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Five years ago McDonald's said it planned to reduce greenhouse gas emissions by more than a third in parts of its operations by 2030. A few years later, it pledged to be "net zero" — cutting emissions to as close to zero as possible — by 2050.

But in its most recent report, McDonald's disclosed that things were moving in the wrong direction: The company's emissions in 2021 were 12 percent higher than its 2015 baseline.

McDonald's is hardly alone. An examination of various climate-related reports and filings for 20 of the world's largest food and restaurant companies reveals that more than half have not made any progress on their emissions reduction goals or have reported rising emissions levels.

The bulk of emissions — in many cases more than 90 percent — come from the companies' supply chains. In other words, the cows and wheat used to make burgers and cereal.

And while companies have worked to eliminate some plastic in packaging and reduce water use to make their products more sustainable, many large food and beverage companies and restaurant chains are struggling to balance their robust growth in recent years with their climate goals.

As consumer patterns have changed since the start of the pandemic, food companies have experienced significant demand. The war in Ukraine and extreme weather, such as droughts and floods, also disrupted supply chains, causing companies to get ingredients and goods from different suppliers.

At PepsiCo, which began setting targets to reduce emissions in 2015, emissions in its supply chain are up 7 percent from its baseline, according to its 2022 climate report. Chipotle, which set a goal of halving its emissions by 2030, reported a 26 percent surge in supply chain and other emissions in its 2022 report.

"This has got to be about performance, not promises," said Barry Parkin, the chief procurement and sustainability officer at the privately held candy and pet food giant Mars, one of the large companies that reported a decline in emissions. "We've had five years of companies making promises and being celebrated for the quality of their promises and not their performance."

The global food system, which accounts for a third of the world's greenhouse gas emissions, is under pressure from consumers and investors to create tangible plans to reduce that output. This week, heads of governments, corporations, climate advocacy groups and activists are gathering in New York City to discuss, debate and attend protests about climate issues.

Many food companies have paid outside groups, like the Science Based Targets initiative, to set and approve medium- and long-term goals to slash emissions. Many say on their websites and in news releases that they aim to be net zero in their emissions by 2050.

“If companies aren’t developing strategies around how to integrate growth and innovation into climate transition plans, that does amplify their exposure to climate risk and their risk of not meeting their targets,” said Meryl Richards, the acting program director for food and forest at Ceres, a nonprofit coalition of climate activists and investors.

For 2022, for example, Starbucks reported a 12 percent increase in its total emissions from 2019 levels. But during that time, revenues jumped by 23 percent or $6 billion — a big chunk from raising prices for lattes and cappuccinos — while it added more than 5,000 new stores.

At this point, the company expects increases in emissions, including in areas like water and waste, “as we saw our business grow and as we further strengthened our systems of measurement,” said Beth Nervig, a spokeswoman for Starbucks. “We are at a crucial point on our journey to becoming a resource-positive company.”

In emailed statements, McDonald’s, PepsiCo and Chipotle all said they continued to work with suppliers to reduce emissions.

Quantifying and reducing supply chain emissions “are significant challenges and critical pathways to achieving our net-zero goal by 2040,” said Jim Andrew, the chief sustainability officer at PepsiCo.

McDonald’s said it was meeting its stated objectives, noting that total emissions at its restaurants had declined and that other metrics showed its supply chain emissions had also been reduced. But the company also said several critical hurdles had to be overcome to further reduce supply chain emissions, including advances in accounting, collaboration within the agricultural industry, and additional funding for suppliers and producers.

Still, some companies reported declines in emissions even as their businesses grew in recent years.

Mars said it had reduced its total emissions, including its supply chain, by 8 percent from 2015 levels while increasing its revenue 60 percent. The company’s goal is to cut its total 2015 emissions by 50 percent by 2030 and to be net zero by 2050.

“This isn’t a trade-off for us,” said Mr. Parkin, the chief procurement and sustainability officer. “It’s a goal that is as important to us as our financial performance.” He said the company intended to spend $1 billion over the next three years on climate-related efforts, including various financial incentives for farmers to use regenerative farming techniques.

Unlike financial reports or securities filings for public companies, emissions data is voluntarily reported and not standardized. And when it comes to supply chains and waste, there is a certain amount of extrapolating, modeling and guesswork by companies. And they still may not disclose all their emissions in their reports.

In their latest publicly available climate-related reports, the meat processors Tyson Foods and JBS did not disclose emissions from their supply chains, which include cows, pigs and poultry.

Cows have been a particular target for climate activists because they produce methane, a potent planet-warming gas, when they belch.

Tyson did not disclose its supply chain emissions in its 2022 sustainability report because it was completing calculations to improve its reporting, the company said in an emailed statement. It said it expected to disclose supply chain emissions in future reports.

Climate activists say JBS, the world's largest meat producer, neither reported its supply chain emissions for 2022 nor the number of animals it processed.Credit...Victor Moriyama for The New York Times

JBS, the world's largest meat producer, whose brands in the United States include Swift and Pilgrim's, has been criticized by climate activists in recent months for what they say are attempts by the company to greenwash its progress on reducing emissions.

On its website, JBS says it is the first major global protein company to set a net-zero target for all its emissions, including its supply chain. But critics say that JBS has not had its targets validated by a third-party organization and that it reported neither its supply chain emissions for 2022 nor the number of animals it processed.

This summer, a panel of the National Advertising Review Board upheld a ruling that JBS had to discontinue claims relating to its goal of achieving "net zero" by 2040.

JBS did report supply chain figures for 2021, but critics say those numbers vastly underestimate greenhouse gas emissions.

"We believe they have significant emissions, but they have very little accountability for reporting, having targets, sticking to those targets and having those targets verified externally," said Alex Wijeratna, senior director of the global protein campaign at Mighty Earth, a climate advocacy organization.

Jason Weller, who joined JBS last year as its first global chief sustainability officer, said the company had made disclosures around its supply chain to CDP, a nonprofit organization that collects and rates climate disclosures by various entities.

Those disclosures, however, were not included in JBS's sustainability report last year, as the company continued to improve its collection of data in that area, Mr. Weller said. When asked, JBS did not provide the supply chain data it gave to CDP.

For JBS, its supply chain emissions include not only the number of animals it processes each year, which are raised by thousands of ranchers all over the country, and the methane they emit but also the emissions that come from their feed, like corn.

While JBS works to quantify emissions from its supply chain, Mr. Weller said, there are bigger questions hanging over the industry, including whether existing technologies to reduce emissions in cows actually help or whether they are too costly.

And then, he said, there's the matter of who will assume the costs around climate-friendly farming: governments, corporations, farmers or consumers?

"It comes down to who is going to pay," Mr. Weller said. "That is the issue that haunts this entire conversation."