CLIMATE ANALYTICS

Cutting methane, limiting overshoot: pathways for Paris alignment

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About Climate Analytics

Climate Analytics is a global climate science and policy institute. Our mission is to deliver cutting-edge science, analysis and support to accelerate climate action and keep warming below 1.5°C.

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Summary

The world is on track to exceed the Paris Agreement's 1.5°C warming limit as early as 2030. How far and for how long temperatures remain above this threshold will depend on actions taken this decade, with rapid methane reductions playing an especially critical role. Since methane is a potent, short-lived pollutant, rapid cuts in methane emissions offer one of the most effective levers to slow warming in the coming decades, reduce the level and duration of overshoot, and lower the risks of irreversible and devastating climate impacts.

Methane is increasingly recognized as a critical lever for limiting overshoot and supporting long-term temperature decline. The Global Methane Pledge, as well as the rise in national methane targets, sectoral regulations, industry-led commitments, dedicated public and private funding initiatives, and new monitoring initiatives highlight a growing consensus that deep methane cuts are essential to setting the world on a path back to well below 1.5°C by 2100. In July 2026, the United Nations Secretary General called for urgent action to reduce methane emissions from energy, waste, and agriculture, noting that while the world may be on a path to overshoot the 1.5°C limit, rapid reductions in these sectors – especially in energy – are one of the most effective ways to limit the duration and magnitude of overshoot.[1]

Despite this momentum, global methane emissions continue to rise, putting the world further off track from climate targets. In 2020, the baseline year for the Global Methane Pledge, average global anthropogenic methane emissions across three datasets – PRIMAP, EDGAR, and CEDS – were 317 Mt CH_4. Since then, emissions have continued to rise, reaching an average of 328 Mt CH_4 in 2023 – a 3.5% increase relative to 2020. This trend is pushing the world further off track from the Global Methane Pledge target of 30% reductions below 2020 levels by 2030, and as a result, methane emissions must now decline by around 32% from current levels to achieve the Global Methane Pledge.

This report assesses the scale of methane reductions required this decade and beyond to align with the temperature limit of the Paris Agreement. Across Paris-aligned pathways, we find that methane emissions must decline by 17% to 33% from 2020 levels by 2030, and by 19% to 35% from current emissions levels.

Immediate reductions across all sectors are critical, but emissions must fall fastest and furthest in the energy sector – by between 48% and 62% between 2020 and 2030 – making the sector central to bringing global methane emissions in line with the Global Methane Pledge and Paris-aligned pathways. Phasing out fossil fuels is the fastest, most

[1] United Nations. Secretary-General's call to action on methane: Three sectors, nine actions by 2030. New York. (2026).

effective way to tackle these emissions, though targeted methane abatement – including leak detection and repair and ending routine venting and flaring – is a necessary complement to reduce emissions from remaining fossil fuel infrastructure over the course of the transition. This suggests methane abatement in this sector should focus on the infrastructure that is expected to be operational the longest and that available resources for abatement are not used to keep infrastructure online that should phase out earliest.

Current policies are not aligned with the Global Methane Pledge or Paris-aligned pathways. Instead of falling steeply, global methane emissions are projected to stay flat between 2020 and 2030 under the median current policy pathway issued through 35 integrated assessment models. By 2030, this pathway leaves methane emissions 49 to 97 Mt CH_4 above Paris-aligned pathways, and around 88 Mt CH_4 above the level required to meet the Global Methane Pledge.

Projected progress differs across sectors. The energy sector is the only sector where the median current policy pathway shows emissions declining – by about 11% between 2020 and 2030. Nevertheless, these reductions fall well short of what's required under Paris-aligned pathways, leaving a 33 to 46 Mt CH_4 gap in 2030. By contrast, both the agriculture and waste sectors show rising emissions under median current policy pathways, increasing by 6% and 9% between 2020 and 2030, respectively.

In addition to assessing global methane reduction pathways, this report also reviews national methane pathways to evaluate whether countries are on track with Paris-aligned trajectories. Few of the jurisdictions in our analysis are currently on track, although some are making meaningful progress. Of the ten jurisdictions (nine countries and the European Union) we examined in our study, only Canada, the United Kingdom, and the European Union have current policy projections that are on track to Paris-aligned methane pathways in 2030. However, all three jurisdictions are just barely on track, underscoring that full and effective implementation of current policies is essential to deliver this level of emissions reductions in practice.

By contrast, China, Russia, the United States, and Brazil – four of the five largest global emitters, alongside India – are far off track from their Paris-aligned pathways. In the United States, current policies lead to a decline in methane emissions over this decade, though these reductions are far from the scale required for Paris alignment. In China emissions are projected to increase in the near term before returning to around 2020 levels by 2030, whereas in Russia and Brazil, methane emissions are projected to continue rising through 2030 and beyond. Because these major economies account for a large share of global methane emissions, the scale and speed of their reductions (or lack thereof) will have outsized implications for global progress.

These trajectories reveal a concerning gap between current policies and Paris-aligned methane pathways, underscoring the need to raise ambition and accelerate methane mitigation across all major sectors this decade.

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1. Introduction

Decades of insufficient climate action have put the world on track for at least a temporary overshoot of the Paris Agreement's 1.5°C temperature limit, with warming expected to exceed this critical threshold as early as 2030.[2] Rapid and sustained reductions in methane emissions are one of the most effective levers to limit the magnitude of 1.5°C overshoot and reduce the risks associated with higher peak warming, including more frequent and intense extreme weather events, growing water and food stress, increased flooding in coastal regions, accelerating biodiversity loss, and worsening impacts on human health and wellbeing.[3]

Methane is estimated to be responsible for approximately one-third of the warming the world is currently experiencing.[4] Methane is a short-lived but potent greenhouse gas, with a global warming potential around 28 times greater than carbon dioxide over 100 years and an atmospheric lifetime of only about 12 years, compared with centuries or millennia for carbon dioxide.[5] Because of its potency and relatively short lifetime, changes in atmospheric methane emissions have a strong influence on near-term warming.

Cutting methane delivers substantial co-benefits beyond climate change mitigation.[6] Reducing methane emissions lowers ground-level ozone formation, improving air quality and reducing premature deaths and illness from respiratory and cardiovascular diseases. Lowering ozone levels through methane mitigation also helps reduce ozone-related damages to crops and ecosystems, thereby supporting food security and biodiversity. By improving air quality and reducing heat and pollution stress, methane mitigation can also enhance labour productivity and support broader economic and social development, particularly in regions heavily affected by ozone pollution.

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[2] Climate Analytics, *Latest Science on the 1.5°C Limit of the Paris Agreement*, (Climate Analytics, 2025).

[3] IPCC, *Summary for Policymakers. In: Climate Change 2023: Synthesis Report*, 1-34 (IPCC, 2023).

[4] Intergovernmental Panel on Climate Change (IPCC), *Climate Change 2021: The Physical Science Basis* (IPCC, 2021).

[5] Methane has a global warming potential (GWP) of about 84 over a 20-year time horizon (GWP20), but in line with the IPCC standard, we report emissions using 100-year GWPs (GWP100). Using 20-year GWPs would attach more weight to short-lived climate pollutants like methane, which could inadvertently weaken the focus on deep, sustained reductions in carbon dioxide that are essential for limiting long-term warming. See: Michiel Schaeffer et al., *Why Using 20-Year Global Warming Potentials (GWPs) for Emission Targets Are a Very Bad Idea for Climate Policy* (Climate Analytics, 2017).

[6] United Nations Environment Programme (UNEP) and Climate and Clean Air Coalition, *Global Methane Assessment: Benefits and Costs of Mitigating Methane Emissions* (UNEP, 2021).

The Global Methane Pledge, launched at COP26 in 2021, has elevated methane on the international climate agenda, setting a collective goal to reduce global methane emissions by 30% by 2030 relative to 2020 levels. To date, 159 countries and the European Union have joined the Pledge, with many translating this high-level commitment into national targets, action plans, and policies. However, a 2023 study found that only 13% of methane emissions are currently covered by methane mitigation policies, and some of the world's largest emitters – including China and Russia – have yet to sign the Pledge.[7]

Recent analyses reinforce the urgency of ramping up these efforts, showing that rapid methane reductions this decade are critical to limiting temperature overshoot and keeping the Paris Agreement's temperature limit within reach. A study by Climate Analytics and the Potsdam Institute for Climate Impact Research, which introduced a new "Rescuing 1.5°C" scenario, identifies accelerated action on methane as one of four key levers to limit overshoot, alongside widespread electrification, faster fossil fuel phase-out, and carbon dioxide removal at scale. The study finds that global methane emissions must decline by at least 17% between 2020 and 2030 to align with the Paris Agreement.[8] This represents a floor, not a ceiling, for global methane mitigation – earlier Paris-aligned pathways assessed in the IPCC's Sixth Assessment Report (AR6) show methane emissions falling by 25% to 54% between 2020 and 2030, with a median decline of 33%. Across all Paris-aligned pathways, methane emissions from the fossil fuel sector fall fastest and furthest this decade.

Despite the clear scientific case for methane mitigation and growing political attention, global methane emissions have continued to rise, putting the world further off track. Between 2023 and 2024, global anthropogenic methane emissions rose by around 1 Mt CH_4 in both the PRIMAP and EDGAR datasets, equivalent to a 0.7% increase. Furthermore, under current policies, methane emissions are projected to remain roughly at current levels to 2030. Closing the emissions gap will require a significant strengthening of ambition and action, from both Pledge signatories and non-signatories, to align global methane trajectories with the Paris Agreement's temperature limit.

Critically, methane mitigation is only one piece of the puzzle. Action to reduce methane emissions must complement, rather than substitute for, deep and rapid reductions in carbon dioxide emissions. While long-term warming is primarily driven by cumulative carbon dioxide emissions, rapid methane reductions can lower peak warming, slow the rate of near-term temperature increase, and reduce the scale and risks of 1.5°C

[7] Maria Olczak et al., 'A Global Review of Methane Policies Reveals That Only 13% of Emissions Are Covered with Unclear Effectiveness Author Links Open Overlay Panel', *One Earth* 6, no. 5 (2023): 519–35.
[8] Climate Analytics and PIK, *Rescuing 1.5°C: New Evidence on the Highest Possible Ambition to Deliver the Paris Agreement* (Climate Analytics and PIK, 2025).

overshoot. Together with net-negative carbon dioxide emissions, methane reductions are also essential to bringing temperatures down after peak warming.

This report provides an up-to-date assessment of where the world stands on methane mitigation in relation to the Paris Agreement's 1.5°C temperature limit and addresses three core questions:

- Where do global and sectoral methane emissions stand today, and how does this level compare with trajectories consistent with minimizing overshoot of the Paris Agreement's 1.5°C limit?
- To what extent do current policies align with Paris-aligned methane pathways at the global and sectoral levels, and where are the largest gaps?
- What level of methane mitigation is required at the national level to be aligned with Paris-aligned pathways, and to what extent are countries on or off track?

The report is structured as follows. Section 2 outlines the methodology for deriving Paris-aligned methane pathways at the global, sectoral, and national levels. Section 3 synthesizes global, sectoral, and national methane pathways consistent with the Paris Agreement. Section 4 provides conclusions and recommendations.

2. Methodology

Defining Paris-aligned methane pathways

Global pathways

Paris-aligned pathways

To identify Paris-aligned methane pathways at the global and sectoral levels, we looked at scenarios produced by integrated assessment models (IAM) which explore how the energy-land-economy-climate system could develop over the twenty-first century.

In this analysis, we first use a set of pathways derived from the IPCC's Sixth Assessment Report database.[9] The database produced 1202 different global pathways that resulted in a wide range of emissions and temperature outcomes – from pathways which limit warming to 1.5°C with no or limited overshoot (<0.1°C) and reach net zero GHGs before 2100, to those where continued emissions growth drives global temperatures to reach around 4°C by 2100.

[9] IIASA and IPCC, 'AR6 Scenario Explorer and Database Hosted by IIASA', International Institute for Applied Systems Analysis, 2022.

For this analysis, we selected scenarios from the AR6 C1a category exclusively. These Paris-aligned pathways limit median global warming to 1.5°C throughout the 21st century, with peak temperatures ranging from no overshoot (≤ 1.5°C) to medium-overshoot (up to 1.8°C), and reach net-zero GHGs before 2100. In total, we selected 50 pathways across 19 models – five no-overshoot pathways (≤ 1.5°C), 39 low-overshoot pathways (1.5 – 1.6°C), and six medium-overshoot (1.6 – 1.8°C).

In addition, we incorporate the new scenario generated by the REMIND 3.5 model from Potsdam Institute for Climate Impact Research, in collaboration with Climate Analytics.[10] This new scenario from the Rescuing 1.5°C report (referred to in this study as the "Rescuing 1.5°C" scenario)[11] accounts for our collective failure to cut emissions between 2020 and 2025, and tries to minimise overshoot of 1.5°C from this new starting point. For more details see the report from Climate Analytics.

Once we selected the pathways, we then harmonised them to historical data in order to account for recent observed methane emissions trends. Historical emissions data are drawn from the PRIMAP-hist dataset v2.7 (2025 release).[12] Of all three datasets reviewed in this study (CEDS, PRIMAP, and EDGAR), PRIMAP aligns most closely to countries' national inventories. The harmonisation is performed to the base year 2020, for consistency with the Global Methane Pledge, and is carried out using the Aneris package – the automated IAM harmonisation tool originally developed for the Coupled Model Intercomparison Project Phase 6 (CMIP6).[13]

Discrepancies between modelled historical emissions in the IAM scenarios and reported country-level inventories are addressed by adjusting scenario data in each world region and sector to match a consistent historical value in 2020.[14] The historical reference values are drawn from PRIMAP-hist sectoral emissions, aggregated to the 10 major world regions used in the analysis.

Current policy pathways

To assess whether current actions are on track with Paris-aligned pathways at the global and sectoral levels, we derived current policy projections by taking the median across all current policy projections from 35 IAMs from the IPCC AR6 database, the Scenario

[10] Climate Analytics and PIK, *Rescuing 1.5°C: New Evidence on the Highest Possible Ambition to Deliver the Paris Agreement*.

[11] This scenario from the Rescuing 1.5°C report was referred to as the Highest Possible Ambition (HPA) scenario, but is referred to as the Rescuing 1.5 scenario in this report.

[12] J. Gütschow et al., 'The PRIMAP-Hist National Historical Emissions Time Series (1750-2024) v2.7', version 2.7, 15 September 2025.

[13] Mathew J. Gidden et al., 'A Methodology and Implementation of Automated Emissions Harmonization for Use in Integrated Assessment Models', Environmental Modelling & Software 105 (July 2018): 187–200.

[14] IPCC, *Climate Change 2022: Mitigation of Climate Change* (IPCC, 2022).

Compass Initiative, and the EU Horizon Elevate project. The scenarios are harmonised to the PRIMAP-hist dataset using the same constant-ratio method applied to the AR6 C1a pathways, anchored to the 2020 base year.

The implementation gap is defined as the difference between the harmonised current policy pathway median and the 1.5°C-aligned benchmark at 2030 for both the global and sectoral pathways, reported in absolute terms (Mt CH_4/yr). Gaps are assessed against both the downscaled AR6 C1a median and the Rescuing 1.5°C trajectory and are therefore reported as a range.

National pathways

Paris-aligned pathways

To define and assess Paris-aligned pathways at the national level, we downscaled IAM scenarios from the macro-regional to the national level and focused on the results for nine countries and the European Union.

For the energy, industrial processes, and waste sectors, regional emissions are downscaled to individual countries using an intensity convergence methodology, specifically the Impact, Population, Affluence, and Technology (IPAT) method, as developed by van Vuuren et al. and extended by Gidden et al.[15,16] This approach assumes that emissions intensities (i.e. the ratio of emissions to GDP) converge from their base-year values to the world region average intensity by 2100, via exponential interpolation. Combined with scenario-specific GDP projections, this interpolation determines how each macro-region's emissions are allocated across constituent countries.

For the agriculture sector, where emissions do not systematically correlate with GDP growth, a simpler "base-year pattern" approach is applied where each country's share of regional agricultural CH_4 emissions in the base year (2020) is held constant throughout the scenario period.

Current policy pathways

To identify national current policy projections for methane, we drew on the country assessments from the Climate Action Tracker, published as of June 2026. The starting point of the projections are country-specific scenarios from literature – whether from governments themselves, national independent research, or from international sources. Where external scenarios miss policies, the Climate Action Tracker adds bottom-up

[15] Detlef P. van Vuuren et al., 'Downscaling Drivers of Global Environmental Change: Enabling Use of Global SRES Scenarios at the National and Grid Levels', *Global Environmental Change* 17 (2007): 114–30.
[16] Mathew J. Gidden et al., "Global Emissions Pathways under Different Socioeconomic Scenarios for Use in CMIP6: A Dataset of Harmonized Emissions Trajectories through the End of the Century," *Geoscientific Model Development* 12, no. 4 (2019): 1443–75.

estimates to account for them, using ranges where the outcomes of a policy are uncertain.

While some country assessments identify separate methane pathways, others only produce total greenhouse gas emissions. For the latter, we used U.S. EPA data on methane's share of total greenhouse gas emissions and estimated a 15-year historical trend in this share. We then extrapolated this trend forward, applying the projected methane share in each year to the total current policy emissions pathway to derive annual methane emissions.

Raw current policy projections are then harmonized to PRIMAP-hist dataset v2.7 (2025 release) at the 2020 baseline year, using the constant-ratio method, consistent with the approach applied to the Rescuing 1.5°C scenario and AR6 C1a ensemble. This anchors each country's projected trajectory to the same historical reference point used across all scenarios.

The implementation gap is defined as the difference between the harmonised current policy projections and the 1.5°C-aligned benchmarks at 2030, reported in absolute terms (Mt CH_4/yr). Gaps are computed against both the downscaled AR6 C1a median and the downscaled Rescuing 1.5°C trajectory, and are therefore reported as ranges. More detailed assumptions behind the current policy projections for each country are available in the country snapshots in Annex A.

These steps provide a high-level view of methane current policy pathways across countries. However, they should be interpreted as illustrative estimates of methane outcomes under current policies. We plan to further refine these national current policy methane pathways in future work.

Limitation and uncertainties of historic and projection emissions

Historical emissions

Historical methane emissions and modelled projections are both subject to considerable uncertainty, which affects the assessment of past trends, the calibration of future pathways, and the interpretation of the emissions gap to the Global Methane Pledge and Paris-aligned pathways.

In this analysis, we use the PRIMAP dataset as our source for historical anthropogenic methane emissions.[17] PRIMAP combines several published datasets to produce a comprehensive time series of annual greenhouse gas emissions for all countries. Its HISTCR scenario prioritises emissions data officially reported to the UNFCCC and fills

[17] PRIMAP reports only anthropogenic methane emissions and does not include natural sources. Recent studies suggest a rise in natural or otherwise un-inventoried methane emissions, which are not well captured in PRIMAP, nor in CEDS or EDGAR. This implies that, for a given temperature pathway, even deeper reductions in anthropogenic methane emissions may be required.

gaps – whether for years or sectors – with third-party sources such as the Carbon Dioxide Information Analysis Center (CDIAC), the Energy Institute, FAOSTAT, and the Emission Database for Global Atmospheric Research (EDGAR). Because this analysis assesses national methane pathways, PRIMAP is especially suitable, as its construction most closely reflects countries' national emissions inventories and UNFCCC reporting.

However, as noted in our previous report, PRIMAP reports the lowest methane emission values of the three historical datasets considered here, below both EDGAR and CEDS. In 2020, our base year, PRIMAP reports global anthropogenic methane emissions of about 300 Mt CH_4, compared with 320 and 330 Mt CH_4 for EDGAR and CEDS respectively. The main uncertainty in PRIMAP lies in the reporting of non-Annex I countries, which can be sporadic, sometimes with gaps of 5–10 years. These gaps are filled by extrapolation, introducing additional uncertainty.

The choice of anchor year and historical dataset for harmonisation also shapes the resulting pathways. While historical emissions are available from PRIMAP to 2024, we harmonise to 2020 to preserve consistency with the Global Methane Pledge target (a 30% reduction below 2020 levels by 2030). Harmonising instead to 2024 would compress the apparent pace of methane reduction by around 6 percentage points, since REMIND's pathway declines from 2020 while PRIMAP emissions continue rising through 2024. Likewise, using CEDS instead of PRIMAP as the historical baseline – which reports the highest methane emissions of our three datasets – would raise the 2020 reference level by roughly 8% to 10%, and would shift the absolute Global Methane Pledge target upward. These choices affect absolute emissions values and the apparent distance to the target, but they do not alter the conclusion that current policy pathways fall well short of the Pledge and Paris-aligned emissions levels.

Uncertainty is further embedded in the representation of methane within integrated assessment models and the way their outputs are used. Marginal abatement cost curves employed by most integrated assessment models embody strong assumptions about technical abatement potential, at times yielding faster methane reductions than those seen in bottom-up sectoral roadmaps. Assumptions about diet, food demand, and agricultural yields differ across models, as do land–energy–water interactions, which are a major source of inter-model variance in methane outcomes. Results from integrated assessment models are also typically downscaled on the basis of Gross Domestic Product (GDP), which does not fully reflect country-specific energy mix targets and policies, resource endowments, or other structural factors shaping feasible methane reductions.

These uncertainties compound across the analysis. If historical methane emissions are underestimated in PRIMAP and integrated assessment model pathways are harmonised to this lower baseline, projected trajectories can underestimate how deep and how fast methane cuts need to be, and shift more of the effort to later years, making Paris-aligned pathways appear less steep and less urgent on paper than they are in reality. At the same time, where current policy scenarios embed modelled abatement that exceeds what is supported by real-world policy action, the implementation gap is further compressed. Taken together, this implies that the true gap between current trajectories and Paris-aligned methane pathways is likely larger than reported here.

Beyond the analysis presented in this report, persistent uncertainties in both historical emissions estimates and modelled projections have important implications for policy design, priority-setting, and tracking progress (see Box 1).

Box 1: Policy implications of emissions uncertainty

Uncertainty in methane emissions estimates has implications across the entire policy cycle.

Uncertainty in methane emissions impacts how governments identify policy priorities and design policies, as policymakers may target the wrong sources, misjudge the scale of methane emissions, or set goals that underestimate the emissions reductions required. Policy implementation is also directly impacted by uncertainty in methane emissions estimates. For example, policy instruments such as methane pricing schemes or carbon markets rely on accurate data to set prices, allocate allowances, and monitor compliance. Furthermore, evaluating policies and tracking emissions reduction progress is also impacted by uncertainty in historic emissions inventories and future projections, making it difficult to determine whether policies are performing as intended and whether countries and sectors are actually making progress towards their methane reduction goals. Lastly, uncertainty also undermines accountability and credibility. When emissions data is incomplete or inaccurate, it becomes much more challenging to hold governments and private actors responsible for methane emissions and accountable against their mitigation goals.

