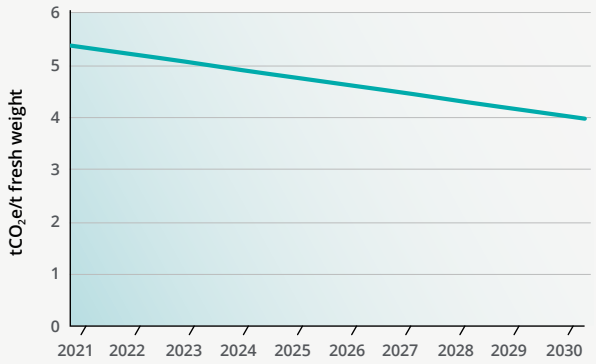


Figure 4 | **Net-zero emissions reduction pathway for chicken**

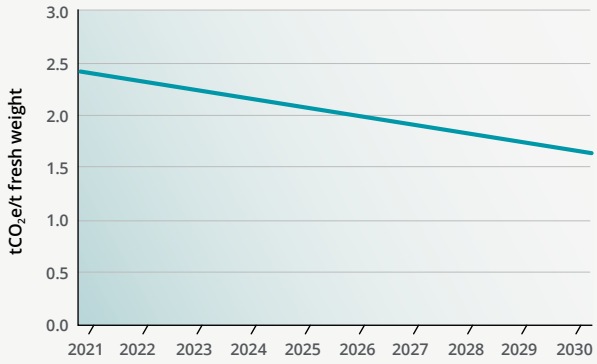
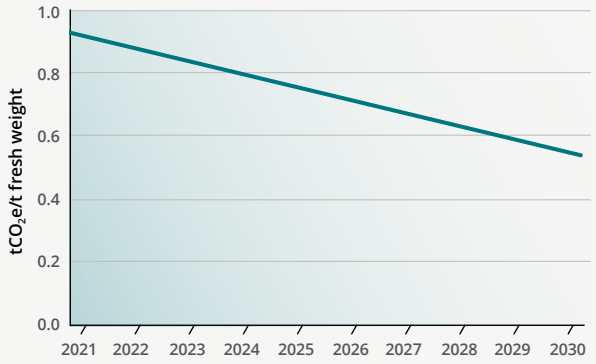


Figure 6 | **Net-zero emissions reduction pathway for dairy**



2. Non-land sector emissions
The user of the *open-source framework* **quantifies and reports on non-land sector emissions and has a documented plan to reduce those emissions in line with the 1.5°C pathway.** Non-land sector emission sources include waste, packaging, fugitive emissions, mobile combustion, electricity consumption, and stationary combustion. The *measurement methodology* includes a standard for measuring them.

3. No conversion of any natural ecosystems, including no deforestation
Producers of the product have a **documented public commitment to eliminate deforestation and the conversion of all natural ecosystems across all emission scopes by 2025.** These commitments should align to the Accountability Framework initiative (AFi), which defines deforestation as forest loss resulting from conversion to agriculture or other non-forest use, conversion to plantation, or severe or sustained degradation; and conversion as changing natural ecosystems to another land use, or change in the ecosystem's species composition, structure, or function.[24]

Measures to protect natural forests in areas of influence, eliminate conversion of other ecosystems from supply chains, and prohibit conversion of natural ecosystems are all becoming critical components of corporate target-setting.

Commitments to no conversion or deforestation

Companies with no-conversion and no-deforestation commitments are contributing to the scale of sustainable supply chains across production, sourcing, and financial investments. Avoiding conversion of grassland is a significant opportunity for Canada—the resulting preservation of soil carbon stocks offers high mitigation potential.[25] Canadian beef farmers are supporting this through the existing land-use and biodiversity goal to maintain the 35 million acres of native grassland within their care.[26] While the annual rate of deforestation in Canada is relatively low, the main cause is cropland expansion.[27]

Halting deforestation also mitigates climate change and supports climate resilience.[28] Measures to protect natural forests in areas of influence, eliminate conversion of other ecosystems from supply chains, and prohibit conversion of natural ecosystems are all becoming critical components of corporate target-setting. New regulations will help, such as the EU regulation on deforestation-free supply chains, which require any company importing or exporting certain commodities to or from the European Union to prove the products have no connection to deforestation. Canadian agri-food companies exporting relevant commodities there, including cattle and soy products, can conduct due diligence through information collection and risk mitigation measures to demonstrate that the relevant commodities are deforestation-free.[29] Accordingly, data and traceability around land-use change are crucial for companies to have adequate visibility into any potential deforestation links.

4. Recyclable or compostable packaging
The product is **already packaged in, or will be packaged in, 100% recyclable or compostable packaging by 2025,** supporting trust in the product certification and in the climate-smart claim. This qualifier aligns to other corporate packaging targets, such as McCain's commitment to ensure 100% recyclable, reusable, or compostable packaging by 2025. As of 2022, 98% of their paper packaging and 90% of their plastic packaging was recyclable.[30]

Don't underestimate the role of packaging

Nearly 50% of Canadian consumers cite third-party certification seals on product packaging as a useful sustainability attribute.[31] And a full 82% indicate they would be willing to pay more for sustainable packaging, with Gen Z being the most willing.[32] During our focus group discussions, participants emphasized the role that packaging plays in fuelling their skepticism about greenwashing; even if a product's written claims appear credible, consumers perceive packaging made from non-sustainable materials as a red flag.

For brands making sustainable claims, sustainable packaging for their products (that still maintains food safety) should be considered a necessity, not an option. Packaging for climate-smart certified products that is 100% recyclable, for example, can build trust with and reassure consumers who are increasingly wary of greenwashing.

PART 4

Planting seeds through a robust measurement methodology

Design principles for certifying emissions intensities

Consumers want to understand the attributes associated with the climate-smart claims on food products they purchase, and they seek assurance that these claims are credible. Transparent, rigorous, and traceable climate metrics that back claims are therefore critical for any trustworthy, climate-smart product certification. To address this need, the *measurement methodology* applies a robust, science-based approach for measuring the carbon intensities of key commodities and employs the following design principles that are considered best practices among industry leaders.

