2024 Commodity Masterclasses: Key Takeaway Report

The Consumer Goods FORUM

Towards Net Zero

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Content and purpose of this document

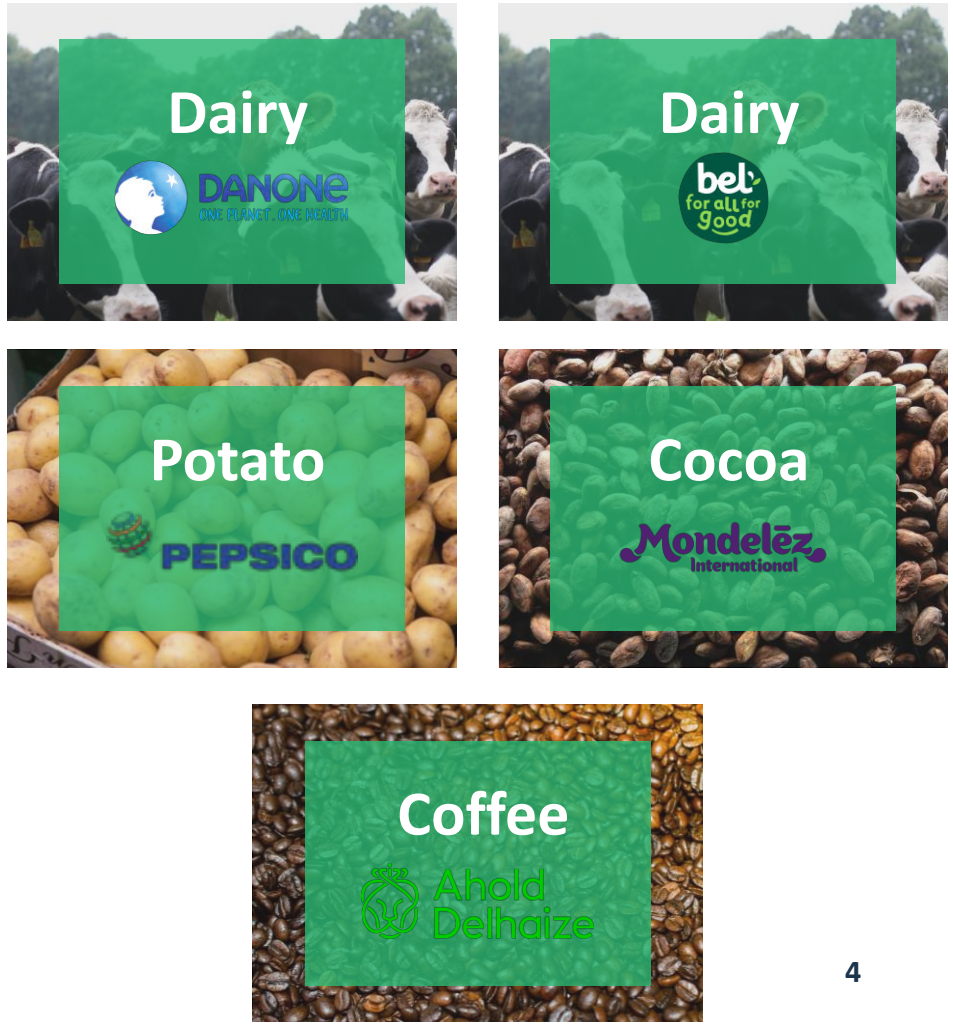
Food supply chains account for **25% of global greenhouse gas emissions**[1], making them vital to reducing the world's carbon footprint

Decarbonizing these supply chains is challenging, as each commodity—from coffee to wheat—faces **unique obstacles that require tailored approaches**

In line with TNZ's mission to leverage collaboration to achieve decarbonization, the **Commodity Masterclass series facilitates the sharing of best practices**, helping organizations learn, collaborate, and create scalable solutions for a sustainable future

This document summarizes the first five masterclasses held in 2024 and their overarching takeaways. **For full materials as well as session recordings, see here**

Masterclasses covered



1. World Economic Forum & BCG report 'The Supply Chain Opportunity' (Jan 2021)

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Themes | Common challenges

Fragmented supplier landscape makes many efforts more challenging

Production can be spread across millions of smallholder farmers from different countries, adding difficulty to key activities including rolling out and scaling new practices, verifying current practices, and collecting accurate carbon data

