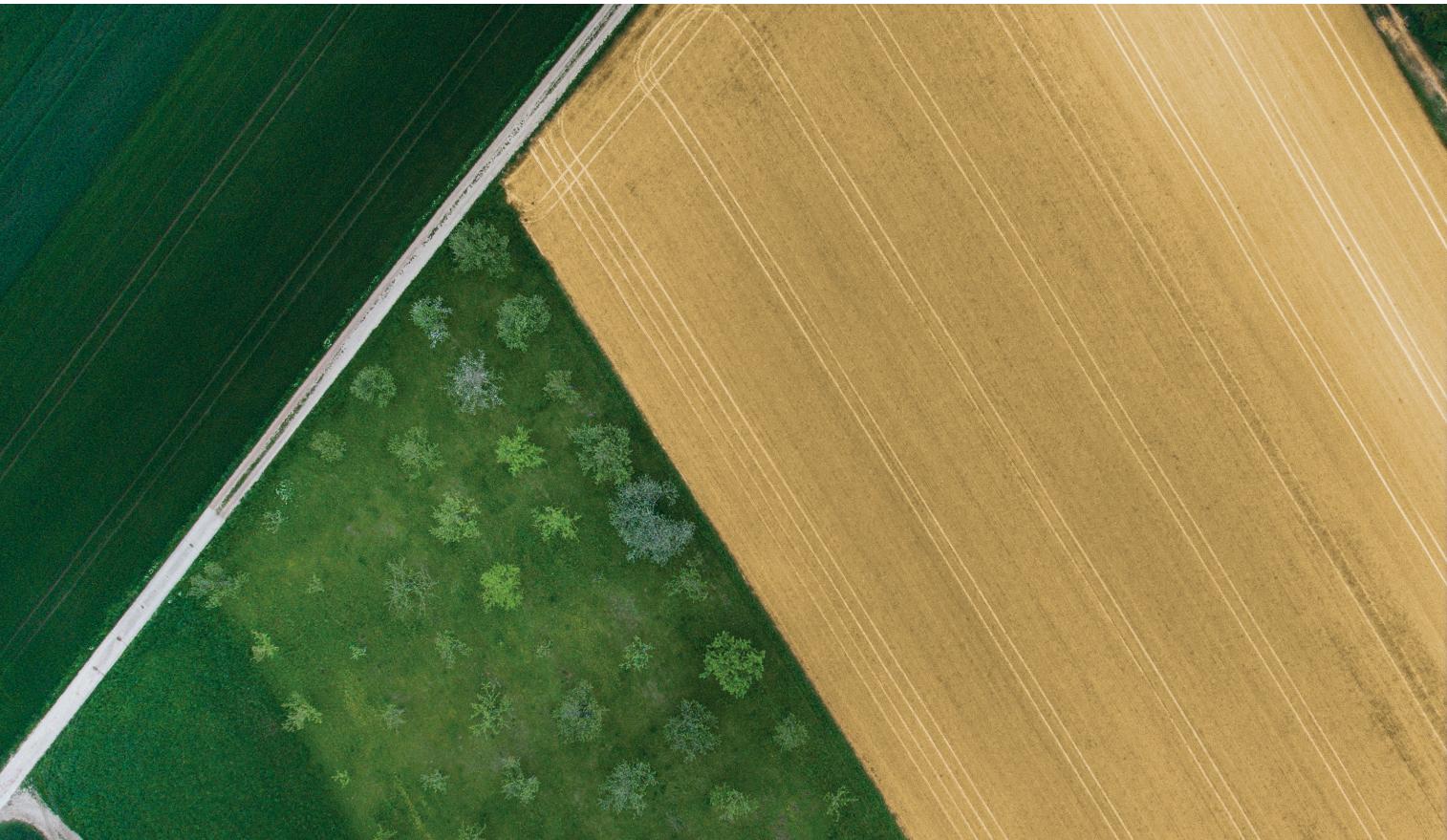


Balancing ambition with reality

Top 10 predictions for agriculture sustainability in 2025



Agriculture Sustainability

January 2025

S&P Global

Commodity Insights

Executive Summary

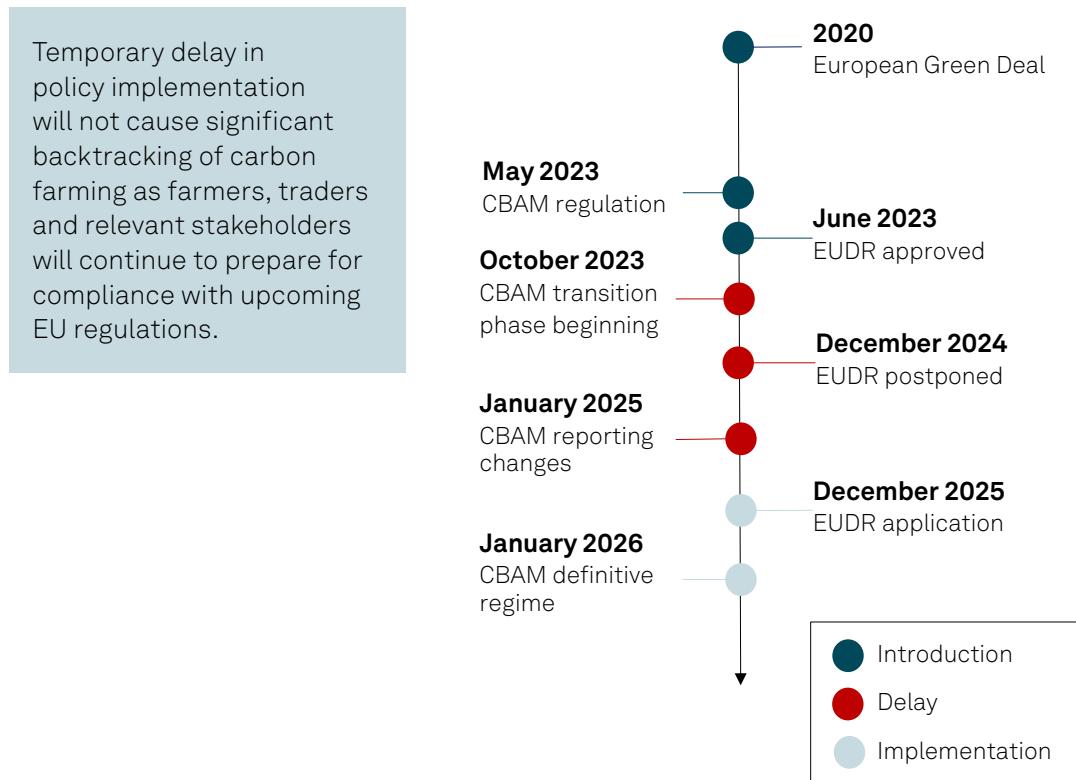
The agriculture sustainability landscape is constantly evolving as the private sector and policymakers progressively add measures to tackle climate change impacts. While there is an uptake of policy and protocol announcements addressing agriculture, 2024 was the year of delaying action as stakeholders recognize that sustainability in agriculture is not “one size fits all”. From companies relaxing agricultural emissions targets to countries delaying the implementation of sustainable agricultural policies, there is still a lot of work to do. Nevertheless, disruptive technologies such as Artificial Intelligence (AI) and enhanced performance of new agricultural input products will continue to push the sustainability agenda in the sector. This will aid farmers in the sustainable transition, while also improving efficiency and economic gains.

The top 10 predictions in the sustainable agriculture sector for 2025 and beyond are:

1. EU to allow time to adapt, prepare, and transition by strategically pausing sustainability legislation
2. Trump-led US likely to shift focus from environmental initiatives to energy dominance, likely reducing regenerative agriculture adoption
3. New US administration may offset incentives for climate-smart crops by repealing IRA biofuel tax credit
4. EU-Mercosur deal may be stuck in limbo again, driven by agriculture concerns
5. Countries will continue to fall short of specific measures to tackle food and agriculture emissions
6. More companies likely to revise emission reduction targets and scale back ambition on sustainability
7. Agricultural carbon credits will remain a nascent market in 2025
8. Increased adoption of AI technologies to enhance climate-resilient agriculture; continued use of AI will increase farm efficiency
9. R&D increasingly targeting climate smart solutions
10. Measurement of methane emissions from the livestock sector will remain controversial

1. European Union to allow time to adapt, prepare, and transition by strategically pausing sustainability legislation

- **In 2025, the European Union will prepare to implement significant regulatory changes.** This year is marked by a strategic pause stagnating any sustainable policies, allowing market players the necessary time to adapt to new rules that will shape the future of various sectors, including agriculture and trade.
- **One key development in 2025 is the ongoing implementation of the planned relaxation of the environmental rules under the Common Agricultural Policy¹, which was approved by EU members in 2024.** This decision, effective until 2027, primarily aims to increase food productivity across the continent.
- **Despite this temporary easing of environmental regulations, the EU remains committed to promoting more sustainable food production by 2030.** Thus, 2025 will be a period of preparation where stakeholders are encouraged to align their practices with future sustainability targets. This transitional phase allows farmers, businesses, and policymakers to innovate and invest in sustainable technologies and practices for meeting the EU's long-term environmental objectives.