The measurement methodology applies a robust, science-based approach.

1. Focus on climate impact

In designing this *open-source framework*, our aim was to focus on key commodities with the highest potential for making a measurable impact in Canada. In creating the *measurement methodology*, we evaluated the extent of a commodity's business and environmental impact throughout the value chain and established a minimum impact threshold to identify which commodities should be considered. At this time, we limited the scope to climate-related qualifiers and emissions intensity measurement metrics; social and nature-related metrics were deferred for future iterations.

Climate and nature: intertwined metrics required

The evolving landscape of reporting and target-setting related to nature and biodiversity, combined with the recognition of the interdependencies of nature and climate, indicate the increasing importance of considering nature and biodiversity alongside climate metrics. In the future, a standardized MRV approach could be enhanced by embedding metrics related to potentially material, nature-related topics, including land-use change, soil pollution, water pollution, waste management, and resource use. For example, soil pollution, water pollution, and resource management could be measured through indicators like avoided pesticide use per hectare and nitrogen use efficiency; waste water discharged and water pollutant loading rates from product processing; and percentage of products sourced from regions with high water scarcity, respectively.[33]

2. Design for flexibility and interoperability

To adapt to changing MRV technologies and integrate new scientific insights, this *open-source framework* allows for interoperability and iteration. By using a value chain approach and identifying the contribution of key commodities to the decarbonization of the agriculture and agri-food sector, users can focus on emission sources associated with the relevant activities within their operations. The *measurement methodology* simplifies complex methodologies and presents data requirements that are aligned to industry associations' life cycle assessments where relevant and possible. It also provides the ability to leverage data that is already being collected in programs administered by industry associations and other sector-wide reporting mechanisms.

Prioritizing data requirement simplicity and the cost-effectiveness of data collection will be key to achieving adoption at scale. Incentives to improve accessibility of on-farm operational data could help to address barriers related to a lack of records and data governance, creating real value for farmers in advancing practice changes. Operational data collection can also leverage existing programs and tools or be outsourced to third parties to limit the burden on farmers.

3. Build in transparency and robustness

In designing this *open-source framework* to be transparent and robust, we employed

globally accepted standards and benchmarked against science-based methodologies in climate change, GHG accounting, product life cycle analysis, and emissions reporting. These methodologies are meant to provide a pathway to measure emissions intensity and the GHG reductions achieved through climate-smart interventions and beneficial management practices and to ultimately enable credible and trustworthy claims. The quantification methodologies were developed to ensure that the accounting principles of relevance, completeness, consistency, transparency, accuracy, conservativeness, and permanence were incorporated, as defined in the Greenhouse Gas Protocol Land Sector and Removals Guidance.[34] Finally, the *open-source framework* provides considerations on the verification and governance of product claims to support building trust.

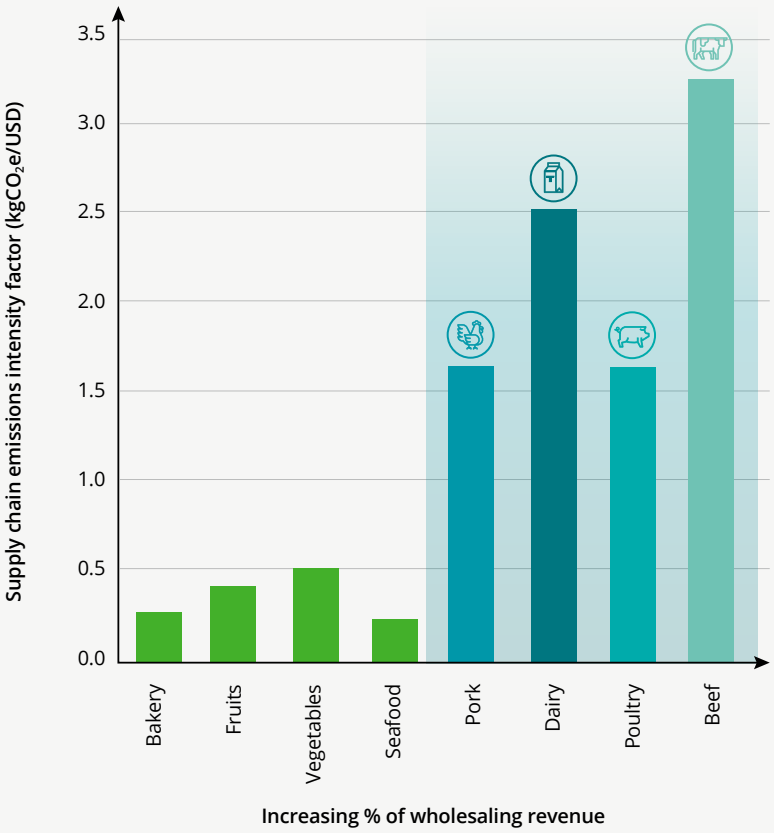
Building trust through transparency

To build an effective third-party certification program, it's important to provide transparency into the process supporting it, including clear facts about measurement, reporting, and verification. Failure to provide such information runs the risk of consumers assuming the certifications are untrustworthy and a hidden attempt at greenwashing. One option is using a QR code, which can also help carry the certification narrative. A landing page for the QR code could direct consumers to different types of information based on their level of interest. It will be important to test this landing page among consumers to optimize the user experience and confirm that it is engaging, informative, and digestible.

Defining the scope for maximum impact

To identify the food commodities with the highest climate impact, we conducted an analysis to identify those with the highest emissions intensity and the largest product sales. This entailed desktop research evaluating the revenue, sales volume, and emissions intensities of various food products and consulting industry experts to gain their specialized knowledge. After rigorous analysis, the food products that were verified and incorporated into the *open-source framework*'s scope are beef, poultry, pork, and dairy, and input commodities like barley, soy, maize, canola, and wheat (collectively referred to as feed).

