The Landscape of Methane Abatement Finance

Summary for decision makers

July 2022

CLIMATE POLICY INITIATIVE

Global Methane Hub

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ABOUT CLIMATE POLICY INITIATIVE

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INTRODUCTION

With a 20-year global warming potential 80 times greater[1] **than carbon dioxide, methane is a key driver of near-term global warming** (Forster et al., 2021; NOAA, 2022; Szopa et al., 2021)**. Sharp and rapid reductions in methane emissions are needed this decade to meet global climate goals and limit global warming to +1.5C** (Pörtner et al., 2022)**.**

Reducing human-caused methane emissions by 30% this decade—as set out in the Global Methane Pledge—would avert at least 0.2°C in global warming by 2050. (CCAC and UNEP, 2021). This goal is within reach. The United Nations Environmental Program estimates that human-caused methane emissions could be reduced by as much as 45% within this decade. Additionally, tackling methane emissions brings numerous additional health, safety, and environmental benefits. (CCAC and UNEP 2021).

However, despite the high stakes, readily-available solutions, and numerous benefits, public and private actors have so far failed to allocate sufficient capital to support global methane abatement efforts.

This first-of-its-kind report aims to assess global primary investment in methane abatement activities in 2019/2020 to create a baseline against which needs and progress can be measured. We define methane abatement as activities with direct and indirect impacts that prevent and/or reduce methane emissions. This report focuses on existing abatement solutions in the three key sectors, which together account for over 95% of human-made methane emissions: fossil fuels, waste (solid waste and wastewater), and agriculture, forestry, and land use (AFOLU).

Terminology

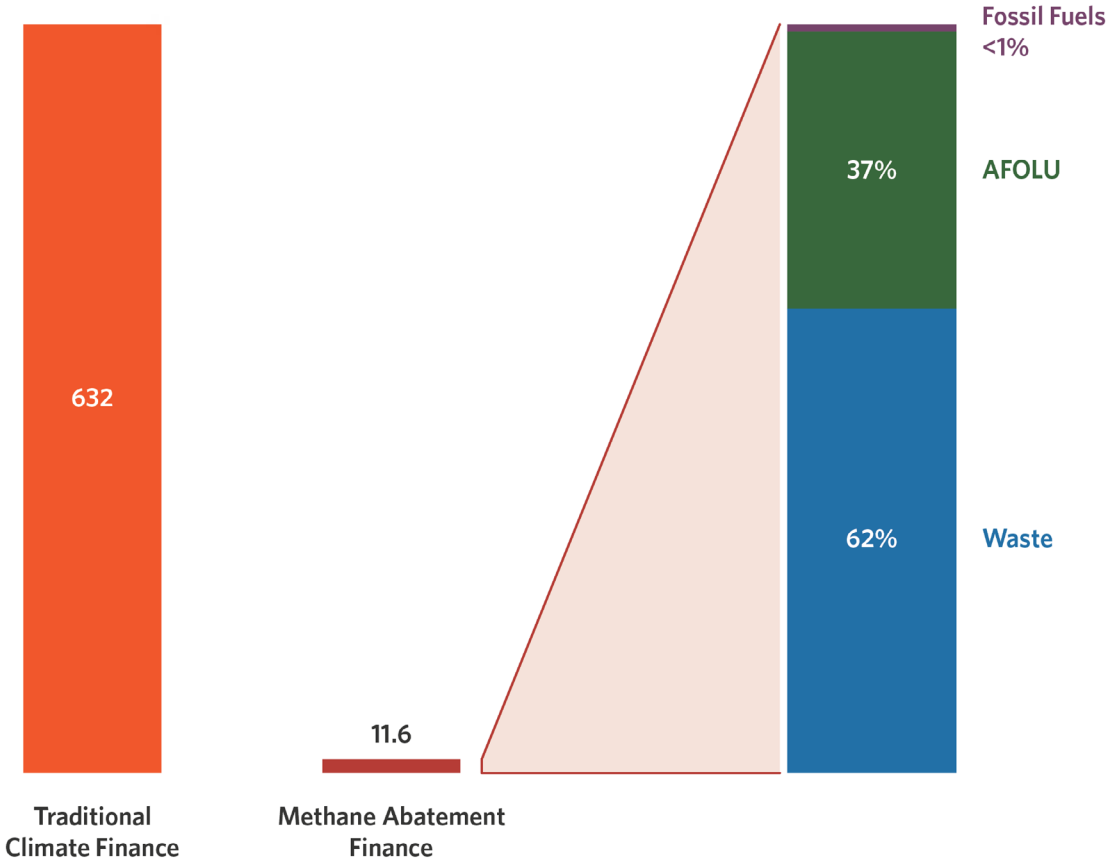
- **Primary investment:** new investment targeting methane-specific outcomes. Secondary market transactions (e.g., re-selling of stakes or public trading on financial markets) are not tracked because they do not represent new investment.
- **Targeted measures:** direct methane abatement solutions categorized as targeted in CCAC's taxonomy.
- **Additional beneficial measures:** interventions that can indirectly result in methane abatement as per CCAC's taxonomy.
- **Technical solutions:** actual implementation of an abatement measure (e.g., changes in machines or processes used).
- **Enabling activities:** A course or principle of action that provide the means for implementation of technical solutions (e.g., policies, technical assistance, and capacity building)
- **2019/2020:** CPI reports two-year averages to smooth out annual fluctuations in data.

