WORLD BIOGAS ASSOCIATION

LANDFILL GAS: THE OVERLOOKED PILLAR OF METHANE MITIGATION

POSITION STATEMENT

Executive Summary

Landfill gas (LFG) contains approximately 50% methane and is generated as organic waste decomposes anaerobically (in the absence of oxygen) in landfills. It is both one of the world's most significant sources of avoidable greenhouse gas emissions and one of its most mature, investable decarbonisation opportunities.

Captured LFG can be used to generate electricity and heat via combined heat and power (CHP) or upgraded to biomethane for injection to the gas grid or use as vehicle fuel. WBA's position is that LFG capture and utilisation must be treated as a durable, funded pillar of national methane strategies - not a transitional technology to be phased out as food-waste diversion policies mature, except where landfills have closed and been permanently exhausted.

Crucially, WBA argues that LFG capture and food/organic waste diversion (via separate collection to anaerobic digestion or composting) are complementary obligations, not substitutes until existing and closed landfills are depleted. Diversion prevents emissions from future waste going to landfill, but it does not address the methane that will continue to be generated for 20–30+ years from the billions of tonnes of organic waste already buried. Nor does it address the additional legacy emissions created by waste that continues to be landfilled during the transition to greater diversion.

Policy that only rewards diversion, while allowing LFG capture infrastructure and obligations to lapse, risks a widening "legacy emissions gap."

Context & Problem Definition

- The waste sector is the third-largest source of global anthropogenic methane emissions after agriculture and oil and gas, responsible for roughly 20% of the total; solid waste (landfills/dumpsites) alone accounts for around 12% of global methane emissions[i].
- Global human-generated solid waste reached an estimated 2.24 billion tonnes in 2020 and is projected to rise a further ~70% by 2050 as populations and incomes grow - most of the increase concentrated in fast-urbanising regions with limited engineered disposal[ii].
- Without further action, waste-sector methane is projected to keep rising through this decade and beyond - by one recent estimate adding a further ~40 Mt/year by 2050, a steeper increase than either the agriculture or fossil-fuel sectors[iii].
- Satellite research increasingly shows official inventories understate the problem: a 2025 study found reported (EDGAR) estimates for open dumpsites under-count emissions by a factor of ~5 and estimated that converting dumpsites to engineered landfills while diverting organics could cut this segment's emissions by up to 80% (a mitigation potential of ~760 Mt CO_2e/year – the equivalent of taking 169 million cars off the road)[iv].
- A 2024 satellite study (*Science*) similarly found methane emissions from US landfills running well above what is reported through federal inventories - reinforcing the case for better monitoring alongside better capture[v].
- The UN Environment Programme's Methane Alert and Response System (MARS) has begun naming individual mega-emitting sites: in 2026 it identified Chile's Lomas Los Colorados landfill as the world's top human-made methane point-source[vi]; separately, satellite analysis by UCLA's STOP Methane Project (using Carbon Mapper data) ranked the 25 highest-emitting landfill "super-emitter" plumes of 2025 across 18 countries, with rates as high as 7.6 tonnes of methane per hour at a single site - comparable in annual warming impact to roughly a million SUVs[vii].

Statement of Position

WBA advocates for landfill gas capture, control and utilisation (to biomethane or CHP) to be maintained and expanded as an obligation on landfill operators for the full duration of gas generation – both pre-closure and for the full duration of post-closure gas generation - run in parallel with, not displaced by, organic-waste diversion policy. WBA calls for regulatory and financial frameworks that recognise LFG's dual role: an immediate, high-integrity methane-abatement tool for legacy waste and a renewable energy source in its own right.

Evidence & Justification

Environmental Case

- LFG capture is one of the lowest-cost, highest-integrity methane abatement levers available today; UNEP's *Global Methane Assessment* found targeted waste-sector measures could cut sector emissions by 29–36 Mt/year by 2030, with around 60% of measures at negative or low cost[viii].
- Because methane's 20-year global warming potential is ~86 times that of CO_2, near-term LFG capture delivers outsized, fast-acting climate benefit relative to its cost - directly relevant to keeping 1.5°C-aligned pathways within reach[ix].
- Utilising LFG also cuts co-emitted volatile organic compounds and local air toxics, delivering community air-quality benefits around landfill sites.

