CLIMATE'S EMERGENCY BRAKE:

The imperative for a livestock transition to slow global warming

Critical global warming limits are on the cusp of being breached and people are already facing dangerous climate impacts. The goal now is to avert the worst possible scenarios by fighting to curb all new climate pollution as much as possible.

Cutting methane pollution is one of the best ways to pump the brakes as we try to get global warming under control. Industrial livestock production is a key source of methane. It is also a problem for a whole host of other reasons, from water pollution to animal welfare. Phasing out this industrial model of production can help protect the climate and benefit farmers, consumers, and rural communities, if done well.

Cutting pollution may be lower on the political agenda today, but the public remains concerned, and the costs of global warming continue to rise. The longer politicians drag their feet on effective climate action, the faster change will need to happen when climate change climbs back up the political agenda and that poses risks for farmers. We need to plan and fund the transition now — the longer we wait, the more extreme climate change will be, and the more disruptive the transition will be.

In this brief, we outline why action on methane is so urgently needed and where there are risks of a sudden shift in the policy or consumer landscape. The sooner there is a public investment in a just transition for animal agriculture in the EU and U.S., the better the chances of landing with healthy rural economies and lower greenhouse gas (GHG) emissions.

The world has entered the danger zone for climate harms. Global temperatures exceeded the 1.5°C temperature limit for the first time in 2024, and that boundary could be permanently breached in the next five years.[1] At this level of warming, warm-water coral reef ecosystems are at risk of collapse, and a massive dieback of the Amazon rainforest may be triggered.[2]

At a personal level, more people are being harmed by climate change each year, as it adds to the death tolls and destruction of record-breaking heatwaves, floods, and wildfires.[3] Climate change effects are also showing up in more mundane, yet significant, ways — whether in the grocery store,[4] in the search for home insurance,[5] or in the declining quality of beer.[6]

Scientists are now exploring how to reduce the top temperature at which global warming maxes out while also planning for how to get average temperatures back down to below 1.5°C by the end of the century.[7] It is uncharted territory and there is no guarantee of being able to return to the world before 1.5°C has exceeded. The name of the game now is to limit the length of time and the extent of overheating society faces — every minute and pollution molecule matters.[8]

Stopping methane pollution is one of the climate's emergency brakes. Methane is the second largest contributor to global warming and one of the most potent polluters.[9] Unlike the other two main sources of climate pollution — carbon dioxide and nitrous oxide — methane's greatest impact on temperature levels occurs within the decade or so after its release.[10] This feature means that cutting methane emissions is one of the fastest ways to

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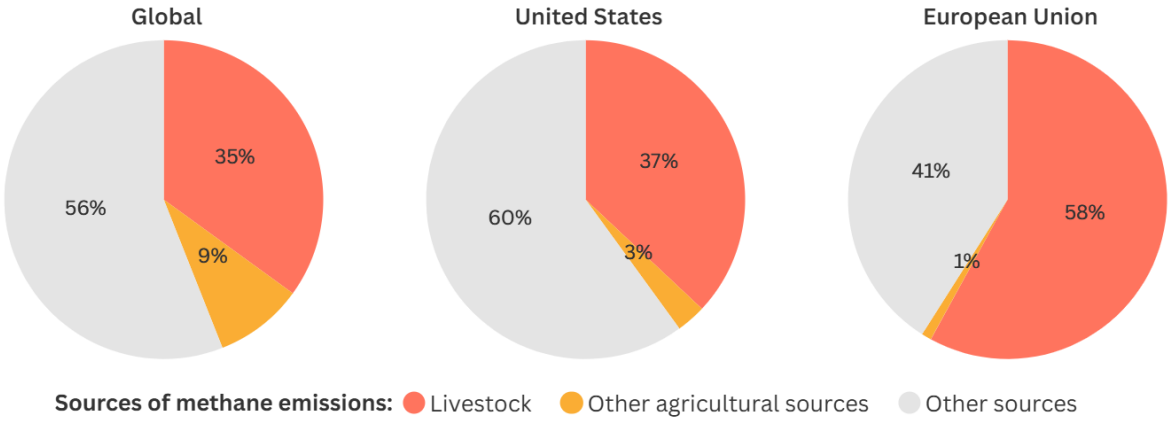
Methane emissions: Share of agricultural sources of methane emissions globally, in the European Union and in the United States



slow the speed at which Earth heats up and to limit the maximum temperature the planet will reach before climate pollution is reined in.[11]