3. Paris-aligned methane pathways

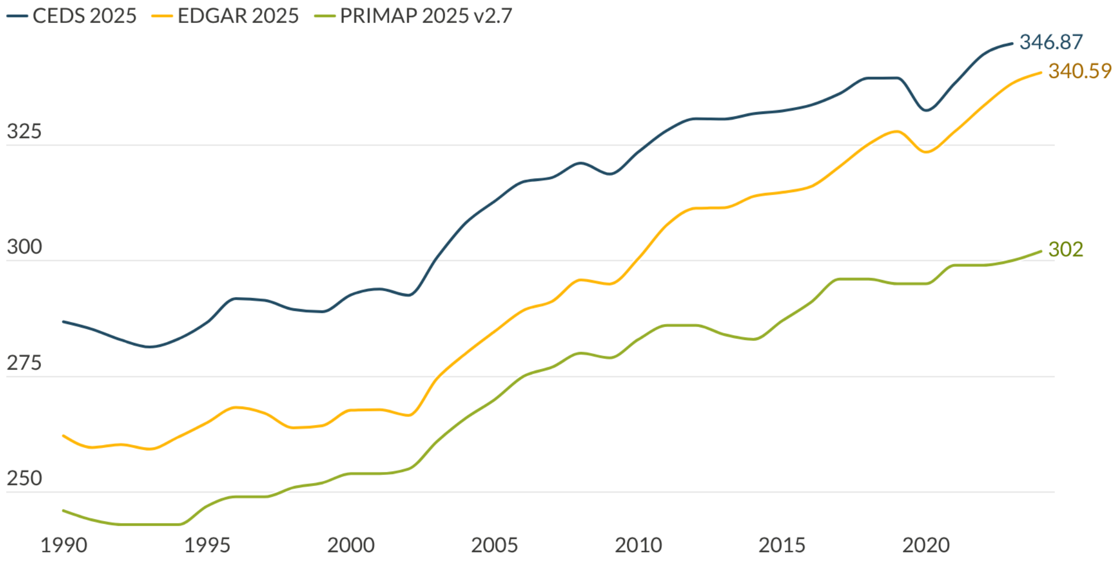
Global methane pathways

Historical trends

Global methane emissions have risen steadily since the beginning of the industrial revolution, driven by the expansion of fossil fuel extraction, growing agricultural and livestock production, and increased waste generation. Figure 1 shows a consistent increase in emissions from 1990 to 2023 across all three datasets, with largely similar trends despite differences in absolute emissions levels (CEDS, EDGAR, and PRIMAP). Across the three datasets, average global methane emissions increased from 265 Mt CH_4 in 1990 to 328 Mt CH_4 in 2023. Growth accelerated from the early 2000s onwards, with a minor decline in 2020, associated with the COVID-19 pandemic, followed by a renewed increase in subsequent years. This persistent upward trend reflects growing emissions from major anthropogenic sources, particularly fossil fuel production, agriculture, and waste sectors.

Figure 1: Historic trends in global methane emissions

Global CH_4 emissions from different datasets



Annual global emissions of methane (CH_4), measured in megatons of CH_4.

The continued increase in methane emissions has contributed to rising atmospheric methane concentrations. According to the World Meteorological Organization, global atmospheric methane concentrations, which reflect methane from both anthropogenic (including cattle, rice farming, fossil fuel extraction, landfills and biomass burning) and natural sources (such as wetlands) reached 1,943 parts per billion in 2024 – around 166% above pre-industrial levels.[18] The analysis in this report focuses solely on anthropogenic sources of methane.

Global pathways

In this section, we examine global methane pathways from 2020 onwards, focusing on trajectories consistent with limiting warming to 1.5°C and comparing them with the Global Methane Pledge. Once harmonised to the latest historical data (PRIMAP), global methane trajectories aligned with limiting 1.5°C overshoot show an overall decreasing

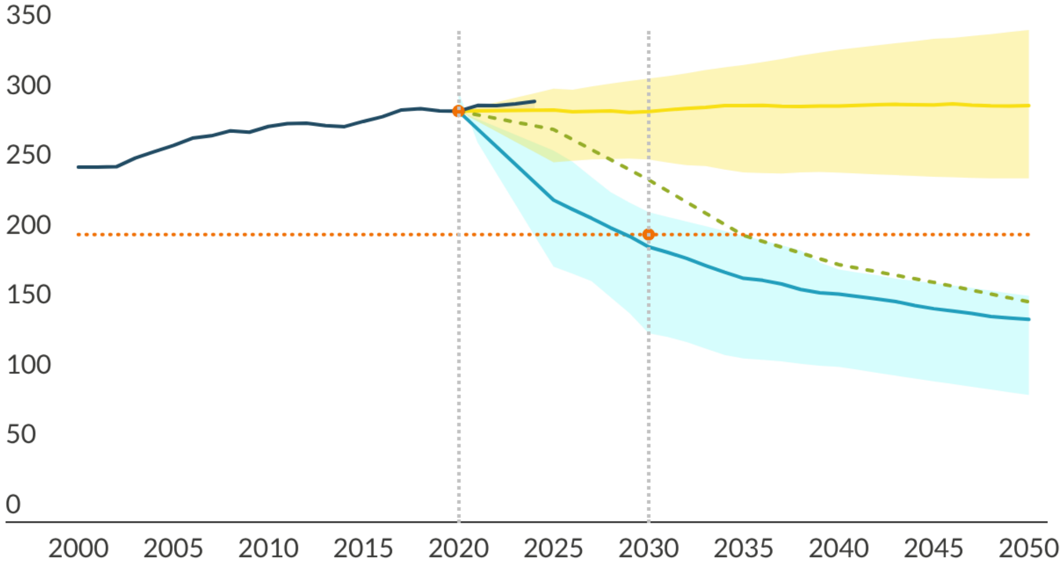
[18] World Meteorological Organization, *Carbon Dioxide Levels Increase by Record Amount to New Highs in 2024* (World Meteorological Organization, 2025).

trend from 2020 onwards, but with markedly different near-term dynamics (Figure 2). The AR6 C1a ensemble assumes an immediate post-2020 decline (reflecting scenarios built on historical data up to around 2015 that predate recent inaction), while the Rescuing 1.5°C scenario acknowledges this delay with a plateau through 2025 before declining.

Figure 2: Global methane gap analysis

Mt CH_4/yr

— Historic (PRIMAP) - - 2025 Rescuing 1.5°C pathway — IPCC AR6 c1a median pathway — IAM current policy median pathway ···· Global Methane Pledge



Historic emissions are taken from PRIMAP-hist v2.7 (2025 release). The yellow shaded area represents the IAM current policy range (percentile 10-percentile 90). The blue fill area shows the range of IPCC AR6 C1a pathways (10th–90th percentile).

Table 1: Change in total methane emissions compared to 2020 (%)

Year	2030	2035	2050
AR6 c1a median	−33	−40	−50
Rescuing 1.5°C	−17	−30	−46
Current policies	−0	1	1

In the AR6 C1a scenarios, global methane emissions fall sharply, with a median reduction of about 33% between 2020 and 2030 and no transitional plateau. By 2030, the C1a median lies around 9 Mt CH_4 below the Global Methane Pledge target level. However, the C1a ensemble is anchored to 2020 emissions without incorporating the observed rise in methane between 2020 and 2024. As shown by the PRIMAP historical series, emissions increased over this period rather than remaining flat or declining. The spread of the C1a envelope is also substantial, reflecting considerable inter-model disagreement about the pace and feasibility of methane mitigation. This variance is linked to the modelling limitations discussed earlier, including differences in marginal abatement cost curves and key structural assumptions across integrated assessment models.

The Rescuing 1.5°C scenario's methane trajectory differs from that of the AR6 c1a ensemble. Between 2020 and 2030, its methane emissions fall by 17%, compared to 33% in the AR6 c1a median. The Rescuing 1.5°C pathway shows a more gradual decline in methane emissions from 2020 to 2025 – far slower than the AR6 C1a ensemble's near-immediate drop – followed by a steeper decrease from 2025 onwards. Overall, it delays major mitigation by about 5–10 years compared to the C1a scenarios, reflecting the lack of meaningful methane reductions in recent years.

Yet even this shallower 2020–2025 decline is not fully consistent with observations. PRIMAP data indicate that methane emissions have continued to rise over this period rather than stabilising. This mismatch is driven by the energy sector, where the model assumes that methane abatement can be rolled out immediately from 2020 – unlike CO_2, which is constrained by existing infrastructure. By contrast, agriculture and waste methane are modelled to grow with population, GDP, and food demand in the near term, with mitigation phased in later in the decade. As a result, both sectors track the observed methane emissions rise more closely, and over 2020–2040, most of the reductions in the Rescuing 1.5°C pathway come from the energy sector, particularly from lower fossil fuel extraction, with more modest cuts in agriculture and waste.

Critically, while the Rescuing 1.5°C scenario's total methane reductions are numerically lower than the cuts shown in the AR6 pathways, this scenario is no less ambitious. Rather, higher-than-expected methane emissions today mean that the necessary reductions to get on track to a Paris-aligned pathway must occur faster and within a tighter timeframe. As such, while the Rescuing 1.5°C pathway starts relatively slower, it quickly accelerates to catch up with the AR6 pathways in 2035 and beyond.

Under current policies, global methane emissions are projected to flatten rather than fall this decade. The median of the current policy pathways reviewed for this analysis shows a flat trajectory between 2020 and 2030, leaving an 88 Mt CH_4 gap to the Global Methane Pledge in 2030 and a 49 to 97 Mt CH_4 gap to the Paris-aligned pathways.

By contrast, the UNEP Global Methane Status Report 2025 estimates that full implementation of existing national policies and pledged commitments could reduce global methane emissions by about 8% below 2020 levels by 2030, and that full deployment of all proven technical measures could deliver a 32% reduction by 2030, in line with the Global Methane Pledge.[19] However, the 8% figure should be interpreted as an optimistic upper bound on what current commitments might achieve, rather than a reflection of where current policies alone are heading.

Closing the gap between current trajectories and what is required under the Global Methane Pledge and Paris-aligned pathways would require both a rapid acceleration of the fossil fuel transition and a substantial scaling-up of dedicated methane abatement across sectors. The following sections explore the reductions required in the energy, waste, and agriculture sectors, as well as the mitigation options available to deliver them.

Sectoral methane pathways

Three sectors dominate global anthropogenic methane emissions: agriculture, energy, and waste. According to PRIMAP-hist v2.7(2025 release), agriculture accounts for around 50% of emissions, energy for about 30%, and waste for about 20%. This section examines how methane emissions from each of these sectors have evolved, how their current policy trajectories compare with Paris-aligned pathways, and which mitigation options can deliver the required reductions.

Energy

Historical trends

Global energy-related methane emissions have increased relative to 1990 levels, with fluctuations over time (Figure 3). From 1990 to 2011, all datasets in our analysis show an increase in emissions, followed by a stabilisation period between 2011 and 2022. In 2020, all datasets show a dip in emissions, likely because of the COVID-19 pandemic. In the years immediately after 2020, EDGAR and CEDS show emissions increasing again, while PRIMAP remains relatively flat. Our 2025 report provides a deep dive into these differences across datasets, including a detailed sector-level comparison.

According to PRIMAP, the energy sector accounted for approximately 30% of global anthropogenic methane emissions in 2024, making it the second-largest source of global methane emissions. On average across datasets, energy-sector methane emissions increased from 100 Mt CH_4 in 1990 to 118 Mt CH_4 in 2023,[20] driven largely by the expansion of oil and gas production and coal mining operations.[21]

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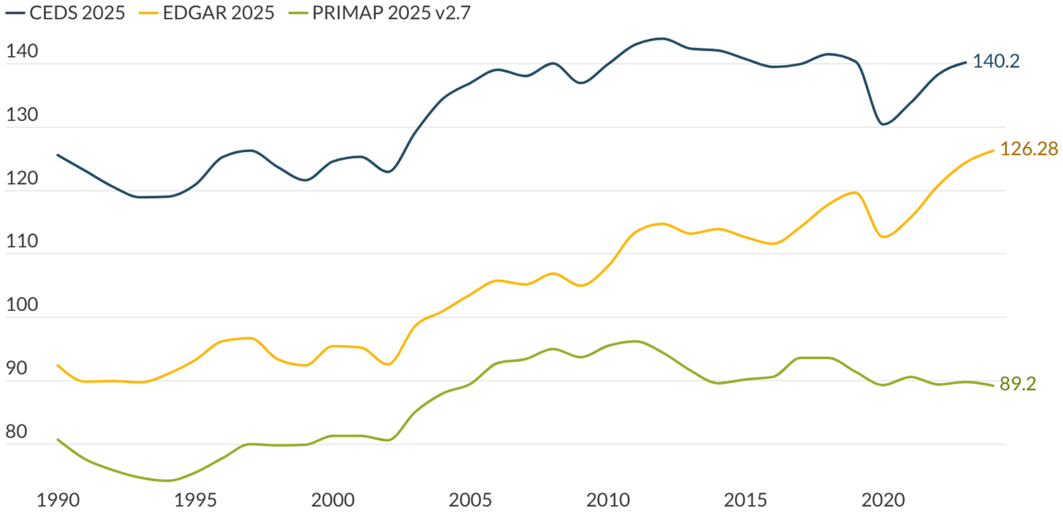
[19] United Nations Environment Programme, *Global Methane Status Report* (UNEP, 2025).
[20] Averages across PRIMAP, EDGAR, and CEDS are calculated for 2023 as CEDS has not yet published data for 2024.
[21] Zhuangzhou Qi and Rui Feng, 'Global Natural and Anthropogenic Methane Emissions with Approaches, Potentials, Economic Costs, and Social Benefits of Reductions: Review and Outlook', *Journal of Environmental Management* 373 (January 2025).

Figure 3: Historic trends in global methane emissions in the energy sector

Global CH_4 emissions from different datasets

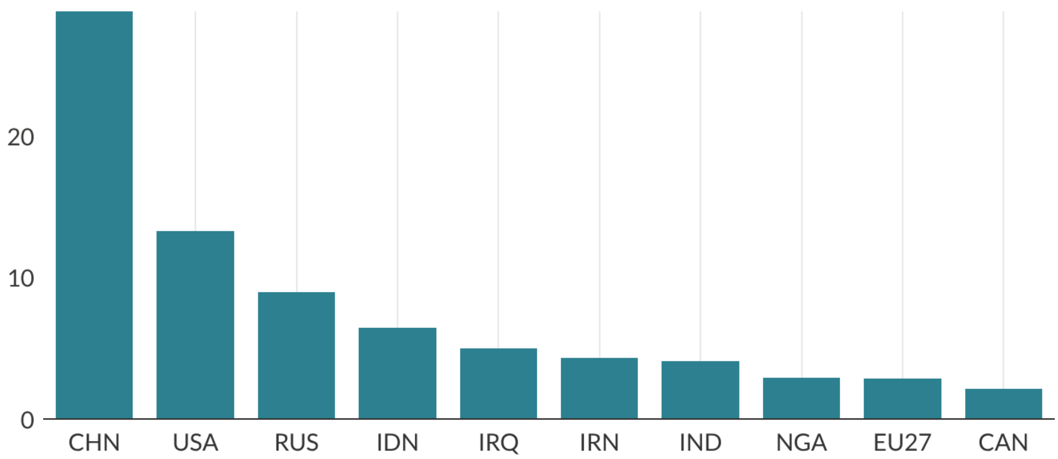


Annual global emissions of methane (CH_4), measured in megatons of CH_4.

The top 10 global emitters from the energy sector in 2023, based on the average of the PRIMAP, CEDS, and EDGAR datasets, are large fossil fuel producers, mostly in the northern hemisphere (Figure 4). China recorded the highest mean energy-sector emissions at 29 Mt CH_4, primarily driven by coal mining activities. The United States and Russia followed with average emissions of 13 Mt CH_4 and 9 Mt CH_4, respectively, mainly from oil and gas production and distribution. Other major emitters among the top 10 include Indonesia, Iraq, Iran, and India.

Figure 4: Average energy-related CH_4 emissions from the top 10 sector emitters in 2023

in Mt CH_4/yr



Emissions are the average across EDGAR, PRIMAP, and CEDS.

Energy sector pathways

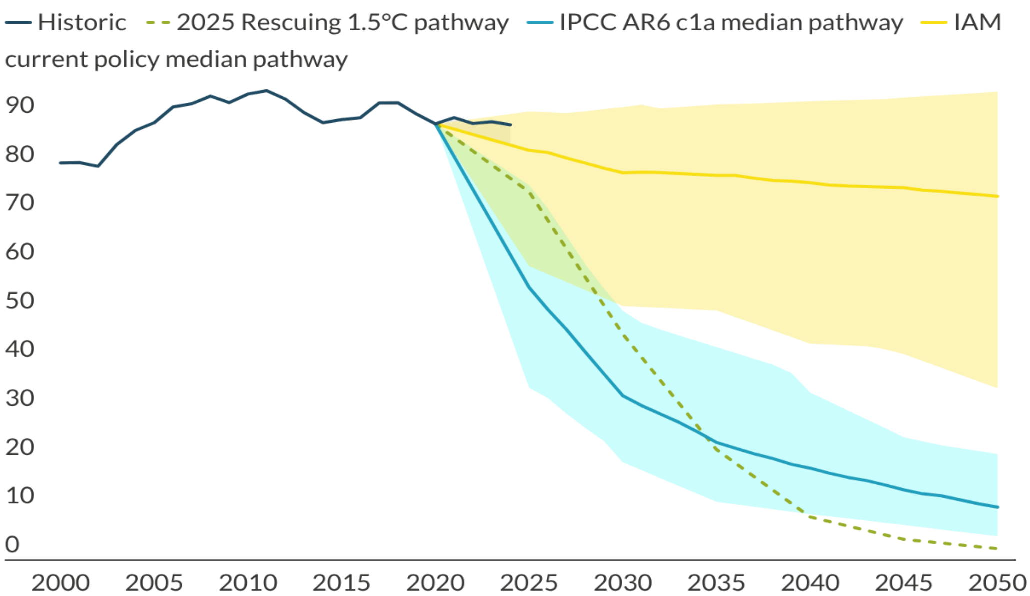
Across the AR6 C1a ensemble and the Rescuing 1.5°C scenario, the energy sector shows the fastest and deepest reduction in methane emissions of all source sectors, with a decrease of 48% (Rescuing 1.5°C) to 62% (AR6 median) between 2020 and 2030.

The two pathways diverge in the first half of the decade. The Rescuing 1.5°C trajectory shows a slower decline than the AR6 C1a median between 2020 and 2025, reflecting the fact that, although it does not fully follow observed trends, it was explicitly constructed using historical emissions up to 2020. As a result, it enters the 2025–2030 window from a higher starting point (~75 Mt CH_4/yr compared to ~56 Mt CH_4/yr for the AR6 median) and follows a shallower decline over the decade, though both pathways converge toward similar levels by 2035. Beyond 2035, the Rescuing 1.5°C trajectory crosses below the AR6 median, projecting deeper reductions in energy-sector methane emissions than the central AR6 C1a pathway through to 2040 (Figure 5)

Under current policies there is an 11% decline in energy sector methane emissions between 2020 and 2030, well short of the 48-62% reduction required for Paris-alignment, and insufficient to drive the deeper cuts needed to offset slower progress in agriculture and waste. The result is a 33 to 46 Mt gap above Paris-aligned pathways for the energy sector.

Figure 5: Energy

Mt CH_4/yr



Historic emissions are taken from PRIMAP-hist v2.7 (2025 release). The yellow shaded area represents the IAM current policy range (percentile 10-percentile 90). The blue fill area shows the range of IPCC AR6 C1a pathways (10th–90th percentile).

Table 2: Change in energy methane emissions compared to 2020 (%)

Year	2030	2035	2050
AR6 c1a median	−62	−73	−88
Rescuing 1.5°C	−48	−74	−97
Current policies	−11	−12	−17

In Paris-aligned pathways, the rapid decline of methane from the energy sector is driven above all by the phase-out of fossil fuel extraction. Both the AR6 ensemble and the Rescuing 1.5°C scenario treat this as the dominant mechanism: as coal, oil, and gas production contracts, fugitive methane emissions fall mechanically along the entire supply chain as a co-benefit of the broader energy transition.

In the Rescuing 1.5°C scenario this effect is made explicit. The lion's share of the methane reductions in the energy sector is attributed to the decline in fossil fuel extraction, with the remainder coming from dedicated abatement of emissions from the infrastructure that remains in operation. By 2030, about one-third of energy-sector methane reductions are due to the fossil fuel phase-out itself, rising to around three-quarters by 2040. This underscores the need for a strong push on dedicated methane mitigation in the near term, alongside a rapid phase-out of fossil fuels.

The International Energy Agency finds that roughly 70% of fossil fuel methane emissions can be abated with existing technologies, which suggests that the gap between current policies and Paris-aligned pathways in this sector is, to a large extent, a gap in policy implementation rather than in technical capability.[22]

Overall, these pathways show that deep cuts in energy-sector methane are both technically feasible and central to Paris-aligned trajectories. Yet emissions from the sector are still rising, and current policies remain far from delivering the pace and scale of change required.

Key mitigation options

Major sources of energy-related methane emissions include coal mining, oil and gas production, and fossil fuel distribution systems. Methane is released during and after coal extraction, and through venting, flaring, and leakage across oil and gas production, processing, transmission and distribution infrastructure.[23]

[22] IEA, *Global Methane Tracker 2025: Understanding Methane Emissions* (IEA, 2025).
[23] United Nations Environment Programme (UNEP) and Climate and Clean Air Coalition, *Global Methane Assessment: Benefits and Costs of Mitigating Methane Emissions*.

Phasing out fossil fuels is the fastest and most effective way to reduce methane emissions in the energy sector. However, targeted abatement will also be necessary in the meantime. Key measures that aim to reduce the methane intensity of existing infrastructure include leak detection and repair (LDAR), limiting or banning non-emergency venting and flaring, enhancing energy efficiency standards, upgrading aging equipment and pipelines, installing degasification and ventilation systems in coal mining operations, and retrofitting older power plants to use cleaner fuels or recover residual gas.

According to the IEA, about 30% of methane emissions from fossil fuel operations could be reduced at no cost. This is because the required capital and operating costs of abatement with existing technology are lower than the market value of the gas captured and sold or used. By applying currently available methane abatement technologies, total energy sector emissions would decrease by almost 70% (100 Mt). The IEA further estimates that if additional policies that require precise emissions data such as emissions pricing, financing instruments and performance standards were also adopted globally, methane emissions from oil and gas could be cut by more than 75%.[24]

The IEA notes that significant fossil gas resources are currently being produced, but ultimately fail to reach consumers due to venting, flaring, and leaks across the supply chain.[25] They estimate that global mitigation efforts to eliminate non-emergency flaring could save 100 billion cubic metres of fossil gas annually, nearly matching the annual flow of fossil gas through the Strait of Hormuz in 2025.[26]

Recent policy developments illustrate how these mitigation measures can be operationalised in the energy sector. The EU Methane Regulation, which entered into force in 2024, requires operators in the oil, gas, and coal industries to apply high standards for measuring and reporting emissions, as well as adopt practices to reduce emissions through enhanced leak detection and repair (LDAR) and limiting venting and flaring.[27] Our recent report on methane import standards found that adopting a 0.2% methane intensity standard in the EU could reduce emissions by more than 3 Mt CH_4 annually from imports alone.[28] The wider adoption of such a standard by six other major importers including the US, Russia, and China, could cut global emissions by over 10 Mt CH_4 annually.

These examples demonstrate that many of the most impactful energy sector methane abatement options are already available, cost-effective, and governed by policy tools that can be rapidly scaled and replicated across other countries.