1 Global warming potential of methane is 27.0 to 29.8 times more potent when estimated over 100 years. However, in a 20 year period, methane's global warming potential is 79.7 to 82.5 times higher than carbon dioxide.

KEY FINDINGS

Methane is responsible for nearly half of observed global warming to date (IPCC WGI, 2021). However, finance flowing to targeted methane abatement measures[2] represents less than 2% of total climate finance flows, standing at USD 11.6 billion in 2019/2020. **At least a ten-fold increase in methane abatement finance is necessary to meet the estimated USD 119 billion needed annually through 2050 to keep warming under +2C.[3]** (Harmsen et al., 2019). **With one of the highest impacts in reducing global warming per dollar of capital invested[4],** significant methane emissions reductions could be achieved in the fossil fuel and waste sectors, within this decade, through readily available low-cost and negative-cost technologies (CCAC and UNEP, 2021).

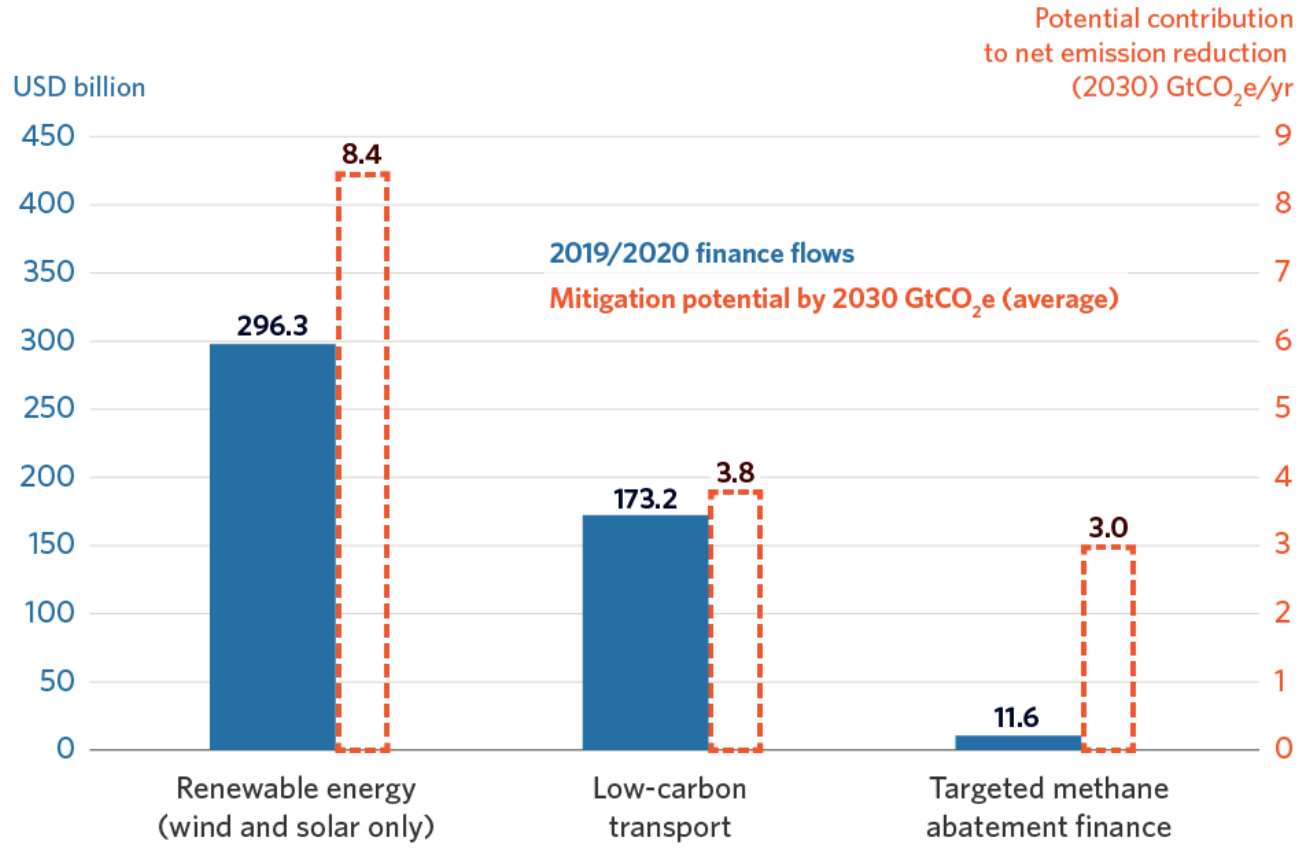
Figure 1. Targeted methane abatement finance compared to 'traditional' climate finance volumes