		Policy Impact
EU Deforestation Regulation (EUDR)	<ul style="list-style-type: none"> - The EU Council and European Parliament have reached a provisional agreement to amend the EU deforestation regulation, delaying its application by 12 months to December 31, 2025. - This delay aims to provide third countries, member states, operators, and traders with adequate time to prepare for due diligence obligations, ensuring that commodities like cattle, wood, cocoa, soy, palm oil, coffee, and rubber are deforestation-free. - The regulation, which entered into force in 2023, will maintain its core objective of minimizing the EU's contribution to deforestation. The amendment, which does not alter the substance of the existing rules, seeks to ensure smooth implementation and legal certainty. 	The cost of producing soybeans will increase in Brazil & Argentina, and in Indonesia for palm oil. EU largely imports from these regions where agriculture is the largest driver of deforestation. Impact on beef will be low as EU mostly produces its own meat. EUDR implementation will drive practices that reduce land use change but may increase emissions leakage.
Carbon Border Adjustment Mechanism (CBAM)	<ul style="list-style-type: none"> - The Carbon Border Adjustment Mechanism (CBAM) is in its transitional phase. CBAM addresses the pricing of carbon emitted on the production of carbon-intensive goods entering the EU. The definitive phase effective from 2026, will see penalties linked to the EU ETS carbon price of €80-€90 per t/CO2e, with concerns that this may raise the price of EU fertilizers. - The pilot period will allow stakeholders to adapt to the new requirements for the definitive regime set to begin in 2026. The gradual implementation of CBAM coincides with the phase-out of free EU Emissions Trading System (ETS) allowances. - Initially, the CBAM targets carbon-intensive imports such as cement, electricity, fertilizers, aluminum, iron, steel, and hydrogen. It applies to imports from non-EU countries, excluding those linked to the EU ETS. Looking ahead, the EU plans to expand the scope of CBAM to cover more sectors by 2030, aligning with broader climate policies under the European Green Deal. 	Demand for low-carbon fertilizers will increase resulting in producers (Russia being largest EU exporter) to use low-carbon hydrogen (e.g., green ammonia). With more sustainable fertilizer products in the market, emissions from agriculture will decrease. However, any yield loss due to use of low-carbon fertilizer will create a hinderance in farmer adoption offsetting any positive impact.

2. Trump to shift focus from environmental initiatives to energy dominance in 2025, farmer adoption of regenerative agriculture will reduce in the short-term; productivity will decline in the long-term

Trump administration's policy manifesto "Project 2025", will require the US Department of Agriculture (USDA) and Environmental Protection Agency (EPA) to play a leaner and non-interventionist role going forward. Primary changes will be repealing environmental incentives, deregulation and relaxation of environmental targets.

Key changes proposed by Trump's administration	Positive for sustainable agriculture?
<ul style="list-style-type: none">Government incentives for conservation practices will be minimized. Adoption of underutilized practices such as cover cropping will slow down causing soil degradation in the long-term. More than 80% of cropland acreage adopts <u>at least one</u> conservation practice in the US as of 2023 (USDA Farmer Surveys). Much of the adoption over the years was driven by environmental subsidies¹ that are at risk of ending under the new administration. Reduced conservation will shift land use to cultivation increasing demand for agricultural inputs.	✗
<ul style="list-style-type: none">Deregulation of biotechnology and GMOs will decrease time-to-market time for new seed technologies. Input suppliers may find new market in the US benefiting companies focusing on resilient crop technologies.	✓
<ul style="list-style-type: none">Relaxed standards for agrochemicals will reduce costs of chemicals potentially resulting in increased use of herbicides, pesticides and fungicides & affecting soil and water quality negatively. While most crop acreage applies integrated pest management systems already, with increased chemical use there will be negative environmental outcomes such as soil degradation and water contamination.	✗
<ul style="list-style-type: none">Withdrawal from the Paris Agreement and UNFCCC negotiations will put EU ahead in global decarbonization leadership from the Western world. With reduced emphasis on environmental initiatives, there will be reduced investments for carbon farming in the US. Private sector may continue to push in absence of federal support.	✗
<ul style="list-style-type: none">Relaxed environmental targets will lower competitiveness of US products in the EU market as EU moves towards importing from lower-carbon emitting economies. As focus shifts from carbon farming to traditional farming, and with continued push from the EU for decarbonization through policy (i.e., CBAM, EUDR), exports from US to the EU will slow down opening markets for other regions such as MERCUSOR².	✗

