Changing Markets FOUNDATION

Planet Tracker

Materially Neglected:

Agricultural Methane and Investor Risk

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This report was researched and written by the Changing Markets Foundation and Planet Tracker.

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Design: Pietro Bruni – toshi.ltd

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Executive summary

Methane is responsible for roughly 0.5°C of current global warming. It's over 80 times more potent than CO_2 over 20 years, but it only lasts about a decade, making reducing methane the fastest way to slow near-term warming. Even if fossil fuel emissions stopped tomorrow, agricultural methane alone could push the world past the 1.5°C warming limit. Cutting methane this decade is essential to prevent dangerous overshoot.

Agriculture is the largest source of human-caused methane, responsible for around 42% of emissions. Livestock accounts for the majority (32% of total methane emissions), followed by rice cultivation (9%). This agricultural methane has driven roughly 30% of the global temperature rise since the industrial revolution.

This report, *Materially Neglected: Agricultural Methane and Investor Risk*, follows two earlier analyses. The 2023 Hot Money report, by Changing Markets Foundation and Planet Tracker, was the first to quantify methane emissions across 15 leading meat and dairy companies and identify 40 investors funding them. Planet Tracker's 2025 Methane Matters report estimated methane emissions across 52 meat, dairy and rice companies. This new analysis focuses on accountability, examining whether investors now treat agricultural methane as a material climate and financial risk, and whether their strategies reflect this.

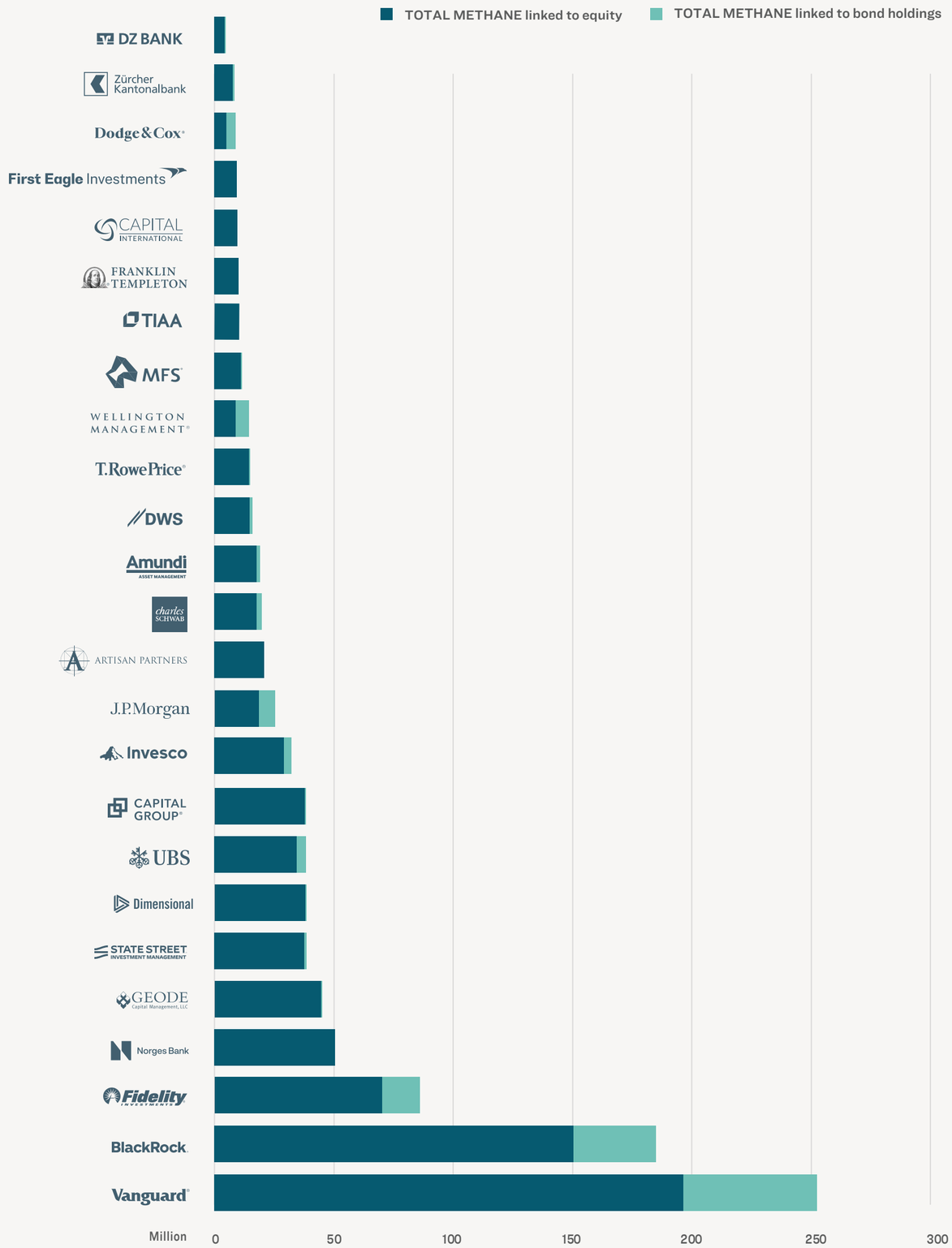
Figure 1 shows the total agricultural methane emissions linked to the holdings of major global investors. A small number of investors, including Vanguard, Blackrock and Fidelity Investments, account for a disproportionate share of financed methane emissions through the meat, dairy and rice companies in which they are invested.

Despite this exposure, our analysis found that investor action is limited. Drawing on publicly available disclosures, we assessed investor practice across two key areas:

1. Integration of methane into investment and risk frameworks.
2. Engagement with high-methane sectors.

Our assessment shows that methane is almost entirely absent from investment and risk strategies. Only four investors (out of 25 analysed) explicitly acknowledge methane's short-term warming impacts and mitigation potential. Most treat methane as a secondary component

Figure 1. Methane footprint of the top 25 investors' equity and bond holdings (tonnes of CH_4).



of CO_2 equivalent frameworks, with no standalone targets or agriculture-specific policies. Norges Bank Investment Management (NBIM) is the only investor that has agricultural methane included in its climate policy, while J.P.Morgan Asset Management and State Street Investment Management have methane policies focused only on the oil and gas sector. No investor analysed aligns their policies with the Global Methane Pledge, an international initiative aiming to reduce global methane emissions by at least 30% by 2030. In our scoring assessment of financial institutions' methane-related policies, 80% scored less than 10% of the total available points.

Where investors do engage in methane it is limited to oil and gas companies. For example, J.P.Morgan Asset Management incorporates methane within sectoral carbon-intensity targets but focuses primarily on the oil and gas sector, while State Street conducted a targeted engagement campaign in 2022-2023 to assess methane management and encourage best-practice disclosure in oil and gas. NBIM is the only investor to explicitly reference the Global Methane Pledge, embedding methane expectations into its climate action plan and encouraging companies in methane-intensive sectors to set standalone methane targets.

In contrast, engagement with food companies focuses on deforestation, biodiversity or supply chain issues, with no expectations for methane disclosure, target-setting or mitigation. Investment in solutions, including alternative proteins, feed additives, low-methane livestock systems or methane-reducing rice practices, remains small and lacks any overarching strategy.

This disconnect creates significant risks for investors, including regulatory changes, transition costs, physical climate impacts and reputational exposure as scrutiny of food-system emissions intensifies. At the same time, it presents a clear opportunity for leadership in the transition to a low-methane food system. Emerging methane-reducing technologies, such as feed additives, alternative proteins and climate-smart agriculture, offer pathways to both risk mitigation and value creation.

Methane remains a systemic blind spot, but one that investors cannot afford to ignore.

Going forward: A call to action

To address this critical blind spot, investors must:

- Publicly recognise methane as a distinct climate driver, but also a major opportunity to slow global heating - a 'climate emergency brake.'
- Integrate methane considerations into all net-zero strategies, especially in high-emitting sectors such as agriculture, energy and waste.
- Adopt dedicated methane policies, with expectations for disclosure, target-setting and mitigation across scopes 1-3.
- Set agriculture-specific methane reduction targets, aligned with science and covering the livestock value chain, that incentivise real-world methane reductions by portfolio companies.
- Align portfolio commitments with the Global Methane Pledge - to collectively cut global methane emissions by at least 30% by 2030 from 2020 levels.
- Shift capital toward sustainable proteins and resilient food systems, and away from high-emitting agriculture without a credible reduction plan.

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1. Introduction

Methane is a major greenhouse gas (GHG), responsible for around 0.5°C of current global heating.[1] It is roughly 80 times more potent than CO_2 but persists in the atmosphere for only about a decade.[2] This makes methane reduction the fastest lever available to slow global heating in the near term, offering one of the highest climate returns per dollar invested. Although it is responsible for more than a third of global heating, methane received only around 2% of global climate finance in 2022, according to the Climate Policy Initiative, which estimates that a ten-fold increase in annual public and private investment is needed.[3] Yet, most investors still fold methane into broad CO_2-equivalent frameworks, including commitments, targets and policies. Methane qualifies as both a major greenhouse gas and an air pollutant, as a precursor of ground-level ozone, and should therefore be treated as a separate risk category with specific abatement pathways explored.

The UN Environment Programme (UNEP) 2025 *Global Methane Status Report* outlined the urgent need for action on methane, estimating that emissions are projected to rise 5% by 2030 and 21% by 2050 (from 2020 levels). If current commitments were met and all technical measures available were implemented, methane emissions could be reduced by 32% and 0.2°C of warming avoided. Delivering this reduction will require rapid progress from high-emitting sectors, particularly agriculture and oil and gas.[4]

Methane action is happening but not fast enough: 159 countries have signed the Global Methane Pledge (GMP) and are taking action to reduce their emissions. If countries implement existing commitments made in nationally determined contributions (NDCs) and methane action plans, methane emissions will fall 8% below 2020 levels by 2030. Agriculture remains the biggest methane blind spot as few countries include the sector in their methane plans, especially the biggest livestock-producing countries.

Developing targeted approaches to methane abatement represents a clear financial and risk-management opportunity for investors. Companies that reduce methane emissions can lower exposure to regulatory, transition and physical climate risks, while improving operational efficiency and long-term resilience. At the same time, capital allocated to methane-reducing technologies and business models, such as feed additives, improved livestock management and alternative proteins, has the potential to outperform peers as policy, procurement standards and consumer demand increasingly favour lower-emission production.