Figure 7 | **Analyzing emissions impact of food products**[35]

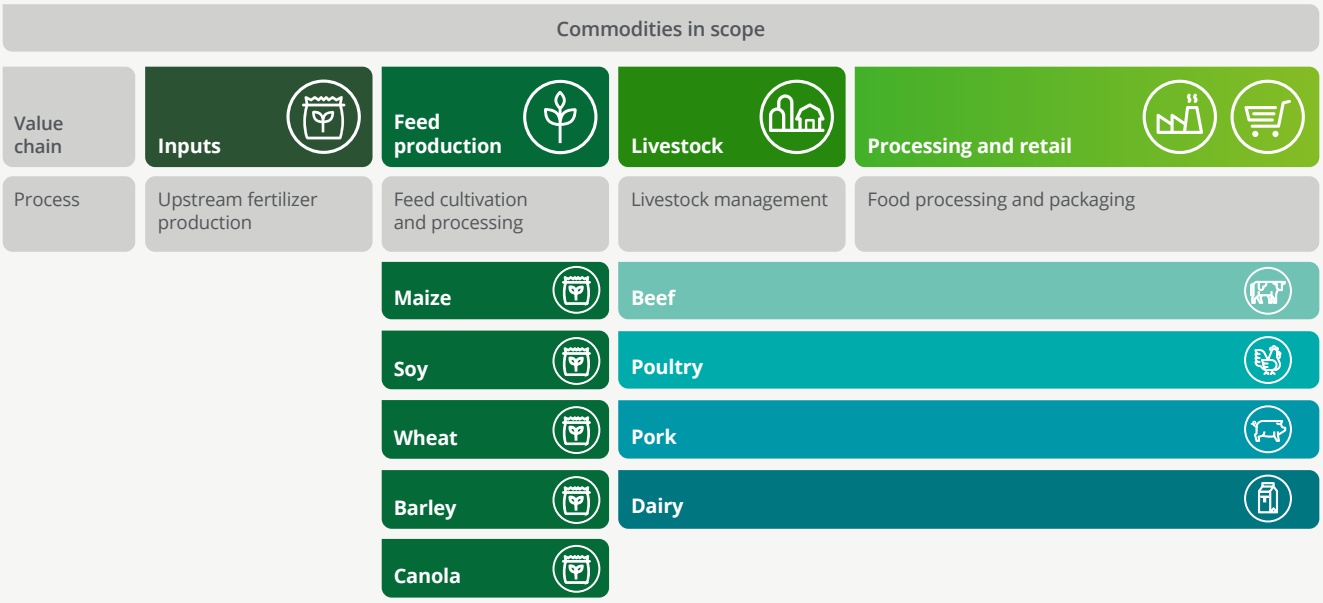


We applied a **value chain approach** to the commodities selected, taking into consideration the key activities from cradle to processing gate. This includes activities from nutrient input to packaged product. Since packaged products are distributed to several retail networks with varying operation environments, the scope of the *measurement methodology* does not include emissions associated with retail operations, transportation or distribution to retail stores, or end-of-life emissions with consumers.

The framework is organization-agnostic so does not take organization-specific operations and procedures into consideration; instead, it is a high-level representation of key value chain processes across Canada.

To develop an effective and actionable approach for generating trustworthy, science-based, low-emission food product claims, there's a need for **broad industry participation** to ensure completeness and capture key insights at every node of the value chain. While this approach requires a high level of effort, ensuring completeness and validating data availability and levels of data maturity, traceability, and current constraints are crucial for making a standardized MRV framework implementable. This *open-source framework* received input from leaders of organizations across the entire value chain, including industry associations and researchers. In addition, the methodology was peer-reviewed by industry experts at each node.

Figure 8 | **Commodities in scope**



Note: The scope does not include emissions associated with retail operations, transportation or distribution to retail stores, or end-of-life emissions from consumers.

Measuring emissions from farm to processing gate

Emissions quantification across the value chain allows for actors to calculate carbon intensity at each node. The *measurement methodology* focuses on the documenting methodologies and data requirements necessary for quantifying relevant GHG emissions at each node for each selected commodity (beef, dairy, pork, and poultry). The approach involved conducting a literature review and examining key industry standards, frameworks, and protocols.[36]

Participants raised a key challenge to quantifying emissions and substantiating product claims: **the availability of farm-level data.** In developing the *measurement methodology*, industry leaders across the value chain provided insights into their challenges, including a lack of data, access to data, an overload of requests, and hesitancy around sharing farm and livestock operational data. Farmers and ranchers play a crucial role in monitoring and reporting this data, and it's critical that producers learn from their direct experiences and perspectives to find solutions that address farm-level data gaps.

The *measurement methodology* seeks to address this challenge in two ways:

Use a tiered approach to measurement and quantification

Scientific research is evolving to allow for different ways to quantify emissions based on specific operational processes and using various data sets. In this *open-source framework*, we present multiple quantification methodologies for each emission source to allow users to select the approach that best serves the needs of their organization or mandate and that leverages the data that is most available to them. Users should consider collecting as much operation-specific data as possible to allow for more accurate emission quantification and hence the opportunity to obtain credit for climate-smart interventions or best management practices. This approach is comparable to the IPCC guidelines for estimating emissions with different levels of methodological complexity: Tier 1 is the simplest method, Tier 2 is intermediate, and Tier 3 is the most complex and demanding in terms of data requirements. Tiers 2 and 3 are more accurate "higher-tier" methods than Tier 1, with Tier 2 adopting a more site-specific assessment of factors influencing emissions, while Tier 3 contains the highest level of detail but requires robust scientific data.

From user-specific, on-farm data to supply chain, regional, or industry averages

As described above, there are various quantification methodologies that each leverage different sets of data. The methodologies range from the most accurate approach, which requires multiple user-specific supply chain factors, regional or industry averages, and other third-party data. In the near term, it's expected that users may leverage these alternative approaches given limitations in user data. At the same time, they may consider developing a plan to improve the availability of operation-specific data, as more accurate emissions quantification could come with more opportunities to commercialize climate-smart commodities.

Understanding the scope of value chain nodes and emission sources

There are opportunities for ecosystem players at each node of the agri-food value chain to contribute toward or undertake activities that reduce emissions and remove carbon. The *measurement methodology* includes value chain nodes from inputs through to retail and provides key emission sources at each node. It captures emissions associated with upstream fertilizer production through the emissions intensities supplied by input providers. The feed production node captures land sector emissions related to land-use change, fertilizer application, crop residue, and transportation of biomass, as well as non-land sector emissions such as waste in operations, electricity, and stationary combustion. Emission sources associated with livestock management include enteric emissions, manure management, and on-farm machinery. And the processing and retail nodes cover processing and packaging of raw products received from farms, predominantly from non-land sources.