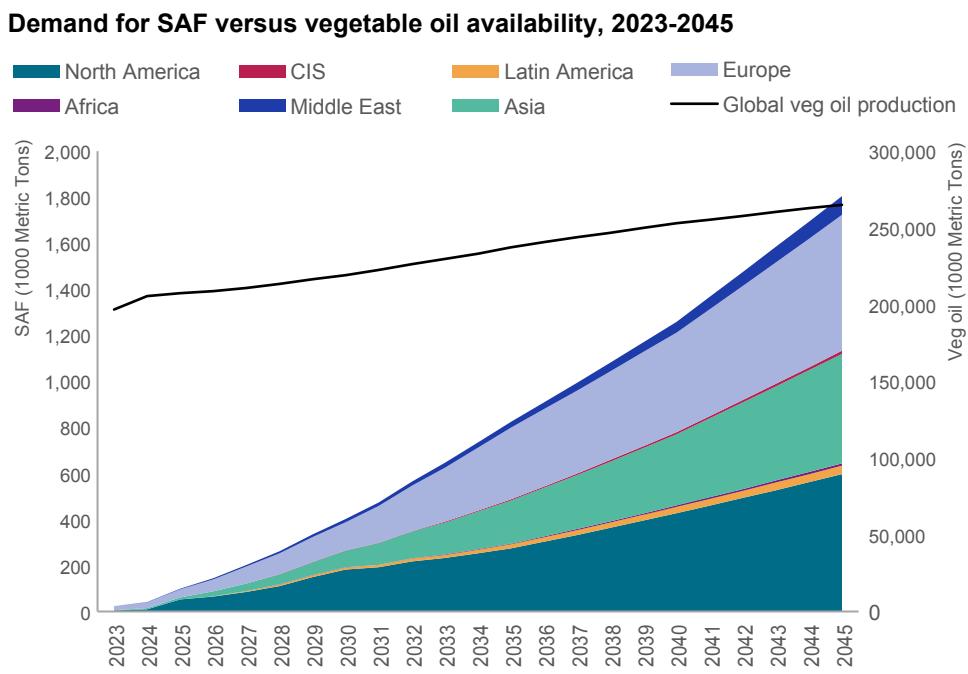
¹ such as the Conservation Reserve Program (CRP) and Environment Quality Inspection Program (EQIP)

² If the EU-MERCUSOR trade agreement progresses positively

3. USDA & Treasury finalizes guidelines to promote biofuel produced from climate-smart crops; new administration may offset impact by repealing IRA biofuel tax credit

- **Technical guidelines to quantify, report and verify the effect of climate-smart farming practices on GHG associated with biofuel crops was submitted by USDA to the White House in Dec 2024.** On 10th Jan 2025, US Treasury issued preliminary guidance for corn, soybean and now sorghum as qualified feedstocks for 45Z credit if they use CSA practices. The rules for CSA are yet to be published.
- **The GHG model would establish voluntary standards for biofuel feedstocks grown with practices that mitigate GHG emissions and/or sequester soil carbon.** This will result in uptake of carbon farming in the US and a decrease in agricultural emissions from major crops.
- **In the next 20 years, demand for SAF will increase at CAGR=15% whereas vegetable oil production is forecasted to only increase by CAGR=1%.** Vegetable oils and used cooking oil, followed by animal fats, are the largest feedstocks used to produce SAF, and so there is a clear supply gap that can be addressed through sustainable practices. The following implications will occur,
 - Pressure on agriculture to produce more feedstocks coupled with increase in energy crops expansion.
 - Without sustainable practices, productivity in the long term will be negatively impacted causing for the gap to increase

With increasing biofuel demand, sustainable agriculture practices adoption is becoming increasingly crucial. However, uncertainty around 45Z tax credit that will incentivize biofuel demand, **the impact of these guidelines may not come to fruition OR the guidelines may not even pass through the new administration.**



1 This tax credit by Inflation Reduction Act (IRA) applies to the production and sale of low emission transportation fuels, including SAF and non-aviation sustainable transportation fuel.