Technical Case

- LFG collection and utilisation is mature, proven technology (wellfields, gas engines/CHP, upgrading to biomethane) already deployed at thousands of sites worldwide - this is a scale-up and retention challenge, not a technology-development one.
- LFG-to-biomethane uses the same grid-injection and vehicle-fuel infrastructure as biomethane produced through standard anaerobic digestion plants, allowing shared investment and blending strategies.
- Gas generation from a landfill site continues for decades after waste is deposited - and for many years after a site closes and stops accepting waste - meaning wellfields and utilisation assets must be funded on multi-decade time horizons distinct from near-term diversion targets.

Economic Case

- LFG-to-energy projects typically have low marginal generation costs once wellfields are installed, and can supply firm, dispatchable renewable power/heat or grid-quality biomethane, unlike some intermittent renewables.
- Continued utilisation monetises a liability (fugitive methane and associated regulatory/reputational risk) as a renewable-energy asset, supporting rural and local authority revenues.
- Conversely, premature abandonment of LFG infrastructure as feedstock volumes decline risks stranding sunk capital and losing an available (if declining) renewable gas stream - an argument for phased, not cliff-edge, transition planning.

Policy Case

- Methane abatement policies should assess LFG capture alongside other methane mitigation measures on the basis of verified tonnes of methane avoided to allow LFG to access methane-mitigation finance and carbon-market mechanisms (MRV) where robust monitoring, reporting and verification can demonstrate abatement.

- LFG capture should be recognised (in various forms) under the EU Landfill Directive, the Global Methane Pledge's waste pathway, national Nationally Determined Contributions (NDCs), and - where applicable - emissions trading/landfill tax regimes.
- It should also be explicitly linked to net-zero delivery pathways as a bridging and legacy-emissions tool, not treated as a declining-relevance technology once separate food-waste collection scales up.
- Certification/guarantee-of-origin treatment for LFG-derived biomethane should be harmonised with AD-derived biomethane (as WBA has argued for bio-LNG) so it can compete for the same RED III-style incentives on a like-for-like carbon-intensity basis.

Open Dumpsites

Scale of the Problem

- Around 40% of the ~2.24 billion tonnes of municipal solid waste generated globally each year ends up in open, uncontrolled dumpsites rather than engineered landfill - rising to as much as 90% in many African cities and ~45% across Latin America and the Caribbean[xi].
- Dumpsites collectively serve an estimated 3.5-4 billion people worldwide - roughly half the global population - as their primary route for waste disposal. The 50 largest dumpsites alone affect the daily lives of an estimated 64 million people - a population roughly the size of France - with around 60 million people living within 10km of them[xii].

Challenge	Why It Matters	WBA Response
Feedstock decline Separate food-waste collection cuts organic input to new landfill cells, reducing future gas yields.	Affects only new, not legacy, tonnage. Waste already in the ground keeps generating gas for decades irrespective of diversion policy.	Decouple capture obligations and funding from annual diversion targets; size them to the long tail of historic deposits.
"Sunset technology" perception Investors and policymakers increasingly treat LFG-to-energy as a declining asset class as circular-economy policy matures.	Risks capital flight and under-investment at sites where methane liability persists for 20–30+ years after closure.	Reclassify LFG capture as legacy-emissions management with a defined multi-decade asset life - a distinct and complementary objective from waste diversion, not a competing one.
Data and measurement gaps Satellite studies show reported inventories materially under-count observed landfill methane.	Undermines confidence in progress metrics, crediting mechanisms and the case for continued investment.	Mandate harmonised MRV: reconcile site-level metering with satellite/remote-sensing data as standard practice.
Competing end-uses and market access LFG-to-biomethane competes with AD-biomethane and bio-LNG for offtake and certification; LFG-to-CHP competes for grid connection and capacity-market access.	Without a level playing field, LFG-derived fuels lose out to other renewable gases on cost or certification grounds alone, not carbon performance.	Push for technology-neutral, carbon-intensity-based support mechanisms - the same principle WBA has argued for bio-LNG in the maritime context[x].
Uncontrolled dumpsites in developing economies The highest-emitting, least-controlled disposal capacity globally is open dumping, not engineered landfill - where capture is currently technically or economically unviable.	Excludes the largest share of global landfill/dumpsite methane from near-term abatement, regardless of capture policy elsewhere.	Back phased dumpsite-to-engineered-landfill upgrade programmes (aligned with Global Methane Pledge/World Bank initiatives) as a precondition for investment.