Land and non-land emissions

In this *open-source framework*, emissions related to forest management, land management, and agriculture are collectively referred to as land sector emissions. The SBTi FLAG Guidance identifies land sector emissions as those associated with land-use change and land management activities such as the cultivation of agriculture products and the rearing of livestock. In this report, land sector emissions refer to emissions from land-use change, fertilizer application, crop residue, enteric fermentation, manure management, on-farm machinery, and the transport of biomass. Non-land sector emissions refer to any other GHGs emitted from relevant activities within the value chain that are currently not included in the land sector emissions, such as stationary combustion, the transportation and distribution of products to manufacturing facilities, electricity use, waste management, and packaging processes.

Land sector emissions include those related to forest management, land management, and agriculture.

Figure 9 | **Value chain of commodities in scope**

Value chain node	Value chain process	Emission node	Constituent gases
Inputs	Fertilizer production	Upstream fertilizer production	CO_2, CH_4, N_2O
Feed production	Feed cultivation and processing	Land use change	CO_2, N_2O
		Fertilizer application	CO_2, N_2O
		Transport of biomass	CO_2, CH_4, N_2O
		On-farm machinery	CO_2, CH_4, N_2O
Livestock	Livestock management	Crop residue	N_2O
		Enteric emissions*	CH_4
		Manure management	CH_4, N_2O
		On-farm machinery	CO_2, CH_4, N_2O
Processing and retail	Food processing and packaging	Waste	CO_2, CH_4, N_2O
		Packaging	CO_2, CH_4, N_2O
Emission sources common to all value chain processes		Fugitive emission	CO_2e
		Mobile combustion	CO_2, CH_4, N_2O
		Electricity consumption	CO_2, CH_4, N_2O
		Stationary combustion	CO_2, CH_4, N_2O

Legend

Land sector emission source | Non-land emission source

*Enteric emissions are not applicable to poultry

Emission sources and beneficial management practices

The *measurement methodology* encompasses emission sources across the agriculture and food value chain: land-use change, application of fertilizers, transport of biomass, on-farm machinery, crop residues, enteric emissions, manure management, waste, packaging, fugitive emissions, mobile combustion, electricity consumption, stationary combustion, and fertilizer production. The approach focused on the most material emission sources by identifying the sources associated with key value chain processes and the resulting constituent gases. For each source, a variety of quantification methodologies that use varying data sets were sourced from globally accepted standards and industry-leading research and frameworks.

Across each node of the value chain, there are beneficial management practices that have the potential to reduce GHG emissions and increase carbon sequestration. For example, growers can introduce on-farm agroforestry and enhanced soil organic carbon (SOC) activities, such as cover cropping or intercropping, to support soil fertility and carbon storage capacity. Separately, nutrient management practices such as precision nitrogen management and enhanced efficiency fertilizers can optimize nitrogen application and reduce nitrous oxide emissions. Livestock producers can improve feed quality or introduce other feed interventions such as rotational grazing and extending grazing periods to reduce enteric fermentation and methane emissions, while manure management practices such as covering manure tanks or acidifying slurry can have a large-scale impact on nitrous oxide and methane emissions. Lastly, processors and retailers can leverage renewable electricity, refrigerant leak detection systems, recyclable or biodegradable packaging, or alternative fertilizers to create value chain emissions reductions that can be quantified by the *measurement methodology*.

PART 5

Commercializing climate-smart commodities

How to account for emissions

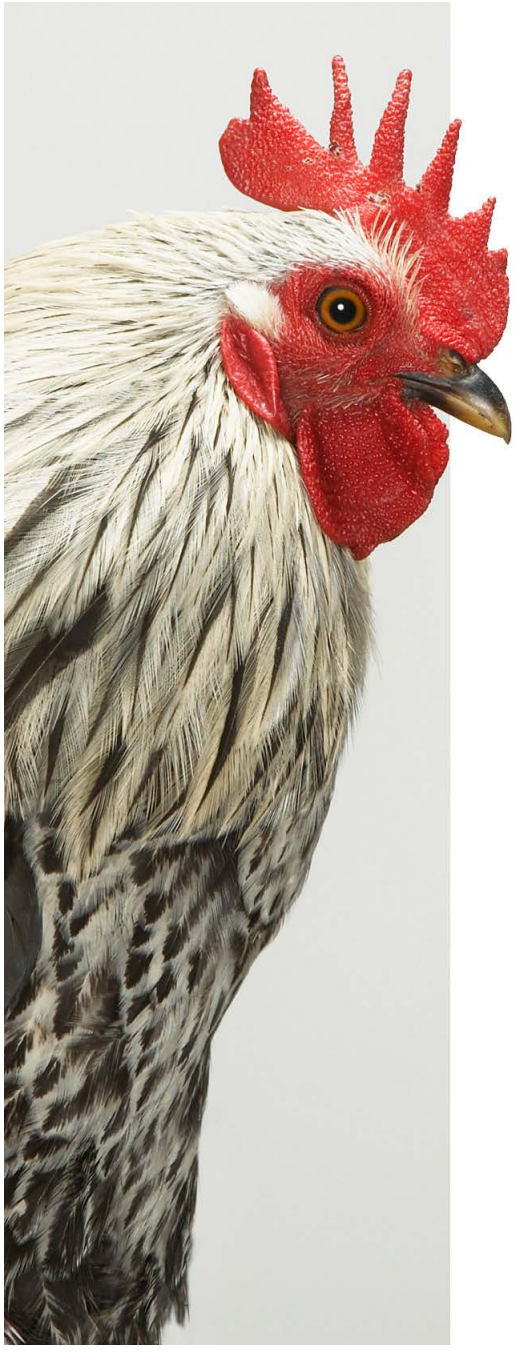
Increasingly, companies from across the agri-food sector—from fertilizer and pesticide companies to food retailers—have committed to reducing their scope 1, 2, and 3 emissions. In line with a mitigation hierarchy, companies should prioritize reducing emissions within their operations and value chain as much as possible before investing beyond the value chain. This enables them to apply an inventory accounting approach to reductions within the value chain.