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[24] IEA, *Global Methane Tracker 2026* (International Energy Agency, 2026).
[25] Ibid.
[26] Ibid.
[27] European Commission, *Methane Emissions* (European Commission, n.d.).
[28] Climate Analytics, *How Import Rules Can Cut Global Methane Emissions* (Climate Analytics, 2026).

Waste

Historical trends

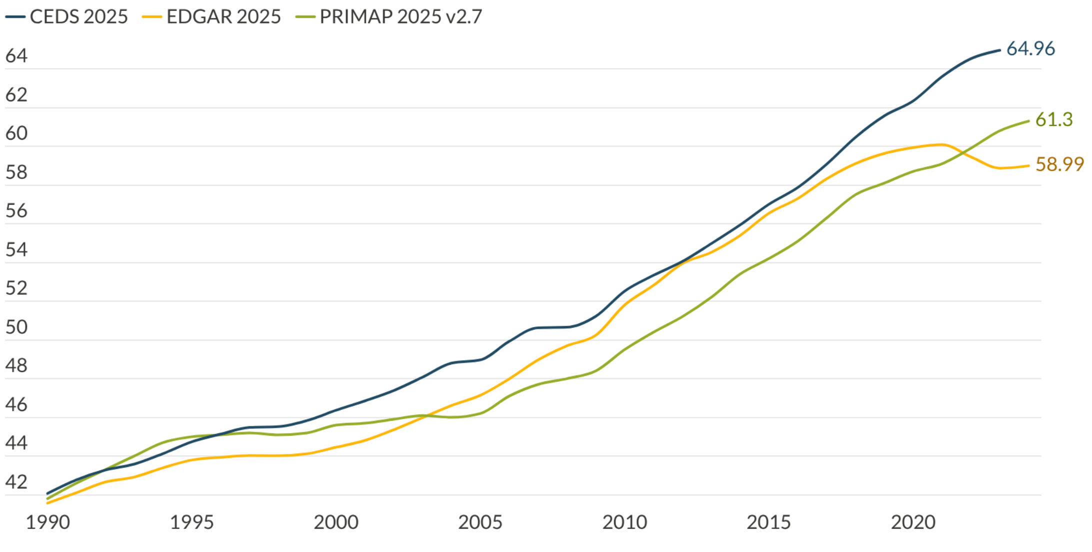
Methane emissions from the waste sector have also been rising over time, reaching an average of 65 Mt CH_4 in 2023, compared to 42 Mt CH_4 in 1990 across our three data sets – PRIMAP, EDGAR, and CEDS.[29]

Since 1990, methane emissions from the waste sector have increased by 47%, driven by rising global consumption, population growth, and urbanisation. As economies expand and demand for goods increases, so too does the generation of organic waste which has led to a corresponding increase in waste generation. This trend is expected to continue into the future, with emissions from solid waste and wastewater projected to continue to rise between 2020 and 2030, driven by growth in population and economic development.[30]

According to PRIMAP, the waste sector accounted for 20% of global anthropogenic methane emissions in 2024. Although its share is smaller than those of the agriculture and energy sectors, it offers substantial, cost-effective mitigation opportunities through measures such as landfill gas capture and improved organic waste management.

Figure 6: Historic trends in global methane emissions in the waste sector

Global CH_4 emissions from from different datasets



Annual global emissions of methane (CH_4), measured in megatons of CH_4.

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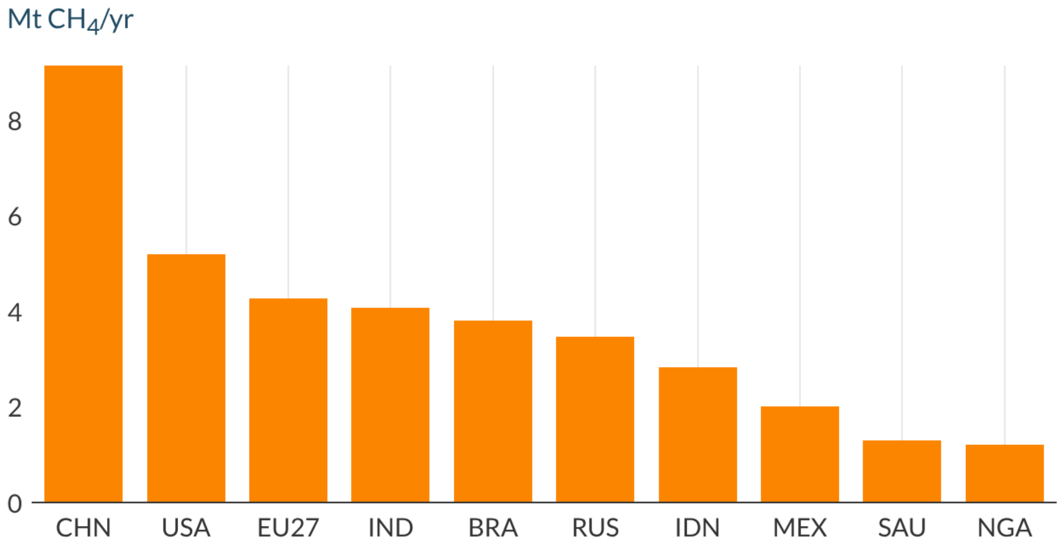
[29] For an in-depth, sector-level comparison of differences across these datasets, including at the sector level, see Climate Analytics. *Clearing the air on methane: A global review of emissions, ambition and the policy landscape* (Climate Analytics, 2025); available at https://climateanalytics.org/publications/clearing-the-air-on-methane-a-global-review-of-emissions-ambition-and-the-policy-landscape

[30] United Nations Environment Programme and Climate and Clean Air Coalition, *Global Methane Assessment: 2030 Baseline Report* (United Nations Environment Programme, Climate and Clean Air Coalition, 2022).

Top emitters of waste-sector methane are also concentrated in a handful of countries. China stands out, accounting for 15% of global methane emissions from the waste sector, followed by the US, EU, India, Brazil and Russia, each contributing between 4% and 8% of global waste methane emissions. These are followed by Indonesia, Mexico, Saudi Arabia and Nigeria as shown in Figure 7.

Figure 7: Average waste-related CH_4 emissions from the top 10 sector emitters in 2023



Emissions are the average across EDGAR, PRIMAP, and CEDS.

Waste sector pathways

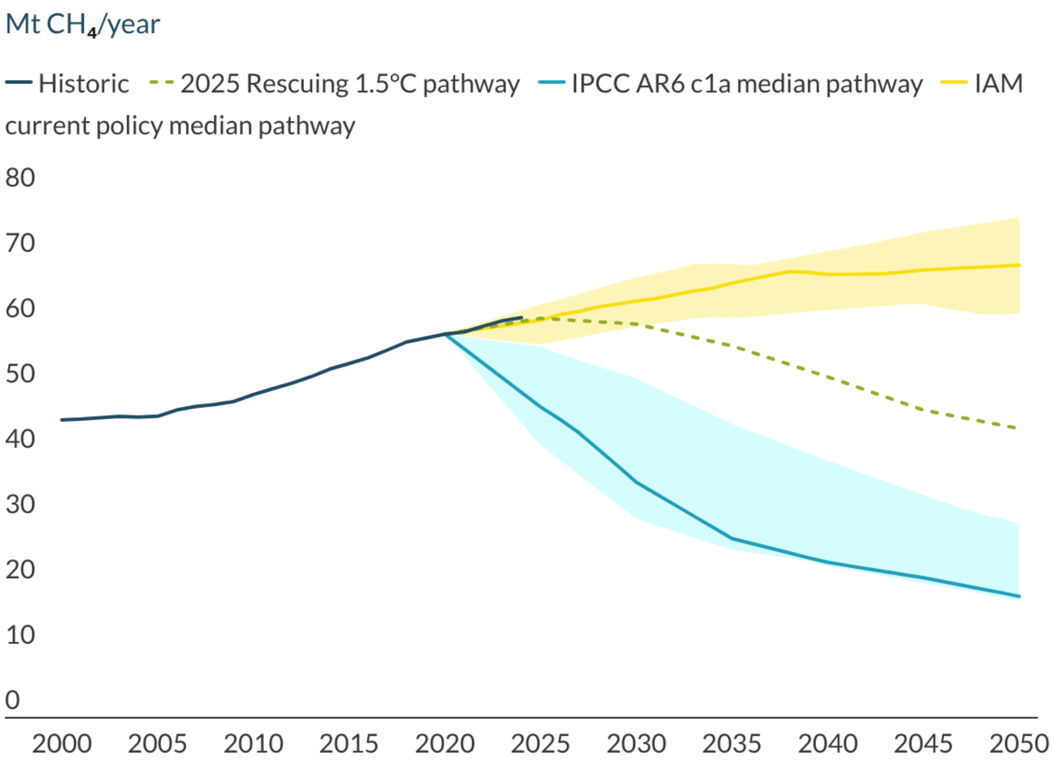
In the waste sector, Paris-aligned pathways show smaller emissions reductions than in energy – both in the AR6 C1a ensemble and, even more clearly, in the Rescuing 1.5°C scenario, where emissions rise slightly until around 2025 before plateauing. As a result, the AR6 C1a ensemble and Rescuing 1.5°C diverge in the near term.

The AR6 median trajectory declines steadily after 2020, reaching approximately 36 Mt CH_4 in 2030 – a 39% reduction from 2020 levels. By contrast, the Rescuing 1.5°C pathway follows observed historical emissions, which continue to increase modestly between 2020 and 2025 before levelling off, leading to projected waste sector emissions of around 60 Mt CH_4/yr in 2030, essentially unchanged from 2020.

This produces the largest relative gap between the two pathways of any sector, with the Rescuing 1.5°C trajectory lying at or above the upper edge of the AR6 10–90th percentile envelope through 2030. After 2030, emissions in Rescuing 1.5°C decline but remain well above the AR6 median. This divergence reflects different modelling assumptions. AR6 C1a scenarios assume immediate mitigation action from 2020, whereas in Rescuing 1.5°C both waste and agricultural methane are driven by a population- and GDP-calibrated function. This function continues to push emissions upward in the near term as global development outpaces abatement deployment, with marginal abatement cost curve-based mitigation only taking effect later in the decade. As a result, the waste pathway presented here should be interpreted as a macro-driven model response rather than an explicit roll-out of waste management policies and infrastructure.

Under current policies, this lag is more pronounced. In the absence of binding waste methane targets in most major emitting countries, the structural drivers of rising emissions, namely urbanisation and consumption growth concentrated in Asia, Africa, and Latin America, continue to dominate. Global waste sector methane emissions are projected to follow a similar rising trend to recent historical data, increasing by 9% between 2020 and 2030 – from 59 Mt CH_4 to 64 Mt CH_4. From current levels in 2024, this corresponds to a 4% increase. By 2030, this leaves emissions under current policies at around 4 Mt CH_4 above the Rescuing 1.5°C trajectory and roughly 28 Mt CH_4 above the AR6 C1a median.

Figure 8: Waste



Historic emissions are taken from PRIMAP-hist v2.7 (2025 release). The yellow shaded area represents the IAM current policy range (percentile 10-percentile 90). The blue fill area shows the range of IPCC AR6 C1a pathways (10th–90th percentile).

Table 3: Change in waste methane emissions compared to 2020 (%)

Year	2030	2035	2050
AR6 c1a median	−39	−53	−68
Rescuing 1.5°C	3	−3	−25
Current policies	9	13	18

Key mitigation options

Waste sector emissions continue to rise, making it the sector furthest from its Paris-aligned pathway by mid-century. This widening gap between Paris-aligned pathways and current policies underlines how urgently waste sector mitigation needs to ramp up if it is to contribute its share to global methane reductions.

The primary sources of waste-related methane emissions are the decomposition of organic material under anaerobic conditions in solid waste disposal sites, landfills, and wastewater treatment and discharge systems, along with the open burning of waste.[31] In particular, unmanaged dumpsites, open landfills, and poorly controlled wastewater systems create conditions in which methane is released directly into the atmosphere as organic waste breaks down. This is particularly relevant for low- and middle-income countries in the Global South, where around 90% of wastewater is estimated to be discharged without adequate treatment.[32] This lack of centralized wastewater treatment systems and reliance on open sewers, direct discharge, and septic systems makes it difficult to produce accurate inventories of methane emissions.

One of the simplest ways to begin reducing methane emissions from the waste sector is to adopt policies that reduce, reuse, or divert the total amount of waste generated. Organic waste can be reduced at the point of generation through enhanced producer responsibility measures, processed to produce biogas for energy or reused as fertiliser for growing crops, or diverted from open dumping sites into covered landfills where the methane emitted from their decay can be captured or broken down. This type of mitigation offers a powerful and effective way to reduce methane emissions because these methods can be deployed at different points across the existing waste cycle. The EU's Waste Framework Directive is one example, laying out key principles for waste

[31] Climate and Clean Air Coalition, *Waste Sector Solutions: Actions for Climate, Public Health, Clean Air and Achieving the Sustainable Development Goals* (Climate and Clean Air Coalition, n.d.).
[32] Climate and Clean Air Coalition, *Methane Emission Mitigation in the Wastewater Sector* (Climate and Clean Air Coalition, n.d.).

management such as "polluter-pays" and extended producer responsibility (EPR), and requiring Member States to comply with food waste reduction targets.[33]

Where waste can be intercepted before disposal, biochemical processes like anaerobic digestion can be used to convert organic material into useful biogas and digestate, capturing methane as a source of energy rather than allowing it to escape as emissions.[34] For organic waste that does reach landfills, the priority shifts to capturing the methane emissions produced during natural decomposition. Landfill gas collection systems use networks of wells and pipes built into or beneath waste deposits to siphon off methane gas before it escapes into the atmosphere. The captured biogas can then be used to generate electricity or heat on-site or be injected into natural gas grids to bolster supply. The US EPA's Landfill Methane Outreach Program (LMOP), established in 1994, provides technical assistance and partnership with hundreds of landfill gas energy projects across America, collectively avoiding more than 700 Mt CO_2e since the program began and nearly 26 Mt CO_2e in 2023 alone.[35]

In areas of the Global South where waste is primarily disposed through open dumping or burning, landfill gas capture may not be possible from the outset. While it may be possible for countries or specific municipalities to receive international financing to convert these unmanaged dumping sites into centralized waste plants with covered landfills and gas capture, it has historically been difficult for low- and middle-income countries to secure this kind of financial support, especially when the waste sector represented just 1% of global climate finance in 2023.[36]

Where centralized treatment of waste is not possible, effective mitigation should focus on reducing the total volume of waste generated and diverting as much as possible of what remains away from dump sites. Several types of composting are well-suited for diversion on a smaller scale, whether vermicomposting which uses earthworms to turn organic waste into fertilizer or Black Soldier Fly composting which uses insect larvae to consume organic scraps and produce high-quality animal feed.[37, 38] It may also be possible to establish anaerobic digestion for municipal use, although the feasibility varies with the size of the bioreactor and the waste volume it is expected to process.

Liquid waste presents a distinct but equally significant challenge. When organic material in wastewater is broken down under anaerobic conditions, as occurs normally via

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[33] European Commission, *Waste Framework Directive* (European Commission, n.d.).
[34] United States Environmental Protection Agency, *How Does Anaerobic Digestion Work?* (United States Environmental Protection Agency, 2025).
[35] United States Environmental Protection Agency, *Accomplishments of the Landfill Methane Outreach Program* (United States Environmental Protection Agency, 2026).
[36] Climate Bonds Initiative and Global Methane Hub, *Webinar: Methane Abatement and Finance Challenges in the Waste Sector*, 2025.
[37] Rick Carr, *Vermicomposting for Beginners* (Rodale Institute, 2016).
[38] Rosannette Quesada H., *The Composter Fly: A Composting Fly Could Significantly Reduce Organic Waste in Panama* (Smithsonian Tropical Research Institute, 2025).

microorganisms in sewage collection, treatment lagoons, and wastewater sludge plants, methane is often released without capture. The main mitigation response is to manage this process under controlled conditions through anaerobic digestion of methane-rich sewage sludge, recovering the biogas produced rather than venting it.[39, 40] This biogas can then be used to power the facility itself or to generate heat and electricity for surrounding communities, while the residual sludge can be dried and subsequently reused as fertilizer.

These mitigation options span the entire waste chain – from waste prevention and diversion to capture and utilisation in landfills and wastewater systems – and are already being implemented through existing technologies and policies, demonstrating that deeper methane cuts in the waste sector are achievable. However, their impact is constrained by growing waste volumes driven by population and urbanisation trends, alongside inadequate infrastructure and limited finance, a challenge further hampered by the World Bank abandoning its pledge to devote 45% of its annual lending resources to projects with climate co-benefits.[41]

Agriculture

Historical trends

Agriculture is the single largest source of global methane emissions and a growing driver of overall methane trends. Figure 9 illustrates the steady increase in methane emissions from the agriculture sector between 1990 and 2023 across all three datasets (PRIMAP, EDGAR, CEDS) with agriculture accounting for 50% of global methane emissions in 2023.

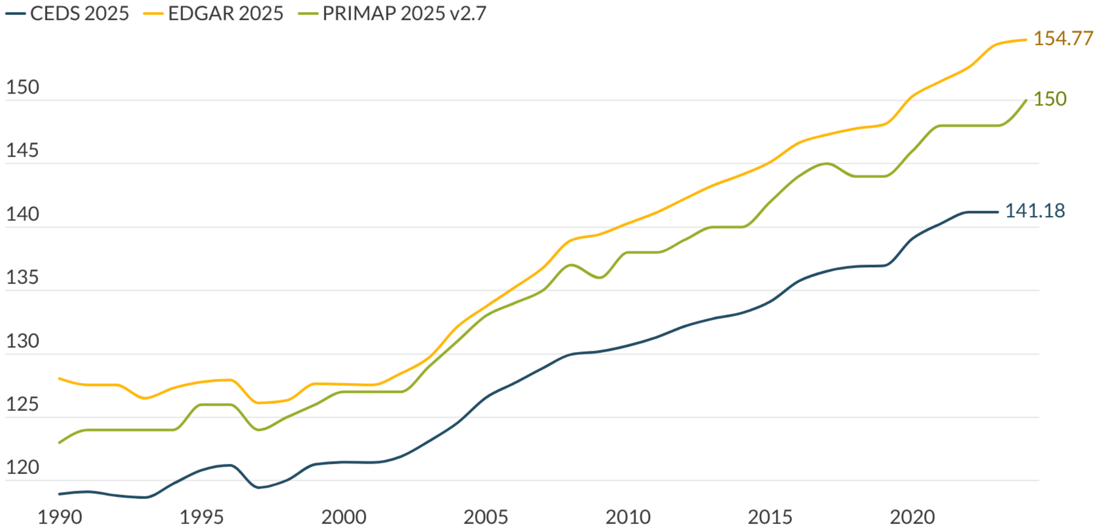
Despite some differences in absolute levels, emissions trends are very similar across the datasets.[42] In 1990, average methane emissions were estimated at 123 Mt CH_4, reflecting lower agricultural activity compared to 2023, where average emissions reached 148 Mt CH_4. Growth is particularly pronounced from the early 2000s onwards. This increase over time is driven by population growth, rising food demand, and the intensification of agricultural practice.

[39] United States Environmental Protection Agency, *How Does Anaerobic Digestion Work?*.
[40] Lise Appels et al., 'Principles and Potential of the Anaerobic Digestion of Waste-Activated Sludge', *Progress in Energy and Combustion Science* 34, no. 6 (2008): 755–81.
[41] David Lawder, *World Bank to Abandon Goal to Devote 45% of Lending Resources to Climate Change Projects* (Reuters, 2026).
[42] For an in-depth, sector-level comparison of differences across these datasets, including at the sector level, seeClimate Analytics. *Clearing the air on methane: A global review of emissions, ambition and the policy landscape* (Climate Analytics, 2025); available at https://climateanalytics.org/publications/clearing-the-air-on-methane-a-global-review-of-emissions-ambition-and-the-policy-landscape

These trends underscore agriculture's growing and increasingly entrenched contribution to global methane emissions, highlighting the urgency of scaling up mitigation options in this sector while also addressing underlying food demand and production patterns.

Figure 9: Historic trends in global methane emissions in the agriculture sector

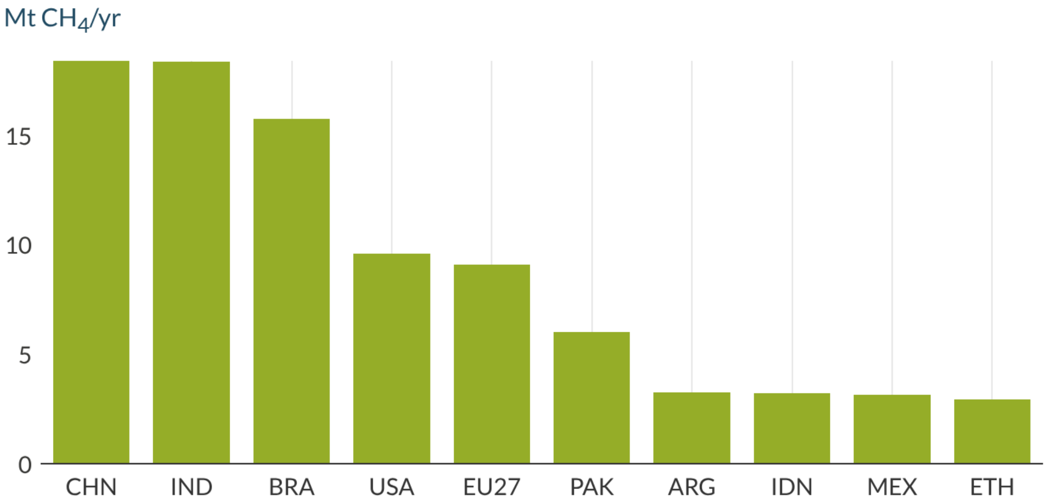
Global CH_4 emissions from different datasets



Annual global emissions of methane (CH_4), measured in megatons of CH_4.

Agricultural methane emissions are particularly concentrated in Asian countries, notably China (18 Mt CH_4) and India (18 Mt CH_4), mainly due to livestock. High emissions are also observed in Latin America, especially in Brazil (16 Mt CH_4), where livestock farming is the primary source of emissions. The USA, European Union, Pakistan, Indonesia, Argentina, Mexico and Ethiopia are also among the largest contributors, with these ten jurisdictions collectively accounting for 60% of global agriculture-related methane emissions in 2023 as shown in Figure 10.

Figure 10: Average agriculture-related CH_4 emissions from the top 10 sector emitters in 2023



Emissions are the average across EDGAR, PRIMAP, and CEDS.