Table 1: Addressing Challenges and Counter Arguments

- The World Bank projects waste generation in Sub-Saharan Africa and South Asia - the regions most reliant on open dumping today - to roughly double and triple respectively by 2050 as urbanisation and incomes rise, meaning exposure will keep growing without intervention rather than shrink on current trends[xiii].
- An estimated 15–20 million people worldwide earn their living as informal waste pickers, many working directly on or around dumpsites without protective equipment or access to healthcare or social protection[xiv].

Health & Environmental Impacts

- Leachate contamination: rainwater percolating through unlined, uncontained waste can carry heavy metals, ammonia and organic pollutants into groundwater and surface water, threatening drinking-water sources and agricultural land downstream of sites.
- Open burning: a common cost-saving practice at uncontrolled sites, releasing dioxins, furans, polycyclic aromatic hydrocarbons (PAHs) and black carbon - a short-lived climate pollutant with an outsized near-term warming effect that compounds the methane problem rather than substituting for it.
- Uncounted methane: without engineered gas capture or metering, dumpsites emit methane and volatile organic compounds directly to atmosphere; because there is no equivalent to landfill gas-collection infrastructure, this source is systematically harder to quantify and is a leading contributor to the inventory-vs-satellite gaps previously mentioned.
- Respiratory and communicable disease: peer-reviewed and WHO-referenced studies link communities near dumpsites to elevated rates of respiratory infection, asthma, skin and eye irritation, and vector-borne disease linked to flies, rodents and other pests breeding in uncollected waste.
- Occupational exposure: waste pickers face daily direct contact with hazardous, medical and electronic waste, contributing to elevated rates of infection, injury and chronic illness, compounded by limited access to healthcare and legal recognition of their work.
- Environmental justice dimension: exposure is heavily concentrated among low-income and informal-settlement communities with the fewest resources to mitigate risk or relocate - reinforcing the case for treating dumpsite closure/upgrade as a health and equity priority, not solely a climate one.

Regional Deep Dives

UK Policy Landscape

- The Environment Act 2021, via the government's "Simpler Recycling" reforms, makes weekly separate food-waste collection mandatory for all English households and (with limited exemptions) businesses from 31 March 2026[xv] - following Wales and Scotland, which have run organics to landfill restrictions for around seven years.
- This sits alongside the UK's stated ambition of sending no food waste to landfill by 2030, explicitly intended to divert biodegradable material toward anaerobic digestion and composting instead.
- Implementation risk flagged by industry bodies (e.g. the UK Anaerobic Digestion and Bioresources Association (ADBA)) and analysts includes funding gaps for local authorities and a coverage "loophole" affecting flats and certain multi-occupancy housing, meaning some biodegradable waste will continue reaching landfill in the medium term regardless of the policy intent. Extensive derogations mean that many councils are not even intending to roll out separate food-waste collections until the late 2030s or in some cases as late as 2043[xvi].

WBA Position

- The faster and more completely food waste is diverted, the sooner the gas-generation potential of landfills declines - reinforcing the case for ring-fenced, long-duration funding/obligations for LFG capture on legacy and closing sites, decoupled from annual diversion-rate targets. Organic waste sent to landfill pre-2028 and beyond under derogation will continue to produce methane gas for ~15-20 years.

  ADBA analysis forecasts LFG represents a potential source of around 5.7 TWh of biomethane annually. At the same time, the methane contained in this resource represents a major emissions-abatement opportunity. By back-calculating the assumed net electrical efficiency of LFG CHP and UK-specific landfill-gas composition assumptions from Defra's landfill methane modelling, the result of not harnessing the available 5.7 TWh pa would be the release to atmosphere of 340 kt of CH_4 annually, representing a global warming impact of approximately 9.5 $MtCO_2e$ over 100 years, using the IPCC AR5 GWP100 multiplier of 28[xvii].

  The UK's Carbon Budget 6 (CB6) covering 2033-2037 assumes that landfill methane capture will improve. The ending of Renewables Obligation (RO) support for landfill-gas energy from 2027 could have the opposite effect: reducing capture rates and increasing methane emissions. If the loss of RO support leads to widespread loss of landfill-gas capture capacity, the resulting increase in methane emissions could represent up to 5% of the annual CB6 emissions reduction requirement.