A key consideration for companies is to understand how to incentivize the adoption of beneficial management practices and then account for the resulting reductions in their scope 3 emissions. The Greenhouse Gas Protocol (GHGP) is the leading international framework for GHG accounting, and the accounting principles for this *open-source framework* are based on it. Its draft Land Sector and Removals Guidance (LSRG) aims to standardize how organizations account for and report GHG emissions and removals from land management, land-use change, biogenic products, and related activities, but has not yet been finalized. Incentivizing climate-smart practices and accounting for the interventions using an inventory accounting approach is still relatively nascent. Nonetheless, companies are driving forward with estimating their GHG emissions, identifying priority regions and commodities, understanding the challenges related to their sourcing regions, and creating plans for implementing scope 3 reductions.

Achieving scale in climate-smart practices in Canada's agri-food sector must be grounded in feasibility for farmers, who are already burdened by data needs, regulatory requirements, and economic challenges. Incentives from value chain players are a critical consideration and should be presented in tangible terms that lead to realizable economic advantages for farmers. Early adopters of the *open-source framework* will likely be those with the tools or reporting processes in place to access detailed on-farm data, which is necessary to quantify emissions reductions achieved through climate-smart practices. Lessons from these pilot adopters can then be leveraged to support scale and adoption with smaller producers who currently have more data limitations.

Incentives from value chain players can lead to realizable economic advantages for farmers.

This section describes three potential pathways to drive GHG reduction opportunities within the value chain using an inventory accounting approach: inset credits, co-investment, and government incentives. Each pathway describes a mechanism that companies can use to finance, measure, and account for emissions or removals associated with climate-smart agriculture practices. The *measurement methodology* could be used as a basis to quantify the emissions reductions achieved through these pathways.

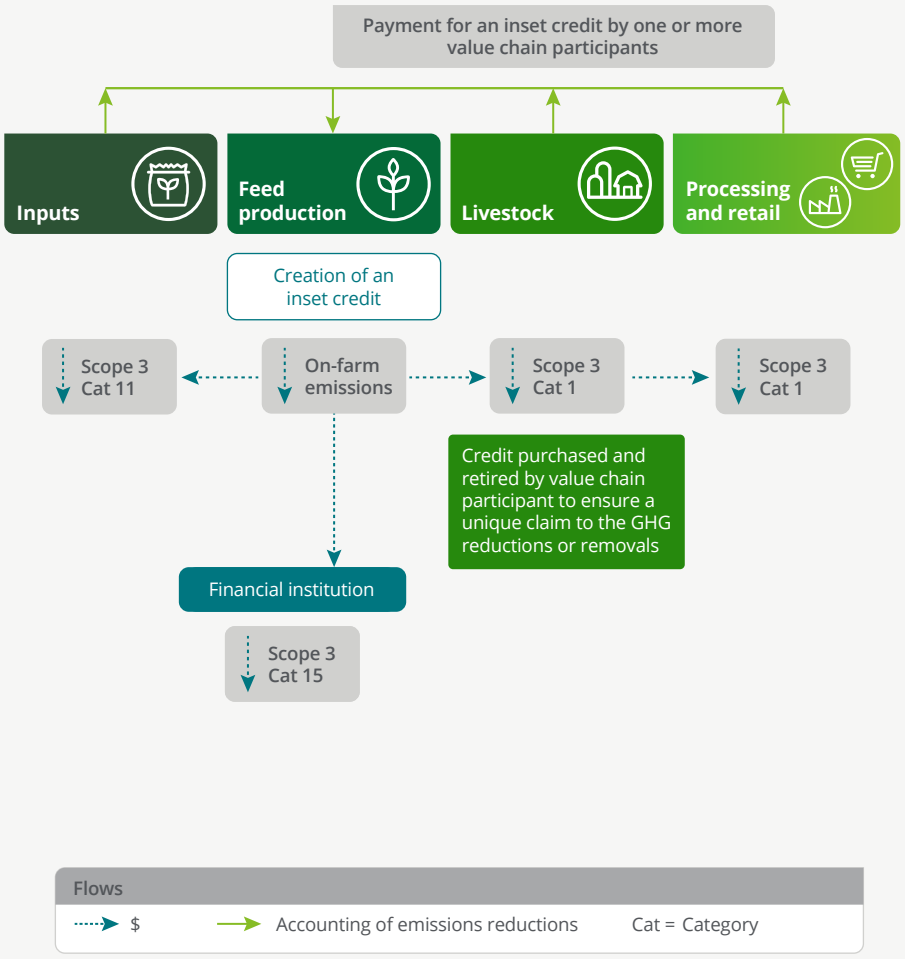


Pathway 1: Inset credits purchased from and retired by value chain partners

In this pathway, a grower introduces climate-smart practices and creates an inset credit tied to the on-farm emissions reductions.[37] One or more value chain players purchase the inset credit to ensure that actions in the value chain are properly accounted for in their scope 3 inventory. The creation, purchase, and sale of these credits is typically done through a credits developer who works as the intermediary between a group of growers and the off-takers of the credits. The purchasers retire but do not use the credits to adjust scope 3 emissions or removals (i.e., they do not subtract credits from reported emissions). Instead, those in the downstream value chain, including livestock producers, processors, and retailers, account for the lower emissions intensity product in their scope 3, category 1 (purchased goods and services) inventory.

Through the same approach, upstream participants such as fertilizer producers will account for the use of the lower emissions intensity product sold in their scope 3, category 11 (use of sold products) inventory, and financial institutions in scope 3, category 15 (investments emissions). The purchasers use the credits to secure the unique claims to the GHG reductions and removals (so that they are not sold or transferred to a third party via a credit) and to ensure that actions in the value chain are accounted for in the inventory.[38]

Inset credits are effectively a tool to incentivize the grower to reduce their emissions, and for other value chain participants to identify and track the activities related to the emissions reductions, which they can then account for through their scope 3 inventory.