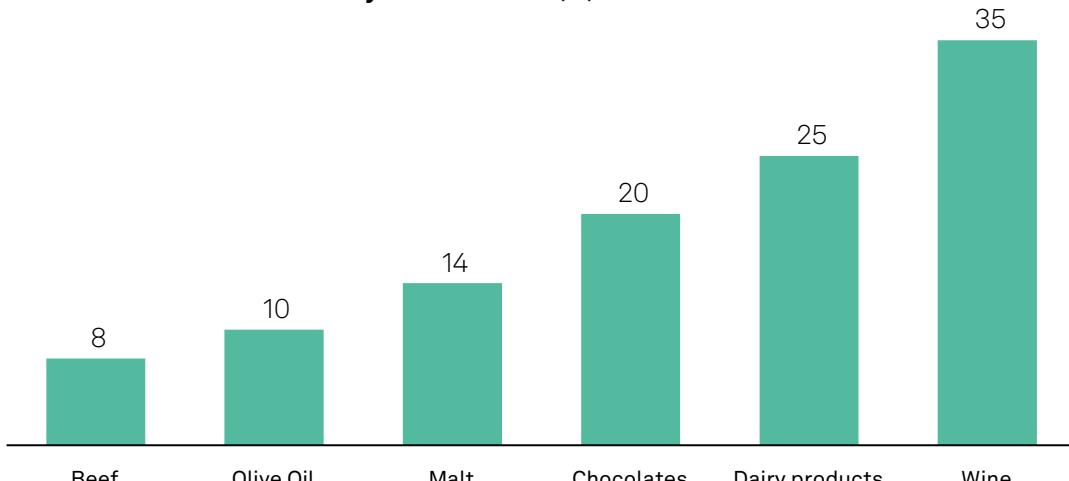
Source: S&P Global Commodity Insights

4. EU-Mercosur deal could save EU exporters €4 billion per year in duties; however farmer protests about unfair competition may see the deal stuck in limbo again

Overview of the deal

- EU and Mercosur countries (Brazil, Argentina, Bolivia, Paraguay, Uruguay) have signed a free-trade deal in 2024 after 25 years of negotiation, covering several commodities incl. agriculture. The agreement has yet to be ratified. The agreement is set to:
 - Create a market of 700m consumers
 - Increase EU exports by €25b by 2035
 - Save EU companies €4b in export duties per year
- Beef imports would be least affected as Europe produces most of its meat domestically and the EUDR requirement will be prohibitive for Brazilian beef exporters to capture the market. Brazil's largest exports are to China and US where demand is growing, hence impact on beef will remain limited.

Current EU tariff rates for key commodities (%)



Source: S&P Global Commodity Insights, European Union

Challenges going forward

Unfair Competition:

EU farmers protest against unfair competition from cheaper Mercosur imports, especially beef. **Carrefour recently announced that it would stop selling beef from Mercosur countries to support EU farmers**, leading to protests from the South American meat industry as well.

Negative environmental impact:

Mercosur countries are pushing to include a rebalance mechanism against EUDR, that introduces a compensation if increased reporting requirements “nullifies or impairs the benefits” of the trade deal. This means trade interests may be prioritised over environmental measures, potentially watering down EUDR provisions.

Way forward:

- **To protect farmers, EU plans to grant limited market access to imports**, with phased tariff rate quotas for sensitive products like beef, poultry or sugar.
- **The EU has proposed addition of environmental provisions in the deal** that would align with the Paris agreement. However, protestors have dismissed these measures as non-binding. Hence, the deal will still increase agricultural emissions until EUDR and CBAM come into full force.

Given opposition by countries incl. France, Poland, Austria, Ireland and potentially Italy; and complications with EUDR, **the trade could risk not being ratified and stuck in limbo again, or else end up prioritising trade interests before environmental measures in EU.**

5. 2025 is a year of stocktake: Increased ambition needed by countries on food and agriculture, specific measures to tackle sector emissions continue to fall short

40%	<ul style="list-style-type: none">– Nationally Determined Contributions (NDCs) only currently address agriculture and food systems emissions. Several countries, including majority of EU countries, do not include specific mitigation measures for the agriculture sector¹
4	<ul style="list-style-type: none">– Countries have submitted their revised NDCs so far: Brazil, Botswana, United States & United Arab Emirates (UAE), including agriculture sector. However, only the UAE has specified a target emission reduction for agriculture, of 39% by 2035²
54%	<ul style="list-style-type: none">– NDCs have identified finance that flows towards climate aligned technologies and practices for agriculture.– While majority of the NDCs refer to on farm innovation for mitigation from agriculture, other innovations such as post-harvest handling to reduce loss and waste, receive less priority³
1/6th	<ul style="list-style-type: none">– of the required finance for transforming agrifood systems⁴ is currently covered by NDCs. The financing gap continues to be huge, particularly for smallholder farmers

Source: 1.FAO1, 2. WRI ClimateWatch, 3. United Nations Foundation, 4. Global Alliance for the Future of Food