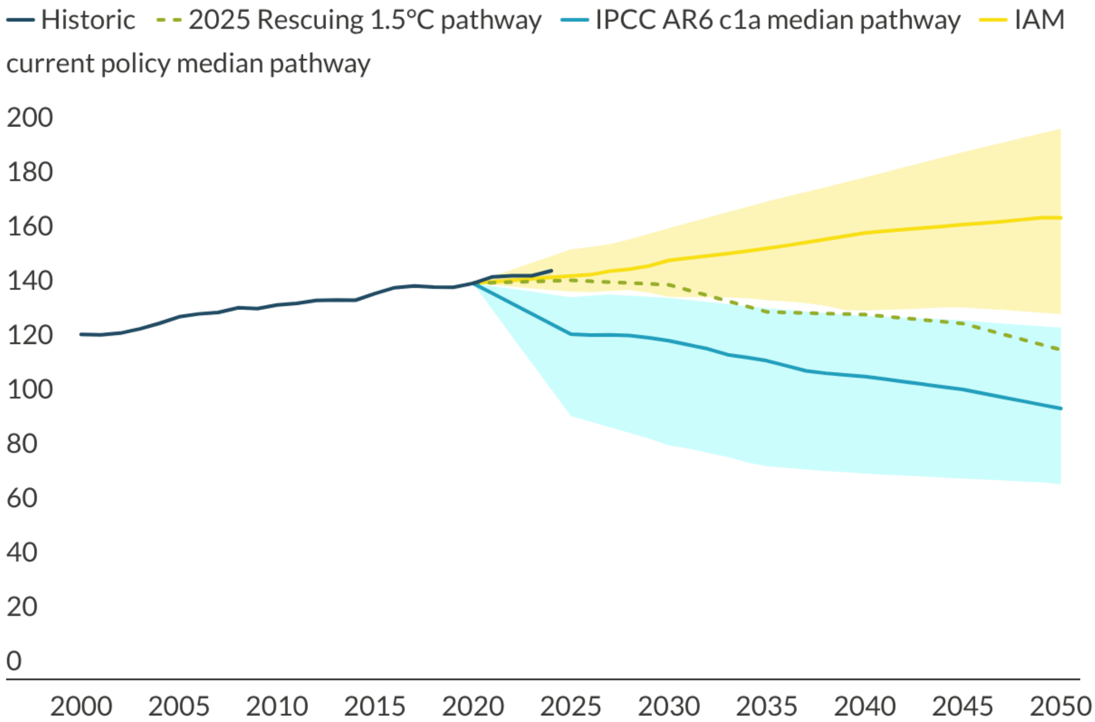
These historical patterns illustrate that agricultural methane is both structurally embedded in global food systems and geographically concentrated, which has important implications for where and how mitigation efforts are prioritised.

Agriculture sector pathways

Agricultural methane in Paris-aligned pathways shows only modest near-term declines and notable inter-model uncertainty. In the agriculture sector, both the AR6 C1a ensemble and the Rescuing 1.5°C scenario show only modest reductions in methane emissions (Figure 11). The AR6 median trajectory declines from 146 Mt CH_4 in 2020 to 127 Mt CH_4 in 2025, after which emissions continue to fall but at a slower pace towards mid-century. By contrast, the Rescuing 1.5°C scenario projects a near-flat trajectory, decreasing by only 0.4% between 2020 and 2030. The wide AR6 envelope at 2030, ranging from a 4% to 41% reduction, reflects genuine scientific disagreement about the pace at which dietary change, food demand shifts, and land-use transformation can occur.

Figure 11: Agriculture

Mt CH_4/yr



Historic emissions are taken from PRIMAP-hist v2.7 (2025 release). The yellow shaded area represents the IAM current policy range (percentile 10-percentile 90). The blue fill area shows the range of IPCC AR6 C1a pathways (10th–90th percentile).

Table 4: Change in agricultural methane emissions compared to 2020 (%)

Year	2030	2035	2050
AR6 c1a median	−15	−20	−32
Rescuing 1.5°C	−0	−7	−17
Current policies	6	9	17

Under current policies, agricultural methane emissions are projected to increase by 6% between 2020 and 2030 from 146 Mt CH_4 to 154 Mt CH_4, and rise steadily thereafter. Closing the gap to Paris-aligned levels therefore requires not only reversing recent growth, but doing so against structural pressures of rising food demand that have driven emissions upward for decades.

Key mitigation options

The majority of agricultural methane emissions globally come from two main sources: raising livestock and rice farming.[43] Targeted abatement generally aims to increase the efficiency of existing operations and reduce their methane footprint without decreasing overall productivity. Alongside on-farm mitigation measures, changes in dietary patterns – particularly reducing the consumption of meat and dairy and shifting towards more plant-based diets – can also significantly reduce agricultural methane emissions by lowering demand for methane-intensive products.

In ruminants like cattle, sheep, and goats, methane is emitted naturally during the digestive process through enteric fermentation, as well as by the decomposition of manure from management and storage systems.[44] Methane abatement seeks to manage the inputs, lifecycle, and outputs of livestock through measures like feed enhancement, efficient herding, and manure management. Integrated systems for managing cattle herds like silvopastoral and crop-livestock-forestry models seek to enhance livestock diets through forage grazing, make more efficient use of manure as fertilizer, and improve cattle digestion through increased shade, thereby reducing herd methane emissions from multiple sources.[45, 46, 47] More advanced technologies like genetic selection or trait engineering aim to produce new generations of livestock with lower emission profiles than their predecessors, lowering the herd's methane footprint over time.[48] Other technologies include feed additives, which are already commercially available, and have been shown to reduce enteric methane emissions by about 30%, with some showing reductions of up to 90%.[49]

During the cultivation of rice plants, the decomposition of organic material in flooded paddies fuels a biochemical process called methanogenesis, where microorganisms digest elements within the soil and produce methane as a byproduct.[50] Because this process occurs naturally in the oxygen-deprived, flooded conditions of rice paddies, effective mitigation seeks to introduce oxygen to the soil through techniques like

[43] Hanna Ritchie et al., *Breakdown of Carbon Dioxide, Methane, and Nitrous Oxide Emissions by Sector* (Our World in Data, 2020).
[44] United States Environmental Protection Agency, *Agriculture Sector Emissions* (United States Environmental Protection Agency, 2026).
[45] H. McDonald et al., *Carbon Farming - Making Agriculture Fit for 2030* (Study for the committee on Environment, Public Health and Food Safety (ENVI), Policy Department for Economic, Scientific and Quality of Life Policies, 2021).
[46] German Environment Agency, *Silvopastoral Agroforestry* (German Environment Agency, 2022).
[47] Gustavo Flores-Coello et al., 'Intensive Silvopastoral Systems Mitigate Enteric Methane Emissions from Cattle', *Atmosphere* 14, no. 5 (2023).
[48] Yuchao Zhao et al., 'Leveraging Gene Editing to Combat Methane Emissions in Ruminant Agriculture', *Trends in Biotechnology* 43, no. 11 (Trends in Biotechnology): 2771–85.
[49] Swati Hegde, *Cutting Cattle Methane through Feed Additives: Lessons from Early Adoption and the Road Ahead* (World Resources Institute, 2025).
[50] IPCC, *CH4 Emissions from Rice Agriculture* (IPCC, 2001).

alternative wetting and drying (AWD), direct seeded rice (DSR), and residue management, thereby reducing the methane produced during the crop cycle.[51, 52]

Conclusion

Significant emissions reductions will be required across all three sectors to close the gap between current policies and Paris-aligned pathways. In the energy sector in particular, deep and rapid reductions are needed, with a decrease of 48% to 62% required between 2020 and 2030. In the waste and agriculture sectors, while the pace of required reductions is comparatively slower, current trajectories remain well off track. For each sector, the mitigation options, technologies and policies described above already exist. Delivering steep emissions reductions therefore requires deploying and adopting them at scale.

3.3 National methane pathways

In this study, we examined nine countries and the European Union to assess how their current policy pathways compare with Paris-aligned methane trajectories. Annex A provides a more detailed discussion for each of these ten jurisdictions.

Of these ten jurisdictions, only three – the United Kingdom, Canada, and the European Union – have current policy pathways that broadly align with Paris-aligned trajectories (Table 5). Canada, the European Union, and the United Kingdom are established leaders in methane mitigation, having been early adopters for ambitious methane policies and among the first signatories to the Global Methane Pledge. All three are projected to arrive at Paris-aligned emissions levels by 2030 under current policies. However, they are just barely on track, underscoring that full and effective implementation of current policies is essential to deliver this level of emissions reductions in practice.

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[51] The European Space Agency, *Rice Methane Emissions Reduction* (The European Space Agency, n.d.).

[52] Climate and Clean Air Coalition, *Cutting Methane and Boosting Rice with Farmer Data* (Climate and Clean Air Coalition, 2026).

Table 5: Methane reduction progress and gaps under current policies

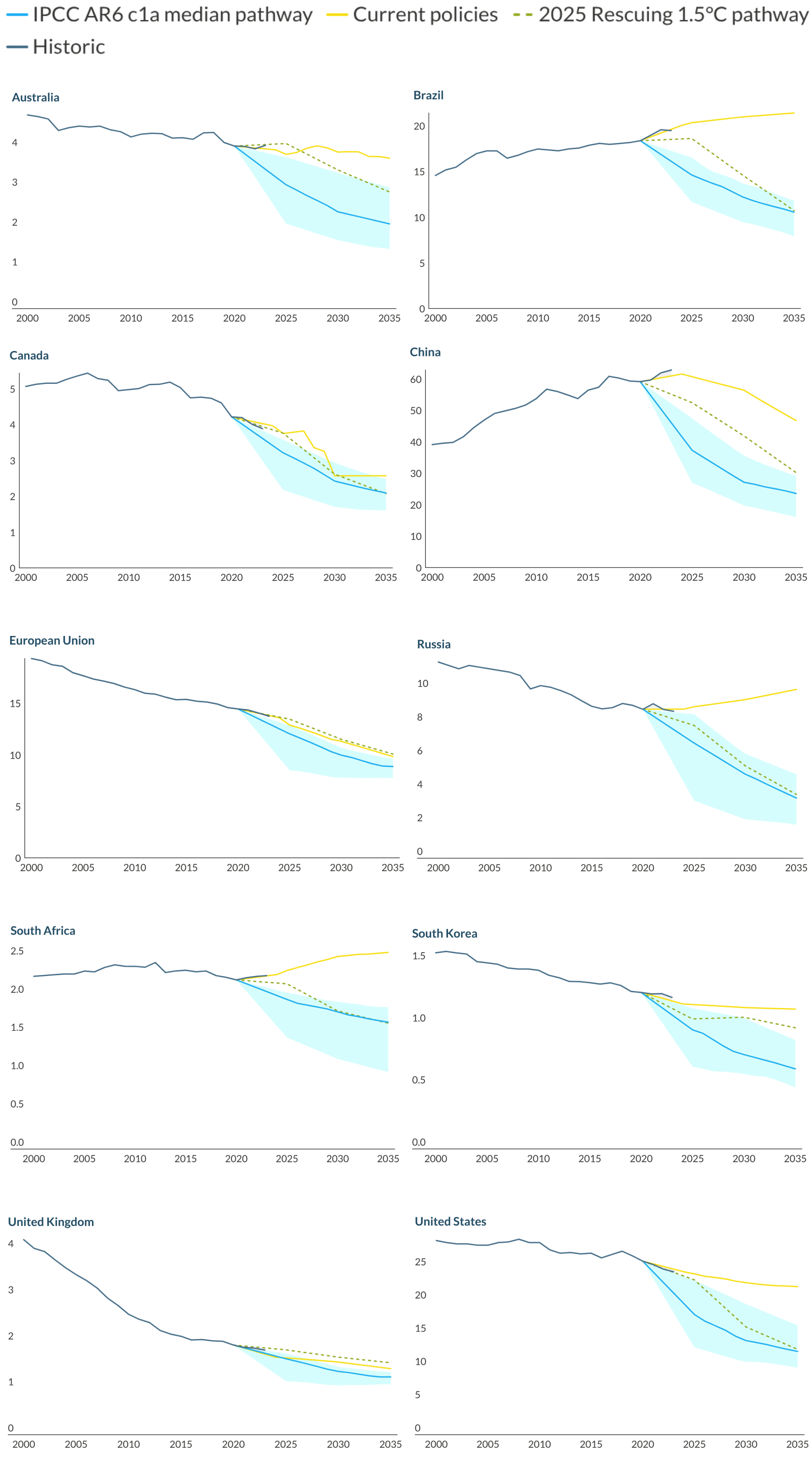
Jurisdiction	Change in methane under current policies, 2020-2030	Paris-aligned methane reductions, 2020-2030	2030 emissions gap ($MtCH_4$)	Status
Australia	-4%	15 - 40%	0.5 - 1.5	Off track
Brazil	14%	21 - 34%	6.4 - 8.8	Off track
Canada	-39%	38 - 43%	0.0 - 0.1	Barely on track
China	-5%	29 - 54%	14.5 - 39.2	Off track
European Union	-22%	20 - 31%	-0.2 - 1.4	Barely on track
Russia	6%	38 - 44%	3.9 - 4.4	Off track
South Africa	14%	18 - 19%	0.7	Off track
South Korea	-10%	16 - 40%	0.1 - 0.4	Off track
United Kingdom	-19%	14 - 29%	-0.1 - 0.2	Barely on track
United States of America	-12%	44 - 51%	6.7 - 8.7	Off track

Under current policies, China and the United States show the greatest divergence from a Paris-aligned pathway among the countries in our study. China's gap is greatest, emitting 29 Mt CH_4/yr more in 2030 than the AR6 1.5°C median pathway and 15 Mt CH_4/yr more than the Rescuing 1.5°C scenario. The United States diverges by 9 Mt CH_4/yr more in 2030 than the AR6 1.5°C median pathway, and by 7 Mt CH_4/yr from its Rescuing 1.5°C scenario.

Australia, Brazil, Russia, and South Africa are also off track from their Paris-aligned methane pathways, but the scale of divergence is smaller than that of China and the United States. Brazil and Russia each exceed the AR6 1.5°C median by around 9 and 4 Mt CH_4/yr respectively by 2030, reflecting continued reliance on high-emitting livestock systems in Brazil and fossil fuel production in Russia. South Africa and Australia both have smaller gaps of 1 and 2 Mt CH_4/yr respectively by 2030.

The fact that China, Russia, the United States, and Brazil – four of the five largest global methane emitters, alongside India – are far off track from their Paris-aligned pathways according to our analysis, is especially concerning. These countries account for an average of 36% of global methane emissions according to major independent datasets (CEDS, PRIMAP, and EDGAR). Due to these countries' large contributions to global methane emissions, the scale and speed of their reductions (or lack thereof) will have outsized consequences for global progress. Overall, their trajectories reveal a concerning gap between current policies and Paris-aligned methane pathways, underscoring the urgent need to raise ambition and accelerate methane mitigation across all sectors this decade.

Figure 12: Current policy methane trajectories compared to Paris-aligned pathways for 10 case study jurisdictions (Mt CH_4/yr



4. Conclusion

Rapid methane mitigation is critical to limiting temperature overshoot and setting the world on a path back to well below 1.5°C by 2100. Because methane is a potent but short-lived greenhouse gas, rapid reductions can help slow the rate of warming, reduce both the magnitude and duration of overshoot, and contribute to long-term temperature decline. As average global temperatures approach 1.5°C above pre-industrial levels, understanding how far and how fast methane emissions must fall has therefore become an increasingly urgent research question and policy priority.

This report identifies and assesses up-to-date global, sectoral, and national methane pathways, clarifying the ambition required for alignment with the Paris Agreement and the Global Methane Pledge. It quantifies the gaps between current policies and these international goals and highlights where action is most urgently needed. In doing so, it provides a basis for governments, funders, advocacy organizations, researchers, and other decision-makers to recalibrate their methane strategies, accelerate the fossil fuel transition and scale up dedicated abatement in energy, agriculture, and waste.

Key findings

In summary, our analysis finds:

- To get on path with Paris-aligned pathways, global methane emissions must decline by between 17% and 33% between 2020 and 2030. Under current policies, emissions remain relatively flat, leaving an implementation gap of between 49 and 97 Mt CH_4 in 2030 above Paris-aligned pathways. The world is also not on track to meet the Global Methane Pledge's collective goal to reduce methane emissions by 30% between 2020 and 2030.
- The energy sector offers the largest and fastest potential for methane reductions, with Paris-aligned pathways showing declines of between 48% and 62% between 2020 and 2030. While current policy pathways show the sector's emissions curve bending this decade (11% reduction), this still leaves a significant implementation gap of between 33 and 46 Mt CH_4 in 2030.
- A rapid, managed phase-out of fossil fuels is the primary driver of sustained and deep cuts, complemented by targeted mitigation measures such as leak detection and repair, ending routine venting and flaring, and upgrading equipment and infrastructure along the supply chain to minimise fugitive emissions.
- The methane gap in the agriculture sector is large and persistent, reflecting structural challenges and slower policy uptake than in the energy sector. Paris-aligned pathways diverge significantly, with the new Rescuing 1.5°C scenario showing a 0.4% decrease between 2020 and 2030, compared to a 15% decline

reported in the AR6 C1a median trajectory. Under current policies, agriculture methane emissions are projected to continue rising, by 6% between 2020 and 2030, widening the gap to Paris-aligned pathways to between 9 and 30 Mt CH_4 in 2030.

- Methane emissions from the waste sector have risen over time and, under current policies, are projected to continue increasing (by 9% between 2020 and 2030), further widening the gap to Paris-aligned pathways.
- At the national level, only a small number of jurisdictions in our study are on track to their Paris-aligned methane pathways under current policies. Most, including several of the largest emitters, remain far off track. Because these lagging countries account for a large share of global methane emissions, whether and how quickly they close their national methane gaps will have a massive impact on global progress.

Recommendations

Global action: align governance, cooperation, and technology to close the methane gap

1. *Better integrate methane into global climate governance*

   While methane is reported in national inventories and included in aggregate greenhouse gas reduction targets, it is often treated as peripheral in practice, with a significant share of action pursued through separate voluntary initiatives rather than as part of core national mitigation strategies.

   Given methane's critical role in limiting near-term warming, it should be more systematically integrated into UNFCCC processes so that reductions are planned, supported, and tracked alongside carbon dioxide, rather than treated as a parallel agenda. Within the architecture of the Paris Agreement, this could mean formally embedding methane into the core NDC structure (including through separate methane targets), ensuring that BTR reporting and related transparency guidance track progress on methane, and reflecting methane outcomes in the Secretariat's synthesis reports on collective progress. The second global stocktake and its follow-up decisions can be used to identify Paris-aligned benchmarks for 2030 and 2035 and highlight the methane gap, while the mitigation work programme can assess methane progress and policy gaps in key sectors.

2. *Strengthen sector alliances and cooperation.*

   Governments and industry should build on existing methane alliances across the energy, agriculture, and waste sectors to leverage them as testing grounds for shared methane reduction standards and the exchange of best practices. Over time, the experience gained could then inform national regulations, trade rules, and financing decisions.

In the oil and gas sector, initiatives such as the Oil and Gas Decarbonization Charter, the Oil and Gas Climate Initiative, and the Oil and Gas Methane Partnership 2.0, already bring together companies representing a large share of global production to set methane-reduction goals and improve reporting.[53, 54] In agriculture, platforms such as the FEFAC Feed Sustainability Charter and the Sustainable Agriculture Initiative (including the European Roundtable for Beef Sustainability) coordinate large feed and livestock companies on lowering emissions intensity.[55, 56] In the waste sector, the Lowering Organic Waste Methane (LOW-Methane) Initiative targets methane emissions generated by the waste sector by collecting emissions data and identifying methane-reducing practices in this sector.[57]

3. *Scale finance, technology, and capacity-building where mitigation potential is highest.*

   Ambitious methane goals will not be met if countries and sectors with large, cost-effective abatement potential lack the means to act. Targeted support packages, combining finance, technology cooperation, and capacity-building, should be prioritised in countries with high mitigation potential but limited resources, helping to close the gap between global ambition and on-the-ground implementation.

   Concrete programs already demonstrate how this can work in practice. Through a USD 255 million loan, the World Bank is sponsoring a program in Hunan province, China's largest rice-producing region, that aims to reduce agricultural methane emissions through improved irrigation and drainage systems.[58] In response to a national waste emergency, in May 2026 Indonesia became the third Southeast Asian country to launch a project under AKCMM, the ASEAN-Korea Cooperation for Methane Mitigation program.[59] The project aims to improve infrastructure and build emissions monitoring capabilities in Indonesia, where it is estimated that only 39% of waste generated nationwide is properly managed, with the remainder left to decay in open landfills or the environment as a major source of

[53] The Oil and Gas Decarbonization Charter, *How We Work* (The Oil and Gas Decarbonization Charter, n.d.).
[54] Oil and Gas Climate Initiative, *OGCI's Strategy and Principles* (Oil and Gas Climate Initiative, 2021).
[55] FEFAC, *FEFAC Feed Sustainability Charter 2030* (FEFAC, n.d.).
[56] European Roundtable for Beef Sustainability, *Shaping the Future of European Beef Sustainability* (SAI Platform, n.d.).
[57] Climate and Clean Air Coalition, *Lowering Organic Waste Methane (LOW-Methane)* (Climate and Clean Air Coalition, n.d.).
[58] World Bank, *World Bank Loan Will Support Reducing Methane, Saving Water in Hunan's Rice Paddies*, Press Release 2023/080/EAP (World Bank Group, 2023).
[59] GGGI, *ASEAN-Republic of Korea Methane Mitigation Project Launched in Indonesia to Strengthen Climate Action*, Press Release (GGGI, 2026).

methane emissions (GGGI, 2026). Building on earlier projects in Malaysia and the Philippines, this signals growing regional momentum in Southeast Asia to tackle methane emissions through joint financing and state cooperation.

Scaling up and replicating these types of programs, particularly in major emitting countries, will be critical to translate global methane ambition into deep and sustained reductions.

National- level action: embed methane in climate policy and scale proven solutions

1. *Set binding national methane reduction targets.*
   Voluntary global commitments, such as the Global Methane Pledge, play an important role in signalling collective action and raising ambition, but cannot on their own ensure countries follow through on policy implementation. Clear national methane targets, with sectoral contributions and interim milestones – formally embedded in NDCs and reflected in long-term strategies (LTS) – can strengthen accountability and guide public and private investment.

2. *Use UNFCCC and Paris Agreement instruments more effectively to drive methane mitigation.*
   NDCs and LTS are important mechanisms for turning high-level political commitments, including global pledges, into concrete national plans. Embedding sector-specific methane pathways, policies, and investment needs into NDCs and LTS – and ensuring consistency with Paris-aligned pathways at both the economy-wide and sectoral level – is essential to move from voluntary ambition to implementation.

3. *Scale up sectoral policies and technologies that can deliver quickly.*
   In the energy sector, governments should pair plans for a rapid, managed phaseout of fossil fuels with stringent methane performance standards, mandatory leak detection and repair, and the elimination of routine venting and flaring for remaining infrastructure. Together, these measures can deliver steep methane reductions this decade while the broader energy transition unfolds.

   In agriculture, countries should expand support for low-emission practices and technologies that enable continued food production while lowering emissions through tailored incentives, finance, and support measures that protect food security and rural livelihoods.

   In the waste sector, regulatory and economic instruments are needed to make methane-avoiding and methane-capturing options the norm – including landfill gas capture, modern wastewater treatment, and organic waste diversion and composting – backed by technical assistance and financial support for municipalities and utilities to plan, invest, and operate these systems.

Next steps and research agenda

1. *Deepening Paris-aligned methane benchmarks and gap analyses*
   We plan to build on this analysis by enhancing and regularly updating Paris-aligned methane benchmarks at global, sectoral, and national levels, and by constructing more robust bottom-up current-policy pathways for select countries using detailed data on national emissions, targets, and measures. This will enable a consistent assessment of how far each country and sector is from Paris-aligned methane trajectories and how that gap changes over time, informing updates to NDCs and BTRs, guiding where additional effort and finance are most needed, and providing a common reference point for initiatives focused on accelerating methane mitigation. This analysis can provide vital inputs to the second global stocktake, commencing at COP31 in 2026 and concluding at COP33 in 2028, helping to ensure that methane benchmarks, gaps, and opportunities are clearly reflected in the global stocktake and, in turn, inform the next round of NDCs.