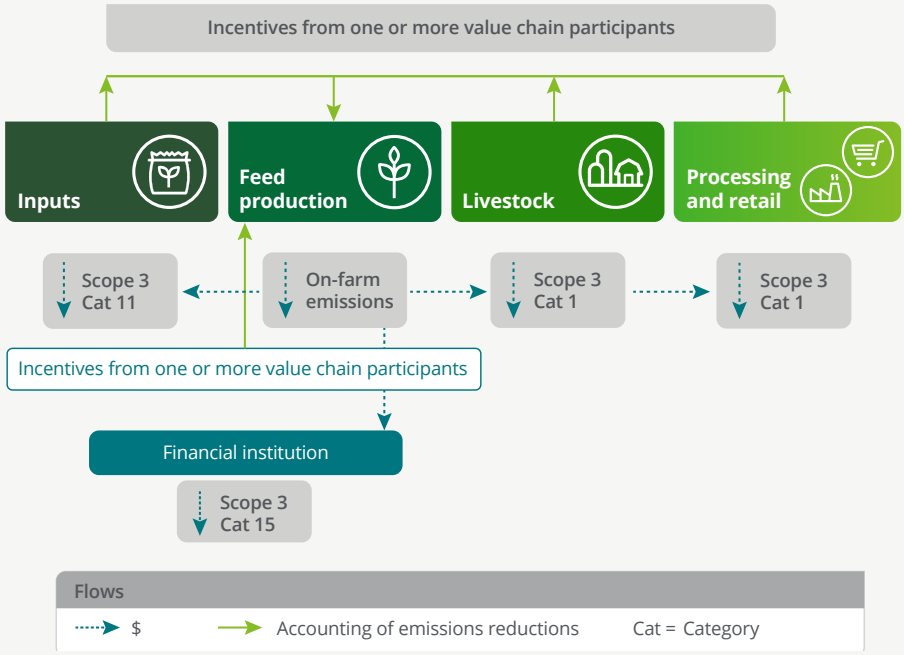
Companies developing inset credits would be responsible for adhering to the GHGP-LSRG quality criteria for GHG credits, which include more stringent quality criteria relating to additionality, baselines, monitoring, permanence, leakage, unique issuance and claiming, validation and verification, governance, and no net harm.[39] While inset credits are one pathway to secure unique claims to GHG reductions and removals, the additional quality criteria and other related requirements take a significant level of effort and investment. At the same time, SBTi's Corporate Net-Zero Standard requires that companies reduce their base year emissions by at least 90% and neutralize the residual emissions by purchasing carbon removal credits at net-zero.[40] To achieve this, an organization needs to reduce most of the emissions within its value chain.[41]

Although insets require a significant level of effort and investment, they deliver a mechanism that could enable participants to reduce emissions within the value chain in the near term.

Pathway 2: Co-investment through contractual agreements

In this pathway, an incentive program is initiated by one or more value chain participants who incentivize growers to implement on-farm climate-smart practices. Value chain partners who work with growers to achieve the GHG reductions or removals can choose to enter into contractual agreements to ensure the unique claims to the GHG reductions or removals from the activity will not be sold or transferred to third parties.[42] In doing so, upstream and downstream participants can use a lower emissions intensity factor to account for their scope 3 emissions. Those in the downstream value chain, including livestock producers, processors, and retailers, would account for the lower emissions intensity product in scope 3, category 1 (purchased goods and services). Through the same approach, upstream participants, such as fertilizer producers, will account for the use of the lower emissions intensity product sold in scope 3, category 11 (use of sold products), and financial institutions in scope 3, category 15 (investments emissions).

While this example illustrates the case where interventions are implemented by the grower, other value chain participants could also implement practices to lower their operational emissions inventory and have a similar impact on other participants' scope 3 emissions.



Financial incentives from the private sector can help fund actions to reduce GHG emissions on farms, creating GHG benefits for participants throughout the value chain alongside financial benefits for farmers. Contractual agreements where the rights to accounting for in-value chain GHG reductions achieved could be sold to value chain partners would allow players to secure the unique claim through a contractual mechanism. This would restrict farmers and other value chain players from selling or transferring insets or offsets to third parties, and thereby avoid the risk of double counting.

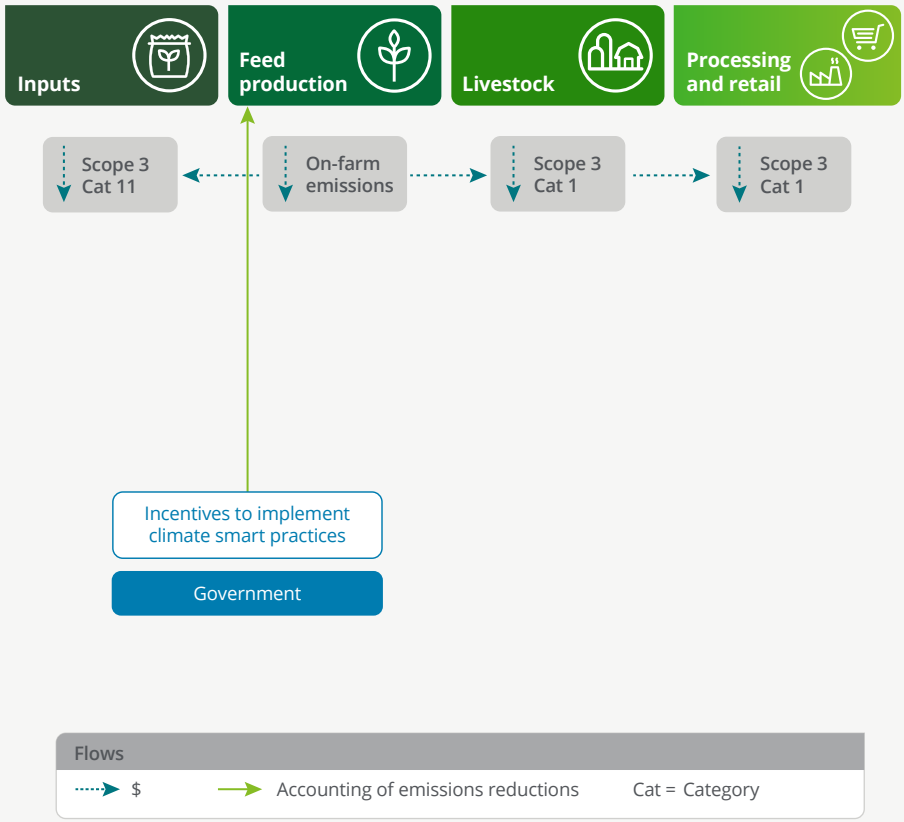
Farm Credit Canada (FCC) has advanced incentive-based programs with a variety of industry partners, including beef with the CRSB, crops with Cargill RegenConnect, dairy with Dairy Farmers of Canada, and potatoes with the McCain Regenerative Agriculture Framework.[43] These programs provide incentives to farmers who are advancing sustainable practices. For example, growers using McCain's Regenerative Agriculture Framework and who are eligible FCC customers are issued an incentive payment for practices that enhance crop diversity, minimize soil disturbance, reduce the toxicity of pesticides, enhance farm and ecosystem biodiversity, and more.[44] Funds for the incentive payments come from FCC's Sustainability Incentive Program and McCain, and are issued annually over the life of the program.[45]