Food systems play a critical role in addressing the challenge of methane reduction. According to the UN Food and Agriculture Organization (FAO), agricultural methane should be cut by 25% below 2020 levels by 2030.[5] Livestock farming together with manure management and rice cultivation are responsible for 42% of global methane emissions. Climate disruption is already undermining yields, threatening food security and eroding asset values, making cuts in agricultural emissions a prerequisite for climate stability. Some analyses suggest that slightly stronger cuts would deliver even greater climate and health benefits. As mentioned above, reducing methane emissions by 32% by 2030 would lead to 0.2°C of avoided warming by 2050. This would prevent 180,000 premature deaths by 2050 and deliver $330 billion in benefits by 2030.[6]

Box 1: **Climate disruption and financial losses in animal agriculture**

Livestock supply chains are both a major source of methane and among the first to suffer the consequences of climate inaction. As unchecked methane emissions accelerate climate impacts on the sector in the form of floods, droughts and other extreme weather events, rising methane emissions also contribute to crop losses and premature deaths. According to UNEP these impacts could reach $43 billion per year in 2030.[7] Part of this cost will translate into rising financial instability facing meat and dairy producers.

In 2023, a prolonged drought across the US Midwest, amplified by near-term warming, pushed up the price of corn and soy, squeezing margins across the sector. Tyson Foods reported a $417 million quarterly net loss, attributing much of the decline to high feed costs and drought-related pressures.[8] That same year, severe floods in Italy's Emilia-Romagna region inundated nearly half of its cultivable land, killing thousands of animals, destroying fruit and feed crops, and causing an estimated €1.5 billion in agricultural and infrastructure damage.[9]

Climate-linked extremes like droughts and floods are becoming more frequent and more severe, a trend reflected in insurance-sector losses over the past decade. This pattern is global. Record heat and drought across Australia in 2024–2025 cut milk output by 10–25% in affected regions, while rising operating costs have left many farmers operating below sustainable margins.[10]

Farming is dependent on an optimal balance of water conditions. Both flooding and drought disrupt this balance, damaging crop yields and animal grazing and feed. Climate change increases the risk of water stress (disruption of the water balance) for the food system, while the Global Commission on the Economics of Water warns that freshwater demand will exceed supply by 40% by 2030.[11] The stability of food supply chains is at risk – yet recent analysis of leading global livestock firms found that around two-thirds are failing to manage water-related risks effectively.[12]

For investors, the risks are direct and material. Rising feed costs, falling productivity, livestock losses and infrastructure disruption threaten the financial stability of food producers and the security of food systems, creating valuation risks across the meat and dairy value chain. It is in investors' interest to understand these risks and guide portfolio companies toward effective mitigation, with strategies to reduce methane emissions from the food value chain central to that effort.

In 2023, Changing Markets Foundation and Planet Tracker published *Hot Money*, a first-of-its-kind report attributing the methane emissions of 15 of the world's largest meat and dairy companies to their top investors and banks.[13] Despite the significance of methane emissions, the report found that most investors had no methane-specific policies, even though most were headquartered in countries that had signed up to the GMP.

This report builds on those findings, assessing whether investors are recognising agricultural methane as a systemic financial and climate risk, and whether they are starting to take meaningful action to address it. While *Hot Money* exposed the financial sector's role in funding methane-intensive industries, this analysis focuses on the responsibility and agency of investors to support, encourage and incentivise companies, particularly in animal agriculture, to reduce methane emissions and manage the associated climate and financial risks.

The analysis in this report is based on publicly available information, including disclosed policies, targets and stewardship activities. Planet Tracker and Changing Markets also contacted 25 of the world's largest funders of major meat and dairy companies, inviting them to complete a questionnaire on their approach to agricultural methane (see Appendix 1). However, only Norde Bank responded. This absence of engagement underscores how deeply methane remains a blind spot within the finance sector.

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2. Research findings

This assessment draws on Planet Tracker's modelling of methane emissions from the 26 largest meat, dairy and rice companies outlined in its recent *Methane Matters* report (December, 2024). This analysis is combined with companies previously assessed by Changing Markets, to evaluate the methane exposure of the 25 largest investors based on their equity and bond holdings. We reviewed publicly available disclosures to assess investors' recognition of methane, together with their strategies, policies, targets, risk modelling and stewardship to address methane exposure across portfolio companies. We then benchmarked this assessment against established best practice.

A survey (Annex 1) was also circulated to all investors, but no responses were received. NBIM later responded to an offer to discuss the topic. The lack of response suggests methane is not a topic that investors feel sufficiently informed about to engage with civil society organisations on, or is not a particular priority for them.

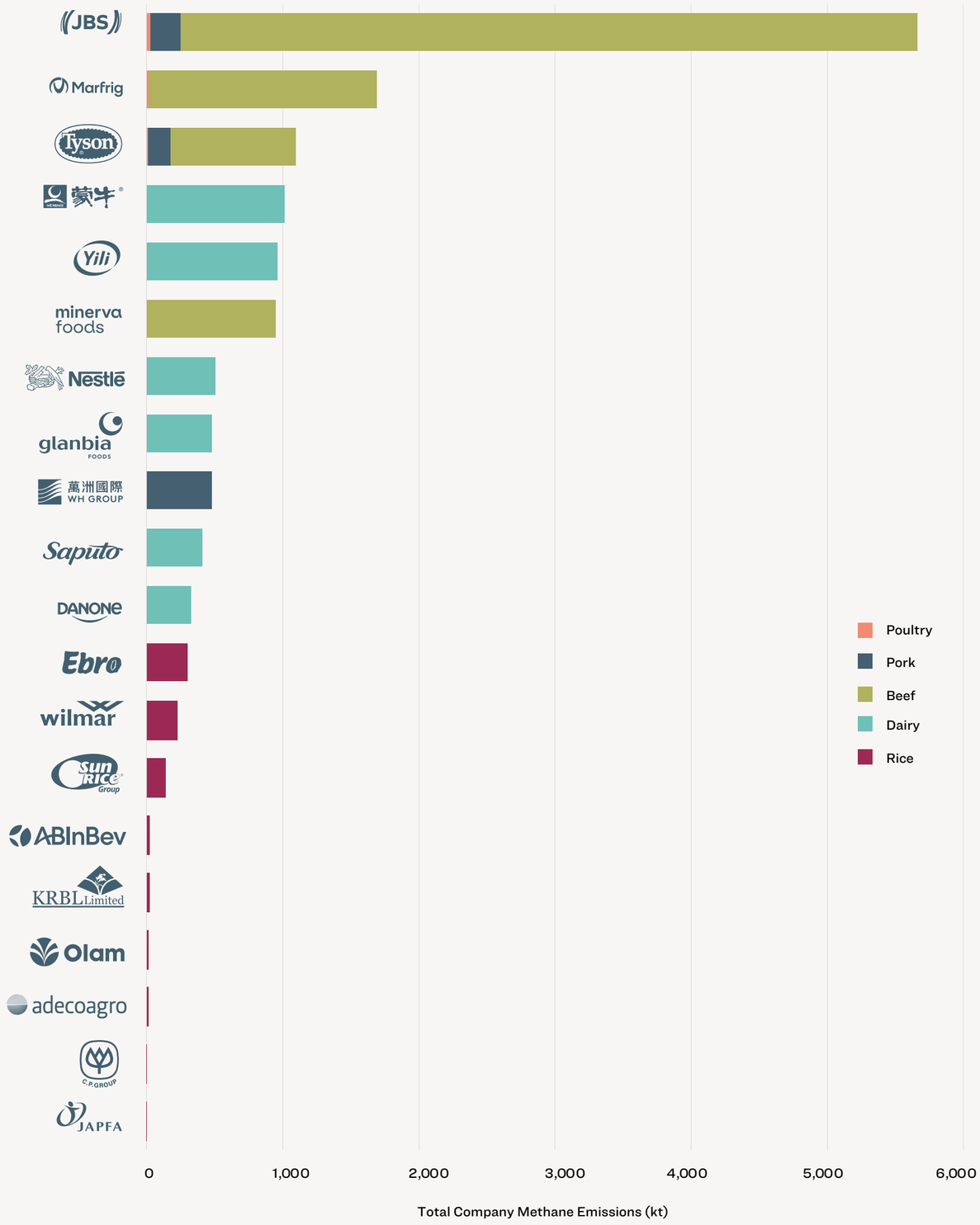
Full details of the methodology, criteria, data sources and survey approach are provided in the annex.

2.1 Investor methane emission estimates

Planet Tracker's *Methane Matters* report calculates the methane footprint and analyses the targets and reduction plans of 52 of the world's largest meat, dairy and rice companies. These companies account for 12% (21.91 Mt CH_4) of total agricultural methane emissions, reflecting the sector's relative fragmentation. Within this group the ten largest companies are responsible for 68.4% of the total estimated methane footprint. JBS dominates, producing over a quarter of the group's emissions, making it the single biggest agricultural methane polluter globally (Figure 2).

We identified 20 of these 52 meat, dairy and rice companies[A] for which equity or bondholder information was available; those excluded were either privately held or lacked publicly disclosed data. These 20 companies represent two-thirds of total emissions calculated in *Methane Matters*. Across these 20 meat, dairy and rice companies, we identified the top 25 investors by both equity ownership and bond exposure. These funders are predominantly large, well-known global institutions (see Table 1).[B]

Figure 2. Estimated methane emissions by company and commodity, 2023.
Source: Planet Tracker Analysis 2025



A Emissions were calculated only for the 20 companies that publicly disclosed production data necessary for methane estimation. Six additional companies were excluded from the emissions analysis due to the absence of production disclosures. As a result, the methane emissions associated with investor exposures are likely underestimated. However, these six companies were included in the assessment of investors' investment exposure and in the analysis of investors' methane-related policies and strategies.

B The policy section of this report focuses on the 20 companies previously in Planet Tracker's *Methane Matters* report and six dairy companies from Changing Markets' *Running Latte* report. However, the emissions of the latter could not be calculated due to a lack of data disclosure by the companies.

Box 2: **Companies starting to move on methane**

After years of inaction, some major food companies are beginning to take methane seriously. Danone and Groupe Bel have set methane-specific targets to reduce livestock emissions by at least 30% by 2030.[14] Marfrig has become the first major meat company to commit to a methane reduction target, aiming for a 33% cut by 2035.

In addition, we are seeing an increase in companies reporting livestock emissions separately. Groupe Bel, Danone, Kraft Heinz, General Mills, Clover Sonoma and Starbucks now report methane emissions in disaggregated form, while Nestlé and FrieslandCampina report scope 3 livestock methane in CO_2e.[15] Participation in the Dairy Methane Action Alliance (DMAA) has also increased, with Agropur, Idaho Milk Products, Savencia and others committing to regular methane accounting and action plans.[16] Early reductions have been recorded by Danone, Bel, Kraft Heinz and Nestlé, although methodology and transparency still require scrutiny.[17]

Investors can support this transition by engaging with companies, directing capital toward low-emission and plant-based proteins, and backing credible methane reduction initiatives. Strong investor involvement can accelerate action, reduce financial and reputational risk, and help turn corporate commitments into measurable methane reductions.