Raising livestock, especially cattle for beef and dairy production, is a significant source of methane pollution. In 2023, 35% of global methane pollution came from livestock.[12] In the U.S., that figure is 37% and in the EU, it is 58%.[13]

If people's food habits stay as they are, the food system could add close to 1°C of warming by the end of the century.[14] More than half of that warming is a result of meat and dairy production, most of which will come from livestock methane emissions.[15] If demand for meat and dairy continues to grow, then total warming will climb even higher, and the work of bringing temperatures back down to less harmful levels will be even harder. Yet, research shows that most regions in the world already exceed the recommended amount of meat and dairy consumption — but that healthy, culturally appropriate diets that stay within Earth's limits are possible.[16]

Deep and sustained cuts in livestock methane are needed to avoid the worst climate harms. The UN Food and Agriculture Organization (FAO) has assessed that methane emissions from livestock would need to be cut by 25% (below 2020 levels) by 2030 and in half for all agrifood methane by 2045 to keep global warming to 1.5°C.[17] These are global figures. Experts have called on high- and middle-income countries to lead this transition in the livestock sector and peak and decline livestock sector emissions at a much faster rate.[18]

As top producers and consumers of meat and dairy, with both the capacity and responsibility to act, the U.S. and EU should lead the way in cutting methane pollution from farmed animals.

The level of change needed is transformational, not piecemeal. Research is beginning to sketch pathways towards what animal farming would look like in wealthy countries in a climate-safe world.[19] There are still a lot of unanswered questions, yet two elements are clear: pollution levels will need to come down significantly and techno-fixes alone are not sufficient to achieve the level of cuts needed.[20] To be effective, the transition will also require smaller herds and fewer animals overall, at levels planetary systems can support, as well as shifting diets to align with a climate-safe diversity of food production.[21]

The German research institute Agora Agriculture found that livestock methane pollution reductions in the EU of more than 65% would be possible by mid-century by shifting to healthier, more plant-based diets and reducing livestock numbers.[22] In their modeling, only about 20% of the reduction in pollution comes from technology. The rest is from reduced herd sizes, especially in areas with a high concentration of animals (i.e., factory farms). Their proposal would afford more space and access to the outdoors for farmed animals, and the reduced demand for feed would free land for other uses, with

benefits for nature and biodiversity. Europe's reliance on land abroad (which is needed to meet current demand for animal feed) would also be reduced under Agora's projections.

Transformational change requires planning, but neither the U.S., nor the EU have a strategy for supporting the livestock transition. In 2021, the EU and U.S. launched the "Global Methane Pledge" to spur international action against methane pollution with a 30% cut in global emissions (below 2020 levels) by 2030 across all sectors. 159 countries have now signed on,[23] but progress has been slow.[24]

Both the EU and U.S. took action to address methane pollution arising from fossil fuel production and garbage in landfills and wastewater. Yet, methane from livestock remains a blind spot.[25]