Nutrien is working with Maple Leaf Foods to provide sustainable feed for livestock by reducing crop emissions, creating a pathway for carbon inset credits. Field-level data is used to measure, track, and validate the GHG reductions from nitrogen fertilizer application and allow Maple Leaf Foods to claim a reduction against their scope 3 emissions. As the level of required data poses a challenge to many growers, value chain participants developing similar programs need to consider how they can support farmers with data requirements to achieve scale and climate impact. Nutrien is the first company in Canada to achieve a validated pathway and verified GHG insets with SustainCert, a globally recognized climate impact verifier.[46]

Pathway 3: Government incentives

In this pathway, a government develops an incentive program to support on-farm emissions reductions by encouraging growers to implement climate-smart practices. Those in the downstream value chain, including livestock producers, processors, and retailers, account for lower emissions intensity products in scope 3, category 1 (purchased goods and services). Through the same approach, upstream participants such as fertilizer producers account for the use of the lower emissions intensity products sold in scope 3, category 11 (use of sold products).

While this example illustrates a case where interventions are implemented by the grower, other value chain participants could also implement practices to reduce their scope 1 and 2 emissions and have a similar impact on other participants' scope 3 emissions. MRV information could be provided directly to the government funding the program to support evaluation of its effectiveness and compare the GHG benefits per dollar across different climate-smart practices.



Governments are increasingly funding climate-smart agricultural practices, particularly on-farm initiatives. Canada's Agricultural Climate Solutions Fund aims to support the development, adoption, and monitoring of practices that sequester carbon and reduce GHG emissions. The On-Farm Climate Action Fund stream promotes beneficial management practices that store carbon and reduce greenhouse gases through nitrogen management, cover cropping, and rotational grazing practices.[47] The USDA's Partnerships for Climate-Smart Commodities provides incentives to help scale on-farm practices that reduce or sequester carbon, with a focus on the quantification, monitoring, reporting, and verification of GHG benefits.[48]

Governments are increasingly funding climate-smart agricultural practices, particularly on-farm, with a focus on monitoring, reporting, and verification.

Traceability of environmental attributes and avoiding double counting

According to the GHGP, double counting must be avoided if GHG reductions or removals take on a monetary value or provide credit in a GHG reduction program, and that contractual agreements can be used to avoid double crediting by specifying the exclusive ownership of reductions. Measures to prevent double counting vary across different commercialization pathways. The GHGP suggests that companies account for scope 3 emissions and removals through an inventory accounting approach, rather than adjusting inset credits against scope 3 emissions.[49] If companies create carbon credits under protocols such as enteric methane, emissions reductions may not be used under the *measurement methodology* because it would constitute double counting.

The GHGP-LSRG indicates that while certification programs are a tool that can be used to support traceability, GHG accounting for certification programs are required to use chain-of-custody models that guarantee physical traceability.[50] And while various chain-of-custody models can track the movement of products and their claims through a supply chain, only three guarantee physical traceability: the identity preserved, segregated, and control-blending models.[51] The identity preserved and segregated models physically separate materials, whereas the control-blending model maintains segregation until the processing stage in the supply chain—at that point, the certified product can be mixed with the non-certified product, but the proportion of certified product in the final output is known.[52] The control-blending model could therefore be used to support commodity traceability.

PART 6

Key tenets of an effective certification process

The necessary players

Taking the *measurement methodology* and building it into a standardized MRV approach and product certification will require organizations to take a comprehensive, rigorous approach to governance, reporting, and verification. This section outlines key considerations in deploying a standardized MRV approach and describes the responsibilities of value chain participants. Investment will be required to cover the costs associated with the activation and maintenance of an effective product certification process.

Three key participants are necessary for achieving product certification: a user, which is the agri-food value chain participant aiming to use a standardized MRV approach for a specific commodity; a governance body, responsible for approving and overseeing the standardized MRV approach adoptions from application to certification; and an independent verification body, which is an eligible third-party organization entrusted with verifying the practices implemented by the user and that the resulting commodity emissions intensities are in line with the *measurement methodology*.

Investment will be required to cover the costs associated with the activation and maintenance of an effective product certification process.

Figure 10 | **Steps to an MRV process**

The role of a future governance body

A certification could be governed and administered by a non-profit organization, such as an existing certification or regulatory body. Before a value chain participant adopts a standardized MRV approach, the governance body could review the user's plan to ensure it meets the certification requirements, such as qualifiers, a description of the climate-smart activities, preliminary measurement of the commodity's carbon intensity, and a monitoring plan. Climate-smart practices could be implemented before or after the certification process, as long as the commodity can be shown to have an emissions intensity that meets or is lower than the commodity pathway.