  However, if support for LFG capture is retained and carbon dioxide captured for removal during upgrading the LFG fleet offers better than assumed reductions in emissions, to an extra ~0.3% on the annual CB6 allowance[xviii].

UK Policy Focus - the Renewables Obligation Cliff-edge

Organics diversion is not the only UK policy dynamic squeezing LFG. A more acute and nearer-term cliff-edge sits on the revenue side: the closure beginning in 2027 of the Renewables Obligation (RO), which has supported landfill gas generation since 2002.

- The RO closed to new capacity in April 2017. Existing accredited landfill gas stations continue to receive RO Certificates (ROCs) for 20 years from their accreditation date, or until 31 March 2027, whichever is later - meaning support for the large majority of the UK's remaining LFG generating fleet ends by that date, with the scheme fully winding down (across all RO technologies) by 2037.
- Support for landfill gas specifically had already been declining well before formal closure: banded down from 1 ROC/MWh at the scheme's 2002 launch to 0.25 ROC/MWh from 2009 and roughly 0.2 ROC/MWh by 2013, on the basis that falling generation costs meant continued full-rate support risked over-compensation.
- Green Alliance's 2025 analysis frames this explicitly as a methane risk, not just a revenue one: without replacement support, operators may have reduced financial incentive to maintain gas-capture infrastructure at ageing or lower-yield sites, risking a sharp rise in fugitive methane and the loss of low-carbon generation equivalent to over a million homes' electricity needs - while, at the time of that analysis, no replacement scheme had been confirmed[xix].
- The UK government has since acknowledged the risk: in a March 2026 parliamentary answer, the Minister of State at the Department for Energy Security and Net Zero confirmed that RO expiry from April 2027 "could affect the commercial viability of generators in a sector which supports hundreds of jobs," and pointed to the Methane Action Plan's exploration of a long-term methane capture scheme with transitional arrangements - but no firm replacement mechanism, funding level or start date had been announced at time of writing[xx, xxi].

WBA Position

- Sites facing declining gas yields as food waste is diverted are the same sites facing the simultaneous loss of the revenue stream that has funded their gas-capture equipment for two decades.

  Taken separately, the impact of either one of these could have likely been absorbed by operators. However, taken together and on broadly the same timeline (RO expiry from 2027; food-waste diversion accelerating from 2026), they create a real risk that operators mothball or under-invest in LFG capture at exactly the sites where legacy methane will keep being generated for years afterward.

  The UK needs to confirm and fund a long-term landfill gas support mechanism (whether an RO extension, a successor scheme, or the mooted long-term methane capture scheme) well before April 2027, with clear transitional arrangements - rather than let the RO simply lapse while its replacement is still under discussion.

  The UK's biomethane incentive Green Gas Support Scheme (GGSS) currently excludes LFG from eligibility. Yet upgrading LFG to biomethane is an established commercial pathway, already deployed across North America and Europe, using the same downstream infrastructure and end-use pathways as biomethane produced from anaerobic digestion. There is therefore no fundamental technology or infrastructure barrier to its deployment in the UK.

  Opening the successor biomethane support mechanism to LFG could unlock an estimated ~5.7 TWh of renewable gas from existing landfill sites, while delivering substantially greater energy recovery and more than twice the carbon abatement per kWh compared with using the same gas to generate electricity through CHP. Including landfill biomethane within the UK ETS would provide an additional market signal for this higher-value use of a legacy methane resource.

EU Policy Landscape

- The revised Waste Framework Directive requires separate collection of bio-waste (in force since 2024) and, from 1 January 2027, only bio-waste that has been separately collected or source-separated may count toward Member States' recycling targets - meaning mechanical-biological treatment output from mixed waste will no longer qualify[xxii].
- The Landfill Directive (EU) 2018/850 caps municipal waste landfilling at 10% by 2035 and requires national strategies to progressively cut biodegradable waste going to landfill, reinforced by landfill taxes/bans in most Member States[xxiii].
- Bio-waste represents roughly one third of EU municipal waste. Studies suggest that achieving the EU's overall 65% municipal waste recycling target by 2035 will require capturing an additional ~40 million tonnes of bio-waste per year through separate collection, further accelerating the decoupling dynamic seen in the UK.