Table 1: Funding of 20 Meat, Dairy and Rice companies by top 25 equity owners

Investor	Equity investment US$bn	Equity owner	Bondholder
BlackRock	20.0	⊗	⊗
Vanguard	19.9	⊗	⊗
UBS	12.0	⊗	⊗
Norges Bank	8.7	⊗	
Capital Group	8.5	⊗	⊗
Geode Capital Management, LLC	5.4	⊗	⊗
Fidelity Investments	4.3	⊗	⊗
Zürcher Kantonalbank	4.2	⊗	⊗
Dodge & Cox	3.9	⊗	⊗
Capital International	3.7	⊗	⊗
MFS	3.4	⊗	⊗
Amundi Asset Management	3.2	⊗	⊗

Investor	Equity investment US$bn	Equity owner	Bondholder
DWS	3.1	⊗	⊗
ARTISAN PARTNERS	2.6	⊗	
STATE STREET INVESTMENT MANAGEMENT	2.4	⊗	⊗
J.P.Morgan	2.1	⊗	⊗
FRANKLIN TEMPLETON	1.9	⊗	
Dimensional	1.7	⊗	⊗
charles SCHWAB	1.6	⊗	⊗
nuveen A TIAA Company	1.5	⊗	
DZ BANK	1.5	⊗	⊗
First Eagle Investments	1.9	⊗	
Invesco	1.1	⊗	⊗
T.RowePrice®	1.1	⊗	⊗
WELLINGTON MANAGEMENT®	0.6	⊗	⊗

2.1.1. Equity

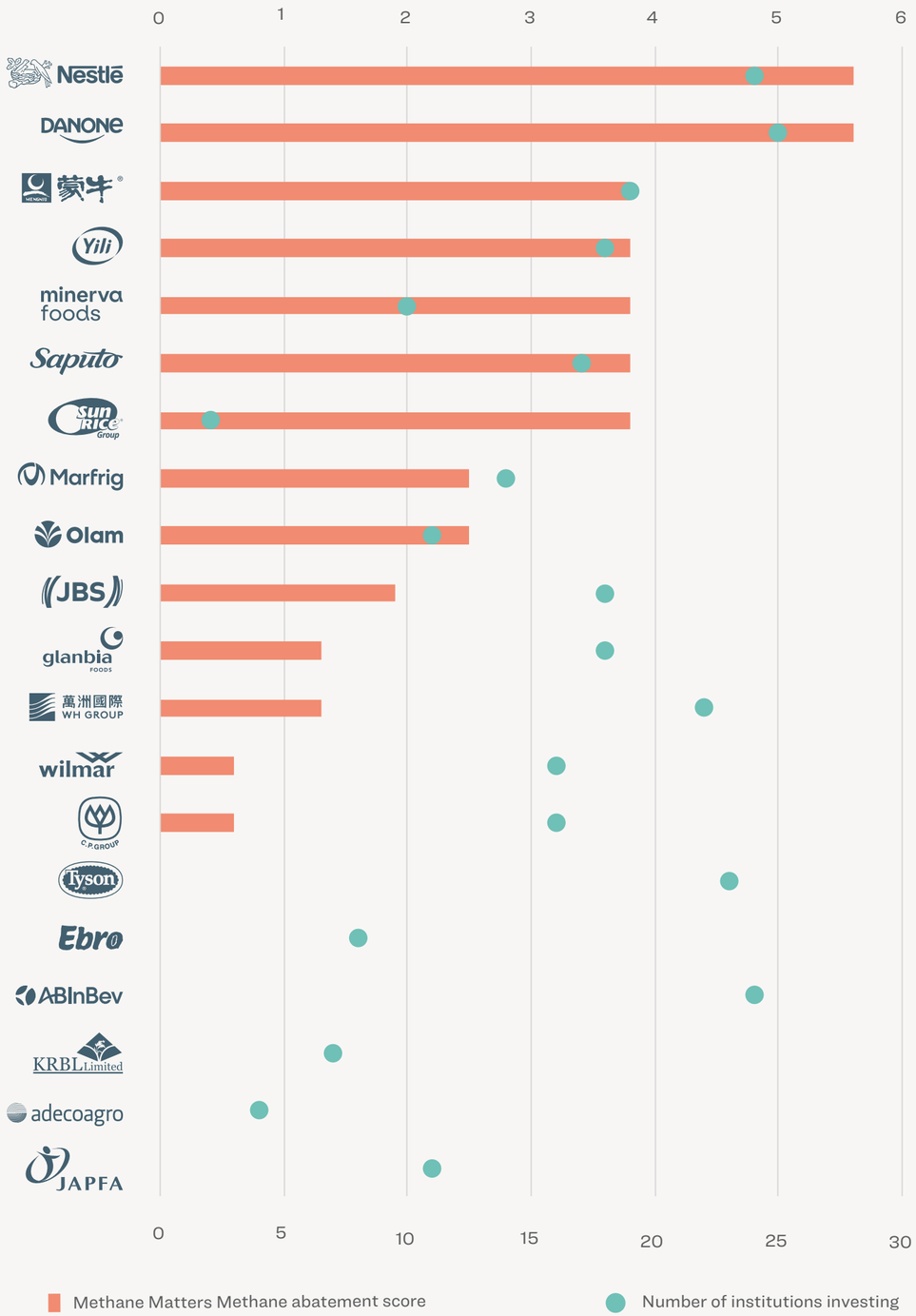
Investors could push meat, dairy and rice companies to address their methane exposure by weighting investment toward companies most proactively addressing their methane footprint (through disclosure, targets and mitigation action plans). If investors were already incorporating methane performance into their investment decisions, companies with a larger number of investors might be expected to show stronger methane management practices. However, there is no apparent correlation between the number of investors holding exposure to a company and that company's score in the *Methane Matters* report.[C] This suggests that methane performance is not yet a material factor for investors' capital allocation.

On a combined basis, the top 25 investors have $120 billion invested in the 20 listed companies, or 0.2% of their total assets under management (AUM). However, these companies account for roughly 8% of total agricultural methane emissions,[18] meaning that directing this relatively small share of AUM toward effective methane abatement could have a material impact.

Nestlé alone accounts for $73 billion or 61% of the total exposure. As a result, dairy makes up the bulk (80%) of the $120 billion total exposure assessed: $96 billion is invested in the six dairy companies, with $16 billion in the seven rice companies and $8 billion in the seven meat companies.

C We recognise this analysis is somewhat crude - investment decisions reflect many factors including AUM, fund mandates and restrictions, assessment of valuation and a range of risk factors. Nevertheless, if methane exposure were treated as a priority risk factor due to its financial materiality for these companies, we would expect to see a correlation between exposure and abatement ambition. The absence of correlation suggests methane exposure is under-prioritised as a risk factor by investors.

Figure 3. Market capitalisation of assessed companies compared with the share of total institutional equity holdings ($120bn).



Institutional concentration is highest in Nestlé, followed closely by AB InBev, reinforcing its position as one of the world's most institutionally held consumer goods companies (Table 3). Danone also demonstrates a heavy institutional footprint, with most major US and European managers invested.

In contrast, firms in the rice sector show lower institutional ownership, reflecting their domicile in emerging economies, making them less likely to appear in high-income countries dominated portfolios. However, leading Asian agrifood groups including Yili, Mengniu, WH Group and Charoen Pokphand Group are experiencing growing levels of Western institutional investment across the 25 investors, reflecting their increasing integration into global equity markets.

Box 3: **Nestlé's methane gap: A case of climate credibility risk**

Methane represents a material financial risk for Nestlé and, by extension, a material concern for investors. Dairy and livestock emissions account for a substantial share of Nestlé's Scope 3 footprint, with methane a dominant contributor, exposing the company to regulatory, transition and reputational risks. Within our analysis, Nestlé alone accounts for $73 billion, or 61%, of total sector exposure, reflecting its outsized market capitalisation. Nestlé's market value is approximately four times larger than Danone's and more than sixteen times larger than JBS's, meaning that any shortcomings in its approach to methane risk management have disproportionate implications for diversified investors and the overall risk profile of the sector.

In 2023, at the UN climate conference in Dubai, Nestlé joined the Dairy Methane Action Alliance (DMAA), committing to disclose methane emissions and publish a mitigation plan alongside peers. This indicated the materiality of methane to its business model and underpinned its intention to contribute to addressing methane risks. However, in September 2025, Nestlé withdrew from the DMAA, while other dairy companies, including Danone and Groupe Bel, continued to advance methane action plans, set methane-specific targets and report progress. Nestlé's withdrawal coincided with the arrival of a new CEO and highlights a core weakness of voluntary climate initiatives: companies can exit them at any time, with no accountability.

It is unclear whether this departure signals Nestlé's withdrawal from methane action at a time when Swiss regulation and upcoming EU legislation will require Nestlé to disclose methane emissions and implement concrete mitigation measures across its value chain. Walking back from its positioning as a climate leader could undermine investors' confidence in Nestlé, unless the company can proactively reassure investors that addressing methane risks remains a high priority, and explain why it believes it can more effectively address those risks outside a material forum such as the DMAA.

2.1.2. Bonds

Disclosure of bond ownership by investors is limited, which means our analysis of bonds can offer only a partial picture. Moreover, only 11 of the 20 food companies in our sample have accessed bond markets. Based on the partial data available, the 25 investors in our study were shown as holding a combined total of $12.7 billion bond exposure to the 20 companies, with JBS, Nestlé and Anheuser-Busch InBev accounting for $11.1 billion (88%). BlackRock held $1.4 billion in AB InBev bonds and $0.9 billion in Nestlé, while Vanguard held $2.3 billion in AB InBev bonds and $0.4 billion in Nestlé - see Annex 3.

2.1.3. Company - methane Intensity

In this section, we consider the methane intensity, measured as the estimated volume of methane emissions produced relative to the total enterprise value (market capitalisation plus net debt outstanding) of the company. The methane intensity ratio gives a sense of the exposure of each company's debt and equity to methane risks.

Multiplying this ratio by the value of the funding provided by an investor to the company gives a funded methane footprint for that company. This is aggregated for all 20 companies to generate the investor's total funded methane footprint (see Figure 4).

Figure 4. Methane footprint of the top 25 investors' equity and bond holdings (million tonnes of CH_4).

2.1.4. Investor methane footprint of invested capital

The 25 investors 'support' a combined 1 billion tonnes of methane emissions. Financed methane emissions are heavily concentrated among a small number of multinational agrifood companies, with the largest contributions linked to investors' holdings in Tyson Foods, JBS and WH Group.

Of the 25 investors, 23 invest in Tyson, with a total combined investment amount of $6.4 billion. While Tyson's level of methane emissions per dollar of enterprise value is about a quarter that of JBS, the sheer amount invested in the company makes it the largest contributor to these investors' footprint (see Annex 2). This suggests that meaningful reductions in investor methane exposure requires engagement with both high intensity emitters and widely held companies, where exposure is the greatest.

2.2 Reviewing methane targets and strategies

This section looks at asset manager policies for methane. We review and compare asset managers' investment policies, portfolio targets and engagement policies on methane. (See Annex 5 for scoring methodology)

Best practice

Investors should adopt an holistic approach to methane, recognising it as both a distinct climate risk and an investment opportunity. Best practice includes:

- Recognising methane as a distinct greenhouse gas (CH_4), rather than only reporting it as CO_2e equivalent.
- Setting time-bound methane reduction targets aligned with the GMP
- Incorporating methane across due diligence, engagement and voting.