Methane abatement solutions are severely underfunded when compared to their mitigation potential. While also underfunded, other climate change solutions with similar mitigation potential, such as low-carbon transport, received 15 times the investment of methane abatement measures. Solar and wind electricity generation received 26 times the investment.

2 As per CCAC classification.
3 Methane pathways compatible with +1.5C° of warming require additional behavioral changes, such as mass adoption of low-meat diets, that are not covered in this study.
4 Low-cost abatement potentials range from 60–80% of the total for oil and gas, from 55–98% for coal, and approximately 30–60% in the waste sector according to the Climate and Clean Air Coalition's Global Methane Assessment.

Figure 2. Climate finance v. mitigation potential

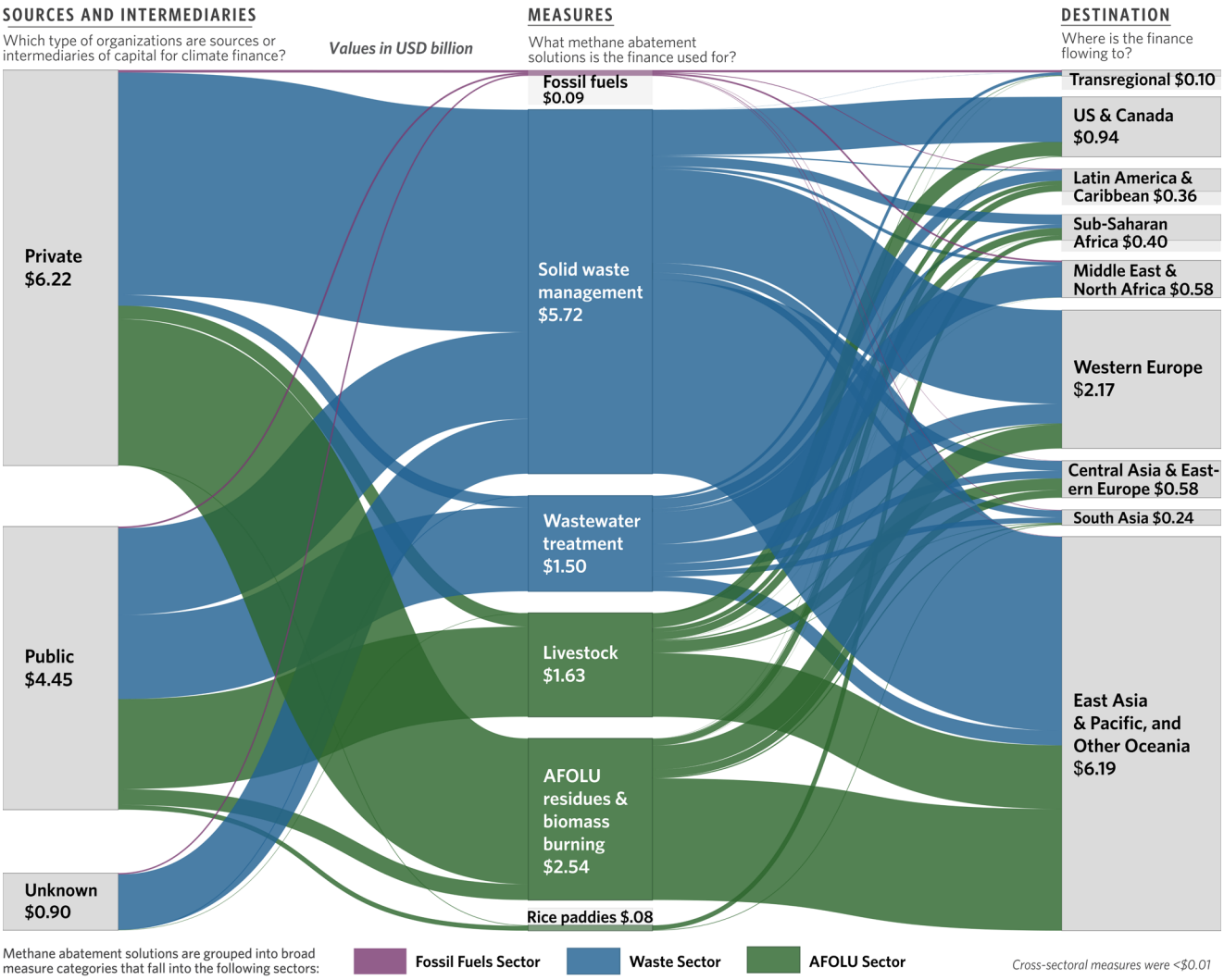


Source: *CPI Global Landscape of Climate Finance 2021 and IPCC AR 6 SPM.7*

The private sector accounted for the majority of tracked financial flows (USD 6.2 billion), particularly in more mature segments where commercial viability is well established (e.g., certain waste-to-energy technologies). Commercial financial institutions and corporations focused on the waste sector. The business case in this sector is motivated not so much by methane abatement but rather by the prospects of energy generation, which allows for a large portion of abatement interventions to be deployed at no net cost (CCAC and UNEP, 2021).