Variability across regions & farming models makes standardized solutions difficult

Regional differences in climate, soil types, and farming and ranching models require tailored decarbonization approaches

Lack of standardized and accessible data hampers progress

The current data landscape is spotty, disorganized, and difficult to navigate, causing unnecessary duplication of efforts and making it difficult to credibly prove impact

Financing is a persistent challenge

There is a need for more and different types of financial mechanisms that spread cost across the value chain and/or de-risk investment; e.g., multi-stakeholder partnerships incorporating public and private entities across the value chain

Scalable low-carbon technologies can be limited in availability and application

Adoption of low-carbon technologies is often hindered by availability, infrastructure gaps, and technical barriers, making it challenging to implement solutions even when funding is available

Themes | Key strategies and enablers

Producer empowerment is crucial for adoption

Successful interventions engage, educate, and benefit farmers and ranchers to help them overcome the financial & operational risks of adopting sustainable practices

Public-private partnerships are a key enabler

Companies frequently cite collaboration with public sector entities as an unlock for their most successful interventions

Data challenges can be mitigated

Investing in carbon monitoring & reporting tools, and using them diligently and uniformly, has helped members improve their ability to track progress

More information, including on successful application of these strategies, can be found in the individual masterclass recordings and materials (available here)

Themes | Common questions from masterclass participants tended to focus on the details of key enablers

Producer engagement

- What specific **financial and technical support** do you provide help farmers overcome the risks of transitioning their operations?
- How are you engaging farmers when you **don't have a direct relationship** with them?
- How do you ensure that new sustainable practices **align with farmers' other competing priorities**?
- What are the main **co-benefits for farmers** when adopting sustainability?

Financing

- How do you partner with your **treasury team / investment banking partners** to raise capital for your sustainability efforts? Or does it come from Opex?
- How can financial support be provided to farmers **several tiers away in the supply chain**, when commercial banks face **challenges in offering favorable terms due to multiple intermediaries**?
- Do **multi-stakeholder partnerships** with competitors get financial institutions to go faster?

Measurement

- How do you collect **accurate emissions data** at the farm level?
- What methods are you using to **measure and track reductions across different farmers**, such as logbooks, mobile apps, etc?
- How have you managed to **align GHG accounting methodologies** amongst a diverse set of suppliers?
- How do you find **LCA data** to be aligned or standardized globally?

Other

- How do you navigate the trade off between **internal pressure for results** and impact versus **solutions taking time**?
- Will new technologies or solutions need to be developed to reach net zero, or **do all necessary solutions already exist**?
- How are these levers **impacting the business model downstream**?
- Do you think it is possible to achieve success in reducing emissions if there is **no regulation in the field of emissions in the country**?

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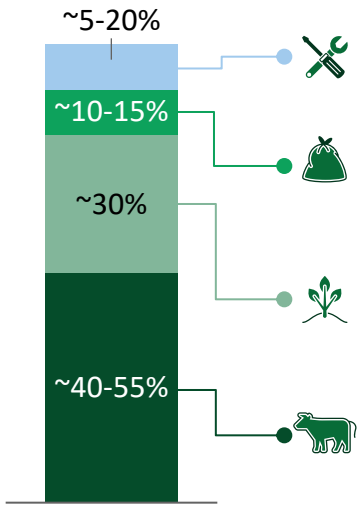
Dairy |
Danone
30 May 2024

Overview | Dairy contributes up to 5% of global GHG emissions; enteric fermentation a key driver

Context

- The global dairy market is valued at approximately $650 billion, with 950,000 kT produced in 2022
- Dairy farming supports the livelihood of over 10% of the global population
- Dairy contributes about 5% of total global greenhouse gas emissions

Main emissions drivers



Infrastructure & utilities

Manure management

- Methane from manure releases into the air decomposes in the absence of a suitable covered pit or digester as it

Feed

- Fertilizer & fuel contributes to emissions from feed grown on the dairy farm or purchased from feed suppliers

Enteric fermentation

- Cows digest feed via enteric fermentation, which results in the production and release of methane

"Milk is a global commodity. This means that decarbonization of the dairy sector is a global and a collective challenge."