2.2.1. Methane target and strategy scorecard and methodology.

Investors are increasingly setting portfolio-level GHG emissions reduction targets in response to regulatory pressure and net-zero commitments. However, strategies that explicitly address methane emissions remain rare, even among investors with exposure to agriculture-linked sectors such as meat, dairy and rice, where methane represents a material share of total emissions.

Table 2: Investors' methane risk integration scorecard summary[D]

Company	Recognition of methane as a distinct climate driver	Methane in net-zero/ climate strategy (inc. agriculture)	Methane policy or formal guidance	Agricultural methane targets/exclusions	Alignment with global methane reduction goalts (GMP etc.)	Agricultural methane in risk models and assessments	Score out of 10	Rank
Norges Bank	✓	✓ includes agriculture	Methane addressed in climate policy including agriculture	✗	Partial	Partial / implicit integration	5.8	1
UBS	✓	✗	✗	✗	Partial	Partial / implicit integration	2.0	2
State Street Investment Management	✓	✗	✗	✗	✗	Partial / implicit integration	1.6	3
Fidelity Investments	Partial	✗	✗	✗	✗	✗	1.3	4
Franklin Templeton	✓	✗	✗	✗	✗	✗	1.0	5
T.RowePrice®	✓	✗	✗	✗	✗	✗	1.0	5
First Eagle Investments	✓	✗	✗	✗	✗	✗	1.0	5
J.P.Morgan	✗	✗	✗	✗	✗	✗	0.0	8
Vanguard®	✗	✗	✗	✗	✗	✗	0.0	8
BlackRock.	✗	✗	✗	✗	✗	✗	0.0	8
Capital Group®	✗	✗	✗	✗	✗	✗	0.0	8
Geode Capital Management, LLC	✗	✗	✗	✗	✗	✗	0.0	8

D Where "Alignment with global methane reduction goals (GMP etc.)" is "Partial", this means the investor has embedded reference to the GMP in its expectations (i.e. it expects companies to set methane targets in line with GMP when methane is material) but has not committed to fund-wide methane emission reduction targets of 30% by 2030, and does not clearly track or report methane-specific metrics across its portfolio.

Company	Recognition of methane as a distinct climate driver	Methane in net-zero/ climate strategy (inc. agriculture)	Methane policy or formal guidance	Agricultural methane targets/exclusions	Alignment with global methane reduction goalts (GMP etc.)	Agricultural methane in risk models and assessments	Score out of 10	Rank
Invesco	⊗	⊗	⊗	⊗	⊗	⊗	0.0	8
charles SCHWAB	⊗	⊗	⊗	⊗	⊗	⊗	0.0	8
WELLINGTON MANAGEMENT®	⊗	⊗	⊗	⊗	⊗	⊗	0.0	8
Amundi ASSET MANAGEMENT	⊗	⊗	⊗	⊗	⊗	⊗	0.0	8
nuveen A TIAA Company	⊗	⊗	⊗	⊗	⊗	⊗	0.0	8
CAPITAL INTERNATIONAL	⊗	⊗	⊗	⊗	⊗	⊗	0.0	8
DWS	⊗	⊗	⊗	⊗	⊗	⊗	0.0	8
Zürcher Kantonalbank	⊗	⊗	⊗	⊗	⊗	⊗	0.0	8
ARTISAN PARTNERS	⊗	⊗	⊗	⊗	⊗	⊗	0.0	8
Dimensional	⊗	⊗	⊗	⊗	⊗	⊗	0.0	8
MFS®	⊗	⊗	⊗	⊗	⊗	⊗	0.0	8
Dodge & Cox®	⊗	⊗	⊗	⊗	⊗	⊗	0.0	8
DZ BANK	⊗	⊗	⊗	⊗	⊗	⊗	0.0	8

Of the 25 investors assessed, only seven recognise methane as a distinct climate driver in public disclosures. Just one investor, NBIM, demonstrates a comprehensive approach to methane, integrating it into its climate strategy and stewardship expectations, including coverage of agricultural methane. NBIM is also the only investor to reference global methane reduction goals within its climate framework.

NBIM ranks first with a score of 5.8 out of 10. It treats methane as a material climate risk across high-emitting sectors, including agriculture. Methane is embedded within NBIM's climate strategy and climate policy framework, with expectations for companies in methane-intensive sectors to set standalone methane reduction targets. While NBIM does not maintain a portfolio-wide methane reduction target, it shows partial alignment with global methane reduction goals and evidence of implicit integration of agricultural methane into risk assessments.

Six other investors - UBS Asset Management, State Street Investment Management, Fidelity Investments, Franklin Resources, T. Rowe Price Group and First Eagle Investments - acknowledge methane to some degree, but fail to translate this into agricultural methane strategies, policies or targets. In most cases, methane is embedded within broader GHG or CO_2eq frameworks. None of the six has a specific methane target, strategy or policy.

The remaining 18 investors assessed score zero across all indicators, reflecting no public recognition of methane, no methane-specific policies or targets and no evidence of integration into risk models or assessments. This group includes many of the world's largest investors, such as BlackRock, The Vanguard Group and Capital Group. The results show a gap in investor approaches to managing one of the most significant near-term climate risk drivers.

Table 2 summarises the results of the methane risk integration scorecard. We used this approach to assess investors' methane and GHG emissions reduction targets and strategies (see Annex for further details).

2.3 Investment pathways for methane reduction in food and agriculture

Best practice

Investors should treat methane as a core climate and financial risk, addressing it with the same rigour applied to carbon. This requires clear expectations that portfolio companies, particularly in food and agriculture, set time-bound, absolute methane reduction targets, disclose progress transparently and align business models with a 1.5°C pathway.

Investors should also work to allocate capital strategically to accelerate transition towards a lower methane livestock sector, recognising that methane abatement will not occur at scale unless livestock companies themselves are able to invest in new technologies and production models.

Where possible, investors should consider allocating capital to companies developing low-methane solutions, or to initiatives within larger corporations that advance methane reduction. Investors should prioritise real methane reductions by their portfolio companies and avoid relying on carbon credits or offsets as a substitute; any claims of emissions reductions should reflect tangible action by the company rather than purchases of carbon credits. Regenerative agriculture and nature-based solutions can play a complementary role, but they should not be a substitute for direct methane abatement.

Table 3: Investors' investment pathways for methane reduction in food and agriculture.

Company	Active engagement with food sector companies	Alternative proteins	Technological fixes (e.g. biogas and methane-inhibiting feed additives)	Breeding low-methane emitting livestock and rice	Companies using carbon credits and/or offsets to mitigate emissions	Regenerative agriculture	Low-methane soil and water management for rice	Portfolio screening or exclusions	Support for relevant policies or regulation
Norges Bank	✗	✗	✗	✗	✓	✗	✗	✗	✗
UBS	✗	✓	✗	✗	✗	✓	✗	✗	✗
State Street Investment Management	✗	✓	✗	✗	✗	✗	✗	✗	✗
Fidelity Investments	✗	✗	✗	✗	✗	✗	✗	✗	✗
Franklin Templeton	✗	✗	✗	✗	✗	✗	✗	✗	✗
T. Rowe Price	✓	✓	✗	✗	✓	✗	✗	✗	✗
First Eagle Investments	✗	✗	✗	✗	✗	✗	✗	✗	✗
J.P. Morgan	✗	✓	✗	✗	✓	✓	✗	✗	✗
Vanguard	✗	✗	✗	✗	✗	✗	✗	✗	✗
BlackRock	✗	✓	✓	✗	✓	✗	✗	✗	✗
Capital Group	✗	✗	✗	✗	✗	✗	✗	✗	✗
Geode Capital Management, LLC	✗	✗	✗	✗	✗	✗	✗	✗	✗

Invesco	✗	✓	✗	✗	✓	✗	✗	✗	✗
charles SCHWAB	✗	✗	✗	✗	✗	✓	✗	✗	✗
WELLINGTON MANAGEMENT®	✗	✗	✗	✗	✓	✗	✗	✗	✗
Amundi ASSET MANAGEMENT	✗	✓	✗	✗	✓	✗	✗	✗	✗
nuveen A TIAA Company	✗	✗	✗	✗	✗	✗	✗	✗	✗
CAPITAL INTERNATIONAL	✗	✗	✗	✗	✗	✗	✗	✗	✗
DWS	✓	✗	✗	✗	✗	✗	✗	✗	✗
Zürcher Kantonalbank	✗	✗	✗	✗	✓	✗	✗	✗	✗
ARTISAN PARTNERS	✗	✗	✗	✗	✗	✗	✗	✗	✗
Dimensional	✗	✗	✗	✗	✓	✗	✗	✓	✗
MFS®	✗	✗	✗	✗	✗	✗	✗	✗	✗
Dodge & Cox®	✗	✗	✗	✗	✗	✗	✗	✗	✗
DZ BANK	✗	✗	✗	✗	✗	✗	✗	✗	✗

In practice, investor action on methane in food and agriculture remains limited. While engagement on broader environmental, social and governance (ESG) issues is common, methane is rarely treated as a priority for capital allocation.

There is no systemic approach to engaging food and agriculture companies on methane specifically. In most cases, investors consider agriculture only as part of broader ESG or climate portfolios, rather than assessing methane emissions from the sector as a distinct financial and climate risk.