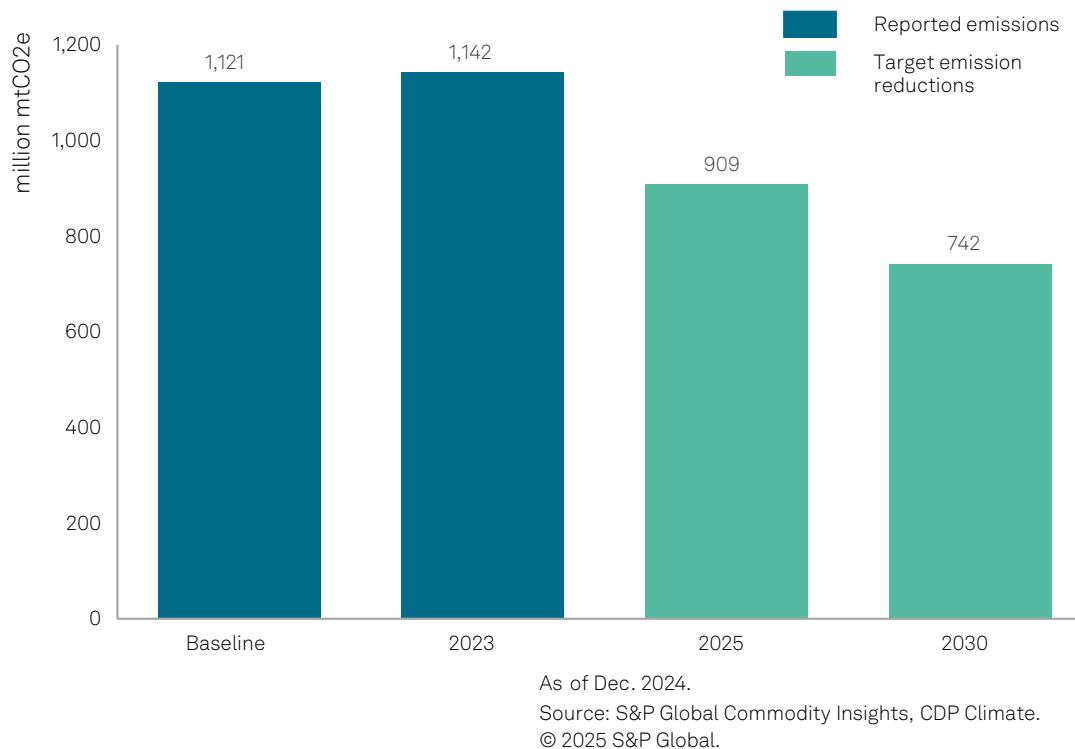
As countries face a deadline of February 2025 to submit their revised NDCs, increased ambition on food and agriculture sector needs to be accompanied by specific measures on emissions mitigation, while identifying sound financing opportunities for implementation.

6. 2025 is a year of stocktake: More companies likely to revise emission reduction targets and scale back ambition on sustainability

- Some large agribusinesses have **interim reduction targets for 2025; on average that is ~20% reduction of total emissions** as per our analysis.¹
- However, progress has been slow, with these companies increasing their emissions footprint in 2023 (the latest reporting year). They will have to reduce a joint total of over 100 million mtCO₂e per year to achieve their interim targets in 2025; which is highly unrealistic.
- **Major agribusinesses**, including Unilever, Coca-Cola and Walmart, **have backtracked on their sustainability commitments in 2024**.
 - They face challenges including setting over-ambitious target to begin with, shifting investor priority and asset flows out of ESG funds, as well as balancing increasing demand for products and higher revenues with emissions reduction goals.
 - Most regenerative practices are ad-hoc projects from companies over a limited period of time to discover impact on supply. Hence, overall impact from the private sector remains uncertain.
- Despite the revisions, **several agribusinesses** (e.g., Cargill RegenConnect) are **still investing in sustainable agriculture initiatives**, particularly in soil carbon sequestration projects that can support their sustainability commitments. While questions over credibility of carbon offsets remain; **insetting projects could gain traction**.
- In 2025, more **agribusinesses will likely scale back their short-term emission reduction targets, set more ambiguous long-term goals**, and reconsider their wider sustainability commitments on plastic, waste etc.

Note: Average domestic bid prices for Chinese turbine makers have been used as a proxy for ASP.

Companies with interim targets for 2025 are unlikely to achieve the desired ~20% emission reduction



7. Despite some progress, agricultural carbon credits will continue to remain a nascent market in 2025



Agriculture carbon credits saw some progress in 2024

- In EU, the **Carbon Removals and Carbon Farming (CRCF) Regulation** was published on 6th Dec 2024, **creating a first EU wide voluntary framework for certifying carbon removals, carbon farming and soil emission reductions**, and carbon storage in products across Europe. It mandates 3rd party verification, aiming to create streamlined and cost-effective certification processes through standardised baselines and remote-sensing technologies, and introduces group certification to ease burden on small farmers
- There was **progress on Article 6 negotiations at COP29** to establish a mechanism for carbon credits trading internationally, including introducing a centralized system for generating, trading and utilizing emission reduction credits. This could open new avenues for funding and demand for agricultural carbon credits and projects.