- Sarah Lockwood,
Global Regen Ag Director, Danone

Insights | Herd and manure management present unique challenges for decarbonization of dairy

Key challenges

- **High methane emissions:** Dairy production has significant methane emissions, especially from enteric fermentation
- **Diversity of farming models:** Dairy farming models vary widely across not only farm size but also feed & housing system (e.g., pastoral, land-based, limited land) and farm outputs (e.g., specialized dairy vs dairy/ meat-eggs/cash crops), making standardized solutions difficult

Decarbonization levers

- **Animal genetics:** Optimize herd management and livestock breeds to enhance productivity and reduce emissions per unit of output
- **Animal feed (incl. DCF):** Use sustainable, deforestation-free feed and optimize rations to reduce methane emissions.
- **Manure management:** Implement advanced storage and application methods to lower methane emissions from manure
- **Methane innovation (incl. feed additives):** Leverage new technology such as feed additives to reduce enteric methane emissions
- **Soil health:** Enhance soil carbon sequestration through regenerative practices like cover cropping and reduced tillage

"Methane is a key battle for us, because it has a very short lifetime in the atmosphere, [and] it also has 80 times higher warming potential than CO2. This means that it's the fastest and most powerful opportunity to curb GHG emissions.

- Sarah Lockwood,
Global Regen Ag Director, Danone"

Overview | Examples of Danone initiatives and progress

Case study 1: NORAM Reg Ag Program

Context: 2017 initiative to improve soil health, carbon sequestration, crop yields, and long-term farm resilience

Results (2017 – 2022): Reduced 119k metric tons of CO_2 equivalent, sequestered >21k tons of carbon, and prevented 337k tons of soil from erosion, resulting in ~$3.3M cost avoidance for farmer partners

Case study 2: H'Lib Bladi, Morocco

Context: 2016 project launched by a coalition of partners aiming to promote sustainable milk production model in Morocco

Results (2016 – 2019): Upgraded 30 Milk Collection Centers that provide resources and guidance to farmers to achieve social, economic, and environmental benefits

Case study 3: Low Methane Milk Belgium

Context: Adding feed additive Bovaer (DSM) into the feed ration to reduce enteric methane emissions from cows

Results: TBD, but potential for 34% reduction of methane per cow and 12% reduction of CO_2 eq. per farm

For more details, see the full [Danone masterclass materials]

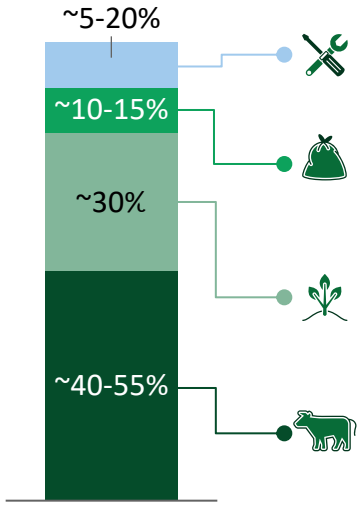
Dairy |
Bel Group
23 October 2024

Overview | Dairy raw materials account for more than half of Bel's global emissions

Context

- Bel supplies >$500M of milk and collects ~1,000 kT of raw milk each year
- Bel's milk supply comes from 8 dairy basins: France, Azores, USA, Slovakia, Iran, Portugal, Poland, and Canada
- Raw milk contributes to 35% of Bel's global emissions. Total dairy raw materials contributes 56%

Main emissions drivers



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Enteric fermentation

- Cows digest feed via enteric fermentation, which results in the production and release of methane

"A key pillar of Bel's mission is to preserve the planet and regenerate natural ecosystems in order to contribute to limiting global warming below +1.5 degrees"