2. *Improving the representation of methane in IAMs*
   Further work is needed to improve how methane is represented in integrated assessment models, in particular by updating marginal abatement cost curves and revising assumptions about the availability, timing, and uptake of mitigation technologies and practices – specifically in agriculture and waste. We will continue to explore opportunities to refine these assumptions and test more ambitious methane pathways at global and sectoral level, building directly on the gaps identified in this report and feeding the results back into scenario design and use.

3. *Exploring the role of methane and other short-lived climate pollutants in limiting overshoot*

   We will conduct further analysis to explore the role of methane and other short-lived climate pollutants in limiting temperature overshoot and other key temperature outcomes. This forthcoming work, in collaboration with the Super Pollutant Action Alliance, will help clarify how to prioritise methane and other short-lived climate pollutant actions as part of a comprehensive mitigation agenda, alongside deep and sustained CO_2 reductions.

Annex A: Country case studies

Australia

Summary

Australia is a major global methane emitter, with emissions dominated by the agriculture sector. Methane emissions in the country declined modestly between 2010 and 2020, driven mainly by reductions in the energy sector, but rising agricultural and waste emissions have left total methane only slightly below 2010 levels.

Australia has joined the Global Methane Pledge and adopted an economy-wide net zero target, yet it still has no explicit methane reduction targets or national methane action plan. Furthermore, policy efforts rely primarily on incentive-based schemes rather than direct binding methane regulations in any sector. Under current policies, methane emissions are projected to decline by around 4% between 2020 and 2030, while Paris-aligned pathways require reductions of roughly 15–40% over the same period, leaving a gap of about 0.5–1.5 Mt CH_4 in 2030. Closing this gap will require substantially stronger measures to tackle methane across all major emitting sectors.

Country context

Australia's methane emissions profile is dominated by agriculture, with independent datasets and national inventories showing broadly consistent estimates and only modest overall change in recent years. According to PRIMAP, Australia emitted 4 Mt CH_4 in 2023 – 58% from agriculture, 30% from energy, and 12% from waste. Across independent datasets, estimates range from 3.9 to 5.2 Mt CH_4, averaging 4.3 Mt CH_4, whereas Australia's 2025 national inventory reported 4.1 Mt CH_4 in 2023.

Australia is the 13th-largest methane emitter globally, and 6th-highest on a per-capita basis. While energy-sector methane emissions declined about 4% per year from 2020 to 2023, rising agricultural and waste emissions offset these reductions, with Australia's total methane emissions declining only slightly over the period.

Australia has set economy-wide targets to achieve net zero greenhouse gas emissions by 2050, with interim net emissions targets of 43% below 2005 levels by 2030 and 62–70% below 2005 levels by 2035. However, despite joining the Global Methane Pledge, Australia has no national or sectoral methane reduction targets.

Australia does not have a national methane action plan, and its existing methane policies rely largely on incentives and research funding rather than binding regulations. While agriculture is by far the largest source of methane emissions in Australia, the sector has no regulatory methane controls.

About 75% of Australia's fossil methane emissions are covered by the Safeguard Mechanism, which sets legislated declining net emissions limits for industrial facilities emitting more than 100,000 tCO_2e a year.[60] Fossil fuel production facilities, primarily coal mines and LNG plants, account for about half of the emissions covered under the scheme. Because the limits apply to net emissions, facilities can comply by purchasing offsets, in the form of Australian Carbon Credit Units (ACCUs) linked to carbon sequestration projects, or Safeguard Mechanism Credits emitted by facilities overcomplying, in lieu of real, on-site emissions reductions.

Several ACCUs issuance methods target methane emissions.[61] In agriculture, the Animal Effluent Management method incentivises the capture of methane from animal waste. A new method for livestock management is in preparation after the Beef Cattle Herd Management method was closed in 2025 over integrity concerns.[62,63] In the waste sector, the landfill gas method allows for the generation of credits after installing, upgrading, or operating landfill gas extraction and combustion systems.[64] The ACCU system has drawn criticism over its integrity, particularly for its most-used land-based methods.[65,66] Their cheap supply de facto allows for the unlimited use of offsets, and coal and fossil gas facilities are the scheme's largest users of them.[67]

Country assessment

Australia's reported methane emissions declined modestly over 2010–2020, and our assessment of current policies indicates that this trend will largely continue out to 2030 and beyond, leaving Australia off track from its Paris-aligned pathways.

Between 2010 and 2020, Australia's methane emissions declined by 5% (an average of about 1% per year). However, to be aligned with the Paris Agreement, emissions would

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[60] Climate Change Authority, *Fossil Methane: A Near-Term Abatement Opportunity* (Climate Change Authority, 2026).

[61] Australian Government Department of Climate Change, Energy, and the Environment and Water, 'ACCU Method Tracker', 26 June 2026.

[62]Minister for Agriculture, Fisheries and Forestry, *Joint Media Release: Beefing up Carbon Credits for Aussie Livestock Farmers*, Media Release (Department of Agriculture, Fisheries and Forestry, 2026).

[63] Australian Government Department of Climate Change, Energy, the Environment and Water, *Beef Cattle Herd Management Method* (Australian Government Department of Climate Change, Energy, the Environment and Water, 2026).

[64] Australian Government Department of Climate Change, Energy, the Environment and Water, *Reducing Methane Emissions from Landfill Gas Method 2025* (Australian Government Department of Climate Change, Energy, the Environment and Water, 2025).

[65] Andrew Macintosh et al., 'Australian Human-Induced Native Forest Regeneration Carbon Offset Projects Have Limited Impact on Changes in Woody Vegetation Cover and Carbon Removals', *Communications Earth & Environment* 5 (March 2024).

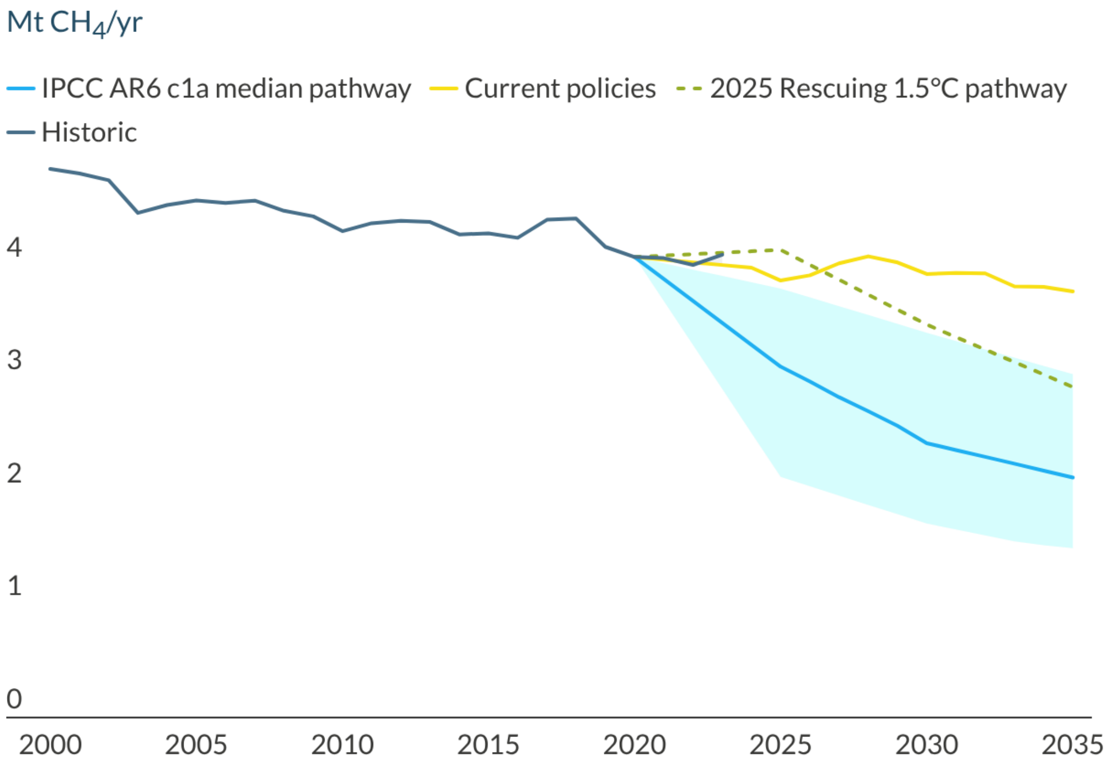
[66] Andrew Macintosh et al., 'Reply to: National-Scale Datasets Underestimate Vegetation Recovery in Australian Human-Induced Native Forest Regeneration Carbon Sequestration Projects', *Communications Earth & Environment* 6 (October 2025).

[67] Climate Integrity, *Latest Safeguard Mechanism Data Shows Australia's Centrepiece Climate Policy Is Primarily a Clearinghouse for Low-Integrity Offsets* (Climate Integrity, n.d.).

need to fall much faster – by between 15 and 40% from 2020 to 2030. Under AR6 median Paris-aligned pathways, methane from energy would need to decline by approximately 80% below 2020 levels by 2030, methane from waste by 58%, and methane from agriculture by roughly 21% in the AR6 median pathway.

Australia's current policies are projected to lead to a 4% decrease in methane emissions between 2020 and 2030, leaving a 0.5-1.5 Mt CH_4 gap between Australia's current policy pathway and Paris-aligned trajectories in 2030. Stronger action across all sectors this decade is therefore critical to accelerate methane reductions and put Australia onto a Paris-aligned pathway for methane.

Figure 13: Australia



Historic emissions are taken from PRIMAP-hist v2.7 (2025 release). Current policy projections are based on Climate Analytics calculations. The blue shaded area shows the range of IPCC AR6 C1a pathways (10th–90th percentile).

Sources and assumptions

The data for Australia's current policy methane pathway is taken from the Climate Action Tracker's country assessment, which leverages the government's 2025 emissions projections (see forthcoming assessment). This pathway is harmonised to the 2020 baseline using the PRIMAP-hist v2.7 2025 release dataset, scaling the projections so that modelled 2020 methane emissions match PRIMAP-hist 2020 values for Australia. National inventory data is drawn from the submission to the UNFCCC in 2025.

Brazil

Summary

Brazil is the world's fifth-largest methane emitter. In 2023, it emitted around 21 Mt CH_4 (excluding LULUCF), with agriculture accounting for more than three-quarters of national methane emissions and enteric fermentation alone contributing roughly 14.5 Mt CH_4. Methane emissions have been rising since 2015 and increased by about 6% between 2020 and 2023, reflecting expanding cattle production and persistent agricultural emissions.

Although Brazil has joined the Global Methane Pledge and adopted economy-wide targets that cover all greenhouse gases, it lacks a dedicated methane target and comprehensive roadmap. Under current policies, we estimate that Brazil's methane emissions are projected to continue increasing through 2030 and 2035, widening the gap to the country's Paris-aligned pathways.

Country context

Brazil's methane emissions profile is dominated by the agriculture sector and shows an overall upward trend in recent years. Across the major independent datasets CEDS, PRIMAP, and EDGAR, Brazil's total methane emissions in 2023, excluding LULUCF, were estimated to be between 19.5 and 22.6 Mt CH_4, with an average of 20.8 Mt CH_4. The Greenhouse Gas Emissions and Removals Estimating System (SEEG) estimates that Brazil emitted approximately 20.8–21.1 Mt CH_4 in 2023. Globally, Brazil is the fifth largest methane emitter after China, the United States, India, and Russia.

Agriculture accounted for 75.6% of Brazil's methane emissions in 2023. Within this, 97.9% of agricultural emissions came from livestock activities, with enteric fermentation alone contributing roughly 14.5 Mt CH_4.[68] Methane emissions have generally increased since 2015 and rose by about 6% between 2020 and 2023.[69] These increases are linked to rising agricultural emissions from expanding cattle production and overall herd growth.[70]

Brazil is a signatory to the Global Methane Pledge. While Brazil does not have a standalone methane-specific target, the country has adopted economy-wide emissions reduction targets for 2030, 2035, and 2050 that cover all greenhouse gas emissions, including methane.[71] Brazil does not have a comprehensive national methane action

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[68] G. O. Quintana et al., 'Solutions for Methane Mitigation in Brazilian Agriculture: Achieving a 28% Reduction by 2035', Climate-Smart Food Systems, *Frontiers in Sustainable Food Systems* 10 (March 2026).
[69] SEEG, 'Total Emissions', n.d..
[70] Quintana et al., 'Solutions for Methane Mitigation in Brazilian Agriculture: Achieving a 28% Reduction by 2035'.
[71] Climate Analytics, *National Methane Reduction Targets* (Climate Analytics Global Methane Explorer, n.d.).

roadmap, though it has several current and planned policies targeting methane in agriculture, waste, and energy.

Brazil's National Programme for the Reduction of Methane Emissions ("Zero Methane") provides an overarching framework to stimulate methane abatement across sectors. The programme aims to reduce methane emissions by encouraging the development of carbon markets, fostering sectoral plans and agreements, and promoting deployment of technologies for biogas and biomethane as renewable energy sources. It operates within the broader Federal Strategy of Incentive to the Sustainable Use of Biogas and Biomethane as one of its implementation mechanisms.[72]

In the energy sector, Brazil is beginning to put in place more explicit instruments targeting methane from fossil fuels. The Biomethane Blending Mandate establishes a national requirement to blend biomethane into the natural gas supply, starting at 1% in 2026. This mandate is intended to drive demand for biomethane, stimulate investment in biogas production from waste and agriculture, and reduce greenhouse gas emissions in the gas supply.[73] At COP28, Brazil announced that its National Council of Energy Policy (CNPE) would establish guidelines on methane reduction in the oil and gas sector by the end of 2024 and that the National Agency for Petroleum, Natural Gas and Biofuels (ANP) would finalise dedicated methane regulations based on these guidelines by the end of 2025.[74] CNPE has since issued guidelines promoting the decarbonisation of oil and gas activities, including minimising flaring and eliminating routine flaring, which represent an initial high-level step toward that commitment.[75] However, as of 2026, ANP has not finalised or adopted the planned oil and gas methane regulations. Brazil is also a member of the Fossil Fuel Regulatory Programme (FFRP), an international initiative aimed at reducing methane emissions from the energy sector.[76]

Methane emissions from waste are addressed primarily through Brazil's solid waste legislation and a dedicated plan for organic waste. The National Solid Waste Policy establishes a comprehensive framework for integrated and environmentally sound management of solid waste. It requires the federal government to develop and regularly update a National Solid Waste Plan, including scenarios, targets and actions, and promotes energy recovery from waste alongside composting and recycling.[77] While not

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[72] IEA, *National Programme for the Reduction of Methane Emissions - Zero Methane* (International Energy Agency, 2023).
[73] RystadEnergy, *Brazil's New Biomethane Legislation Calls for a Twenty-Fold Production Increase* (RystadEnergy, 2025).
[74] European Commission, *2023 Global Methane Pledge Ministerial: Decisive Action to Curb Emissions* (European Commission, 2023).
[75] IEA, *Global Methane Tracker 2025: Policies* (International Energy Agency, 2025).
[76] Clean Air Task Force, *Egypt, Brazil, and Bosnia and Herzegovina Join the Fossil Fuel Regulatory Programme to Abate Methane in Their Energy Sectors* (Clean Air Task Force, 2026).
[77] Law No. 12305 - Brazilian National Policy on Solid Waste.

methane-specific, its implementation has direct implications for landfill gas generation, capture, and utilisation.

To tackle methane from organic waste more explicitly, Brazil adopted the National Plan for Reduction and Recycling of Municipal Organic Waste (PLANARO). PLANARO defines a national pathway that includes reducing waste sent to disposal units by 25.3% by 2030 and 35% by 2035, and treating or recovering 14.3% of organic waste by 2030 and 19% by 2035.[78]

The Low Carbon Agriculture Plan (ABC+ Plan) is the flagship framework for reducing emissions from agriculture and livestock. It outlines measures to expand animal waste treatment capacity and the use of biodigesters, increase the share of rice cultivated under methane-reducing irrigation regimes, and scale up low-emission livestock systems and pasture restoration.[79]

Country assessment

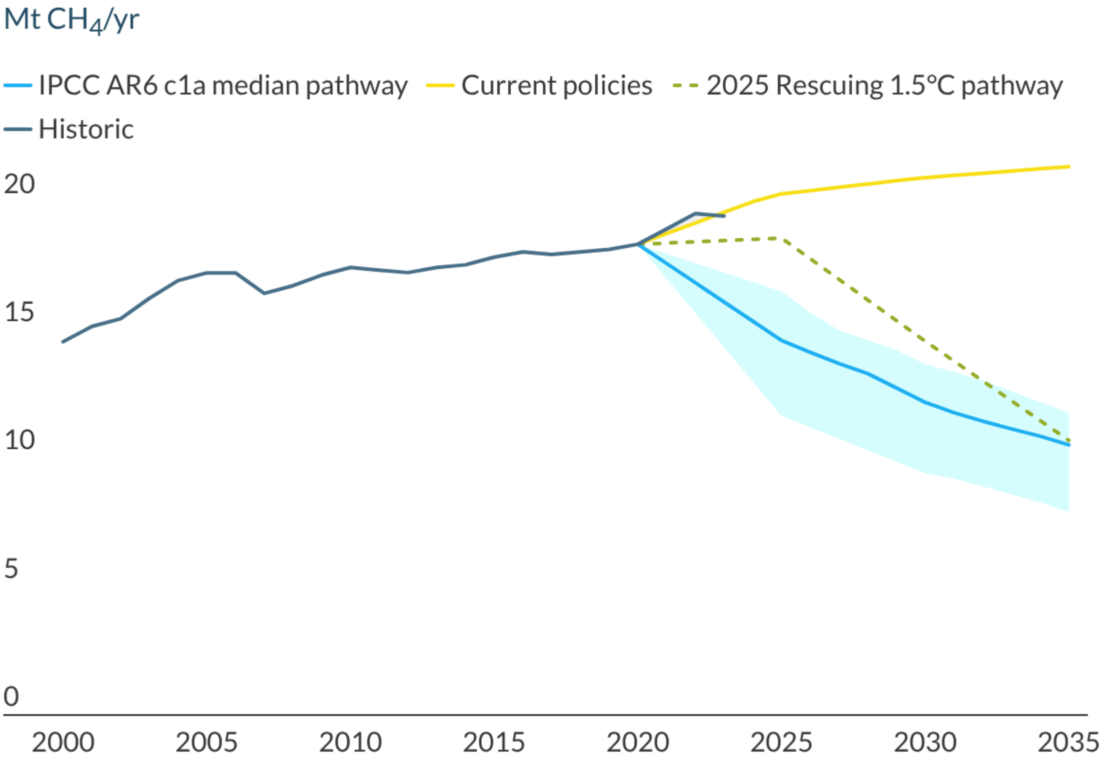
Brazil is not currently on track for a Paris-aligned methane pathway. Between 2010 and 2020, Brazil's methane emissions increased by 5%, and under existing policies they are projected to keep rising rather than falling over the coming decade.

Under current policies, our analysis finds that methane emissions increase by 14% between 2020 and 2030 and continue to rise out to 2030 and beyond. This would leave a 6.4-8.8 Mt CH_4 gap between Brazil's current policy pathway and Paris-Aligned trajectories in 2030. In our assessment of Brazil's current policy pathway, methane emissions grow from about 18 Mt CH_4 in 2020 to roughly 21 Mt CH_4 by 2030 and continue increasing towards 2035, in contrast to the sustained declines required in Paris-aligned pathways.

To be compatible with the Paris Agreement, emissions would need to fall by between 21–34% from 2020 to 2030. In the median AR6 Paris-aligned pathway, methane from energy would need to decline by 59% below 2020 levels by 2030, methane from waste by 48%, and methane from agriculture by 27%.

[78] Climate and Clean Air Coalition, *Brazil's Leadership at a Turning Point in Global Climate Action* (Climate and Clean Air Coalition, 2025).
[79] Climate and Clean Air Coalition, *Brazil's Leadership at a Turning Point in Global Climate Action*.

Figure 14: Brazil



Historic emissions are taken from PRIMAP-hist v2.7 (2025 release). Current policy projections are based on Climate Analytics calculations. The blue shaded area shows the range of IPCC AR6 C1a pathways (10th–90th percentile).

Sources and assumptions

Our current policy projection for Brazil's methane emissions is based on the Climate Action Tracker's country assessment, using the average of the minimum and maximum current policy pathways (see more details about how those pathways were derived here). To derive a methane-specific current policy pathway, we use the U.S. EPA data on methane's share of Brazil's total greenhouse gas emissions and estimate a 15-year historical trend in this share. We then extrapolate this trend forward and apply the projected methane share in each year to the total current policy emissions pathway from the Climate Action Tracker, obtaining annual methane emissions for Brazil out to 2035. This pathway is harmonised to the 2020 baseline using the PRIMAP-hist v2.7 (2025 release) dataset, scaling the projections so that modelled 2020 methane emissions match PRIMAP-hist 2020 values for Brazil.

Canada

Summary

Canada has taken several steps to increase both its ambition and action on methane mitigation. It has made its commitment to tackling methane clear by signing the Global Methane Pledge in 2021, assuming the role of co-convener in 2025, and adopting an ambitious methane-reduction target for the oil and gas sector, the country's largest methane emitter.

Canada has introduced a comprehensive suite of methane-focused policies across the energy, waste, and agriculture sectors, including newly finalized command-and-control regulations in the upstream oil and gas and waste sectors. Canada's methane emissions have already been on a downward trajectory in recent years, driven by policy-led reductions in the oil and gas sector, and our analysis finds that current policies can accelerate progress and bring Canada's projected methane emissions in line with a Paris-aligned pathway.

However, the country's ability to deliver these reductions in practice will ultimately depend on the timely and effective implementation and enforcement of these measures, and recent reversals and uncertainty in climate policy increase the risk that projected methane cuts will not materialize.

Country context

Canada's methane emissions profile shows consistent patterns across independent datasets and demonstrates a gradual downward trend in recent years. According to PRIMAP, Canada emitted 4 Mt CH_4 in 2023 – 52% from the energy sector, 28% from agriculture, and 19% from waste.

Across major independent datasets (CEDS, PRIMAP, and EDGAR) estimates for Canada's 2023 methane emissions range from 3.7 to 4.7 Mt CH_4, with an average of 4.2 Mt CH_4. Canada's 2025 National Inventory Report reported total 2023 methane emissions at 3.9 Mt CH_4, closely aligned with independent estimates. Canada has also incorporated measurement-based adjustments for oil and gas methane in recent national inventory reports, using aerial and atmospheric data to update emission factors and improve accuracy.[80]

Canada ranks as the 14th-largest methane emitter globally, both in absolute terms and on a per-capita basis – reflecting its emissions-intensive resource sectors and relatively small population.

[80] Environment and Climate Change Canada, *National Inventory Report 1990-2023: Greenhouse Gas Sources and Sinks in Canada* (Environment and Climate Change Canada, 2025).

According to PRIMAP, Canada's methane emissions declined by an average of 3% per year between 2020 and 2023, driven primarily by a 4% annual decrease in the energy sector. Agricultural methane fell by about 1% per year, while waste-sector emissions remained relatively flat over the period.