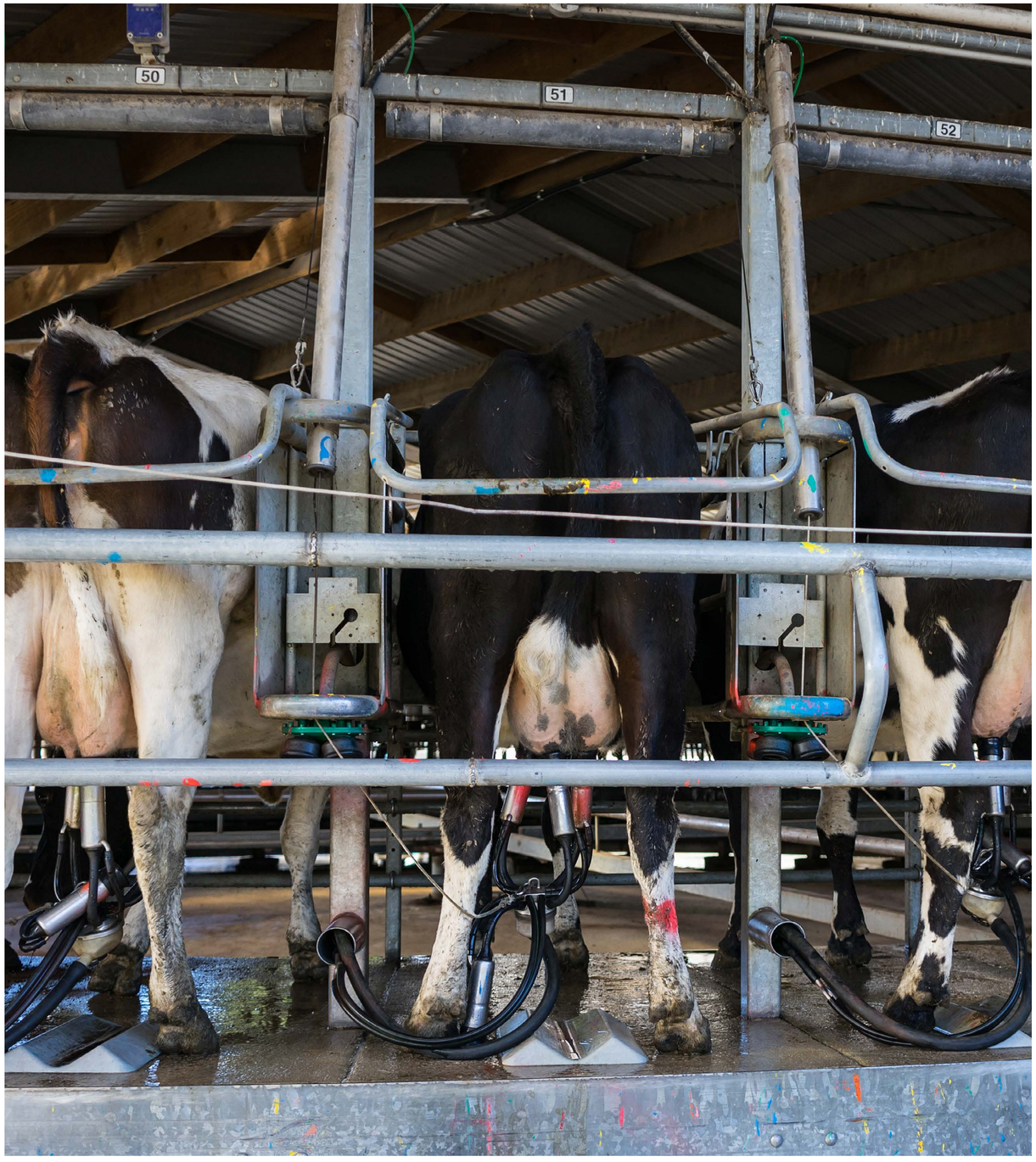
Capital allocation to methane-related solutions is emerging but uneven, and is rarely shaped by dedicated methane strategies. Most methane-related investments remain primarily within the oil and gas sector.

Several investors allocate capital to alternative protein companies as part of broader sustainable food or climate strategies. Investors including BlackRock, UBS, State Street, J.P.Morgan and Amundi are backing alternative protein companies through equity stakes, venture financing, ESG-linked lending and thematic funds. These investments support long-term shifts in food demand and the growth of lower-emission protein options, which can contribute to reducing methane emissions over time. However, such investments do not directly reduce methane emissions from existing livestock systems unless they are paired with transition finance and targeted engagement that supports methane reduction across current agricultural supply chains.

A small number of investors have committed capital to regenerative agriculture as part of broader food-system and land-use strategies, including Fidelity Investments (via Farmland LP), UBS Asset Management, Charles Schwab Investment Management and J.P.Morgan Asset Management. While regenerative agriculture can support long-term reductions in emissions intensity and improved ecosystem health, its contribution to direct methane reduction is often indirect and highly context-dependent. Few investors explicitly link regenerative strategies to methane abatement objectives.

Investment in agricultural methane abatement technologies remains particularly limited. BlackRock is the only investor identified with direct exposure to dedicated methane-reduction technologies, primarily through manure management and circular waste-to-energy systems. Other investors, including Nuveen, DWS Group, Dimensional Fund Advisors and Zürcher Kantonalbank, have indirect exposure through biogas or clean-energy infrastructure. Current investment activity focuses on manure and organic waste methane rather than the largest source of agricultural methane, enteric fermentation. None of the investors assessed reported investments in low-methane livestock breeding, commercial-scale feed additives, low-emission rice varieties or rice field management innovations, underscoring a significant financing gap between research and deployment.

Finally, nearly half of investors recognise carbon credits and offsets as legitimate but strictly supplementary tools. Institutions including BlackRock, Norges Bank Investment Management, J.P.Morgan Asset Management, Amundi and Wellington Management emphasise that offsets should complement, not replace, direct emissions reductions. However, continued reliance on offsets risks delaying the investment and engagement required to deliver real methane reductions within food and agricultural systems.



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3. Systemic risk

As policy, market and consumer pressures grow, investors face growing scrutiny over their exposure to high-emitting agrifood assets. Regulators and civil society organisations are beginning to integrate methane performance into climate alignment metrics and ESG disclosure frameworks.[19,20]

Methane-intensive business models, long insulated from carbon pricing and regulation, are now confronting structural change. Governments are integrating methane into climate strategies, while corporate disclosure initiatives such as the Science Based Targets initiative (SBTi) Forest, Land and Agriculture (FLAG) guidance and the Global Methane Pledge establish new benchmarks for accountability and emissions performance.

For investors, this creates three main categories of risk: regulatory, transition and reputational.

3.1 Regulatory risk

Methane is rapidly shifting from a voluntary reporting topic to a regulated climate risk, raising compliance, disclosure and transition pressures for the livestock and dairy sectors and their financiers. Global policy momentum is accelerating. The Global Methane Pledge, endorsed by over 150 countries, commits signatories to

a 30% reduction in methane by 2030 compared to 2020 levels.[21] While non-binding, the GMP is shaping national strategies, funding programmes and sector-level regulatory agendas, particularly for agriculture.

Europe: methane regulation moving toward agriculture

The EU has emerged as a leader on methane oversight. The 2024 EU Methane Regulation introduced mandatory monitoring, reporting, and verification (MRV) requirements for methane in the energy sector. Although agriculture was excluded from this piece of legislation, the EU Methane Strategy envisages potential other measures to cut methane from agriculture.

The EU's Corporate Sustainability Reporting Directive (CSRD), coming into effect in 2026, will require large agrifood companies to disclose emissions, including methane, across scopes 1-3. This makes transparent reporting and reduction strategies a regulatory obligation. For investors, the CSRD effectively forces portfolios and stewardship strategies to address agricultural methane or face compliance, financing and market-access risks.

Action on health, competitiveness and food security is setting the EU on a path toward more low-emission approaches, including feed additives, slurry treatment technologies and better MRV for agriculture. This includes the EU's Ambient Air Quality Directive and the National Emissions reduction Commitments Directive (NECD), which address ammonia and PM2.5 and require reductions in animal agriculture pollution. Key policy files like the Carbon Removals and Carbon Farming (CRCF) are also under discussion. Collectively, these lay the groundwork for mandatory methane reporting in the agriculture sector.

Member States are also supporting the shift to more plant-based diets: Denmark, for example, is implementing a plant-based action plan and a methane tax on agriculture.[22] As more countries update their national dietary guidelines to be more in line with the EAT-*Lancet* Planetary Health Diet, integrating health and sustainability considerations into dietary advice, the trend toward healthier and lower-meat diets is likely to gain momentum.

International frameworks: stricter disclosure expectations

Beyond national policy, international standards are raising the bar for methane measurement and target-setting. The STBi's FLAG guidance requires participating meat and dairy companies to account for methane from livestock and manure. Disclosure mandates are tightening for methane measurement: the ISSB standards and the Taskforce on Nature-related Financial Disclosures (TNFD) are making methane a measurable component of environmental accountability.

Alongside these standards, governments and institutions are signalling stronger global methane ambition. Initiatives such as the World Bank's Methane Reduction Blueprint aim to scale methane abatement in livestock, waste and energy systems, pointing to tighter collective action in the years ahead.

The COP28 Declaration on Food and Agriculture further shows that food-system emissions, particularly agricultural methane, are becoming central to global climate discussions and negotiations.

Companies unable to quantify or reduce their methane footprint now face heightened risks of non-compliance, restricted financing, and exclusion from major supply chains as downstream buyers adopt methane-intensity criteria. With the majority

of agricultural methane occurring upstream at the farm level, these international standards and disclosure frameworks cover not only operational (scope 1 and 2) emissions but also scope 3, assigning responsibility across the entire value chain to address upstream emissions.

Investor implications

For investors, this evolving landscape signals that methane is becoming a systemic, price-relevant financial risk. Companies unprepared for stricter standards - in particular meat, dairy and rice producers - may face rising compliance costs, loss of market access, higher insurance premiums or stranded-asset risk. Investors that fail to integrate methane into their risk models, stewardship and investment strategies risk holding assets that become misaligned with tightening policy.

3.2 Transition risk

Businesses that fail to address their emissions footprint face the risk of increasingly volatile demand and input costs, and ultimately of obsolescence, in a transitioned economy.

Companies that fail to implement credible methane reduction or diversification strategies risk being left behind as transparency, innovation and efficiency become defining features of competitiveness. Technologies such as feed additives, anaerobic digestion and low-emission breeding are increasingly considered important for maintaining supply contracts and export access. Some retailers and multinational buyers are beginning to embed methane intensity thresholds into procurement policies, making emissions performance a potential commercial differentiator.

For investors, these trends mean that exposure to lagging producers may lead to asset devaluation, higher financing costs or loss of market access, while early adopters of science-based targets and climate-smart technologies stand to benefit.

Box 4: **Insurers exiting mega-dairies**

Growing climate scrutiny is reshaping how insurers assess agriculture. Several leading global insurers, including AxA, Swiss Re and Munich Re, are tightening underwriting criteria for high-impact agricultural operations, including large-scale dairy and feedlot systems. This is due to concerns over methane emissions, deforestation and animal welfare.

In recent years, major insurers have begun tightening their environmental risk frameworks for agriculture and land-use sectors, with implications for industrial livestock operations. AxA's ecosystem protection and deforestation policy restricts financing and insurance for activities linked to deforestation risk and reinforces expectations for stronger environmental performance across agricultural supply chains.[23] Swiss Re's ESG risk framework identifies agriculture, forestry and food production as high-risk sectors subject to enhanced due-diligence screening, including assessments related to climate and biodiversity impacts.[24] Munich Re similarly embeds agricultural and land-use considerations within its sustainability and ESG risk processes, signalling that clients with significant environmental exposure may face stricter underwriting requirements or additional scrutiny.[25] Together, these shifts indicate a growing recognition within the insurance sector that high-impact agrifood systems pose material transition and environmental risks.

Industry analysts note that insurers are aligning their underwriting portfolios with net-zero and biodiversity commitments, while regulatory bodies such as the European Insurance and Occupational Pensions Authority (EIOPA) are strengthening expectations for climate-related risk disclosure across the insurance sector. As a result, intensive livestock assets are becoming more difficult and more expensive to insure. This shift indicates that methane-intensive agribusinesses face rising capital costs and increasing pressure to adopt low-emission practices to maintain insurability.