The public sector accounted for USD 4.5 billion of tracked finance, a significant portion originated from Development Finance Institutions (DFIs). DFIs accounted for 13% (USD 1.5 billion) of all tracked financial flows directed towards methane abatement in 2019/2020. Notably, DFIs played an important role in financing methane abatement within the AFOLU sector where concessional funding is particularly needed given the limited mature commercial opportunities.

Figure 3: Global finance flows in methane abatement projects (USD billion 2019/2020 annual average)



Source: *CPI analysis of public and private finance data. AFOLU (green), Waste (Blue), Fossil Fuels (Purple), Cross-sectoral (Grey)*

FINDINGS BY REGION AND SECTOR

Our findings show that methane abatement financing is not always directed towards the regions or sectors with the highest historical emissions or with the greatest emission reduction potential. **The fossil fuel sector has the highest potential for methane mitigation potential by 2030, yet by far received the lowest amount of methane abatement finance.**

Figure 4: Methane abatement finance, annual emissions, and ratio of the two (USDm/Mt) broken down by regions and sectors

Region	Fossil Fuels sector	Waste Sector	AFOLU sector
East Asia and Pacific	50 Mt 3 USDm	20 Mt 3,138 USDm	35 Mt 2,911 USDm
South Asia	6 Mt 9 USDm	9 Mt 192 USDm	30 Mt 36 USDm
Central Asia and Eastern Europe	27 Mt 4 USDm	7 Mt 274 USDm	9 Mt 303 USDm
Western Europe	3 Mt 0 USDm	6 Mt 1,778 USDm	10 Mt 393 USDm
Middle East & North Africa	21 Mt 26 USDm	3 Mt 554 USDm	3 Mt 3 USDm
Sub-Saharan Africa	9 Mt 1 USDm	6 Mt 212 USDm	20 Mt 191 USDm
Latin America & Caribbean	22 Mt 12 USDm	7 Mt 175 USDm	31 Mt 169 USDm
US & Canada	15 Mt 34 USDm	8 Mt 710 USDm	12 Mt 234 USDm
Other Oceania	2 Mt 0 USDm	1 Mt 138 USDm	5 Mt 0 USDm