Canada has adopted several methane-specific commitments that have helped position the country as a leader in global mitigation efforts. Canada signed the Global Methane Pledge at COP26 in 2021 and became co-convener of the Pledge with the European Union in 2025.[81] Canada has also set two methane-specific targets in the oil and gas sector, its largest methane emitter – 45% reduction below 2012 levels by 2025 and 75% below 2012 levels by 2030.

Canada has also set economy-wide emissions reduction targets that cover all greenhouse gases, including methane, aiming for net zero emissions by 2050, with interim targets of 40-45% below 2005 levels by 2030 and 45-50% below 2005 levels by 2035. However, since becoming Prime Minister, Mark Carney has not recommitted to Canada's 2030 and 2035 targets and has conceded that Canada will miss them.

Canada published its National Methane Action Plan, *Faster and Further: Canada's Methane Strategy*, in 2022, outlining a whole-of-government approach to reduce methane emissions across the energy, waste, and agriculture sectors.[82]

The federal government has several direct policies targeting methane emissions in all three sectors. In the energy sector, the government recently finalized its Enhanced Oil and Gas Methane Regulations, which are expected to reduce methane emissions from the sector by 72% below 2012 levels by 2030.[83] Alberta, Saskatchewan, and British Columbia implement their own methane regulations under equivalency agreements, which are required to achieve equivalent federal outcomes.

In the waste sector, the government recently finalized its Landfill Methane Regulations, which establish performance-based methane concentration limits for municipal solid waste landfills and require regular surface methane monitoring, leak detection, and corrective actions.[84] The federal GHG Offset Credit System includes a landfill methane protocol enabling operators to generate credits for capturing and destroying methane

[81] Mitchell Beer, *Canada Signs On as Co-Convener of Global Methane Pledge* (The Energy Mix, 2025).
[82] Government of Canada, *Faster and Further: Canada's Methane Strategy* (Government of Canada, 2022).
[83] Government of Canada, 'Regulations Amending the Regulations Respecting Reduction in the Release of Methane and Certain Volatile Organic Compounds (Upstream Oil and Gas Sector): SOR/2025-280', *Canada Gazette*, 31 December 2025.
[84] Government of Canada, *Landfill Methane Regulations (SOR/2025-279)* (Government of Canada, 2026).

beyond regulatory requirements, provided installations are not subject to carbon pricing.[85]

In the agriculture sector, the federal government has implemented programs to incentivize the development and adoption of low-emissions agricultural practices and technologies, including the Agricultural Clean Technology Program and the Agricultural Methane Reduction Challenge.[86, 87]

Country assessment

Canada's reported methane emissions have been on a steady decline, with reductions expected to continue under current policies. From 2010 to 2020, Canada's methane emissions have declined by 15% (an average of around 2% per year). To be aligned with the Paris Agreement, emissions would need to fall much faster - by between 38-43% from 2020 to 2030. Under the AR6 median Paris-aligned pathways methane from energy would need to decline by 73% below 2020 levels, methane from waste by 61%, and methane from agriculture by 18%.

If Canada implements its current policies effectively, most notably the newly finalized oil and gas methane regulations and landfill methane regulations, national methane emissions are expected to decline by 39% between 2020 and 2030 (an average of around 4% per year) putting Canada on a Paris-aligned methane pathway. However, this outcome will ultimately depend on how quickly and effectively these policies are implemented and enforced, and ongoing climate policy uncertainty in the country – including plans for expanding oil and gas production – risks undermining this result.

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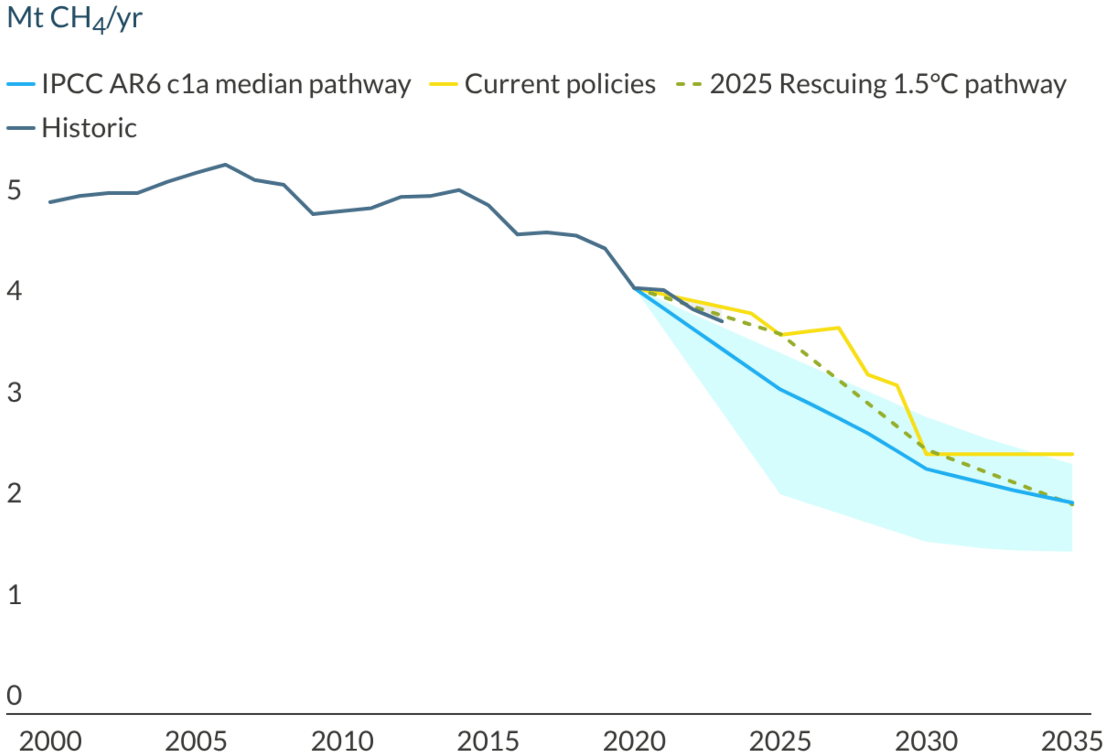
[85] Government of Canada, *Canada's Greenhouse Gas Offset Credit System* (Government of Canada, 2026).
[86] Government of Canada, *Agricultural Clean Technology Program - Adoption Stream: 1. What This Program Offers* (Government of Canada: Agriculture and Agri-Food Canada (AAFC), 2023).
[87] Impact Canada, *Agricultural Methane Reduction Challenge* (Government of Canada: Impact Canada, 2026 (last modified)).

Figure 15: Canada



Historic emissions are taken from PRIMAP-hist v2.7 (2025 release). Current policy projections are based on Climate Analytics calculations. The blue shaded area shows the range of IPCC AR6 C1a pathways (10th–90th percentile).

Sources and assumptions

The data for the current policy pathway is based on the “with additional measures” scenario Canada’s official greenhouse gas projections (2025).[88] This scenario was selected because it includes two key methane regulations – the Enhanced Oil and Gas Methane Regulations and the Landfill Methane Regulations – which were finalized in December 2025 but too late for inclusion in the with measures, or current policy, scenario. This pathway is harmonised to the 2020 baseline using the PRIMAP-hist v2.7 (2025 release) dataset, scaling the projections so that modelled 2020 methane emissions match PRIMAP-hist 2020 values for Canada. National inventory data is drawn from the inventories submitted to the UNFCCC in 2025.

[88] Government of Canada, *Greenhouse Gas Emissions Projections* (Government of Canada, 2026 (date modified)).

China

Summary

China is the largest emitter of methane in the world and is responsible for over 70% of all coal-mine methane emissions globally.[89] While a surging rollout of new renewable energy sources and grid expansion has put China on a path towards decarbonisation, state support for coal continues. Although China's latest 2035 emissions reduction target includes methane, the NDC has been criticized as intentionally under-ambitious, leaving China significant room to overperform. Both total greenhouse gas and methane emissions are expected to peak soon, but more rapid action is needed for China to align with a Paris-aligned pathway.

Between 2010 and 2020, China's methane emissions increased by approximately 10% (an average of about 1% per year), with the largest increases in the waste sector, which nearly doubled from 4 Mt CH_4 in 2010 to 7 Mt CH_4 in 2020. Our analysis finds that, under current policies, methane emissions are projected to decrease by around 5% between 2020 and 2030, from 59 Mt CH_4 to 56 Mt CH_4, whereas Paris-aligned pathways require reductions of roughly 29–54% over the same period, leaving a gap of about 14.5–39.2 Mt CH_4 in 2030. Closing this gap will require significantly stronger methane-specific measures across all sectors.

Country context

China's methane emissions have increased alongside its total CO_2 emissions since 1990, but are expected to peak and begin declining soon as a huge surge of new renewable power and electrification take effect.

According to PRIMAP, China emitted 63 Mt CH_4 in 2023 – 49% from the energy sector, 38% from agriculture, and 12% from waste. Across major independent datasets (CEDS, PRIMAP, and EDGAR) estimates for China's 2023 methane emissions range from 53.2 to 62.8 Mt CH_4, with an average of 56.5 Mt CH_4. China's 2024 Greenhouse Gas Inventory reports total methane emissions at 59.3 Mt CH_4 (excl. LULUCF) in 2021, slightly lower than PRIMAP's estimate of 63.2 Mt CH_4.[90]

China's energy-sector methane emissions increased by 4% per year from 2020–2023 according to PRIMAP. Although most of China's methane emissions come from the energy sector, emissions from the agriculture and waste sectors remain significant. While exact trends differ between PRIMAP, CEDS, and EDGAR, they consistently show that methane emissions from waste have increased significantly since 1990, while agricultural emissions have either increased or failed to meaningfully decline.

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[89] Global Energy Monitor, *Report: China's New Coal Mines Could Raise Global Methane Emissions by 10%* (Global Energy Monitor, 2022).
[90] China, *China*. *2024 Common Reporting Table (CRT)* (United Nations Climate Change, 2025).

China is not a signatory to the Global Methane Pledge and has not announced any methane-specific targets. Its 2035 target aims to reduce economy-wide greenhouse gas emissions by 7-10% below peak levels by 2035, including methane.

China's Methane Emission Control Action Plan serves as its primary framework for action on methane, covering oil, gas, and coal energy infrastructure as well as standards for the waste and agricultural sectors. The plan aims to strengthen the monitoring, reporting, and verification (MRV) of methane emissions through standardization of emissions accounting and on-site inspections.

China has command-and-control policies to reduce methane emissions in the energy sector, notably its Emission Standard for Coalbed Methane and Emission Standards of Air Pollutants for Onshore Oil and Gas Exploitation and Production. These standards prohibit the direct emission of coal methane gas above a 30% concentration, mandate oil and gas operators to perform leak detection and repair (LDAR) on pipelines, establish guidelines for gas capture and utilization, and require regular inspections and continuous monitoring of methane across energy infrastructure.

Despite being the second largest source of methane emissions in the country, China has no regulatory methane controls in the agricultural sector.

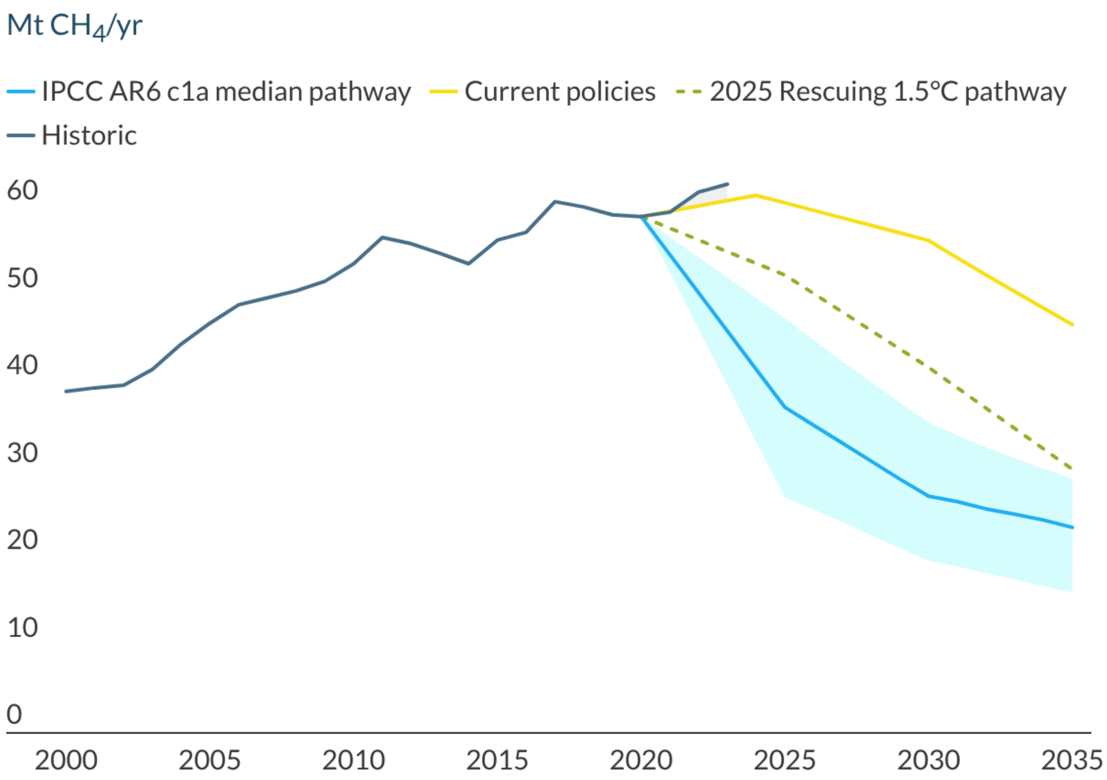
In the waste sector, China's Law on the Prevention and Control of Environmental Pollution by Solid Wastes establishes a comprehensive legal framework for the regulation of solid waste. It mandates reduction, recycling, and safe disposal; prohibits open dumping and burning; and requires that landfill and waste treatment facilities comply with technical standards.

Country assessment

China's reported methane emissions have been increasing since 2000, although these are expected to peak soon and begin slowly declining. From 2010 to 2020, China's methane emissions have increased by 10% (an average of 1% per year). However, to be aligned with the Paris Agreement, emissions would need to fall rapidly – by between 29% and 54% between 2020 and 2030. Under AR6 median Paris-aligned pathways, methane from energy would need to decline by 82% below 2020 levels, methane from waste by 46%, and methane from agriculture by 25%.

If China effectively implements its current policies, we estimate that national methane emissions are expected to decline by 5% between 2020 and 2030 (an average of 0.5% per year). This leaves a 15 to 29 Mt CH_4 gap between China's current policy pathway and Paris-aligned trajectories in 2030. Furthermore, this outcome depends on how quickly and effectively China's policies are implemented and enforced.

Figure 16: China



Historic emissions are taken from PRIMAP-hist v2.7 (2025 release). Current policy projections are based on Climate Analytics calculations. The blue shaded area shows the range of IPCC AR6 C1a pathways (10th–90th percentile).

Sources and assumptions

The current policy projection for China's methane emissions is based on the Climate Action Tracker's country assessment for China, which reports total greenhouse gas emissions in $MtCO_2e$. To derive a methane-specific current policy pathway, we use U.S. EPA data on methane's share of China's total greenhouse gas emissions and estimate a 15-year historical trend in this share. We then extrapolate this trend forward and apply the projected methane share in each year to the total current policy emissions pathway from the Climate Action Tracker to obtain annual methane emissions to 2035. This pathway is harmonised to the 2020 baseline using the PRIMAP-hist v2.7 (2025 release) dataset, scaling the projections so that modelled 2020 methane emissions match PRIMAP-hist 2020 values for China. National inventory data is drawn from the inventories submitted to the UNFCCC in 2025.

European Union

Summary

The European Union has positioned itself as a global leader on methane mitigation by co-leading the Global Methane Pledge, adopting leading methane regulations for the fossil fuel energy sector, and promoting stronger international monitoring and cooperation. Yet this leadership is only partial with the EU remaining among the world's 10 largest methane emitters, accounting for around 5% of global methane emissions.[91] Progress within the bloc has been uneven and major sources, particularly agriculture, remain insufficiently addressed.

EU methane emissions have steadily declined over the past two decades, falling by 28% between 2000 and 2023, according to PRIMAP. Emissions reductions have occurred in part due to policies to transition away from fossil fuels and improve waste management, but also from falling livestock populations and meat consumption. The deepest emission reductions have been especially pronounced in coal. The share of coal in EU electricity generation fell by nearly 60% between 2000 and 2023, and coal-mine methane has fallen with it.[92] Comparatively, agricultural methane emissions have only fallen by 11% over the same period. Meanwhile methane emissions from international shipping have more than doubled due to the increase in LNG as a marine fuel.

Our assessment finds that, under current policies, EU methane emissions are projected to continue falling, just barely in line with a Paris-aligned methane pathway.

Country context

According to PRIMAP, the European Union emitted about 13.7 Mt CH_4 in 2023 – 16% from the energy sector, 60% from agriculture, and 25% from waste. Across major independent datasets (CEDS, PRIMAP, and EDGAR) estimates for the bloc's 2023 methane emissions range from 9.1 to 15 Mt CH_4, with an average of 12.7 Mt CH_4. The European Union's 2025 Greenhouse Gas Inventory reports total methane emissions at 14.4 Mt CH_4 in 2023.[93]

The European Union and its 27 Member States are signatories to the Global Methane Pledge, having launched the initiative as a co-convener alongside the United States at COP26 in 2021.

[91] European Environment Agency, *Methane, Climate Change and Air Quality in Europe: Exploring the Connections* (European Environment Agency, 2025).
[92] Magdalena Zięba and Adam Smoliński, 'Methane Emissions from Mining in the European Union', *Energies* 18, no. 4 (2025).
[93] European Environment Agency, *Annual European Union Greenhouse Gas Inventory 1990-2023 and Inventory Document 2025* (European Environment Agency, 2025).

In 2020, the European Union adopted the EU Methane Strategy to address methane emissions across the agriculture, waste, and energy sectors.[94] While the strategy sets out a direction for EU-wide methane reductions it stops short of setting methane emissions targets for these sectors and fails to address structural problems, such as the unsustainable livestock and harmful subsidies.

The centerpiece of the bloc's Methane Strategy is the EU Methane Regulation.[95] It sets out rules to accurately measure, monitor, report and reduce methane emissions in the EU energy sector. It also applies to methane emissions associated with imported crude oil, natural gas and coal by placing reporting and monitoring obligations on importers of these fuels and requiring them to comply with methane-intensity standards. It is the first EU-wide binding law targeting methane emissions in the energy-sector, including penalties for non-compliance domestically and for energy importers who breach reporting requirements.

Responding to lobbying by the United States and other fossil fuel exporters, in July 2026 the EU decided to delay penalties for non-compliant energy importers which had been set to come into effect in 2027.[96] This move temporarily curbs the bloc's enforcement capabilities for regulating upstream methane emissions.

Several laws have been adopted addressing various sources of emissions in the waste and agriculture sectors, such as the EU Landfill Directive and the Industrial and Livestock Rearing Emissions Directive.[97,98] However, a unified methane-reduction regime is still lacking, leaving significant emissions sources under-regulated. For example, livestock emissions are only marginally addressed in existing legislation. The Industrial and Livestock Rearing Emissions Directive brings only the largest pig and poultry operations – roughly the top 30% of such farms – under a binding permitting regime, while cattle were struck from its scope.

The Common Agricultural Policy (CAP), the cornerstone of EU agricultural regulation, has lacked stringent measures to cut methane emissions as well as sufficient support measures to aid farmers in delivering those changes. Contrary to the goals of cutting

[94] European Commission, *Communication from the Commission to the European Parliament, the Council, the European Economic and Social Committee and the Committee of the Regions* (European Commission, 2020).
[95] Official Journal of the European Union, *REGULATION (EU) 2024/1787 OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL of 13 June 2024 on the Reduction of Methane Emissions in the Energy Sector and Amending Regulation (EU) 2019/942* (European Commission, 2024).
[96] Kim Mackrael, 'EU to Ease Methane Rules After U.S. Pressure', *Wall Street Journal*, 20 July 2026.
[97] European Commission, *Landfill Waste: EU Rules Aim to Minimise the Amount of Waste Sent to Landfills* (European Commission, n.d.).
[98] European Commission, *Industrial and Livestock Rearing Emissions Directive (IED 2.0)* (European Commission, n.d.).

methane emissions, 80% of the CAP's subsidies have been directed towards emission intensive animal products.[99]

In July 2026, the EU published its Livestock Strategy, but it does not address high livestock densities or intensive production as underlying emissions drivers.[100] Instead, it prioritises incremental measures such as feed additives, breeding and nutrient cycling, while offering no clear alignment with the 2040 target, dedicated transition finance or transparent methane accounting. Its emphasis on the biogenic carbon cycle, without clarifying how warming impacts will be assessed, risks understating livestock methane emissions and weakening accountability for the sector's contribution to near-term warming.[101]

Country assessment

The EU's methane emissions have declined since 2000, and current policies are expected to continue this gradual downward trend over the next decade, putting the bloc's methane emissions just barely on track with Paris-aligned pathways in 2030.

Between 2010 and 2020, emissions fell by 12% (a little over 1% per year), whereas Paris-aligned pathways require a steeper reduction of 20–31% between 2020 and 2030. In AR6 median Paris-aligned pathways, methane from energy would need to decline by 69% below 2020 levels by 2030, methane from waste by 59%, and methane from agriculture by 18%.

If the EU fully implements its current policies, we estimate that national methane emissions are expected to decrease by 22% between 2020 and 2030 (an average of about 2% per year). This would leave a 0.2-1.4 Mt CH_4 gap between the EU's current policy pathway and Paris-Aligned trajectories in 2030. However, the EU is a diverse bloc, encompassing Member States with very different energy mixes and political environments. Mitigation measures will need to be implemented effectively across multiple sectors, jurisdictions, and contexts – without effective coordination, some Member States may fall behind and threaten to undermine the EU's progress.