-Elodie Parre,
Sustainability Director, Bel Group

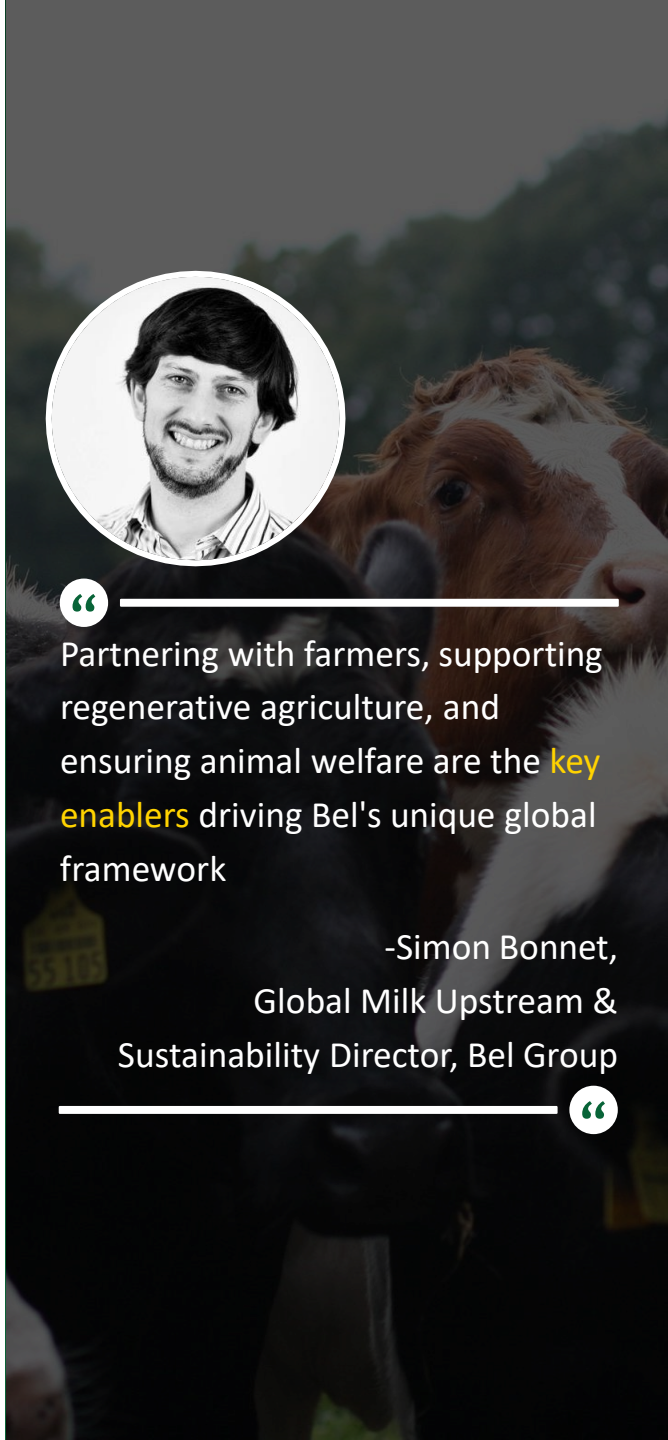
Insights | Herd and manure management present unique challenges for decarbonization of dairy

Key challenges

- **High methane emissions:** Dairy production has significant methane emissions, especially from enteric fermentation
- **Diversity of operating models and agricultural conditions:** High heterogeneity between countries and within countries means there is not a single solution for all

Decarbonization levers

- **Reduce unproductive animals:** Decrease emissions by optimizing herd productivity and removing underperforming livestock
- **Manure storage conditions:** Improve manure storage and handling to minimize methane and nitrous oxide emissions
- **No deforestation feeding for EU:** Use animal feed free of deforestation-linked commodities like soy or palm oil in the EU
- **Unsaturated fatty lipids in ration:** Incorporate unsaturated fatty acids in livestock diets to reduce enteric methane production



"Partnering with farmers, supporting regenerative agriculture, and ensuring animal welfare are the key enablers driving Bel's unique global framework"

-Simon Bonnet,
Global Milk Upstream & Sustainability Director, Bel Group

Overview | Examples of Bel Group initiatives and progress

Case study 1: ABPO partnership in France

Context: 2018 collaboration with French association of 700 dairy farms to reduce milk carbon footprint

Results (end of 2023): 100% of farms with no GM feeding and pasture access. 100% of farms with a 1st carbon diagnostic, and 15% with a 2nd

Case study 2: Bovaer deployment in Europe

Context: Partnership with DSM-Firmenich started in 2022 to incrementally deploy Bovaer in European countries

Results: By end of 2024, 50% of milk from Slovakia will come from cows with Bovaer

Case study 3: Regen ag promotion in Azores

Context: 2022 pilot with 5 farms, implementing trials in crops & fertilizer as well as grazing management

Results: Strong results so far, especially in improving grazing and feeding, as well as on farmer margins. Plans to scale up with 15 additional farms in 2025