Methane abatement finance to methane emissions ratio

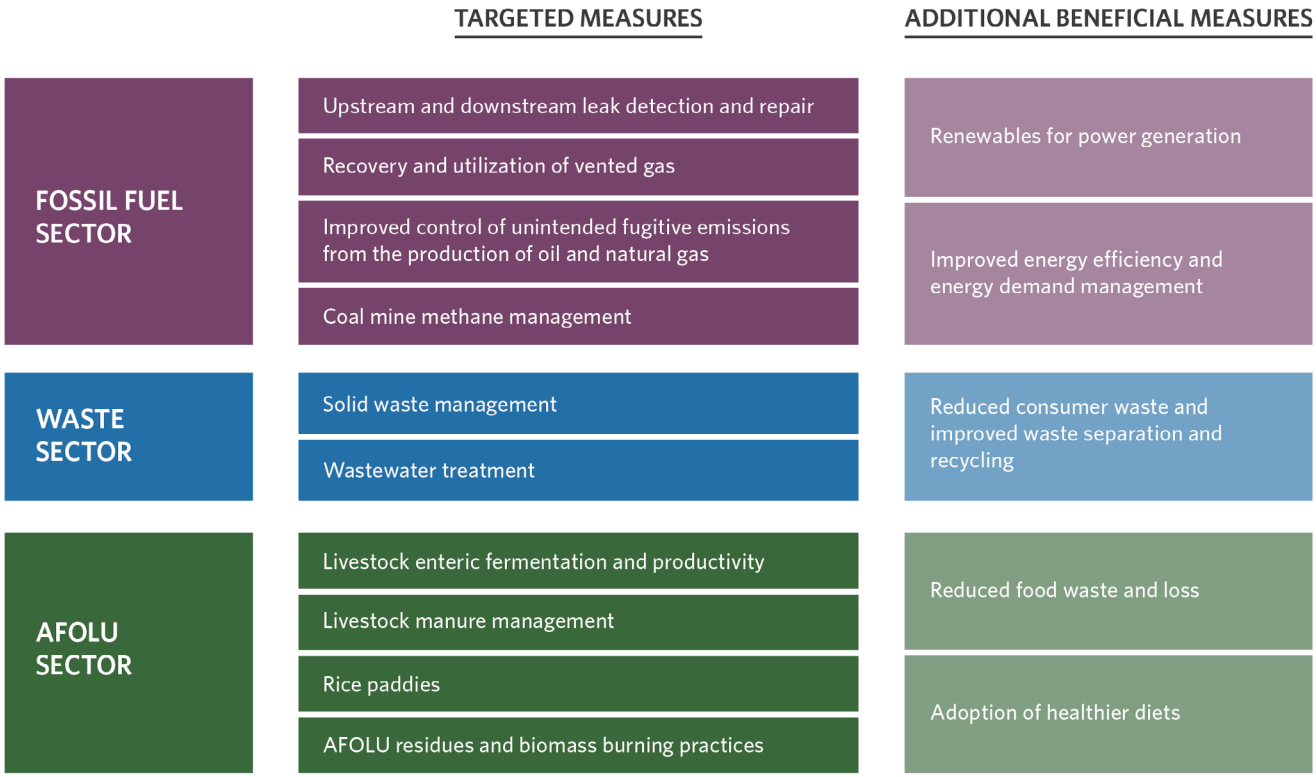
<10	between 10 and 100	>100

2015 methane emissions (top figure, Hoesly et al. 2018a), 2019/2020 tracked targeted methane abatement finance (bottom figure), and finance-to-emission ratio (color scale).

At a **regional level**, more than 25% of methane emissions originated in the East Asia and Pacific region (led by China). This region also concentrated most of the methane mitigation finance tracked in 2019/2020 (USD 6.0 billion, just over 50% of tracked abatement finance). In comparison, South Asia and Latin America & Caribbean, which combined produced just as much in terms of methane emissions (28% of total) only received 5% tracked finance (2% South Asia; 3% LAC). Methane mitigation spending in the US & Canada was shy of USD 2 billion annually, representing around 7% of tracked finance, and only marginally above expenditures in Central Asia and Eastern Europe (US 1.86 billion).

At a **sector level**, while investment falls short across all tracked sectors, **we find massive gaps in methane finance in the sectors with the highest mitigation potential.** Notably, almost two-thirds of methane abatement funding was directed towards the waste sector, but 82% of human-caused methane emissions originated from activities in the fossil fuel and agriculture sectors.

Figure 5: Categories of methane abatement measures



This classification displays how methane abatement solutions are captured and categorized in this report. A more detailed version of this classification with some examples of the abatement solutions that fall under each category is available in the Annex.
Source: Adapted from CCAC and UNEP 2021

Sectoral findings are presented below by order of mitigation potential by 2030.

#1: Fossil fuel extraction, processing, and distribution sector. Despite having the greatest methane mitigation potential by 2030 (CCAC and UNEP, 2021) and being the greatest source of methane emissions (Hoesly et al., 2018a), tracked investment in this sector is less than 0.5% of methane abatement finance (USD 0.1 billion) – falling well below the estimated USD 30 billion needed annually, on average, by 2050 (Harmsen et al., 2019).

Table 1: Fossil fuel sector summary metrics.

Annual emissions (2015)	Mitigation potential by 2030	Tracked abatement finance (2019/2020, $ billion)	Average annual needs through 2050 ($ billion)
155 Mt/yr	29-57 Mt/yr	0.1	31.6

The mitigation potential in this sector is highly significant, with the International Energy Agency (IEA) estimating that it is technically possible to avoid 75% of today's methane emissions from the oil and gas subsector. The IEA further estimates that deploying all available abatement technologies to reduce methane emissions and flaring from the oil and gas subsector alone could avoid 0.1°C of warming by 2050 – equivalent to eliminating the

greenhouse gas footprint of all cars, trucks, buses, and two- and three-wheelers in the world (IEA, 2022a). Notably, at today's high prices, nearly all the methane abatement potential in the oil and gas sector can be implemented at no net cost. (IEA, 2021). Most of the mitigation finance in this sector focused on measures aiming to capture and reuse methane as the captured gas can often be monetized (IEA, 2021)

Coal mining accounts for 12% of fossil fuel related methane emissions (CCAC and UNEP, 2021) yet our analysis tracked only USD 0.02 billion towards methane abatement in this sector. With investment in coal projects and coal use on the rise, international actors have a key role to play to ensure methane mitigation actions are incorporated into coal supply operations through the introduction of regulatory and policy standards (IEA, 2022b).