WBA Position

- EU policy on diverting organics from landfill is ahead of the UK. As a consequence, the EU faces the same challenge as the UK of diversion leading to declining output. As with the UK, the EU should set a standing, non-declining obligation tied to the (multi-decade) presence of historic waste in place - not scaled down in step with rising diversion/recycling rates.

EU Policy Focus - the Regulatory Patchwork on Landfill Methane

The diversion story above is only half the EU picture. A second, equally important point is that Brussels has an ambitious biomethane target, good evidence that landfill gas (LFG) can help meet it and - for now - no proper rulebook to make that happen.

- REPowerEU sets an EU-wide production goal of 35 billion cubic metres (~350TWh) a year of sustainable biomethane by 2030 - but it does not specify where that gas should come from, leaving LFG's contribution undefined and easy to overlook[xxiv].
- The evidence says LFG can deliver up to 10% of the target. A recent study estimates landfill biomethane potential at ~15–20 TWh/year, or ~5–10% of the EU 2030 biomethane production target. – accounting for the 10% limit on municipal waste the Landfill Directive requires by 2035[xxv]. In other words, capturing more gas and sending less waste to landfill are not competing goals. The two can, and should, be pursued together - but current policy treats them as separate tracks rather than a single strategy.
- The 2020 EU Methane Strategy names landfill methane as a leading source of waste-sector emissions[xxvi]. However, it is only a policy communication, not law. It sets no binding target, no required measurement method and no performance standard for any Member State. The only binding law is the original 1999 Landfill Directive[xxvii], and this simply requires LFG to be "managed." It sets no common EU method for measuring how much methane is actually captured, no standard for fugitive emissions and no shared performance benchmark - so in practice, every country monitors and permits LFG its own way, and standards vary widely as a result.
- A fix is in the pipeline. The Commission's 2026 proposal for the fifth phase of the EU Emissions Trading System (2031–2040) (ETS5) would introduce the first EU-wide Monitoring, Reporting and Verification (MRV) rules for landfill methane. Useful in principle - but as not due to apply until 2031 it is not something the sector can plan around this decade[xxviii]. The Commission has also begun work on the EU's first-ever Landfill BREF (Best Available Techniques Reference Document), a genuine opportunity to set common technical standards for gas management and operational performance across all Member States[xxix].
- A final, quieter problem hampering LFG modernisation and expansion is that green finance rules do not match green energy rules. RED III supports landfill biomethane as a renewable fuel, but the EU Taxonomy and its Climate Delegated Act use eligibility criteria that are unclear on LFG - how biodegradable waste already in the ground should be treated, whether open and closed landfill cells are treated differently, and how a fixed cut-off date of 8 July 2020 should be applied. Left unresolved, this ambiguity risks locking projects that currently capture large volumes of methane from operating landfills out of taxonomy-aligned green finance altogether[xxx, xxxi].

WBA Position

- The EU has set itself an ambitious biomethane target and has its own commissioned evidence that LFG is a meaningful, low-cost way to help meet it - but needs to match that ambition with binding measurement rules, technical standards and finance eligibility that actually work for LFG projects.

  To address these issues the EU should bring the ETS5 MRV requirements forward from 2031, use the LAN BREF process now underway to lock in harmonised capture-performance standards, and resolve the RED III/Taxonomy mismatch so operating LFG projects are not excluded from green finance on a technicality.

US Policy Landscape

- The US Environmental Protection Agency (EPA) estimates that municipal solid waste (MSW) landfills account for over 14% of total US annual methane emissions - the third-largest US methane source[xxxii].
- Federal control has rested on 2016 New Source Performance Standards (NSPS) and Emission Guidelines (EG) under Clean Air Act (Section 111), with a 2021 federal implementation plan covering states that failed to submit their own compliance plans.
- A 2024 satellite-based study published in *Science* found real-world US landfill methane emissions substantially exceed those reported through federal inventories, strengthening the evidence base for tighter measurement, recording and verification (MRV).
- Regulatory direction has since reversed. Under the current administration, the EPA proposed in September 2025 to eliminate the Greenhouse Gas Reporting Program (Subpart HH) reporting requirements for MSW landfills and paused/rolled back related oil and gas methane rules - reducing federal oversight of (and pressure to control) landfill methane[xxxiii].
- In the absence of federal mandates, LFG capture economics are increasingly sustained by state-level regulations, voluntary corporate commitments and market-based incentives.
- While federal MRV standards remain a baseline, the primary economic catalysts have shifted to state-level compliance programs (e.g.,