Despite introduction of new carbon market mechanism including carbon tax, wider appetite for carbon credit and tax remain low

- **Denmark became the first European country to implement a carbon tax on livestock:** from 2030, farmers will have to pay ~ \$43 per tonne of methane, set to rise to over \$100 by 2035. However, **there has been little momentum elsewhere**, with New Zealand backtracking on a similar goal on carbon tax from livestock emissions
- **Brazil recently issued a law to create a regulated national carbon credits market; however agriculture is excluded with only voluntary participation for the sector. Meanwhile the EU Commission continues to consider extending the EU Emissions Trading Scheme (ETS) to cover the agriculture sector in 2027.** A 2023 EU commissioned study looked at 5 options including ETS for: all on-farm emissions, on-farm livestock emissions only, on-farm peatland emissions only, upstream emissions from feed production, imports and use of fertilisers, and downstream emissions from enteric fermentation and manure management. However; **progress remains slow, given political discontent within the agricultural sector** in major EU countries like France and Spain.

No significant impact is expected in the short-term on agricultural emissions through carbon markets. However, as captured above, what happened in 2024 are steps in the right direction towards creating a more mature market going forward. Building on this, similarly slow but steady progress can be expected in 2025.

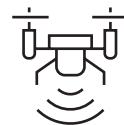
8. Increased adoption of AI technologies to enhance climate-resilient agriculture; continued use of AI will increase farm efficiency



Plant Genomics



Weather Forecasts



On-farm technology



AI-driven crop protection



Data-driven decision making

	Recent Developments	AI-based methods for weather forecasting are gaining momentum where the accuracy of the forecast is similar to non-AI models while saving processing. New models with long-term forecasting are emerging.	Precision agriculture technologies such as AI-driven tractors and drones are increasingly used in the US, making it highly effective for farmers to be sustainable in production.	Use of AI to analyze microbes/molecules to identify yield increasing biological is going to reduce time for R&D. Syngenta, ICL, Lavie Bio have recently developed AI driven platforms.	Advisory services using predictive analysis in a pilot AI project doubled net income for farmers in India. The digital platform also allowed buyers and sellers to connect and promising results to scale AI in more regions of India.
Impact on Agriculture	Faster development of new plant varieties that are climate-resilient with lower cost on R&D in the long-term	No change in the short-term weather forecasting for agricultural decision making until AI based models increase in accuracy. With forecasting range increase there can be momentum in accuracy.	Lower emissions and higher efficiency on farmlands using precision ag technologies.	Avoided costs from plant loss and higher efficiency in loss prevention strategies directly impacting farmers' margins.	Increase in farm income through efficiency despite high upfront costs of AI implementation.

9. R&D increasingly targeting climate smart solutions



Seed Innovation



Biologicals demand growth



Livestock sustainability

	Current trends	Biologicals demand growth	Livestock sustainability
Challenges	<ul style="list-style-type: none"> Microplastic-free coating: 40% of leading companies use microplastic-free coatings, which aligns with EU regulation that envisions banning intentionally added microplastics by 2028. Resistant breeding: Drought and pest-resistant seeds are gaining momentum. Approving new GMs aims to ensure food security while increasing yields. Direct Seeded Rice (DSR): Adoption of DSR, a water-efficient rice crop, is increasing in India and has the potential to reduce methane emissions. India being a large rice producer can impact global ag emissions with this practice. 	<ul style="list-style-type: none"> Increased adoption by sector: While fruits and vegetables create the largest demand for biologicals, positive movement in using biologicals for row crops is seen as a trend. Demand for sustainability: The Asia-Pacific region is seeing growth for biologicals specifically due to increasing demand for sustainable food driving sustainable practices on the farm 	<ul style="list-style-type: none"> Emissions-reducing additives: Animal feed additives are moving forward on increasing muscle production while simultaneously reducing ammonia gas and methane emissions. Sustainable labels: Consumer behavior shows limited interest in sustainable labels, highlighting that consumers are still driven by other priorities, like price. The federal government in US issued new guidance over sustainable labels such as "grass fed" that may be misleading and does not have robust documentation.
	<ul style="list-style-type: none"> Increasing seed prices: As technology advances, prices for seed will increase as area is not expanding as rapidly. New seeds will have to be economically beneficial for farmers to adopt. Sustainability seen as "marketing": While largest players (i.e., Bayer, Corteva, Syngenta) consider sustainability to be a priority, the industry is considering this to be a marketing opportunity. Food security is higher on the agenda. 	<ul style="list-style-type: none"> EU farmer protests: Backlash over Green Deal may potentially slow the growth of biologicals in the next 5 years. The drive to speed up approval process for new products remains ensuring quality and effectiveness. Uncertainty in US: Depending on appointment of RFK Jr as the new Health Secretary, the future of biopesticides remains uncertain in the US. RFK Jr is an advocate for regenerative agriculture and can push the use of Integrated Pest Management (IPM) methods. Fertilizer prices: As fertilizer prices dropped in recent years, adoption of biologicals reduced due to price premiums. 	<ul style="list-style-type: none"> Livestock operation differences: In a cow-calf operation, feed additives are usually given to animals at feedlots before slaughtering, whereas most methane emissions are concentrated at early pregnancy and feeding which is an earlier stage of the livestock value chain. Hence, the impact of feed additives will be lower in this case. Lack of clear definition of sustainability: The sector still requires a clear sustainability definition to guide future market trends.