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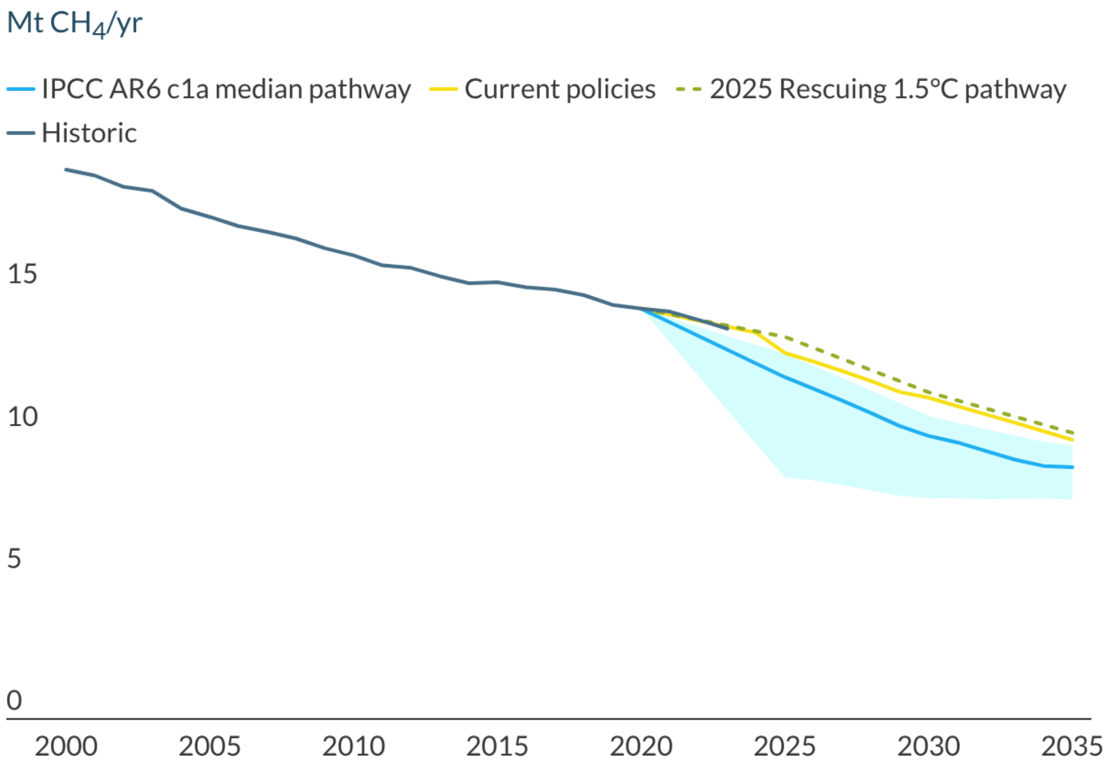
[99] Anniek J. Kortleve et al., '[Over 80% of the European Union's Common Agricultural Policy Supports Emissions-Intensive Animal Products]', *Nature Food* 5 (April 2024): 288–92.
[100] European Commission, *[Communication from the Commission to the European Parliament, the Council, the European Economic and Social Committee and the Committee of the Regions: EU Strategy on Livestock]* (European Commission, 2026).
[101] Claire Stockwell, *[Three Essential Elements for the EU's Forthcoming Livestock Strategy]* (Institute for Agriculture and Trade Policy, 2026).

Figure 17: European Union



Historic emissions are taken from PRIMAP-hist v2.7 (2025 release). Current policy projections are based on Climate Analytics calculations. The blue shaded area shows the range of IPCC AR6 C1a pathways (10th–90th percentile).

Sources and assumptions

Our current policy projection for the European Union's methane emissions is based on the Climate Action Tracker's country assessment, using the average of the minimum and maximum current policy pathways. These pathways were derived from the European Environment Agency's 2025 projections and supplemented by the IEA's World Energy Outlook 2024 (see more details about how those pathways were constructed here).

To derive a methane-specific current policy pathway, we use data from the European Environment Agency on methane's share of the EU's total greenhouse gas emissions and calculate a 15-year historical trend in this share. We then extrapolate this trend forward and apply the projected methane share in each year to the total current policy emissions pathway from the Climate Action Tracker, obtaining an estimate for the EU's annual methane emissions out to 2035. This pathway is harmonised to the 2020 baseline using the PRIMAP-hist v2.7 (2025 release) dataset, scaling the projections so that modelled 2020 methane emissions match PRIMAP-hist 2020 values for the EU.

Russia

Summary

Russia is one of the top three largest emitters of methane in the world, alongside China and the United States.[102] The majority of Russian methane emissions come from its fossil-dominated energy sector, which the state heavily relies on for political and economic stability and continues to support despite a vast renewable potential. Russia has not adopted any methane-specific mitigation measures or targets and remains far off course from a Paris-aligned pathway.

According to PRIMAP's version 2.7, between 2010 and 2020, Russia's methane emissions decreased by about 14% from 10 Mt CH_4 to 9 Mt CH_4 (an average of 2% per year), with the largest decreases in the energy sector, from approximately 6 Mt CH_4 in 2010 to 4 Mt CH_4 in 2020. This stands in sharp contrast to PRIMAP's previous version 2.6, which recorded Russia's methane emissions as increasing by about 1% over the 2010 to 2020 period. This significant discrepancy highlights the ongoing challenge of reliability in the measurement and reporting of methane emissions data, particularly in cases where the underlying sources may not be available for independent verification.

Our analysis finds that, under current policies, methane emissions are projected to increase by around 6% between 2020 and 2030, whereas Paris-aligned pathways require reductions of roughly 38–44% over the same period, leaving a gap of around 4 Mt CH_4 in 2030. Closing this gap will require significantly stronger methane-specific measures across all sectors.

Country context

While Russia's methane emissions declined between 2000 and 2015, progress has been minimal and has since largely stalled out. State funding that could be used to fund decarbonisation has instead been consistently directed to state oil and gas companies Rosneft, Gazprom, and Lukoil, further entrenching reliance on fossil fuels. Russia's war in Ukraine has also created significant secondary emissions from wartime damage to oil and gas infrastructure, although the precise extent remains difficult to quantify. The Russian economy and political system remain deeply reliant on the sale of oil and natural gas.

According to PRIMAP, Russia emitted 9 Mt CH_4 in 2023 – 45% from the energy sector, 20% from agriculture, and 35% from waste. Across major independent datasets (CEDS, PRIMAP, and EDGAR) estimates for Russia's 2023 methane emissions range from 8.8 to 24.8 Mt CH_4, with an average of 16.2 Mt CH_4. This average is nearly double the PRIMAP data for 2023, highlighting the ongoing uncertainty around the exact level of Russia's methane emissions across different sources. Russia's 2025 Greenhouse Gas Inventory

[102] IEA, *Global Methane Tracker 2026 - Key Findings* (International Energy Agency, 2026).

reports total methane emissions at 9.2 Mt CH_4 in 2023, slightly higher than PRIMAP estimates.[103]

Russia's energy-sector methane emissions decreased by approximately 0.2% per year from 2020–2023 according to PRIMAP. While exact estimates differ, all three datasets agree that methane emissions from agriculture have fallen significantly since 1990, while emissions from waste consistently increased over the same period.

Russia is not a signatory to the Global Methane Pledge and has not announced any methane-specific targets. Both its 2030 and 2035 NDC targets include methane emissions, alongside a commitment to reach net-zero by 2060.

Russia's *Law on Limiting Greenhouse Gas Emissions* serves as the overarching framework for regulating all emissions, including methane, from the energy, waste, and agriculture sectors. The law establishes a national accounting and reporting system for major emitters, including waste sector facilities, and facilitates the development of carbon offset projects via landfill gas capture.

Russia's main policy addressing methane emissions in the energy sector is an environmental fee system which requires companies in the oil and gas sector to pay fees based on their reported methane emissions, creating a financial incentive to reduce the methane intensity of their operations.

The *Law on Production and Consumption of Waste* sets out Russia's legal framework for waste management, including requirements for landfill operation, waste diversion, and environmental fees for noncompliance. It mandates regional waste management programs, prioritizes recycling, and sets standards for landfill operation. While methane reductions are not an explicit goal of the legislation, requirements for waste diversion and landfill management contribute to limiting methane emissions in this sector.

Russia's *State Program on the Development of Agriculture and Regulation of Agricultural Products, Raw Materials and Food Markets* provides subsidies and technical support for the modernization of livestock and crop production, including improved feed, manure management, and rice cultivation practices. Although methane reduction is not an explicit goal, improved efficiency and modernization of the agricultural sector can reduce methane emissions from enteric fermentation, manure, and rice paddies.

Country assessment

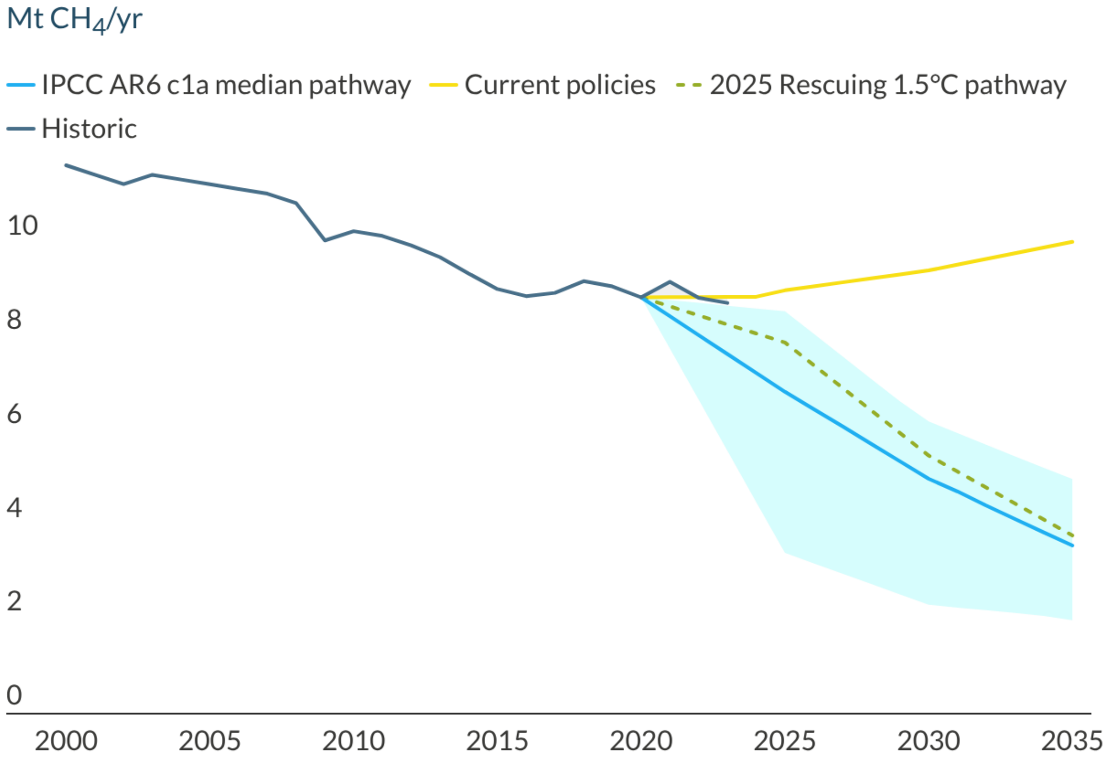
Although Russia's reported methane emissions have decreased since 2000, our current policy projection suggests that emissions are likely to increase over the next decade, putting the country far off track from its Paris-aligned pathways.

[103] Russian Federation, '[Russian Federation. 2025 Common Reporting Table (CRT)]', United Nations Climate Change, 22 April 2025.

From 2010 to 2020, Russia's methane emissions have decreased by about 14% from 10 Mt CH_4 to 9 Mt CH_4 (an average of around 2% per year). In order to be aligned with the Paris Agreement, emissions would need to fall more rapidly – by between 38–44% from 2020 to 2030. Under AR6 median Paris-aligned pathways, methane from energy would need to decline by 55% below 2020 levels by 2030, methane from waste by 49%, and methane from agriculture by 0.4%.

Our analysis estimates that national methane emissions are expected to increase by 7% between 2020 and 2030 under current policies (an average of around 1% per year). This would put Russia far off from a Paris-aligned methane pathway, leaving a 3.9-4.4 Mt CH_4 gap between Russia's current policy pathway and Paris-Aligned trajectories in 2030.

Figure 18: Russia



Historic emissions are taken from PRIMAP-hist v2.7 (2025 release). Current policy projections are based on Climate Analytics calculations. The blue shaded area shows the range of IPCC AR6 C1a pathways (10th–90th percentile).

Sources and assumptions

Our current policy projection for Russia's methane emissions is based on historical data from the latest national inventory and extended to 2035 using a growth rate from the US EPA non-CO2 projections. This pathway is harmonised to the 2020 baseline using the PRIMAP-hist v2.7 (2025 release) dataset, scaling the projections so that modelled 2020 methane emissions match PRIMAP-hist 2020 values for Russia. National inventory data is drawn from the inventories submitted to the UNFCCC in 2025.

South Africa

Summary

Although South Africa does not rank among the top ten methane emitters globally, its methane emissions remain significant and progress has largely stalled. The majority of South Africa's methane emissions come from the agricultural sector, where enteric fermentation from livestock is a major contributor, although waste sector emissions remain significant and have expanded over the last decade.[104]

While South Africa has strong methane and climate policies on paper, implementation still lags; emissions are still flat and projected to rise, widening the gap between current policies and a 1.5°C-aligned pathway.

Country context

South Africa's methane emissions have been largely flat since 2010. Across CEDS, EDGAR, and PRIMAP, total methane emissions in 2023 (excluding LULUCF) are estimated to range between 2.3 and 3.3 Mt CH_4, with an average of 2.8 Mt CH_4. According to PRIMAP, 60% of South Africa's anthropogenic methane emissions in 2023 came from the agriculture sector, 31% from waste, and 10% from energy. South Africa's 9th National Greenhouse Gas Inventory Report (covering 2000–2022) reports total methane emissions of 2.2 Mt CH_4 in 2022 (excluding LULUCF), slightly below the independent estimates.

The waste sector stands out as an increasingly important source of methane. Emissions from this sector increased by about 44% according to PRIMAP between 2000 and 2022, driven largely by wastewater treatment and discharge and solid waste disposal, which together accounted for 87% of waste-sector methane in 2022. This growing contribution from waste contrasts with relatively stable or only modestly changing emissions from the energy and agriculture sectors over the same period.[105]

South Africa has not signed the Global Methane Pledge and has not adopted a standalone methane-specific target. However, methane is included within the country's broader climate commitments - both the 2030 and 2035 NDCs cover methane as part of South Africa's overall greenhouse gas emissions reduction targets.

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[104] Republic of South Africa, *First Biennial Transparency Report of South Africa*, BTR no. 1 (Department of Forestry, Fisheries and the Environment, 2024).
[105] Ibid.

Internationally, South Africa participates in methane-focused initiatives such as the Methane Guiding Principles, an industry-led effort to reduce oil and gas methane, and the technical group of the Global Methane Initiative.

South Africa does not yet have a comprehensive methane strategy, but several policy instruments and proposals touch on methane, particularly in the energy sector. The Climate Change Act (2024) provides the overarching legal framework for mitigation, establishing sectoral emission targets for the energy sector, legally binding carbon budgets for major emitters, requirements for mitigation plans and a national GHG inventory system, all of which apply to methane as well as other greenhouse gases.

In the energy sector specifically, the government is considering a methane-specific regulatory approach for coal mining. Draft regulations under the National Environmental Management: Air Quality Act would introduce mandatory methane capture and flaring requirements at large underground mines by 2026, including financial provisions for addressing methane leakage from abandoned mines. Methane is also covered by a suite of regulations under the Air Quality Act, including the declaration of greenhouse gases as priority air pollutants and associated pollution prevention plan and reporting regulations, which require large emitters in coal mining and oil and gas to quantify their methane emissions and prepare emission-reduction plans.

In addition, methane is indirectly regulated through South Africa's carbon budgeting and carbon tax systems. Under the National Greenhouse Gas Carbon Budget and Mitigation Plan Regulations, several methane-intensive activities, such as mining and ferroalloys production, are to be allocated mandatory carbon budgets. While the 2019 Carbon Tax does not tax methane separately, methane emissions are included in the calculation of liable greenhouse gas emissions, creating a price signal that also applies to methane-intensive sectors.[106]

Country assessment

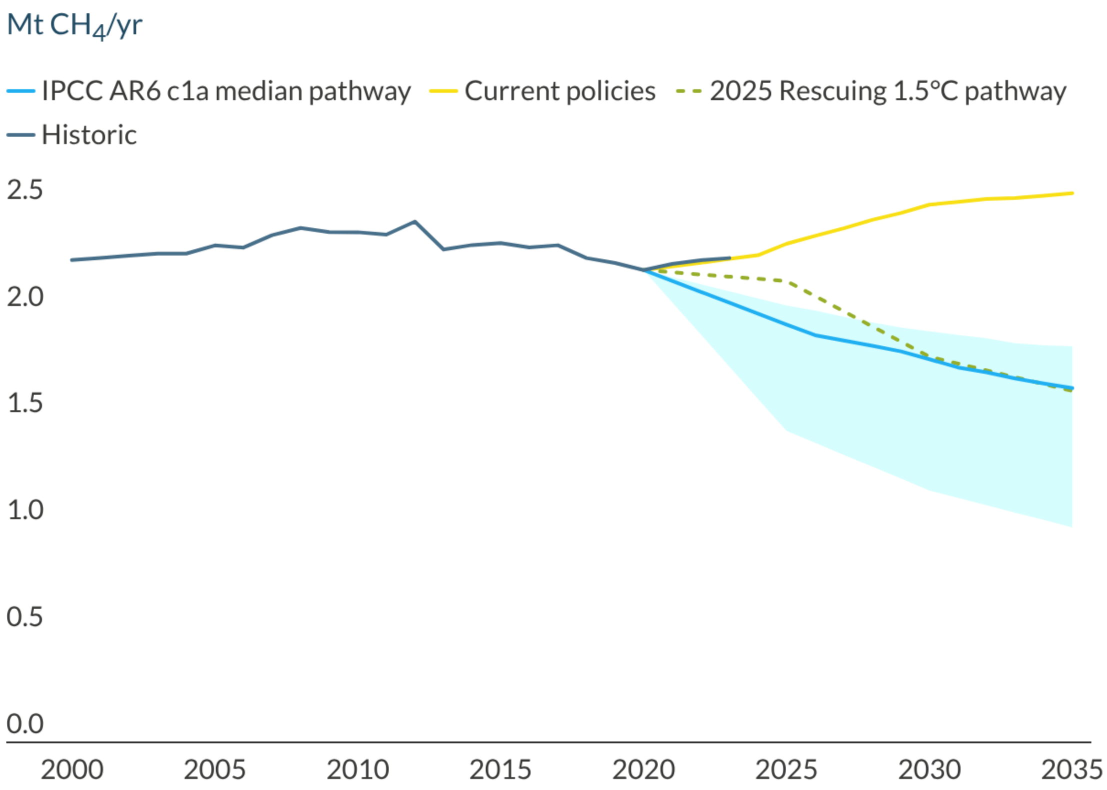
South Africa's reported methane emissions have increased slightly since 2000 and our current policy projection suggests that this trend is likely to accelerate over the next decade, putting the country far off track from its Paris-aligned pathways.

According to PRIMAP, from 2010 to 2020, South Africa's methane emissions have decreased by 5%. Yet in order to be aligned with the Paris Agreement, overall methane emissions would need to fall rapidly – by between 18–19% from 2020 to 2030. Under AR6 median Paris-aligned pathways, methane from the energy sector would need to decline by 33% below 2020 levels, methane from waste would need to decrease by 18%, and methane from agriculture by about 17%.

[106] Nicola Wills et al., *A Climate Blindspot? Coal Mine Methane in South Africa* (Swaniti Global, 2025).

Even if South Africa successfully implements its current policy measures, our assessment finds that national methane emissions would increase by 14% between 2020 and 2030 (an average of around 2% per year). This would leave a 0.7 Mt CH_4 gap between South Africa's current policy pathway and Paris-Aligned trajectories in 2030. An absence of methane-specific targets or a dedicated roadmap to reduce methane emissions across the economy, incomplete monitoring infrastructure and patchy data availability, alongside continued growth in waste-sector emissions all leave South Africa far off track.[107] More ambitious action on methane is needed to bend the curve and put the country on a Paris-aligned pathway.

Figure 19: South Africa



Historic emissions are taken from PRIMAP-hist v2.7 (2025 release). Current policy projections are based on Climate Analytics calculations. The blue shaded area shows the range of IPCC AR6 C1a pathways (10th–90th percentile).

Sources and assumptions

Our current policy projection for South Africa's methane emissions is based on the Climate Action Tracker's country assessment, using the average of the minimum and maximum current policy pathways (see more details about how those pathways were derived here). To derive a methane-specific current policy pathway, we use the U.S. EPA data on methane's share of South Africa's total greenhouse gas emissions and estimate a

[107] Wills et al., *A Climate Blindspot? Coal Mine Methane in South Africa*.

15-year historical trend in this share. We then extrapolate this trend forward and apply the projected methane share in each year to the total current policy emissions pathway from the Climate Action Tracker, obtaining annual methane emissions for South Africa out to 2035. This pathway is harmonised to the 2020 baseline using the PRIMAP-hist v2.7 (2025 release) dataset, scaling the projections so that modelled 2020 methane emissions match PRIMAP-hist 2020 values for South Africa. National inventory data is drawn from the inventories submitted to the UNFCCC in 2025.

South Korea

Summary

While independent datasets disagree about the exact trajectory of South Korea's methane emissions, the country is nevertheless rising to the challenge with a comprehensive 2030 Methane Emissions Reduction Roadmap that lays out reduction targets and mitigation measures for the energy, waste, and agricultural sectors. Unfortunately, many of the proposed mitigation measures in this plan have not yet been implemented, raising concerns that South Korea will not be able to act fast enough to meet its ambitious targets.

According to PRIMAP between 2010 and 2020, South Korea's methane emissions decreased by about 12% (an average of around 1% per year), with the largest reduction in the agriculture sector. Our analysis finds that, under current policies, methane emissions are projected to decrease by around 10% between 2020 and 2030 from 1.3 Mt CH_4 to 1.1 Mt CH_4, whereas Paris-aligned pathways require reductions between 16-40% over the same period, leaving a gap of about 0.1-0.4 Mt CH_4 in 2030. Closing this gap will require significantly stronger, methane-specific measures across all sectors.

Country context

South Korea's methane emissions present an interesting case, as trends between major independent datasets (CEDS, PRIMAP, and EDGAR) do not align with the public data submitted to the UNFCCC. While UNFCCC data from South Korea's national inventories and PRIMAP show methane emissions gradually declining from their peak in 1990, CEDS and EDGAR show reductions in the 1990s that were ultimately erased by growing emissions through the early 2000s, with emissions in 2023 above 1990 levels. Such wide divergence between datasets highlights the challenge of accurately measuring methane emissions across the economy, complicating policy interventions.

According to PRIMAP, South Korea emitted about 1 Mt CH_4 in 2023 – 14% from the energy sector, 50% from agriculture, and 36% from waste. Across major independent datasets (CEDS, PRIMAP, and EDGAR) estimates for South Korea's 2023 methane emissions range from 1.2 to 1.6 Mt CH_4, with an average of 1.4 Mt CH_4. However, the datasets disagree on the trend of South Korea's methane emissions over time. South

Korea's 2024 Greenhouse Gas Inventory reports total methane emissions at 1.3 Mt CH_4 in 2022, closely aligned with independent estimates.[108]

South Korea is a signatory to the Global Methane Pledge with both a general methane target and sector-specific methane targets in energy, waste, and agriculture, alongside 2030 and 2035 NDC targets that cover all greenhouse gases, including methane. South Korea has a net-zero target, but this is understood to be a carbon neutrality target and does not cover methane.

While South Korea's 2030 Methane Emissions Reduction Roadmap lays out an ambitious framework for reducing methane emissions across the energy, waste, and agricultural sectors, many of the specific mitigation measures contemplated by the plan have not yet been translated into national law or regulation. As a result, despite the plan's ambitious targets, it remains to be seen whether South Korea can truly implement its goals fast enough to meet the 2030 deadline.

One notable policy is South Korea's 2022 Biogas Law, which aims to promote the production of usable biogas from organic waste and reduce uncontrolled methane emissions from both the waste and agricultural sectors.[109] The law places obligations to produce biogas on major pig farms, manure treatment facilities, and organic waste processing plants. Government-run industries are obliged to produce up to 50% biogas from waste by 2025, with the share set to steadily increase until 2045.