Overall, tracking methane abatement investments in the fossil energy sector presents challenges due to lack of standardized reporting and can be hard to distinguish from business-as-usual operational expenditures. Corporate actors need to design, set, and promote methane mitigation targets, state these targets publicly, and track and report progress against them. Policymakers focused on fossil fuel sectors have a key role to play in setting technology and emission standards, promoting reduction targets, driving incentives for efficient and impactful capital allocation, and in developing measurement, reporting, and verification standards.

#2: Waste sector: solid waste and wastewater. With just under a fifth of global methane emissions but the second highest mitigation potential by 2030 (CCAC and UNEP, 2021; Hoesly et al., 2018b), the waste sector received more than half of targeted methane abatement finance in 2019/2020, at USD 7.3 billion. While this sector received the most methane abatement financing, tracked finance flows are still well below investment needs – USD 44 billion needed annually on average through 2050.

Table 2: Waste sector summary metrics.

Annual emissions (2015)	Mitigation potential by 2030	Tracked abatement finance (2019/2020, $ billion)	Average annual needs through 2050 ($ billion)
66 Mt/yr	29-36 Mt/yr	7.3	44.3

The solid waste subsector has the highest methane mitigation potential in this sector (CCAC and UNEP 2021) and received USD 5.7 billion – mostly directed towards waste-to-energy projects, which rely on mature yet relatively expensive technologies. However, waste incinerators represented the bulk of investment in this subsector (USD 4.6 billion[5]). While they offer a methane-free alternative to landfilling, incinerators also generate significant CO2 emissions and can lead to air pollution concerns if not properly operated (Mutz et al., 2017).

Methane abating investments in wastewater represented 13% of total methane abatement finance (USD 1.5 billion) and were driven by multilateral development finance institutions. Methane abatement solutions in this subsector often have important health co-benefits. Eighty-six percent of tracked finance went to projects that replace decentralized wastewater treatment practices (e.g., latrines) with centralized collection and treatment systems, which comes with clear methane cuts (EPA, 2013). However, the main driver behind investment in

5 Unless mentioned otherwise by the reporting entity, the full project cost was accounted for. More details in the data limitations section.

these technologies was improving access to clean water and sanitation (SDG 6), as reflected in project documentations.

Investment in this sector is characterized by solutions that are relatively expensive and capital intensive. As such, the public sector plays an important role in closing the finance gap. In turn, public actors are likely to finance projects with multiple SDG-aligned co-benefits alongside methane abatement. Public actors can also play a role in driving investment to this sector through policy and regulatory incentives (e.g., establishment of organic waste diversion laws to prevent landfilling and circular economy programs). Private sector actors in this space often rely on carbon offsets to generate additional revenue streams (CCAC and UNEP 2021).

#3: Agriculture, Forestry, and Other Land Use sector (AFOLU). Together with the fossil fuel sector, AFOLU is the largest contributor to human-made methane emissions (41% of global total) and ranks third in terms of abatement potential by 2030. This sector attracted slightly over a third of targeted methane abatement finance in 2019/2020 (USD 4.3 billion annually). Tracked finance levels are still significantly below estimated needs – an average of USD 43 billion needed annually by 2050.

Table 3: AFOLU sector summary metrics.

Annual emissions (2015)	Mitigation potential by 2030	Tracked abatement finance (2019/2020, $ billion)	Average annual needs through 2050 ($ billion)
154 Mt/yr	~ 30 Mt/yr	4.3	43.2

Over half of methane abatement investments in this sector focused on bioenergy projects that use forestry and crop residues (primarily rice and maize) to produce energy[6]. These projects provide a lower-methane alternative to current widespread practices such as open field burning, landfilling, or disposal of residues in rice paddies (Allen et al., 2020; Cassou, 2018). However, the methane abatement impact of these projects was not systematically assessed.

Livestock enteric fermentation emissions are almost entirely tackled through animal productivity and health gains[7], which attracted 99% of the USD 1.4 billion flowing to this segment. Solutions that specifically intend to mitigate enteric fermentation emissions (e.g., feed additives) - the remaining 1% remain underserved and early stage in the form of Research & Development (R&D) and pilot programs.

Similarly, beyond bioenergy projects that use rice residues, targeted methane abatement finance for rice was negligible at USD 100 million with only a handful of projects targeting capital expenditure in water management and deployment of new rice varieties, the majority being research projects.