Insurers are also among the world's largest asset owners, and these underwriting trends have implications for the investment side of their balance sheets. If climate considerations are becoming material to risk selection on the liability side, it is reasonable to expect insurers to begin embedding similar criteria into the mandates they award external investors. In this sense, underwriting restrictions may be an early signal of how methane could shape future investment allocations and stewardship expectations across the sector.

3.3 Reputational risk

Methane is shifting from being treated as a technical issue to a marker of climate credibility within the agrifood space. Although most investors are not closely judged on their methane exposure, pressure is beginning to come from their clients. In both the US and Europe, climate concerns have already led asset owners, including the New York State Comptroller and several Dutch pension funds, to pull or redirect mandates when they felt managers were not taking these risks seriously. Civil society groups and investor networks such as FAIRR and Ceres are adding to this momentum by highlighting the financial sector's links to high-methane supply chains. Raising expectations around disclosure is making losing a mandate a possibility for managers who appear slow to respond.

At the same time, reputational risk extends beyond climate to intersect with issues of biodiversity loss, deforestation and animal welfare. Methane emissions often signal underlying pressures such as land-use intensity or biodiversity risk, and are therefore used in risk-screening tools (e.g. FLAG guidance and lender biodiversity impact assessments) as proxies for unsustainable practice.

Asset owners and managers who fail to engage on methane disclosure or mitigation risk being seen as inconsistent with net-zero and nature-positive objectives. Conversely, investors that proactively drive transparency and reduction efforts are strengthening their social licence, mitigating reputational damage, and positioning themselves as credible actors in the global transition toward low-emission food systems.

3.4 Opportunities

The transition to a low-methane food system presents an emerging opportunity for investors to align portfolios with methane reduction goals while capturing emerging sources of long-term value. As global initiatives such as the GMP and SBTi FLAG drive new standards for measurement and reduction, this may increase capital allocation toward methane reduction tech and business models. However, as shown in this report, this potential has not yet translated into observable shifts in capital allocation among the asset managers analysed.

Investment opportunities now extend across sustainable livestock management, supply chain improvements, agroecological practices and alternative protein development, each offering measurable mitigation potential and transition-aligned returns. Development finance institutions, sovereign funds and sustainability-focused investors are beginning to mobilise blended finance and green bonds to scale these solutions, supported by initiatives such as the Global Methane Hub and AIM for Climate. These mechanisms lower barriers to private capital entry and accelerate implementation in emerging markets.

Methane abatement is increasingly seen as a strategic investment opportunity. Financing solutions that accelerate reductions across livestock and dairy supply chains can deliver both climate impact and long-term financial value as the food system decarbonises.

Box 5: **Biogas: Handle with care**

Biogas and biomethane can have positive impacts on methane emission reduction when implemented well. However, the gas is regularly promoted as a 'renewable' energy by the biogas industry while strict, regularly monitored and enforced regulations on what this means remain absent in many countries.[26] Sustainability, pollution and health concerns remain, including from methane leaks, many of which go unrecorded. The EU Joint Research Centre estimated average losses in the region to be around 5%,[27] representing a significant source of methane emissions; other research suggests losses could be even higher, with annual leaks in Germany being as high as the GHG emissions of Cyprus or Malta.[28]

Unaccounted methane leaks pose an increasing challenge to biogas and biomethane sustainability. As MRV standards improve, investments without verified methane reductions may fail to deliver real climate impact, creating transition and reputational risks. Investors should ensure strong MRV and environmental impact assessments accompany any biogas or biomethane investment to safeguard both climate outcomes and financial sustainability, recognising that the total sustainable supply of biogas and biomethane is inherently limited by available feedstocks. While government incentives and investor interest are driving rapid expansion, much of this growth may rely on unsustainable feedstocks (such as manure from mega-dairies) that could be scaled back over time, reducing production and associated returns. Biogas should therefore be treated as a niche, transitional solution, and investors should also allocate capital to broader and more reliable renewable energy sources to support a sustained transition away from fossil fuels.

Local communities can also be negatively impacted by biogas and biomethane production through exposure to volatile organic compounds (VOCs) and other harmful substances and toxins causing respiratory issues.[29],[30] Moreover, the digestate from biogas production can increase water pollution if it isn't properly addressed: spreading it on fields untreated can cause nutrient run-off, with polluting nitrogen and phosphorous entering waterways and soils.[31]

These local impacts may translate into legal, permitting and reputational risks, increasing costs and delaying or constraining asset development.

Lock-in effects of biogas production are also an important consideration. While biogas can reduce methane emissions from manure, its production largely relies on intensive animal agriculture systems to provide manure as a feedstock, which are often the most polluting. Investment and subsidies to support manure as a 'waste product' of intensive animal production could lock-in intensive systems with high absolute emissions, limiting methane emission reductions.[32] This has happened already in the US, where incentives to produce manure for biogas production led to a year-on-year increase in herd sizes,[33] contrary to the scientific consensus that herd sizes must be reduced to meet climate goals.[34]

Such lock-in risks may undermine long-term decarbonisation strategies, exposing investors to stranded-asset and misalignment risks as climate policies tighten.

4. Recommendations

Given methane's potent short-term warming potential and the urgent need to bring agricultural emissions in line with climate goals, investors must act decisively to address this critical blind spot. In particular, we recommend the following actions:

- **Publicly recognise methane as a distinct c mate driver and an opportunity to slow global heating:** Investors should explicitly acknowledge methane as a standalone and material climate risk, which should be addressed as a priority. This recognition should be reflected in policy statements, climate reports and engagement frameworks, underscoring the opportunity that methane mitigation represents for slowing near-term global warming and contributing to financial stability and food security.
- **Integrate methane into net-zero strategies:** Methane must be treated as an integral component of all net-zero transition plans. Investors should require that companies set methane-specific reduction targets and pathways alongside carbon dioxide and nitrous oxide, ensuring that mitigation efforts reflect the gas's shorter atmospheric lifetime, outsized warming potential and impacts on air pollution.
- **Set methane reduction targets and policies, aligned with the Global Methane Pledge:** Investors should align their portfolio-level commitments with the objectives of the Global Methane Pledge, seeking at least a 30% reduction in methane emissions by 2030 compared to 2020. Given agriculture's dominant role in global methane emissions, investors must establish quantitative, time-bound, sector-specific targets, which should extend across the livestock value chain, including feed production, manure management and enteric fermentation, with performance monitored and disclosed annually.
- **Adopt methane policies and frameworks:** Investors should introduce dedicated policies addressing methane emissions, including explicit expectations for corporate disclosure, target-setting and mitigation across scopes 1, 2 and 3. These policies should mirror existing approaches to high-emitting sectors such as energy, incorporating measurable goals, exclusion criteria for high-risk activities and engagement escalation mechanisms.
- **Redirect capital toward sustainable proteins and resilient food systems:** Investors should accelerate capital allocation away from high-emitting livestock operations and toward low-emission and diversified protein production. By supporting innovation and resilience in the food sector, investors can mitigate portfolio exposure to transition and physical risks while contributing to global methane reduction objectives.

5. Annex

5.1 Assessment framework and methodology

Planet Tracker's report *Methane Matters* previously modelled methane emissions of the 52 largest meat, dairy and rice companies. The methane emissions for each company were calculated by combining company production volumes and location data with regional average emissions intensity data for each commodity from the FAO's GLEAM 3.0 model for meat and dairy, while the IPCC 6th Assessment methodology was used for rice. For more details of the methodology please see appendix 3 and 4.

In our further assessment of these companies, we identified 20 that were either publicly listed or for which investor and bondholder information was available. We also incorporated six companies from the Changing Markets report *Running Latte*.

Using this dataset, we modelled the methane emissions associated with the 25 largest investors based on their equity and bond holdings in these 26 companies - see table 5.

We then analysed the 25 investors to determine whether they had any methane-specific policies in place. This assessment was compared against the best practices outlined below.

Best practice includes standalone, transparent methane reporting with independent verification, alongside science-based, time-bound reduction targets aligned with the 1.5°C goal. Methane should be embedded across investment, stewardship and risk frameworks, with dedicated consideration in due diligence, portfolio screening, engagement and voting. Policies should drive credible reduction across scope 1-3 emissions, incorporate methane performance into valuation models and ensure governance oversight, aligned with frameworks such as the Global Methane Pledge. Investors should also avoid financing high-methane activities unless credible mitigation plans exist and apply active stewardship with escalation pathways where targets are unmet.

Participation in science-based frameworks and harmonised standards further strengthens strategy credibility, enabling investors to set measurable targets, reduce greenwashing risk, and manage emerging climate and nature-related exposures effectively.

The assessment draws exclusively on publicly available information, including investor websites, sustainability and stewardship reports and annual disclosures, policy statements and climate-related documentation. No private or non-public data was used. This approach ensures comparability and reflects the information accessible to beneficiaries, regulators and other stakeholders evaluating investors' climate performance.

5.2 Survey

A short survey to supplement publicly available information was distributed to all investors in the study sample. The survey requested additional detail on investors' methane-related strategies, target-setting, risk assessment tools, stewardship and internal modelling approaches. Respondents were invited to provide clarifications on gaps or ambiguities in their public disclosures, and to outline any forthcoming policies or initiatives relating to agricultural emissions.

Despite multiple contact attempts, not a single investor group responded to the survey. However, NBIM later responded to an offer to discuss the topic. This absence of engagement is itself significant. It suggests a degree of reluctance within the sector to discuss methane exposure, even when provided with the opportunity to contextualise or explain their current practices. The lack of participation also highlights the persistent transparency gap surrounding agricultural emissions, particularly in comparison with more established areas of climate disclosure, such as the energy sector decarbonisation or portfolio-wide net-zero commitments.

The non-response rate therefore reinforces the findings from the public disclosure review: while investors increasingly acknowledge climate risk at a high level, methane emissions linked to livestock supply chains remain largely unaddressed, insufficiently measured, and rarely integrated into investment decision-making or stewardship activity.

Appendix 1.

Questionnaire: Institutional investors and methane

Planet Tracker and Changing Markets Foundation are conducting a study to better understand how leading investors are acknowledging the role of agricultural (meat, dairy and rice) methane emissions to tackle climate change and how these are addressed in their policies. This research will be included in a joint report assessing investors in the world's largest meat, dairy and rice companies.

Any responses you provide will remain confidential and your name and organisation will be anonymised by default. You will be given the option for your responses to be associated with your organisation. You are also free to withdraw your responses at any time, without reason.

Thank you for taking the time to share your views.

Section A: Methane Strategy & Positioning

Please provide links for your answers.

1. Does your institution publicly recognise methane as a critical and distinct driver of climate change?

- ◯ Yes
- ◯ No
- ◯ Not sure

2. Does your institution have a net-zero or climate strategy that explicitly addresses methane emissions?

- ◯ Yes
- ◯ No
- ◯ In progress
- ◯ Not applicable

If yes, which sectors does it cover? *(tick all that apply)*

- ◯ Oil & gas
- ◯ Waste
- ◯ Agriculture (e.g. cattle, pork, poultry, dairy, rice)
- ◯ Other:.....
  .....
  .....