Country assessment

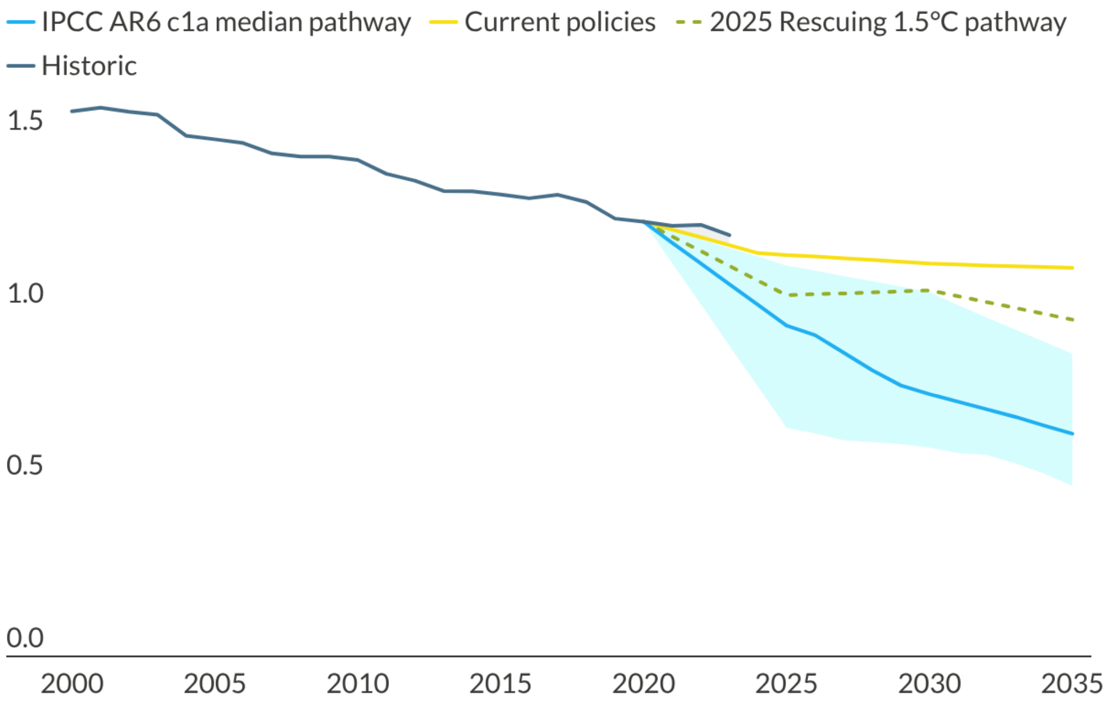
According to PRIMAP, South Korea's methane emissions have declined since 2000, and current policies are expected to continue this gradual downward trend over the next decade – though not at a pace consistent with Paris-aligned pathways. Between 2010 and 2020, emissions fell by 12% (a little over 1% per year), whereas alignment with the Paris Agreement would require a much steeper reduction of 16-40% between 2020 and 2030. In AR6 median Paris-aligned pathways, methane from energy would need to decline by 51% below 2020 levels by 2030, methane from waste by 32%, and methane from agriculture by 27%.

If South Korea effectively implements its current policies, we estimate national methane emissions to decrease by 10% between 2020 and 2030 (an average of about 1% per year). However, a fully successful implementation would still leave a 0.1-0.4 Mt CH_4 gap between South Korea's current policy pathway and Paris-Aligned trajectories in 2030.

[108] Republic of Korea, 'Republic of Korea. 2024 Common Reporting Table (CRT)', United Nations Climate Change, 30 September 2025.
[109] Lee Jung-joo, 'South Korea to Produce Biogas from Organic Waste Resources', *Asia News Network*, 29 December 2023.

Figure 20: South Korea

Mt CH_4/yr



Historic emissions are taken from PRIMAP-hist v2.7 (2025 release). Current policy projections are based on Climate Analytics calculations. The blue shaded area shows the range of IPCC AR6 C1a pathways (10th–90th percentile).

Sources and assumptions

Our current policy projection for South Korea's methane emissions is based on the Climate Action Tracker's country assessment, which is based on projections from South Korea's First Biennial Transparency Report (BTR1) and the US EPA, with the pathway here representing the average of the two sources' estimates (see more information here[110]). The current policy pathway is harmonised to the 2020 baseline using the PRIMAP-hist v2.7 (2025 release) dataset, scaling the projections so that modelled 2020 methane emissions match PRIMAP-hist 2020 values for South Korea. National inventory data is drawn from the inventories submitted to the UNFCCC in 2025.

United Kingdom

Summary

Methane emissions in the United Kingdom have maintained a steady decline since the turn of the century. Among the countries included in our analysis, the United Kingdom

[110] Climate Action Tracker, *South Korea: Assumptions* (Climate Action Tracker, 2025).

has adopted one of the most ambitious policy regimes to achieve a Paris-aligned methane emissions pathway.

Country context

The United Kingdom's methane emissions continue to trend downward. According to PRIMAP, the United Kingdom emitted 2 Mt CH_4 in 2023 – 53% of which came from agriculture, 35% from waste, and 12% from the energy sector. Across major independent datasets (CEDS, PRIMAP, and EDGAR), the U.K.'s methane emissions ranged from 1.5 to 2.1 Mt CH_4 in 2023, averaging 1.8 Mt CH_4. The most recent estimates from the U.K. National Atmospheric Emissions Inventory reported methane emissions reached 2.1 Mt CH_4 in 2023.[111] This tracks closely with independent estimates.

Between 2020 and 2024, the U.K.'s methane emissions declined by an average of 2% per year. This was largely driven by reductions in emissions from the energy sector and waste, amounting to 5% and 3% per year respectively. Emissions from agriculture remained largely flat.

The U.K. is a signatory of the Global Methane Pledge, however, the U.K. has no standalone methane target. Instead, methane emissions are covered under the Climate Change Act of 2008 (CCA).[112] The CCA formalized a 100% reduction in all greenhouse gas emissions (net zero) by 2050.[113] The Act, which set the first legally binding climate mitigation target for a country, covers methane and legally mandates annual reporting of emissions across sectors.

The U.K. published a Methane Action Plan in October 2025.[114] This document outlines existing national policies adopted to curb methane emissions across key sectors. The U.K. government has adopted several policies geared toward mitigating methane emissions. For instance, the North Sea Transition Authority's Flaring and Venting Guidance establishes a regulatory framework to eliminate routine flaring and venting in U.K. offshore oil and gas operations by 2030. The U.K. Emissions Trading Scheme (UK ETS) will expand to include maritime emissions beginning 1 July 2026.[115] The proposed inclusion will apply to ships of 5,000 gross tonnage or more undertaking domestic voyages between UK ports and include methane emissions.

[111] P. Brown et al., *UK Greenhouse Gas Inventory, 1990 to 2023: Annual Report for Submission under the Framework Convention on Climate Change* (National Atmospheric Emissions Inventory, 2025).
[112] Climate Change Act 2008 (2008).
[113] When originally adopted in 2008, the CCA committed the UK to reduce greenhouse gas emissions by 80 per cent by 2050, compared to 1990 levels. In 2019, the target was amended to 100% net zero emissions.
[114] Department for Energy Security and Net Zero, *UK Methane Action Plan* (UK Government, 2025).
[115] International Carbon Action Partnership, *UK Government Confirms Major UK ETS Expansions: Maritime, Waste, and Carbon Removals to Be Phased in Image* (International Carbon Action Partnership, 2025).

Country assessment

From 2010 to 2020, the United Kingdom's methane emissions have decreased by 26% (an average of 3% per year). In order to be aligned with the Paris Agreement, emissions would need to fall by between 14-29% from 2020 to 2030. Under AR6 median Paris-aligned pathways, methane from energy would need to decline by 66% below 2020 levels, methane from waste by 59%, and methane from agriculture by 14%.

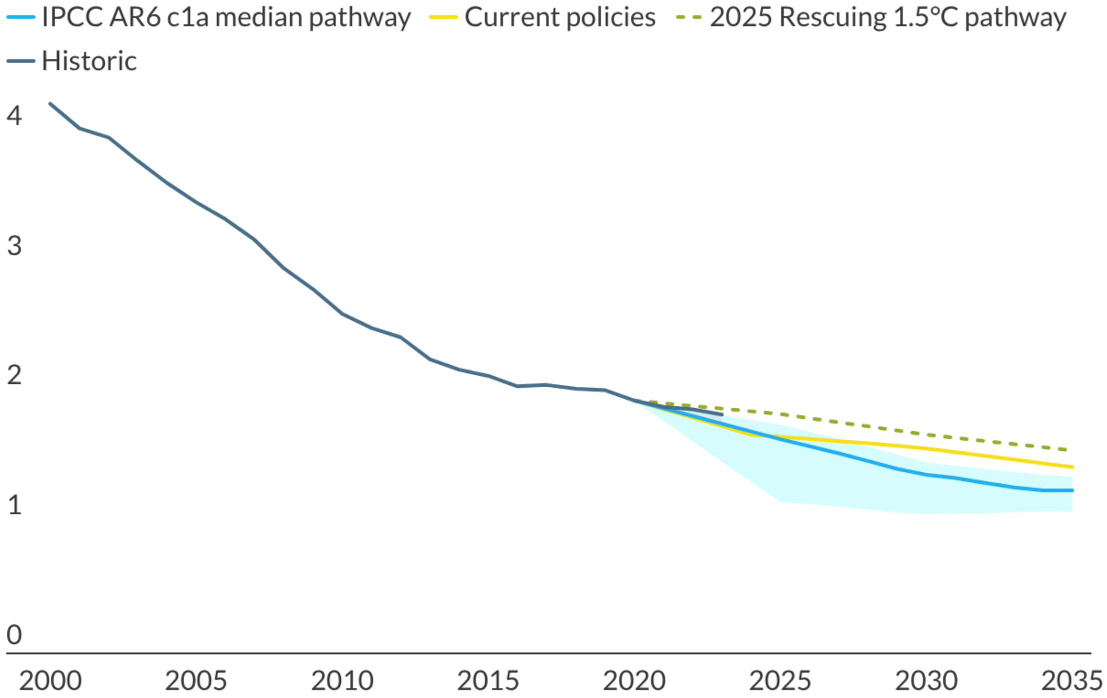
Our assessment of the current policy trajectory in the United Kingdom finds that methane emissions will continue to decline through 2030. If the United Kingdom implements current policies effectively, methane emissions are expected to decline by 19% between 2020 and 2030 (an average of 2% per year). The country is, therefore, on track with a Paris-aligned methane pathway should it continue to faithfully implement ascribed policies.

While the United Kingdom's current pathway is on track, the situation is tenuous, dependent on the effective rollout and enforcement of existing policies. Spurred by the 2026 fuel crisis, British lawmakers are openly discussing the expansion of oil and gas production in the North Sea.[116] Such moves would undercut progress made and jeopardise the United Kingdom's alignment with the Paris Agreement.

[116] Fiona Harvey, *New North Sea Drilling Would Barely Reduce UK Gas Imports at All*, *Data Shows*, 4 April 2026.

Figure 21: United Kingdom

Mt CH_4/yr



Historic emissions are taken from PRIMAP-hist v2.7 (2025 release). Current policy projections are based on Climate Analytics calculations. The blue shaded area shows the range of IPCC AR6 C1a pathways (10th–90th percentile).

Sources and assumptions

The current policy projection for the U.K.'s methane emissions is based on the Climate Action Tracker's country assessment, using the average of the minimum and maximum current policy pathways, which are themselves derived from the U.K. Climate Change Committee's emissions projections (see the Climate Action Tracker assumptions for more information). This pathway is harmonised to the 2020 baseline using the PRIMAP-hist v2.7 (2025 release) dataset, scaling the projections so that modelled 2020 methane emissions match PRIMAP-hist 2020 values for the U.K. National inventory data is drawn from the inventories submitted to the UNFCCC in 2025.

United States

Summary

The United States is the second largest emitter of methane globally, behind China. Since January 2025, the second Trump Administration has made deep cuts to federal funding for mitigation efforts and has rescinded or effectively nullified policies targeting methane emissions. These developments deeply exacerbate the long-term outlook for the country's methane emissions. While individual states continue with existing and adopt new policies to curtail emissions within their jurisdictions, this is not enough to offset the decline in federal support for mitigation efforts.

Country context

Methane emissions in the United States have gradually declined since the turn of the century. According to the U.S. Environmental Protection Agency (EPA) methane emissions inventory, emissions peaked in 1990 and have continued to decrease, albeit at a rate insufficient to meet reduction targets.[117]

Per PRIMAP, the United States emitted 25 Mt CH_4 in 2023 - 40% from the energy sector, 40% from the agricultural sector, and 20% from waste. Across major independent datasets (CEDS, PRIMAP, and EDGAR), U.S. methane emissions estimates range from 24.5 to 30.4 Mt CH_4, with an average of 27.3 Mt CH_4.

According to PRIMAP estimates, the U.S. is the second largest emitter of methane in absolute terms and 19th in terms of per capita emissions. Between 2020 and 2023, methane emissions declined by an average of 2% per year. This is driven largely by reduced emissions in the energy sector, which declined by an average of 3% per year over the same period. Methane emissions from agriculture and waste both declined by around 1% per year.

The EPA's Inventory of U.S. Greenhouse Gas Emissions and Sinks: 1990-2022 reported 25.1 Mt CH_4.[118] The EPA's estimate falls within the bottom range of independent estimates.

The United States is a signatory to the Global Methane Pledge, having launched the initiative as a co-convener alongside the European Union at COP26 in 2021. In 2025, the United States stepped aside as a convener of the pledge and was replaced by Canada.[119]

The United States had set a net-zero emissions target of 2050, formalizing a reduction strategy in 2021.[120] This strategy resulted from Executive Order 14008 Tackling the Climate Crisis at Home and Abroad adopted by the Biden administration, declaring the climate crisis to be a central consideration in U.S. domestic policy, national security, and

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[117] United States Environmental Protection Agency, *Methane Emissions* (United States Environmental Protection Agency, 2026).
[118] United States Environmental Protection Agency, *Inventory of U.S. Greenhouse Gas Emissions and Sinks: 1990-2022* (United States Environmental Protection Agency, 2026).
[119] European Commission, *Methane Emissions* (European Commission, n.d.).
[120] United States Department of State and United States Executive Office of the President, *The Long-Term Strategy of The United States: Pathways to Net-Zero Greenhouse Gas Emissions by 2050* (The United States Department of State and the United States Executive Office of the President, 2021).

foreign policy.[121] Fulfilling the U.S. commitment to the Global Methane Pledge was specifically addressed under the strategy.

Following the beginning of the second Trump administration in 2025, Executive Order 14154 Unleashing American Energy rescinded the policies of the Biden administration to reduce methane and other greenhouse gas emissions.[122] As of adoption, the U.S. government no longer has formalized reduction targets.

The United States adopted the Methane Emissions Reduction Action Plan in November 2021, published by the White House Office of Domestic Climate Policy.[123] The Trump administration abolished this office in 2025.[124]

The second Trump administration and the Republican-controlled 119th Congress are focused on reviewing or undoing prior regulations (particularly landmark climate legislation passed during the Biden administration), pausing the collection of methane emissions from the oil and natural gas sector, and expanding fossil fuel production. A key policy from the Biden administration's Inflation Reduction Act, the Waste Emissions Charge for methane emissions was effectively pushed back from 2024 to 2034.[125] In February 2026, the Environmental Protection Agency (EPA) repealed the endangerment finding under the Clean Air Act.[126,127] The endangerment finding is a foundational legal decision which concludes that greenhouse gas pollution endangers human health and requires regulation. Following its formalization in 2009, the EPA utilised the finding as the legal basis for regulating greenhouse gas emissions across sectors. This includes regulating vehicle, industrial and power plant emissions and the treatment of climate change as a public health issue under the EPA's authority.

While the federal government reneges on its commitments to the Global Methane Pledge, state governments continue to enact policies addressing methane emissions within their jurisdictions. In Colorado, the Air Quality Control Commission adopted new regulations to reduce methane emissions from municipal solid waste landfills in late

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[121] Executive Order 14008: Tackling the Climate Crisis at Home and Abroad, Pub. L. Nos 2021-02177 (86 FR 7619), 3295-F1-P (2021).
[122] Executive Order 14154: Unleashing American Energy, Pub. L. Nos 2025-01956 (90 FR 8353), 3395-F4-P (2025).
[123] United States White House, *Delivering on the U.S. Methane Emissions Reduction Action Plan* (The White House Washington, 2022).
[124] Executive Order 14154: Unleashing American Energy.
[125] Harvard Law School Environmental and Energy Law Program, *EPA VOC and Methane Standards for Oil and Gas Facilities* (Harvard Law School Environmental and Energy Law Program, 2026).
[126] United States Environmental Protection Agency, *Final Rule: Rescission of the Greenhouse Gas Endangerment Finding and Motor Vehicle Greenhouse Gas Emission Standards Under the Clean Air Act* (United States Environmental Protection Agency, 2026).
[127] Sarah Brown, *EPA Repeals Legal Basis for Regulating Greenhouse Gases. What It Means for the US — and the World* (World Resources Institute, 2026).

2025.[128] Colorado was the first state to regulate methane emissions from oil and gas, starting in 2014 with targets for methane emissions.[129] New Mexico has adopted a set of coordinated state regulations, the centerpiece of which is the Methane Waste Rule.[130] This policy requires oil and gas operators to capture 98% of their methane emissions by December 31, 2026. California mandates aggressive methane reductions, targeting a 40% reduction below 2013 levels by 2030.[131] New York's methane reduction strategy targets a 40% reduction in greenhouse gases by 2030 and 85% by 2050 from 1990 levels.[132]

Country assessment

From 2010 to 2020, the United States' methane emissions have decreased by 10% (an average of about 1% per year). In order to align with the Paris Agreement, emissions would need to fall rapidly – by between 44-51% from 2020 to 2030. Under AR6 median Paris-aligned pathways, methane from energy would need to decline by 69% below 2020 levels by 2030, methane from waste by 61%, and methane from agriculture by 24%.

Our assessment of the current policy trajectory in the United States indicates methane emissions will decline by 12% from 2020 to 2030. However, the pace of reductions from the existing policy landscape is not sufficient to bring the United States in line with a Paris-aligned methane trajectory, leaving a 7 and 9 Mt CH_4 gap in 2030. Hostility by the federal government toward mitigation measures can be expected to widen this gap.

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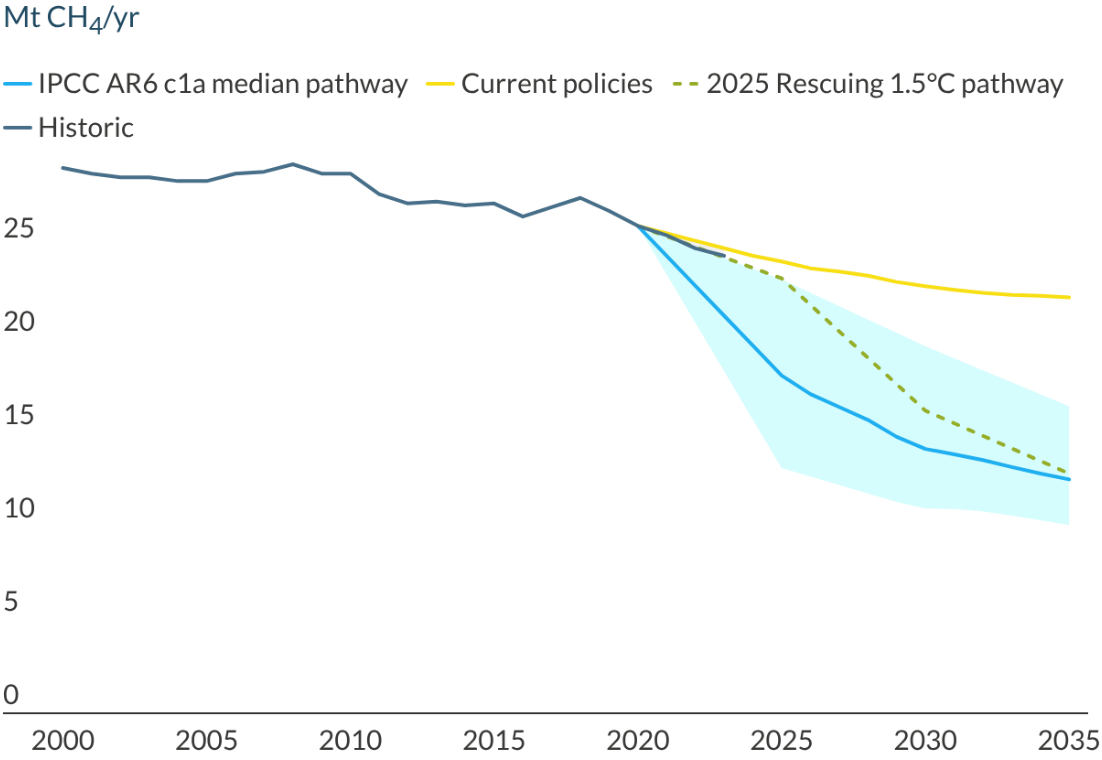
[128] Colorado Department of Public Health and Environment, *New Colorado Air Standard Addresses Methan Emissions from Landfills, Advances State Climate Goals* (Colorado Department of Public Health and Environment, 2025).
[129] Colorado Climate Action, *Mitigation: Oil and Gas* (Colorado Climate Action, n.d.).
[130] New Mexico Energy, Minerals and Natural Resources Department, *Methane Waste Rule* (New Mexico Energy, Minerals and Natural Resources Department, n.d.).
[131] Ezra David Romero, 'California Adopts Tougher Methane Rule for Landfills to Curb Planetary Warming', *KQED*, 20 November 2025.
[132] New York Department of Environmental Conservation, *Methane Reduction Plan* (New York Department of Environmental Conservation, 2017).

Figure 22: United States



Historic emissions are taken from PRIMAP-hist v2.7 (2025 release). Current policy projections are based on Climate Analytics calculations. The blue shaded area shows the range of IPCC AR6 C1a pathways (10th–90th percentile).

Since coming to office in January 2025, the Trump administration has actively worked to undermine and rescind policies that curtail greenhouse gas emissions. Simultaneously, new policies seek to expand the oil and gas sectors while hollowing out emissions limits and safeguards.[133,134] While state-level action is notable, it is inadequate to counter federal hostility to methane emissions controls and standards. Under such conditions, the policy pathway used in our analysis – already Paris-inadequate – becomes increasingly unattainable. Assuming a continuation of these trends, the United States's methane emissions profile can reasonably be expected to worsen over the coming years.

Sources and assumptions

The current policy projection is taken from the Climate Action Tracker country assessment, which develops its own policy projections for the United States and aggregates a range of emissions projections from external studies (see the country assumptions for more details). The current policy pathway is harmonised to the 2020

[133] The Associated Press, 'Trump Gives the Go-Ahead for a Major New Canada-U.S. Oil Pipeline', *NPR*, 30 April 2026.

[134] Victoria Bekiempis, 'Trump Signs Memos to Boost US Fossil-Fuel Production for "Defense Readiness"', *The Guardian*, 21 April 2026.

baseline using the PRIMAP-hist v2.7 (2025 release) dataset, scaling the projections so that modelled 2020 methane emissions match PRIMAP-hist 2020 values for the United States. National inventory data is drawn from the inventories submitted to the UNFCCC in 2025.

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