Overall, public and private investment is needed in this sector to support research and development and better impact assessments of abatement solutions. Public sector intervention is urgently needed in hard-to-abate and less mature segments like livestock

6 Including both thermal and anaerobic digestion energy generation.
7 Improving animal productivity and health can decrease methane emissions associated with the production of one unit of output (meat, milk, etc.).

enteric fermentation and rice paddies, where fragmented value chains and varying agricultural practices challenge solutions' scalability and penetration potentials.

DATA LIMITATIONS

Overall, the current state of reporting on methane abatement activities by public and private sector actors is insufficient. Several caveats underpin our analysis – most notably the lack of visibility into both private and public expenditures in methane abatement due to the lack of standardized reporting. This leads to an information gap on the state of methane abatement finance.

Our analysis is subject to several limitations, including:

- **Inability to quantify impact.** We are not able to determine actual methane emission reductions associated with tracked finance. Our focus on 2019 and 2020 financial commitments does not support an assessment of actual methane cuts because many projects tracked are either being implemented or not operational yet. The goal is instead to capture trends in recent financial decisions. Abatement potential and related limitations are highlighted throughout the report, when deemed relevant.
- **Inability to assess intentionality.** The method we used to screen relevant projects and financial flows does not allow us to assess whether all tracked projects purposely intended to reduce methane emissions. Our approach instead focused on extracting projects and project components which had an established or deliberate potential to reduce methane emissions.
- **Limited visibility into the most recent investment trends.** Our tracking exercise focused solely on finance flows and projects executed in 2019/2020. As a result, our analysis does not capture new flows announced or committed after the 2021 Global Methane Pledge.
- **Gaps in fossil fuel and AFOLU sectors.** Tracking methane abatement investments in the fossil fuel and AFOLU sectors presents challenges due to a lack of standardized reporting and can be hard to distinguish from business-as-usual operational expenditures (e.g., maintenance of natural gas pipelines).
- **Differences in reporting practices across data sources and reporting entities.** This is especially true when a climate-relevant amount is derived from the total cost of the project (e.g., in OECD-DAC).
- **Nascency of investment needs assessment.** Understanding the investment needs is critical for investors to gauge the gap between current and required finance levels. In this report, we rely on estimated implementation costs of abatement measures as analyzed by J.H.M Harmsen and colleagues. While multiple studies estimate the cost of implementing various methane mitigation strategies, we find the Harmsen study was closest to our definition of investment. Nonetheless, further research efforts should be dedicated to estimating methane abatement finance needs in a way that aligns with the metrics and the granularity (actors, geographies, etc.) that best suit investors' needs.

However, even with these data gaps factored in, the initial stocktake indicates that actions in methane reduction, as well as reporting of such activities, do not come close to reflecting the level of investment needs.

INCREASING FINANCE FOR METHANE ABATEMENT

Overall, our report finds that current methane abatement finance is not adequate to reduce methane emissions at the rate needed to avoid the worst impacts of climate change. Despite the availability of cost-effective and market ready abatement solutions, business and policy strategies for methane reduction are not prioritized by policymakers and investors. The Global Methane Pledge has brought together nearly 120 countries in support of methane emissions reductions. Building on this momentum, countries should next consider rapidly developing concrete methane reduction plans as well as financing strategies.

Key barriers to increasing finance for methane abatement include:

- **Emissions measurement uncertainties.** Measuring methane emissions is complex. Some sources likely are underestimated. Having reliable, asset-level, methane emission baselines is crucial to tracking progress and identifying key levers for action. In addition, informed decision-making demands more accurate ex-ante emission reduction assessments. Significant progress needs to be made in methane emissions tracking to enable targeted methane mitigation finance.
- **Methane abatement finance data gaps.** Compiling data on methane abatement investment is complex and available data to date is insufficient, overall hindering the assessment of abatement investment gaps and needs. This is partly because reporting on methane abatement activities by public and private actors is not standardized which increases the risk of over or underestimating the benefits of methane related investments.
- **Policy and regulatory barriers.** Across all geographies and sectors, the current policy and regulatory environment fails to support methane mitigation activities. For example, even though oil and gas methane emissions can often be reduced at minimal cost or net savings, policies and regulatory schemes to track leaks and require methane mitigation are patchy across the world.
- **Lack of support for innovation.** Some methane abatement solutions with high mitigation potential, such as feed additives in the livestock sector and chemical inhibitors in the AFOLU sector, are still early in their development cycle and require additional research and development support.

RECOMMENDATIONS

Methane abatement finance has one of the highest impacts in reducing global warming per dollar of capital invested. The world cannot avoid the worst impacts of climate change without sufficient finance flowing towards methane abatement. Both public and private actors have an essential role to play in closing the methane abatement finance gap.

Table 4 provides a list of recommendations for key stakeholders in this space. Further sector specific recommendations are available in the sectoral analysis of the full report.