California and Climate Alliance initiatives), international frameworks like the Global Methane Pledge and corporate offtake agreements for Renewable Natural Gas (RNG). Furthermore, project monetisation relies heavily on access to RNG market incentives, including federal Renewable Fuel Standard (RFS) RINs and state-level Low Carbon Fuel Standard (LCFS) credits. California's SB 1440 established a Renewable Gas Standard (RGS), requiring the state's four major gas utilities to procure biomethane through approved programmes of the California Public Utilities Commission (CPUC). It therefore creates an important, regulated demand signal for RNG, although the program's effectiveness remains in its early stages with ongoing amendments to establish a final ruling on landfill gas eligibility.

WBA Position

- The current situation in the US provides a potential blueprint for global policy. Market-led and sub-national frameworks are currently outperforming centralised federal mandates in driving investment in LFG capture infrastructure. As federal regulations have receded, project underwriting has successfully migrated to resilient state-level compliance programs, corporate Renewable Natural Gas (RNG) offtake agreements and robust environmental credit markets. This could potentially inform approaches for federated countries globally. While baseline federal rules establish minimum standards, it is the monetisation of carbon attributes - via structures like the US Renewable Fuel Standard (RFS) and Low Carbon Fuel Standard (LCFS) frameworks - that will attract institutional investors.

  At the local level, California has set the benchmark for RNG policy in several respects, with its LCFS and wider biomethane framework helping shape markets well beyond the state. SB 1440 has the potential to do the same. The current amendments being considered demonstrate that even market-leading policy needs continual adjustment, to incentivise maximum methane abatement from existing waste without creating incentives for more waste to enter landfill. That balance will be increasingly important as other states develop their own RNG markets.

Market Dynamics: A Sector in Transition

The landfill gas (LFG) sector should stop being framed as an electricity technology in decline and start being framed as what it's becoming: a specialised methane-management industry, whose job is minimising legacy emissions while extracting maximum value from the gas recovered.

Mature Markets, Diverging Paths

- The US, EU and UK together form the world's most mature LFG markets - but their trajectories have split. The US keeps adding capacity on the back of abundant landfill volumes and supportive policy; Europe and the UK have successfully cut landfilling, squeezing new-build opportunities and pushing the sector's focus toward managing legacy sites instead. (See respective Deep Dives.)

The US: the Growth Market

According to the latest data from the American Biogas Council;

- LFG now supplies almost two-thirds of all US renewable natural gas (RNG) production.
- More than 700 additional US landfill sites are considered suitable for future LFG development.
- Over 90 new LFG projects have come online since 2020 - almost all producing RNG rather than electricity alone, confirming upgrading (not power generation) as the sector's new default.
- Collectively, US LFG facilities capture 559+ billion cubic feet (~16bcm) of gas a year, produce ~144 million MMBtu (~42TWh) of RNG, represent ~$15 billion of cumulative investment, and recover enough energy to meet the annual needs of ~4 million households.

Europe and the UK: Same Asset, Different Job

- Diversion policy has worked - but a shrinking landfill does not mean a shrinking climate problem. Millions of tonnes of biodegradable waste already in the ground will keep generating methane for decades.
- The result: the European/UK question is no longer "how do we maximise power output" but "how do we maximise capture and minimise fugitive losses for the remaining life of each site" - a legacy-management mandate, not a growth one.

The Technology Inflection Point: from CHP to Biomethane

- LFG has historically been a difficult upgrading feedstock - air ingress brings in nitrogen and oxygen, and contaminants like siloxanes and VOCs need heavy pre-treatment - which is why CHP, not upgrading, was the default use for most of the sector's history.
- That's changing. A new generation of upgrading systems - combining membrane separation, pressure swing adsorption and, in some designs, cryogenic distillation - can now strip nitrogen and oxygen even from low-quality, variable landfill gas streams.
- Different suppliers are solving this problem in different ways, but the effect is the same across the board: sites previously written off as unsuitable for biomethane are becoming viable, and gas-upgrading performance is being decoupled from the variability of the landfill itself (see Case Studies).