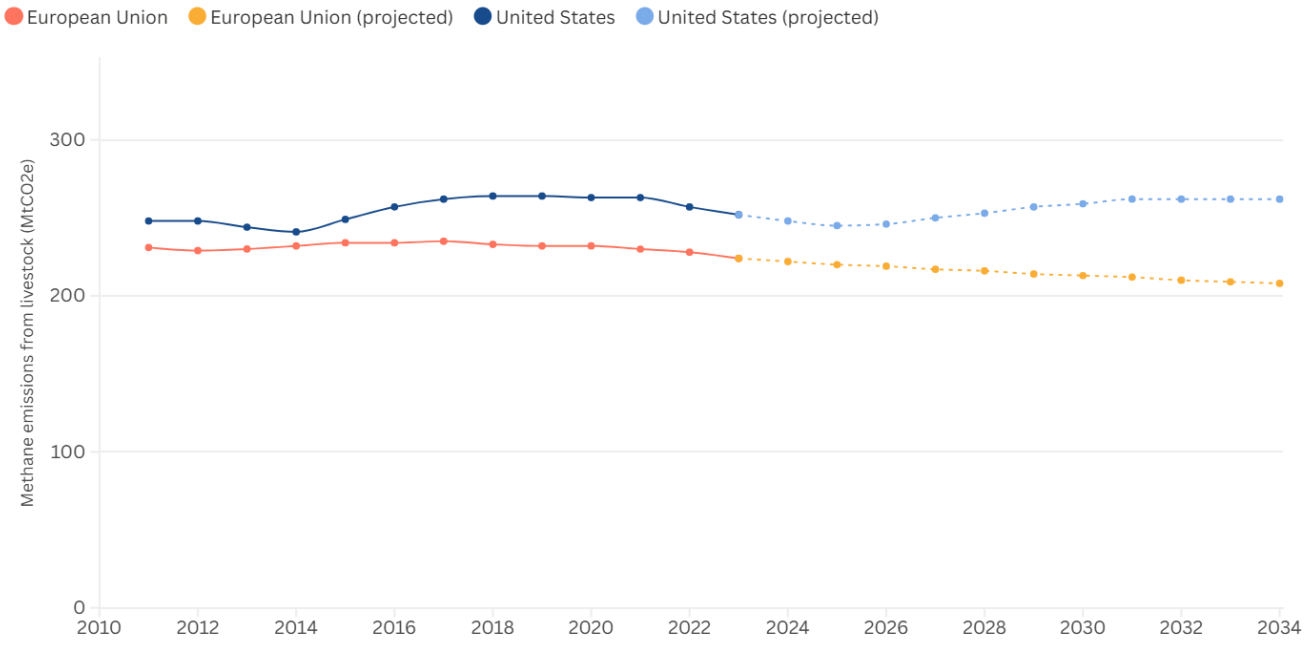
Methane pollution from livestock is roughly at the same level as it was a decade ago in the U.S. and on a slight downward trend in the EU.[26] U.S. emissions are expected to rebound as the herd is rebuilt, while EU emissions are expected to continue to trend downwards gradually. Policies currently being considered in the EU would only modify this trend slightly, with at most an additional 5% reduction in emissions by 2034 from what is shown in the graph below.

The EU recently reaffirmed its commitment to lead on cutting methane pollution globally as part of its climate diplomacy,[27] but to do so credibly will require the bloc to tackle methane pollution from livestock production. The European Commission has promised a livestock strategy by mid-2026,[28] yet if preparatory work done so far is any indication,[29] this strategy will not chart the course for how to achieve the needed transformation.

Although there has been no formal announcement from the Trump administration, the U.S. methane reduction plan developed under President Biden has likely been shelved. The plan is no longer on the White House website. The Trump administration has pulled the U.S. out of the Paris Agreement and dismantled climate policy across government departments. Trump's EPA has lowered the volume of biogas that is eligible for credits under a Renewable Fuels Program.[30] While large-scale biogas harms the environment and local communities in other ways,[31] limiting a subsidy that the industry was counting on — without offering an alternative way to address animal waste — will slow efforts to stop methane pollution.

At the U.S. state level, California leads the way with the nation's most comprehensive agriculture methane strategy. Yet, its focus has been tech-heavy, with

Historic and projected methane emissions from livestock in the United States and the European Union (MtCO2e)



funding centered on methane digesters (primarily for large dairies). While this support is being phased out over the next few decades,[32] and there is some support for farmers to transition to pasture-based systems, a comprehensive transition plan is lacking.

The case for action is clear. Whether action will happen fast enough is not. The Trump administration's withdrawal of the United States from the Paris Agreement and declaration that climate change is a scam,[33] the EU's drawn-out adoption of weaker climate targets,[34] and the general reluctance of other governments to adopt ambitious 2035 climate targets,[35] all suggest that leaders are not concerned with taking action to curtail emissions. Action on agricultural methane is especially lacking. New Zealand, a major agricultural producer, has weakened its methane targets[36] and the UK government made a last-minute decision to shelve the adoption of a livestock-specific methane pollution reduction target.[37]

There is a strong case that 2025 is the *annus horribilis* for efforts to cut climate pollution and halt global warming.

Yet the longer transition planning is delayed, the more risks to farming communities continue to grow.[38] A fair transition to animal farming within nature's limits cannot take place overnight — especially if governments want to ensure farmers' welfare. It takes time to establish the alternative markets, supply chains, and infrastructure that will allow farmers to earn a fair living by diversifying their farms away from intensive animal products by, for instance, growing more fruits, vegetables, or legumes; shifting to agroforestry; or even growing sustainable construction material on rewetted peatlands.