Through a transparent evaluation process, the governance body could also develop a list of competent verification bodies that can measure commodity emissions intensities and verify that they're in line with the standardized MRV approach. Other agricultural certifications have similar governance structures, such as the CRSB's assurance protocols, which mandate that certification bodies must have a documented process for selecting auditors and evaluating their competence.[53] Along with the elements described in the table to the right, the governance body should comply with international standards and design all future product claims in accordance with the Sustainability Claims Good Practice Guide.[54]

Creating a strong narrative behind the certification that empathizes with consumer values can help in both developing trust and securing recognition.

Governance body criteria

An appropriate governance body would meet the following criteria:

Independence	Is not associated with a particular industry, has no conflict of interest, and is a non-profit organization or regulatory body
Capacity	Available to sufficiently oversee the certification process for an appropriate number of prospective participants
Competence	Experience governing similar certification processes and/or employment of experienced and accredited personnel
Transparency	Organization governance and operational funding sources are not industry-associated, and the organization's methodologies, criteria, and certification decisions are all made publicly available
Accountability	Has clear mechanisms for accountability, including frequent reporting and external audits

Once the governance body confirms a product's eligibility, the user could select an eligible verification body to ensure it aligns with the standardized MRV approach. Upon receiving that verification report, and assuming adherence, the governance body could then certify the product.

A future governance body should explore naming options for this certification that are clear, quantifiable, and easy to contextualize for consumers, as complex or ambiguous language may frustrate or discourage them. The need for sustainable action is not just a technical topic but one that many consumers feel strongly about on a more personal level; thus, creating a strong narrative behind the certification that empathizes with consumer values can help in both developing trust and securing recognition. This narrative and all subsequent messaging should be in clear, conversational language.

The effectiveness of plain language

A recent study shows that consumers generally have limited understanding of information related to sustainability, so it's important to use language cues in climate-smart claims that are simple, accurate, and intuitive.[55] When shown a list of sustainable terms and phrases, our focus group participants responded negatively to terminology they deemed vague or difficult to contextualize, such as "healthy climate" and "climate conscious," while terminology such as "sustainably farmed" and "low carbon" was favoured for being clear and quantifiable.

Monitoring, reporting, and transparency

Reporting on monitored emissions-related data on an ongoing, long-term basis is crucial. As noted above, the user could be required to submit a monitoring plan as a step toward registration in the program. Monitoring plans could detail the data and parameters being assessed, as well as all monitoring practices, procedures, and personnel. The Climate Action Reserve soil enrichment protocol, for example, lists the key components of a robust monitoring plan to ensure sufficient data acquisition, record-keeping, monitoring, and quality control procedures.[56]

The user could also continuously monitor relevant data on an ongoing basis, as described in the *measurement methodology*'s principles based on GHGP-LSRG, to track emissions reductions and removals outcomes. The data collected could inform annual monitoring reports to the governance body to confirm that actual emissions intensities meet or exceed the SBTi FLAG commodity emissions intensity pathway. These reports could be published by the governance body on its website, providing public visibility into ongoing measurement. Gold Standard takes a similar approach by making monitoring reports publicly available for continuous feedback.[57] Transparency and public awareness are central to an effective certification as they build trust in consumers and retailers.

Verifying a commodity's alignment

Developing a product certification requires a robust verification process to ensure that commodities meet the requirements of a standardized MRV approach. This process could be conducted by the verifying body at least once every five years to align to updated measurement approaches based on any new information, as described by SustainCERT's Verification Requirements for Value Chain Interventions.[58] Verification procedures for similar frameworks include meticulous field visits and desk reviews, encompassing data collection on key parameters such as fertilizer usage, crop yields, livestock population, and energy consumption. Quality and assurance measures help validate the accuracy of collected data and can be supported by new and innovative technologies that help measure soil carbon. Verification could provide a reasonable level of assurance around reported emissions intensities, and that the user is performing GHG inventory accounting in adherence to GHG-LSRG. The GHGP-LSRG recommends assurance for all GHG programs to provide confidence that reported emissions reductions or removals follow the GHGP principles of conservativeness and permanence.[59]

Verification body criteria

An appropriate verification body would meet the following criteria:

Independence	Not associated with either the governance body or user
Expertise	Team has relevant and specialized knowledge of: • GHG inventory accounting approaches • Non-financial data monitoring, auditing, and assurance, including GHG accounting and assurance principles, testing and evaluation, and materiality analysis • Agri-food sector GHG emissions
Accreditation	Accredited as a verification body by the Standards Council of Canada, the ANSI National Accreditation Board (ANAB), or another member of the International Accreditation Forum to the most recent ISO Standard 14065—General principles and requirements for bodies validating and verifying environmental information, and ISO 14063—Greenhouse gases
Impartiality	No conflicts of interest or biases
Quality assurance	Internal quality assurance mechanisms and regular internal audits

Maintaining product certification

Once a climate-smart commodity has been verified, the governance body could confirm product certification and allow the commodity to be publicly listed on its website. Certified products could be labelled for both consumers and retailers in a similar way to Fairtrade, whose labels communicate compliance with their standards.[60] Importantly, the certification status of any commodity can be made subject to public appeals and complaints through the governance body, ensuring accountability and reinforcing the credibility of the entire certification process. Certified commodities could be recertified at least every five years to maintain product claims and support continuous reductions in emissions intensities in alignment with the SBTi FLAG pathway. Similarly, B-Corp requires recertification every three years to maintain continuous improvement and longevity.[61]

Toward a brighter tomorrow

This report outlines how the implementation of a standardized MRV approach is crucial to achieving our vision of sustainable, competitive agriculture and food systems in Canada and enabling more value chain players to advance toward their climate targets. It presents an *open-source framework* that includes technical considerations and the commercialization pathways for product label certification, with a focus on GHG accounting. It also offers a perspective on how companies can scale up measurable, reportable, and verifiable emissions reductions and commercialize climate-smart products for key agricultural commodities.

We want a climate-safe future where Canadians can choose healthy, affordable, sustainable food that is clearly labelled and supports the transition to net-zero. This future depends on the decisions and actions that Canada's agriculture and food sector make starting today. Both are fundamental to our well-being; governments and value chain participants need to take critical action to decarbonize, and to better measure, report, and verify the climate impacts of improved agricultural practices.

Let's work together toward a brighter future for agriculture and create a food system that aligns with the values of Canadians.

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