3. Does your institution have a methane policy? Any formalised guidance or framework used to assess, manage, or engage on methane emissions through investment decisions, stewardship, or risk analysis.

- ◯ Yes, a standalone methane policy
- ◯ Yes, methane is addressed within climate policy
- ◯ No
- ◯ No, but a standalone policy is in development
- ◯ No, but methane will be integrated into a broader climate policy

If yes, which sectors does it cover? *(tick all that apply)*

- ◯ Oil & gas
- ◯ Waste
- ◯ Agriculture (e.g. cattle, pork, poultry, dairy, rice)
- ◯ Other: .....
  .....
  .....

4. If no methane-specific policy exists, would your institution consider developing one in the coming year?

- ◯ Yes
- ◯ Possibly - explain .....
- ◯ No

5. Does your institution have any internal targets, exclusions, or restrictions related to agricultural methane from meat, rice and/or dairy?

- ◯ Yes
- ◯ No
- ◯ Other + if so what are these? .....
  .....
  .....

Section B: Agriculture & Food System Transformation

6. To what extent does your institution consider agricultural (meat, dairy, rice) methane in climate risk models and assessments?

(open answer)

7. What data sources, methodologies, or tools do you use to measure agricultural (meat, dairy, rice) methane exposure in your portfolios?

(open answer)

8. What steps, if any, is your institution taking to support a shift towards more sustainable food systems? *(tick all that apply)*

- ◯ Active engagement with food sector companies
- ◯ Investment in alternative proteins
- ◯ Investment in technological fixes, such as biogas and methane inhibiting feed additives
- ◯ Investment in breeding low-methane emitting livestock and rice
- ◯ Companies usage of carbon credits and/or offsets to mitigate emissions
- ◯ Investment in regenerative agriculture
- ◯ Investment in low-methane soil and water management for rice
- ◯ Portfolio screening or exclusions
- ◯ Support for relevant policies or regulation
- ◯ No current steps taken
- ◯ Other: .....

.....

.....

Section C: Engagement with Meat & Dairy Companies

9. Has your organisation ever engaged with any food companies specifically on any of the following topics?

- ◯ Methane reduction targets and/or methane disclosure
- ◯ Supply chain emissions and traceability
- ◯ Protein diversification strategies
- ◯ Deforestation or land-use issues
- ◯ Other: .....

.....

.....

10. Do you consider your engagements with high methane-emitting food companies to be effective? Why or why not?

(open answer)

11. Are there barriers that prevent your institution from engaging more impactfully with the food and agriculture sector on methane?

(open answer)

12. Would your institution benefit from more sector-specific guidance on engaging with food and agriculture companies on climate risks?

- ◯ Yes
- ◯ No
- ◯ Maybe

Section D: Policy Influence & Alignment

13. How influential are the following initiatives or regulations in shaping your institution's climate-related policies?

(Rate 1 = not influential, 5 = very influential)

- ◯ Climate Action 100+ ..... ① ② ③ ④ ⑤
- ◯ UN High-Level Expert Group ..... ① ② ③ ④ ⑤
- ◯ Science-Based Targets initiative (SBTi) ..... ① ② ③ ④ ⑤
- ◯ Global Methane Pledge ..... ① ② ③ ④ ⑤
- ◯ RePowerEU..... ① ② ③ ④ ⑤
- ◯ EU Corporate Sustainability Reporting Directive (CSRD)..... ① ② ③ ④ ⑤
- ◯ EU Deforestation Regulation ..... ① ② ③ ④ ⑤
- ◯ Task Force on Climate-related Financial Disclosures (TCFD)..... ① ② ③ ④ ⑤
- ◯ Other (please specify): .....

.....

.....

14. Are you aligning your portfolios or stewardship practices with global methane reduction targets (e.g. 30% reduction by 2030 Global Methane Pledge)?

- ◯ Yes
- ◯ No
- ◯ In progress
- ◯ Not sure

15. Is your institution following any government or financial policy developments in your jurisdiction that may impact investment choices?

- ◯ Yes
- ◯ No
- ◯ If Yes, please detail which policies and how the action you plan to take in response:.....

.....

.....

Appendix 2.

Data tables

| Table 5: Equity ownership of the 25 investors within meat, dairy and rice companies. Showing the top 5 investors in each company.

	MEAT							DAIRY						RICE						
	JBS	Marfrig	Tyson	minerva foods	JAPFA	Cargill	WH Group	Danone	glanbia	蒙牛	Nestlé	Sapito	Yili	adecoagro	AB InBev	Ebro	KRBL Limited	Olam	Sun Rice Group	wilmar
Vanguard	③	①	①	②	①	①	②	③	①	②	②	②	x	-	③	-	①	①	-	②
BlackRock	①	②	②	①	③	②	①	①	③	③	①	③	④	③	②	x	④	②	-	①
Fidelity	②	x	x	-	x	x	x	x	x	①	x	①	x	-	x	⑤	-	-	①	x
Norges Bank	-	x	x	-	-		x	⑤	②	x	⑤	④	③	-	④	-	③	-	-	-
GEODE Capital Management, LLC	④	x	④	-	x	③	x	x	x	x	x	⑤	x	-	x	-	x	x	-	③
STATE STREET INVESTMENT MANAGEMENT	x	⑤	③	-	④	x	⑤	x	④	x	x	x	x	-	x	x	⑤	x	-	④
Dimensional	⑤	③	x	-	②	④	x	x	⑤	⑤	x	x	x	-	x	①	②	④	②	⑤

| Table 5: Equity ownership of the 25 investors within meat, dairy and rice companies. Showing the top 5 investors in each company.

	MEAT							DAIRY						RICE						
	JBS	Marfrig	Tyson	minerva foods	JAPFA	C.P. GROUP	萬洲國際 WH GROUP	DANONE	glanbia foods	蒙牛	Nestlé	Sapito	Yili	adecoagro	ABInBev	Ebro	KRBL Limited	Olam	Sun RICE Group	wilmar
UBS	x	x	x	x	-	x	x	x	x	④	③	x	x	-	x	-	-	⑤	-	x
CAPITAL GROUP	-	-	x	④	-	-	③	x	-	-	④	-	-	-	x	-	-	-	-	-
Invesco	x	x	⑤	③	-	x	x	x	x	x	x	x	①	①	x	x	-	x	-	x
J.P.Morgan	x	x	x	-	-	x	x	x	x	x	x	x	②	-	x	-	-	-	-	x
ARTISAN PARTNERS	x	-	x	-	-	-	-	②	x	-	x	-	-	-	x	-	-	-	-	-
charles SCHWAB	x	④	x	-	-	⑤	x	x	x	x	x	x	x	②	x	②	-	③	-	x
Amundi ASSET MANAGEMENT	x	-	x	-	-	x	x	④	x	x	x	x	x	④	⑤	-	-	-	-	x
DWS	x	-	x	-	-	x	x	x	x	x	x	x	x	-	x	③	-	x	-	x
T.RowePrice	-	-	x	-	-	-	x	x	-	x	x	x	-	-	x	-	-	-	-	x

Table 5: Equity ownership of the 25 investors within meat, dairy and rice companies. Showing the top 5 investors in each company.

	MEAT							DAIRY						RICE						
	JBS	Marfrig	Tyson	minerva foods	JAPFA	COFCO	萬洲國際 WH GROUP	DANONE	glanbia	蒙牛	Nestlé	Sapito	Yili	adecoagro	ABInBev	Ebro	KRBL Limited	Olam	Sun RICE Group	wilmar
WELLINGTON MANAGEMENT®	x	x	x	-	-	x	④	x	-	x	x	-	x	-	x	-	-	-	-	-
MFS	x	x	x	-	-	-	x	x	x	-	x	-	⑤	-	-	-	-	-	-	-
nuveen A TIAA Company	x	-	x	⑤	④	x	x	x	x	x	x	x	x	-	x	-	x	x	-	x
FRANKLIN TEMPLETON	x	-	x	-	-	x	x	x	x	x	x	x	x	-	x	④	-	x	-	x
CAPITAL INTERNATIONAL	-	-	x	-	-	-	x	x	-	-	x	-	-	-	x	-	-	-	-	-
First Eagle Investments	-	-		-	-	-	-	x	-	-	-	-	-	-	-	-	-	-	-	-
Dodge & Cox®	x	-	x	-	-	-	x	x	-	-	-	-	-	-	①	-	-	-	-	-
Zürcher Kantonalbank	x	-	x	-	-	x	x	x	x	x	x	x	x	-	x	-	-	-	-	x
DZ BANK	-	-	x	-	-	-	x	-	x	x	-	-	-	x	-	-	-	-	-	-

| Table 6: Equity ownership of the 25 investors within meat, dairy and rice companies. Showing the top 5 investors in each company.

	MEAT					DAIRY				RICE	
	JBS	Tyson	minerva foods	JAPFA	萬洲國際 WH GROUP	DANONE	蒙牛	Nestlé	Saputo	ABInBev	Olam
Vanguard	999.9	508.3	-	-	5.4	92.2	-	430.2	30.3	2,282.2	-
BlackRock	610.3	208.1	7.0	4.4	17.6	242.2	1.5	937.0	30.6	1,397.9	1.6
CAPITAL GROUP	-	-	-	-	-	-	-	-	-	28.2	-
GEODE Capital Management, LLC	0.4	-	-	-	-	-	-	0.4	3.9	0.1	-
Norges Bank	-	-	-	-	-	-	-	-	-	-	-
Fidelity INVESTMENTS	482.1	-	-	-	-	9.3	-	0.7	10.8	8.0	-
UBS	20.0	7.4	7.6	2.0	7.9	45.6	0.9	1,148.8	1.2	119.9	-
STATE STREET INVESTMENT MANAGEMENT	7.4	8.0	-	-	0.4	13.3	-	60.4	0.9	294.2	-
Invesco	27.2	25.1	5.9	4.4	-	0.7	-	146.8	12.5	87.3	-
charles SCHWAB	52.9	11.2	-	-	-	-	-	-	-	34.1	-

| Table 6: Equity ownership of the 25 investors within meat, dairy and rice companies. Showing the top 5 investors in each company.

	MEAT					DAIRY				RICE	
	JBS	Tyson	minerva foods	JAPFA	萬洲國際 WH GROUP	DANONE	蒙牛	Nestlé	Saputo	ABInBev	Olam
J.P.Morgan	156.9	22.6	17.5	-	2.0	5.0	-	6.9	-	105.3	-
WELLINGTON MANAGEMENT®	131.8	29.5	6.9	-	-	-	-	-	-	526.7	-
FRANKLIN TEMPLETON	-	-	-	-	-	-	-	-	-	-	-
Amundi ASSET MANAGEMENT	1.9	3.3	-	0.8	0.9	86.9	-	164.7	0.4	78.0	-
nuveen A TIAA Company	-	-	-	-	-	-	-	-	-	-	-
CAPITAL INTERNATIONAL	-	-	-	-	-	-	-	-	-	-	-
DWS	8.4	1.6	-	4.4	0.0	32.0	-	157.8	0.1	166.1	-
T.RowePrice®	-	1.7	-	-	0.0	-	-	3.8	-	18.9	-
Zürcher Kantonalbank	-	2.8	-	-	-	-	-	126.6	0.1	-	-
ARTISAN PARTNERS	-	-	-	-	-	-	-	-	-	-	-

| Table 6: Equity ownership of the 25 investors within meat, dairy and rice companies. Showing the top 5 investors in each company.