For more details, see the full Bel Group masterclass materials

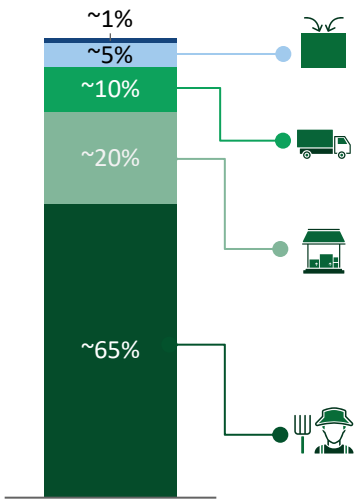
Potatoes |
PepsiCo
7 November 2024

Overview | Fertilizer, land use change, & storage drive emissions for ~$130B global potato market

Context

- The global potato market is large, valued at ~$130B
- ~374 Mt of potatoes are produced globally each year
- 7 countries account for 60% of production: China (~95 Mt), India (56 Mt), Ukraine (20 Mt), Russia (18 Mt), USA (17 Mt), Germany (10 Mt), and Bangladesh (10 Mt)
- Potato movements tend to be largely intra-regional due to risk of spreading disease

Main emissions drivers



Packaging
- Emissions from extraction, production, transport, & recycling

Transport
- Fuel emissions

Storage
- Emissions from energy use for long-term storage of potatoes

Agriculture
- Emissions drivers can vary by country and production method, but globally, major drivers are fertilizer production & application (35-40%) and land use change (~25%)

"We work to source our crops in a way that aims to restores the Earth's soil, strengthens farming communities, decarbonizes the food system and creates a more sustainable food system for the future"

-Archana Jagannathan, CSO, PepsiCo Europe

"Through our engagement with farmers, we've seen uptake of regenerative practices, with the associated carbon impacts."

-Margaret Henry, VP, Sustainable & Regenerative Agriculture, PepsiCo

Insights | Potato production entails sometimes-overlooked nuances that impact decarbonization

Key challenges

- **Energy-intensive storage:** Potato storage can be very energy intensive in hot/cold climates, creating significant carbon footprint in some regions
- **Funding sources:** Relative to other crops, potatoes are not as top-of-mind for global organizations that help fund sustainable agriculture
- **Farmer risk:** Potato farmers are often less diversified than farmers of other crops, meaning they face more risk from changing their practices

Decarbonization levers

- **Yield optimization:** Maximize crop yields through improved farming practices to reduce emissions per unit of production
- **Reduced & low carbon fertilizer:** Use fertilizers with lower carbon footprints to minimize emissions
- **Precision agriculture:** Employ data-driven technologies to optimize input use and minimize resource waste
- **Renewable electricity:** Transition to renewable energy sources for irrigation, storage, and other farm operations
- **Soil coverage:** Maintain living roots or cover crops year-round to improve soil health and enhance carbon sequestration

"Potatoes don't get as much attention as some other crops. They don't get as much investment when you look at global flows of financing for regenerative agriculture. But they should, given the opportunities for decarbonization in this value chain.

-Steven James,
Sr. Director, North American Potatoes,
PepsiCo

Overview | Examples of PepsiCo initiatives and progress

Case study 1: Renewable electricity

Context: 2023 & 2024 pilots of using renewable energy to cover on-farm grid electricity

Results: Pilots ongoing. Anticipating meaningful reduction in GHG footprint

Case study 2: Reduced soil disturbance

Context: Implementing multiple sustainable practices, including pre-tilling and ground cover, to reduce soil disturbance

Results: Sustained progress on emissions reduction and environmental impact reduction

Case study 3: Fertilizer optimization

Context: Utilizing low carbon fertilizers made via renewable energy and which replace nutrients in the soil lost during harvest

Results: "Green" fertilizer reduces CO2 emissions and can promote soil health and biodiversity

For more details, see the full PepsiCo masterclass materials

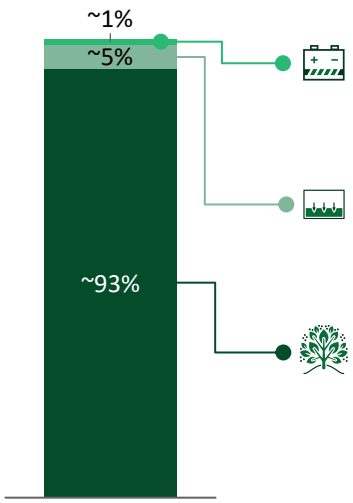
Cocoa |
Mondelēz International
26 November 2024