Farmers need time, financial support, a clear vision for what animal farming will look like in 2040 or 2050, and a firm commitment to stay the course on implementing the plan to make that vision a reality, if they are to make the investments needed to reduce methane emissions and produce enough nutritious food for the global population within Earth's natural boundaries. This is why clear and aligned policies are critical to make this transition possible, sending signals on methane reduction to the food industry and to farmers, while providing a pathway to get there.

Industrial animal farming puts itself at risk by overlooking possible changes on the horizon. The globe continues to heat up, even as cutting climate pollution has dropped down the political agenda. The public is concerned, and the costs of global warming continue to rise. The longer politicians drag their feet on effective climate action, the faster change will need to happen when climate change returns as a political priority. When that happens, the importance of deep cuts to methane will again top the agenda because of the fast-acting benefits of cutting it — and from there, attention will turn to industrial livestock production.

Health concerns, changing consumer preferences, corporate strategies, and even the impacts of climate change itself may accelerate the transition away from meat and dairy production faster than one may think.

It is worth unpacking these policy and demand headwinds further.

Advances in climate modeling will continue to refine and reinforce the need to reduce meat and dairy consumption to avoid the worst impacts of climate change. The potential contribution a reduction in meat and dairy consumption can make to bringing down methane pollution is well-established,[39] however, it is not yet fully captured in all the climate modeling that informs decision-makers. Only half of the scenarios used by the world's top climate scientists in their latest assessment report (published in 2022) have specific results for agriculture and even fewer cover livestock emissions.[40] It is worth remembering that analysis on how to cut climate pollution has historically prioritized technological solutions — and research into the full potential of demand-size measures, like changing diets, is only about a decade old.[41]

This picture is changing rapidly. Reducing meat and dairy consumption will form a core part of the low temperature pathways currently being prepared for the next global climate science assessment.[42] This science will support governments when they next review international commitments to fight climate change in 2028.[43]

Beyond climate, there is a growing recognition of the need to reduce pollution across several fronts as the Earth's life support systems like clean air, water, and natural habitats are being pushed to the limit.[44] The current method of industrialized food production is a key stressor on many of these systems, and shifting diets to lower reliance on animal-sourced foods is a core element of trying to live well within the Earth's means.[45]

The reduction in meat and dairy production envisaged to achieve either climate or Earth system objectives will mean transformational change for the sector. So, when policymakers finally want (or are forced by their voters) to confront these issues, the message from the scientific community will be clear and even more emphatic.

The health imperative to reduce meat and dairy consumption is overwhelming. The health risks from overeating red and processed meat are well established,[46] while the burden this places on public health systems — not to mention individual well-being — continues to mount.[47] The FAO estimates that unhealthy diets costs wealthy countries, like the U.S. and those in the EU, a combined $2.5 trillion in hidden costs.[48] This assessment is shared by health care professionals.[49]

The EAT-Lancet Commission has undertaken extensive analysis — first in 2019, updated in 2025 — showing how shifting to healthier diets can be beneficial for both people and the planet.[50] Health agencies are starting to take these recommendations on board.[51] While few guidelines are fully consistent with the EAT-Lancet's planetary health diet, consideration of the environmental impacts of food is becoming more prevalent. In recent years, several scientific advisory bodies in European countries have recommended predominantly plant-based diets.[52] These recommendations are having an impact. Finland's largest grocery retailer found a 7% drop in deli meat sales a year after the country's dietary guidelines were updated.[53] 30% of consumers surveyed said they had reduced their consumption because of the recommendations.

Advice on healthy diets is only one part of the puzzle in helping people improve their diets. To make the healthy and sustainable choice the easiest option requires changes across the entire food chain.[54] Yet, rising health care costs related to poor diets may put pressure on governments to support a shift to a healthier plant-based diet, driving a quicker transition away from meat and dairy production.

Swift changes in consumer demand are also possible. A generational shift in preferences and health concerns can lead to rapid changes in demand — a lesson European and American wine producers are learning the hard way.