	MEAT					DAIRY				RICE	
	JBS	Tyson	minerva foods	JAPFA	萬洲國際 WH GROUP	DANONE	蒙牛	Nestlé	Saputo	ABInBev	Olam
Dimensional	-	-	-	-	-	-	-	149.6	-	-	-
MFS	0.6	-	-	-	-	-	-	1.8	-	1.8	-
Dodge & Cox	93.4	-	-	-	9.7	-	-	-	-	-	-
DZ BANK	-	-	-	-	-	0.9	-	33.3	-	-	-
First Eagle Investments	-	-	-	-	-	-	-	-	-	-	-
TOTAL OWNED by top 25 institutions	**2,593.2**	**829.6**	**44.9**	**16.0**	**44.0**	**528.1**	**2.4**	**3,368.8**	**90.6**	**5,148.7**	**1.6**

| Table 7: Methane footprint (Kt CH_4) of top 25 investors by meat, dairy and rice company.

	MEAT							DAIRY						RICE						
	JBS	Marfrig	Tyson	minerva foods	JAPFA	C.P. GROUP	萬洲國際 WH GROUP	DANONE	glanbia	蒙牛	Nestlé	Saputo	Yili	adecoagro	ABInBev	Ebro	KRBL Limited	Olam	SunRice Group	wilmar
Vanguard	33,407	1,497	107,238	465	0	2	23,127	18,457	14,839	13,722	17,000	10,959	2,886	-	579	-	204	149	-	7,757
BlackRock	23,956	910	50,161	1,117	0	1	26,714	21,307	9,264	13,393	19,119	7,068	3,289	18	481	0	25	62	-	8,008
Fidelity	18,303	49	11,136	-	0	0	4,096	6,946	516	16,631	2,026	25,724	45	-	78	68	-	-	24	248
Norges Bank	-	26	7,335	-	-	-	4,720	8,734	10,650	3,738	8,656	2,498	3,956	-	115	-	65	-	-	-
GEODE Capital Management, LLC	1,881	27	17,228	1	0	0	8,178	4,676	297	2,398	4,552	2,381	436	-	94	-	0	4	-	2,858
STATE STREET INVESTMENT MANAGEMENT	340	175	19,079	10	0	0	3,824	2,243	6,169	1,592	1,641	607	347	-	74	10	4	8	-	2,405
Dimensional	1,201	479	5,237	39	0	0	7,492	1,181	4,776	4,679	1,293	1,434	335	-	26	8,531	74	34	21	1,503
UBS	764	12	1,269	247	0	0	3,006	5,463	1,072	7,642	17,282	744	268	-	37	-	-	11	-	384
CAPITAL GROUP	-	-	1,354	-	-	-	17,126	10,239	-	-	9,044	-	-	-	76	-	-	-	-	-
Invesco	922	60	13,876	198	0	0	346	213	63	1,200	448	729	13,752	39	31	13	-	0	-	126

	MEAT							DAIRY						RICE						
	JBS	Marfrig	Tyson	minerva foods	JAPFA	C.P. Group	WH Group	Danone	glanbia	蒙牛	Nestlé	Saputo	Yili	adecoagro	AB InBev	Ebro	KRBL Limited	Olam	SunRice Group	wilmar
J.P.Morgan	4,926	24	1,704	567	-	0	2,468	1,298	3,494	2,658	2,175	905	4,200	-	33	-	-	-	-	752
ARTISAN PARTNERS	-	-	1,798	-	-	-	-	18,720	87	-	8	-	-	-	14	-	-	-	-	-
charles SCHWAB	1,789	355	6,423	-	-	0	3,629	1,469	1,414	1,079	1,258	816	83	19	31	337	-	34	-	1,068
Amundi ASSET MANAGEMENT	58	-	2,124	-	0	0	354	11,002	2,027	583	1,548	129	855	1	103	-	-	-	-	85
DWS	427	-	2,358	-	0	0	1,617	2,533	3,802	578	3,577	255	127	-	59	103	-	1	-	331
T.RowePrice	-	-	11,938	-	-	-	52	35	-	42	1,116	0	-	-	3	-	-	-	-	1,402
WELLINGTON MANAGEMENT	4,200	78	3,321	223	-	0	4,166	102	-	1,470	587	-	137	-	61	-	-	-	-	-
MFS	43	-	250	-	-	-	478	802	1,939	-	4,576	-	3,016	-	0	-	-	-	-	-
nuveen A TIAA Company	144	32	1,552	9	0	0	1,418	1,082	2,534	719	1,448	176	143	-	21	-	3	3	-	930
FRANKLIN TEMPLETON	118	2	431	-	-	0	2,023	5,946	11	4	1,505	23	22	-	1	-	-	0	-	17
CAPITAL INTERNATIONAL	-	-	-	-	-	-	150	5,644	-	-	3,586	-	-	-	53	-	-	-	-	-

	MEAT							DAIRY						RICE						
	JBS	Marfrig	Tyson	minerva foods	JAPFA	C.P. Group	WH Group	Danone	glanbia	蒙牛	Nestlé	Saputo	Yili	adecoagro	AB InBev	Ebro	KRBL Limited	Olam	SunRice Group	wilmar
First Eagle Investments	-	-	-	-	-	-	-	8,040	-	-	1,266	-	-	-	-	72	-	-	-	-
Dodge & Cox	2,936	-	2	-	-	-	711	4,669	-	-	-	-	-	-	382	-	-	-	-	-
Zürcher Kantonalbank	48	-	474	-	-	0	162	1,002	98	193	5,957	88	33	-	4	-	-	-	-	108
DZ BANK	-	-	426	-	-	-	-	2,234	-	89	1,586	-	-	-	10	-	-	-	-	-
Total	95,461	3,727	266,715	2,875	0	4	115,858	144,036	63,051	72,410	111,256	54,535	33,929							

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Appendix 3.

Meat and dairy emissions methodology

This study quantifies methane emissions from meat (beef, pork and poultry) and dairy production companies using the Global Livestock Environmental Assessment Model (GLEAM) version 3.0, developed by the FAO. The model calculates emissions from enteric fermentation and manure management based on animal category, production system and geographical region. It incorporates life-cycle assessment principles to provide an estimate of emissions intensity per unit of output.

Each company's total methane emissions were estimated by multiplying the reported production volumes for 2023 (the latest complete reporting year for all companies) by the corresponding emission intensity values generated by GLEAM for that livestock type and region. For dairy companies, emissions were calculated based on milk production, while for meat producers, emissions were based on liveweight or carcass weight equivalents for the year 2023. Where companies did not provide location data for commodity production, global production averages for each commodity were used.

GLEAM 3.0 limitations

While GLEAM 3.0 represents an improvement on the previous GLEAM 2.0 model by incorporating updated datasets, refined methodologies and broader geographical coverage, it has also faced some criticism.

One point of contention is that changes in emission factors and modelling assumptions between GLEAM 2.0 and 3.0 can result in significant differences in emission estimates for the same production systems, complicating comparisons over time. Critics argue that these updates, while methodologically justified, can obscure trends or inflate perceived emissions growth, especially without clear disclosure of methodological shifts.

Additionally, some stakeholders question the transparency and regional representativeness of certain default values used in GLEAM 3.0, particularly for intensive production systems in developing regions.

Appendix 4.

Rice emissions methodology

Methane emissions from rice production were estimated using the methodology outlined in the Intergovernmental Panel on Climate Change (IPCC) Sixth Assessment Report - see Figure 5.

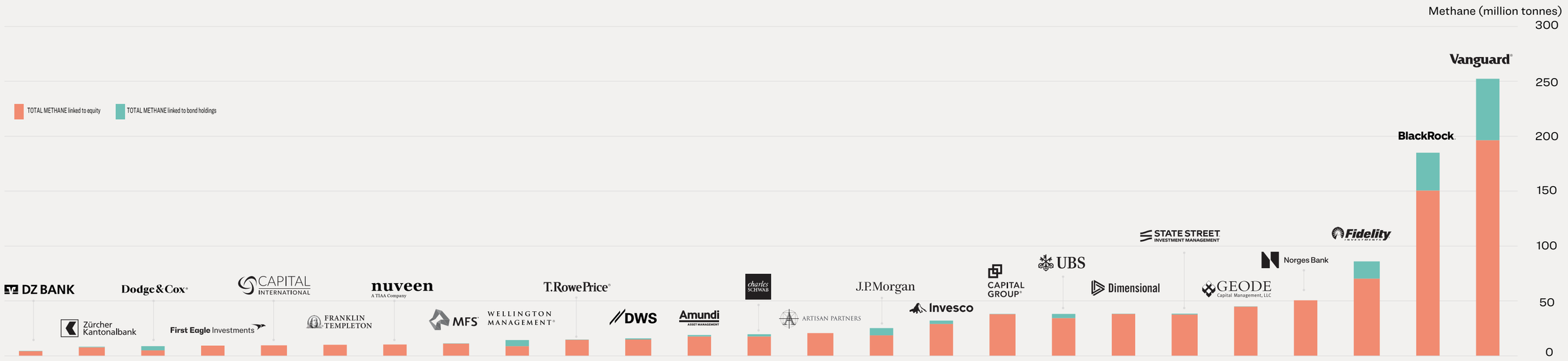

Figure 5. Figure 5: Rice methane equation. **IPCC (2019).** *Special Report on Climate Change and Land*

$$CH_{4\,RICE} = \sum_{i,j,k} \left(EF_{i,j,k,} \times t_{i,j,k} \times A_{i,j,k} \times 10^{-6} \right)$$

EF - Emission Factor
T - Cultivation period
A - Annual harvested area of rice

Data on rice production volumes and production location data for 2023 was collected from company annual reports. When direct volume figures were not available, rice production was estimated by dividing the company's rice-related revenue by the average regional rice price.

To adjust for post-harvest losses, a 31% loss rate was applied and cultivated area was then estimated using the FAO's average area per tonne of production. FAO regional emissions factors and cultivation durations were then applied where companies provided production location data. Where companies did not disclose location-specific production data, the company headquarters location was used as a proxy.

Appendix 5.

Scorecard methodology

Each element of the target scorecard is weighted as outlined below, to give a total maximum score of 10.

| Table 4:

Metric	Max points	Weighting
Recognition of methane as a distinct climate driver	10	10%
Methane in net-zero/climate strategy (including agriculture)	10	20%
Methane policy or formal guidance	10	15%
Agricultural methane targets/exclusions	10	20%
Alignment with global methane reduction goals (GMP etc.)	10	15%
Agricultural methane in risk models and assessments	10	20%

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