Overview | Cocoa emissions driven almost entirely by land use change

Context

- Overall cocoa market is valued at ~$26B[1]
- ~5 Mt of cocoa is produced each year
- Over half of cocoa production comes from two countries: Ivory Coast (~2Mt) and Ghana (~550kt)
- West African markets are top cocoa exporters across top producing markets

Main emissions drivers



Energy & other | Typical range: 1-2%

- On-farm energy use and miscellaneous upstream emissions sources

Land management practices | Typical range: 5-10%

- Mostly decomposition of waste (leaves, pods, etc.) plus fertilizer and other inputs

Land use change | Typical range: 45-95%

- Deforestation and land conversion events over the last 20 years (with linear discounting) – *varies widely by country*

1. Includes cocoa butter, powder, and liquor

"We see a wide range of emissions factors between countries and growing areas, as historically deforestation events and land management practices can vary a lot. Farm level data insights are a key requirement to support carbon reduction roadmaps."

-Michael Weber,
Sr. Director Climate & Environment,
Mondelez International

Insights | Fragmented supply makes it challenging to address deforestation risks of cocoa farming

Key challenges

- **Highly fragmented supply:** Cocoa is produced by ~5M smallholder farmers from different countries, adding difficulty to key activities, including:
  - Rolling out and scaling new practices
  - Verifying farmers' current practices
  - Collecting accurate carbon data
- **Regulatory enforcement:** Countries' changing regulations related to cocoa can be unclear and difficult to keep up with

Decarbonization levers

- **Zero deforestation:** Eliminate deforestation from cocoa production by protecting forests and avoiding land conversion
- **Agroforestry:** Integrate shade trees and diverse plant species into cocoa farming systems to sequester carbon, improve soil health, and enhance biodiversity
- **Productivity:** Increase cocoa yields through improved farming techniques and access to better planting material, reducing the need for expansion into new land
- **Farm Management:** Implement sustainable practices such as crop rotation, nutrient management, and proper use of inputs to optimize resource use and lower emissions per unit of output

"Fragmentation is a key challenge in decarbonizing cocoa supply chains. Cocoa is produced by five million farmers from different countries. Not all of these farmers are registered."

-Cedric van Cutsem,
Sr. Director Cocoa Life,
Mondelez International

Overview | Examples of Mondelēz International initiatives & progress

Case study 1: 10+ years of implementing Cocoa Life program

Context: Cocoa Life program focuses on an integrated approach to support smallholder farming and communities

Results: Comprehensive progress report available in masterclass materials (p. 26)

Case study 2: Addressing deforestation & climate change

Context: Implementing awareness building & trainings, planting of trees, farm mapping & satellite monitoring, & payment for Ecosystem Services Models

Results: ~146k farms mapped, ~323k hectares with deforestation risk assessments complete, ~16.5k farmers applying agroforestry, and more

Case study 3: Developing land management practices

Context: Coaching farmers, building awareness and conducting trainings to increase yield and promote agroforestry, climate resilience, and crop /income diversification

Results: ~225k farmers trained/coached, ~498k community members & farmers trained on Good environmental practices ~ 8.6M economic shade trees distributed, and more