Table 4: Targeted recommendations by actor

Actor	Recommendation(s)

Governments and regulators	▪ Develop legally binding methane mitigation targets at a national and/or sectoral level.
	▪ Establish emission standards that focus on monitoring, reporting, and verification of methane mitigation on a sectoral level.
	▪ Set a timetable this decade for enhanced and progressively binding policy and regulatory signals that are tailored to the key sectors by specifying minimum standards, regulations, and tailored penalties/ incentives for methane leakage and reduction.
	▪ Strengthen accurate and transparent emission measurement:
	  ▪ Mandate reporting of scope 1 and 2 methane emissions actors in key sectors.
	  ▪ Mandate scope 3 emissions reporting for companies that have methane intensive value chains, including livestock and rice production.
	  ▪ Set clear guidelines to accurately report on methane emissions separate from other gases such as carbon dioxide.
	  ▪ Foster enabling activities to support more accurate emission measurement including data collaboration across jurisdictions.
	  ▪ Boost investment in innovative technologies to enhance real time emission measurement, including the use of emerging remote sensing platforms.
	▪ Incentivize the uptake of existing technologies for methane reduction through awareness-raising initiatives and fiscal incentives.
	▪ Invest in R&D with research institutions and private sector participation to improve industrial practices and further reduce technology costs, particularly in the agriculture sector.
	▪ Redirect capital from carbon intensive activities to methane abatement solutions in key sectors, enabling investors to pursue methane abatement at a greater speed and scale.
	▪ Financial regulators and international sustainability reporting bodies should agree on:
	  ▪ A common framework and definition for methane abatement finance.
	  ▪ A taxonomy of methane abatement solutions, by sectors, to guide public and private actors to track investment.
	  ▪ Mandate fugitive emissions reporting in the oil and gas sector.
	▪ Set a timetable to explore and integrate carbon pricing in all its forms, including the social cost of carbon emissions, carbon taxes and methane fees, and emission trading schemes.
	▪ Use the Global Methane Pledge as a forum for building a knowledge base, dialogue with countries that are not yet part of the Pledge but are major emitters, exchange lessons learned on regulatory frameworks and reporting standards on methane abatement investments at a national level, and scale up action.

Corporates	Scope 1 emitters: ▪ Assess methane exposure risk and measure methane emissions and leakage. ▪ Identify and set methane reduction targets in interim net zero goals and improve transparency on capital expenditure figures in sustainability reports. ▪ Report transparently on: ▪ Capital expenditure on methane abatement activities. For example, corporates in the oil and gas sector could include targets for investment in leak detection and repair systems as part of investment goals and report on progress. ▪ Annually report on progress towards meeting methane abatement and methane abatement finance goals. Scope 2 and 3 emitters: ▪ Assess methane emissions exposure from purchased energy (Scope 2) and through value chains (Scope 3), including livestock and rice production. ▪ Engage in dialogues with actors across their value chains to report and set targets to reduce methane emission.
Public development banks	▪ Provide proactive support to priority governments in adopting effective methane reduction policies through technical assistance and policy-based lending. ▪ Engage with counterparts and intermediaries to implement methane reduction strategies and pursue project finance in methane abatement solutions. ▪ Establish methane related climate finance targets and enable short-lived climate pollutant mitigation in key countries of operation with high methane exposure. ▪ Build on existing reporting methodologies, e.g., Joint MDB methodology on climate mitigation finance and International Financial Institution (IFI) Framework for GHG accounting to further define methane mitigation activities in taxonomies and tracking of methane emissions separate from other gases. ▪ Integrate lifecycle emissions assessments as part of due diligence for any new or ongoing natural gas generation projects. Include support for methane abatement measures as part of financing packages. ▪ Take action against the Global Methane Pledge, for public development banks who are members, by determining and pursuing strategies for increased methane financing.
Private financial institutions	▪ Build an understanding of how to account for methane abatement finance across a variety of investment approaches, and financing products. Integrate into portfolio alignment tracking and temperature mapping of existing investments. ▪ Evaluate involvement and exposure to the methane intensive sectors and push for action from corporates that receive funding. ▪ Provide support to innovative methane abatement solutions which align with business activities.
Other organizations, initiatives, and enablers	▪ Agree on a timeline compatible with 2030 abatement targets and work program to set benchmarks and catalogue best practices across methane-relevant sectors. ▪ Prioritize capacity building to address gaps in evidence on the practical application of existing approaches to methane abatement finance tracking given the still relatively limited pool of investments in this space. ▪ Enhance, identify, and update investment needs by geography, actor, and sector following revised climate goals. ▪ Establish annual tracking of methane emissions and related financing activity. ▪ Participate in and enable R&D activities to further reduce methane abatement cost in livestock enteric fermentation, manure management, rice paddies among others.

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