Global wine consumption is at its lowest level in three decades, in a continuous decline since 2017.[55] European wine producers had been balancing a drop in domestic consumption with lower production ("helped" by reduced yields due to climate change) and increased exports. Yet, global consumption dropped during the COVID-19 pandemic and has not recovered, necessitating a sector bailout.[56] Older consumers are exiting the market, and the younger generation prefers alternatives or abstains altogether.[57] Health concerns are also driving consumption changes. In 2023, the World Health Organization declared that there is no safe level of alcohol consumption.[58]

Headline trends for per-capita red meat and dairy consumption in the U.S and Europe do not (yet) indicate any major shifts, beyond the fall in U.S. fresh milk (which is somewhat offset by increased consumption of other dairy products like cheese) and a gradual decline in red meat consumption in Europe.[59] Yet, there are hints of more nuanced trends underneath these population-wide figures.

The potential parallels for meat consumption are evident. Eating less and higher-quality meat has significant health benefits. For processed meats, questions are now being raised as to whether there is any safe level.[60] Younger generations are purchasing less meat and more likely to be vegan or vegetarian.[61] Similarly, older Americans are responsible for a larger share of the country's meat consumption.[62] Both of these trends hint at generational shift.

Consumers often say they already have or intend to reduce their meat consumption.[63] Health is by far the greater driver of such intentions, though the environmental impacts of meat production and concern for animal wellbeing are also consistently cited. Research suggests that small changes in consumers' food environments have significant potential to shift

diets among certain demographics within society,[64] if governments wanted to help consumers realize their intentions. New GLP-1 agonist weight loss drugs may also play a role as emerging research suggests lower consumer preferences for beef and dairy.[65]

Corporate accountability continues to advance in key jurisdictions. With U.S. climate-related corporate reporting rules on pause and the European lawmakers actively rolling back their own provisions,[66] one could be forgiven for thinking corporate accountability has been thrown in the recycling bin. Yet, California's requirements are scheduled to apply from 1 January 2026.[67] Most major meat and dairy producers have to report under four different jurisdictions.[68]

Further down the value chain, more and more grocery retailers are starting to shift their product offerings away from animal products towards more plant-based alternatives.[69] This rebalancing of their product offer will also help them meet any climate targets effectively, should the regulatory picture change.[70]

Nature may force the transition as climate change will make animal farming more difficult. Climate change itself is playing a role in shrinking cattle herd sizes in parts of the world. Cattle are affected by climate change in multiple ways: Livestock deaths have been caused by heatwaves, [71] wildfires,[72] and floods.[73] Wildfires, drought, and other climate impacts adversely affect grazing pasture land,[74] increasing the reliance on feed, while heat stress reduces milk production.[75] The areas that grow feed are also struggling, facing drought, soil loss and degradation, depleted freshwater sources, and a rapidly changing range of pests and weeds emerging from disrupted temperatures, moisture levels, and weather patterns.

Globally, losses from lower milk and beef production could be in the billions by mid-century, even if global warming is kept to the lowest levels.[76] While the greatest losses are expected to occur in the tropics, the U.S. and EU will still be affected. U.S. production losses could total $660 million for beef and $200 million for milk production.[77] Individual EU countries could face losses in the tens of millions.[78] Farmers could take measures to reduce heat stress on cattle and bring down some of these expected costs, but that requires an investment that would need to be weighed against the possibility of stranded assets, if consumer demand or the regulatory environment reduced demand for animal sourced foods.

Climate change may also harm livestock production in surprising ways. There is a non-zero chance that ticks could shift the demand curve for red meat. Yes, ticks. Tick bites have been linked to the development of a human allergy to red meat, which manifests in ways that range from unpleasant rashes to life-threatening reactions. In the past 15 years, more than 100,000 cases have been identified in the U.S., though the real number could be closer to half a million.[79] The ticks are expanding their range due to climate change and thus could put millions of Americans at risk.[80] Whether this new allergy has any meaningful impact on consumption trends remains to be seen, but, as a metaphor, it encapsulates well how climate harms continue to arise in unexpected ways.

It is hard to know exactly how and when any of these policy or demand shifts will materialize, but there are enough indicators to warrant attention. The sooner we have a plan and start financing the transition, the easier the changes will be. The longer the foot-dragging goes on, the more likely it is that farmers will be at risk of losing from investments in industrial production that do not pan out.

If this decade has taught us anything thus far, it's that change moves faster now. There is no more time to wait — the future of farmers, consumers, and our planet depends on our governments to take action now.

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