For more details, see the full Mondelez International masterclass materials

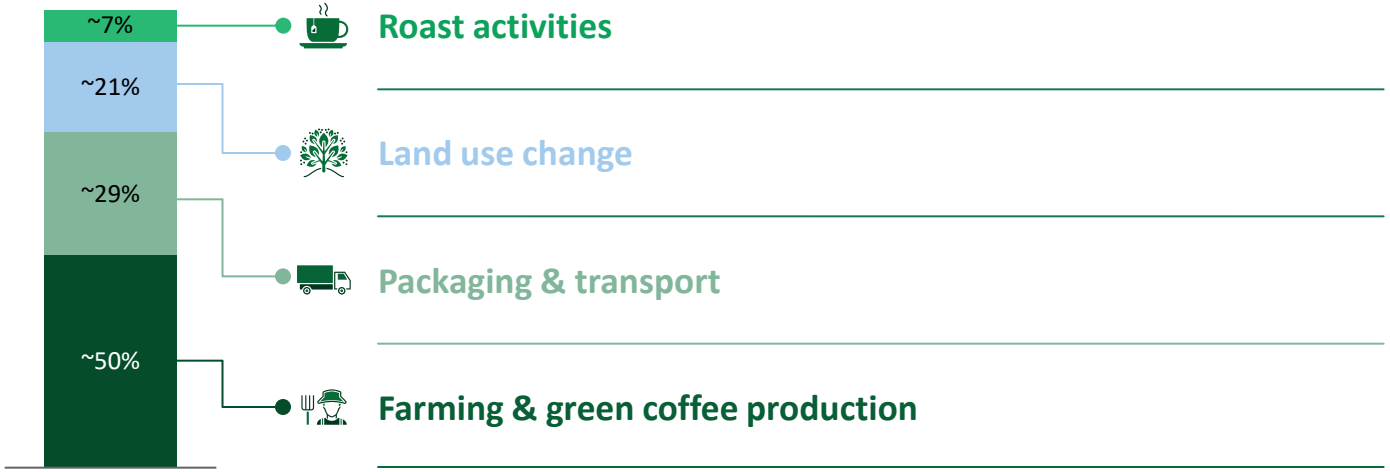
Coffee |
Ahold Delhaize
12 December 2024

Overview | Farming, packaging, and land use change are all significant emissions sources for coffee

Context

- Overall coffee market is valued at ~$138B
- Over 10M tonnes kg of coffee is produced each year
- ~73% of global production comes from five countries: Brazil (39%), Vietnam (17%), Colombia (7%), Ethiopia (5%), and Indonesia (5%)
- Coffee production mainly takes place in the southern hemisphere, while coffee consumption occurs mostly in the northern hemisphere

Main emissions drivers



Source: USDA (2024)

"The coffee industry is estimated to support the livelihoods of over 12M families around the world. While we're focused here on decarbonization, we cannot forget the opportunity to improve social conditions."

-Grant Sprick, VP, Climate & Environment, Ahold Delhaize

"In recent years, coffee prices are steadily rising, seeing an absolute price record last year that was mainly attributable to climate change."

-Maarten Vreeswijk, Manager Biodiversity & Product Sustainability, Ahold Delhaize

Insights | Fragmented supply and lack of financing among challenges for sustainable coffee production

Key challenges

- **Large, fragmented supplier landscape:** Coffee is produced by many individual smallholders, making it difficult to enact change at scale
- **Challenging economics of transitioning practices:** Sustainable practices cause short-term reductions in yield and higher production costs, impacting farmer revenues
- **Financing:** It is difficult to obtain funding for the adoption of regenerative practices

Decarbonization levers

- **Regenerative agriculture (farm level):**
  - Monitor and enforce compliance with deforestation laws
  - Replace chemical fertilizers with organic
  - Implement multi-cropping instead of mono-cropping
- **Circular processes (post-farm):**
  - Used coffee grounds, previously considered as waste, can create value through circular models around the creation of biofuels and clean energy products
  - Wastewater treatment is needed for water runoffs resulting from wet milling production process, which are a large contributor to CO_2

"The current coffee production model, which focuses on cost reduction and profit maximization, contradicts sustainability commitments. We need to find a way to get financial incentives to the farmers where they can actually make a difference in how they produce the coffee."

-Sven Drillenburg, Green Coffee Buyer & Sustainability Lead, Ahold Delhaize Coffee Company

Overview | Examples of Ahold Delhaize initiatives and progress

Case study 1: Moving towards 100% renewable energy

Context: Improving ADCCs[1] own operations through moving towards wind-generated electricity, offsetting natural gas, using solar panels for 5% of total electricity, with further initiatives planned

Results: Steady increase in renewable energy share

Case study 2: Addressing emissions in the farming stage

Context: Eliminating land-use change by buying only Rainforest Alliance certified coffee, ensuring no land use change after 2014

Results: Joining Rainforest Alliance has led to a price increase, but retailers have been willing to accept this given carbon reduction and social factors

Case study 3: Reducing plastic use in coffee packaging

Context: Introducing design updates to make packaging thinner, lighter, and more recyclable

Results: TBD; efforts ongoing

For more details, see the full Ahold Delhaize masterclass materials

1. Agricultural Demand and Community Centers

We'll be hosting more masterclasses in 2025! If you are interested in hosting one, please reach out to Sharon Bligh at The Consumer Goods Forum (s.bligh@theconsumergoodsforum.com)

Thank you