Research and development of new technologies to push sustainability will continue but challenges with high costs, uncertain political landscape and unclear expectations may offset some positive impact

10. Measurement of methane emissions from the livestock sector will remain controversial: The case of New Zealand

Global Warming Potential (GWP): GWP100 versus GWP*

- The **GWP100** metric measures the global warming potential for greenhouse gas emissions over a 100-year period.
- The **GWP*** metric recalculates GWP metric to consider methane as short-lived gas that breaks down in 10-12 years' time.

GWP100	GWP*
Covers all GHG	Only covers Methane (for now)
Can use any emissions data	Needs at least 20 years of emissions data
Focuses on fixed emission quantities	Focuses on change in rate of emissions overtime

Controversy over methane measurements:

- Livestock industry including large livestock companies like Cargill, Tyson Foods and McDonalds are pushing for GWP* to be an accepted method to calculate methane emissions. **Using the new metric reduces the methane reduction target for livestock producers.**
- Opposition to GWP* includes NGOs and academics that conclude that the use of **GWP* only depicts temporary climate neutrality and that the use of this metric would be misleading and goes against the wider outcomes set out by the Paris Agreement.**¹
- Policymakers have yet to adopt the GWP* method.

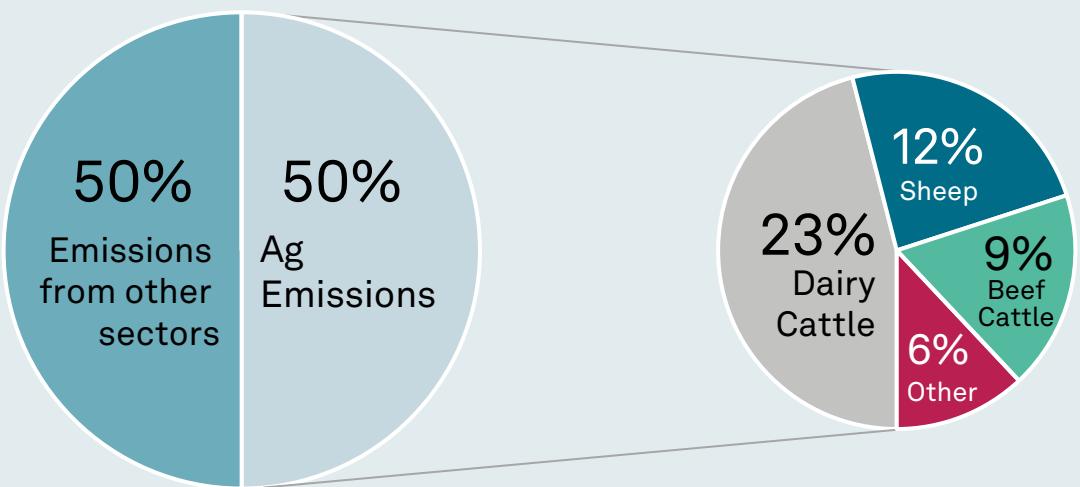
¹Caspar L Donnison and Donal Murphy-Bokern 2024 Environ. Res. Lett. 19 [Are climate neutrality claims in the livestock sector too good to be true? - IOPscience](#)

Is New Zealand backtracking on livestock emission reduction?

A panel set up by the New Zealand government in June 2024 announced that by using a “no additional warming” approach associated with GWP*, **the country would only need to reduce methane from agriculture by 14-24% by 2050 as opposed to 24-47% by 2050 which is the initial target**. New Zealand has yet to officially adopt the GWP* metric. Additionally, in 2024, New Zealand announced **repealing measurement of agricultural emissions including livestock** completely from its Emissions and Trade System (ETS). New Zealand was one of the first movers in livestock carbon credit trading after Alberta, Canada.

IMPLICATION: Half of New Zealand’s emissions are related to agriculture and 90% of the emissions are from livestock. With New Zealand relaxing its commitment to reduce emissions and accepting an underestimated target, **there will be delay in emission reduction globally especially from livestock as New Zealand is one of the largest livestock exporters.**

Greenhouse gas emission sources in New Zealand, 2022



Source: New Zealand GHG Inventory 1990-2022

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