Beyond Electrons: New Value Pools

- Access to biomethane markets (rather than power-only offtake) strengthens the case for maximising recovery, extends the economic life of gas-collection infrastructure, and improves the viability of capturing emissions at ageing, lower-yield sites that might otherwise be abandoned.
- Upgrading also concentrates a biogenic CO_2 by-product stream – a future feedstock for carbon capture, utilisation or storage as circular-carbon markets develop.

Recommendations

Policy Support

Recognise landfill gas capture as a core methane mitigation strategy
Governments should explicitly recognise LFG capture as an essential component of methane reduction strategies and Nationally Determined Contributions (NDCs). Even as landfill declines in many economies, legacy waste will continue emitting methane for decades and requires sustained intervention.

Decouple methane capture policy from landfill diversion policy
Waste diversion reduces future methane generation but does not eliminate emissions from existing landfill. Capture obligations, regulatory oversight and financial support should therefore reflect the long-term emissions profile of landfilled waste rather than annual landfill volumes.

Mandate progressive landfill gas capture standards
Countries should adopt minimum standards for gas collection efficiency, methane destruction and emissions monitoring, with progressively tighter performance requirements for both new and existing landfill sites. Where technically and economically feasible, beneficial utilisation – including upgrading LFG to biomethane – should be prioritised over methane destruction alone.

Create technology-neutral market incentives
Support mechanisms should reward verified methane abatement and greenhouse gas reductions rather than favouring specific technologies. High-efficiency electricity generation, biomethane production, bio-LNG and carbon dioxide utilisation should all compete on emissions performance.

Prioritise engineered landfill in developing economies
International finance should support the transition from uncontrolled dumpsites to engineered landfill systems capable of collecting methane. This represents one of the largest untapped opportunities for rapid methane reduction globally.

Encourage best practice through guidance on best available techniques
Establish clear, regularly updated guidance on best available techniques (BAT) for LFG capture, monitoring, upgrading and utilisation, providing operators and regulators with a consistent benchmark for maximising methane recovery, minimising emissions and improving environmental performance.

Support performance assessment
Standardise assessment of landfill methanogenic potential through improved national guidance, enabling more consistent measurement of LFG recovery performance and strengthening the basis for green-finance certification.

Industry Actions

Treat landfill gas as a strategic resource
Operators should move beyond compliance-led gas management towards maximising methane recovery, recognising landfill gas as both a climate mitigation opportunity and a valuable renewable energy resource.

Deploy best available monitoring technologies
Operators should integrate continuous monitoring, drone surveys, satellite verification and advanced leak detection to identify fugitive emissions rapidly and optimise gas collection systems throughout the landfill lifecycle.

Optimise utilisation pathways
Rather than defaulting to electricity generation, operators should evaluate the highest-value use of recovered gas – including biomethane injection, transport fuels and industrial applications – according to local infrastructure and market conditions.

Integrate landfill gas into wider circular carbon systems
Where appropriate, projects should combine methane recovery with biogenic CO_2 capture, carbon utilisation and carbon removal pathways to maximise overall climate benefit.

Research, Innovation and Evidence

Establish harmonised global methane measurement
Governments, industry and international organisations should develop consistent MRV protocols that reconcile site measurements with satellite observations and atmospheric monitoring.

Accelerate innovation in low-yield landfill recovery
Research should focus on improving gas collection from ageing landfill sites through enhanced wellfield design, digital optimisation, AI-enabled monitoring and novel extraction technologies capable of economically recovering methane at lower concentrations.

Improve understanding of landfill emissions trajectories
Commission lifecycle/legacy-emissions modelling showing gas-generation curves for landfill cells post-closure, to underpin long-duration funding cases. Greater research is needed to refine long-term methane generation models under changing waste composition, climate conditions and waste diversion policies, enabling more accurate forecasting and better investment decisions.

Conclusion

Landfill gas remains one of the largest and most tractable sources of avoidable methane emissions globally, and one of the few climate levers capable of delivering deep, near-term reductions from waste already in the ground. As food-waste diversion policy accelerates globally, WBA's position is that this must be treated as complementary to - not a substitute for - sustained investment in LFG capture and utilisation. With the right long-duration policy and funding frameworks, LFG can and should continue to convert a legacy liability into a renewable energy resource for decades to come.

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