



Methane Abatement in Sustainable Taxonomies

Best Practice Measures

December 2025



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ABOUT CLIMATE POLICY INITIATIVE

CPI is an analysis and advisory organization with deep expertise in finance and policy. Our mission is to help governments, businesses, and financial institutions drive economic growth while addressing climate change. CPI has seven offices worldwide, in Brazil, India, Indonesia, South Africa, the United Kingdom, and the United States.

ABOUT CLIMATE BONDS INITIATIVE

Climate Bonds is an international investor-focused not-for-profit organization working to mobilize the bond market for climate change solutions. It promotes investment in projects and assets needed for a rapid transition to a low-carbon and climate- resilient economy. The mission is to help drive down the cost of capital for large-scale climate and infrastructure projects and to support governments seeking increased access to capital markets to meet climate and greenhouse gas (GHG) emission reduction goals.

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1. INTRODUCTION

Methane is a high-impact pollutant with a global warming potential more than 80 times that of CO₂ over 20 years, and has accounted for roughly 30% of historical warming.

Yet, finance for methane abatement—one of the most cost-effective mitigation opportunities currently available—remains low. Less than USD 14 billion was invested annually in methane abatement in 2021/22, and preliminary results suggest this figure dropped to around USD 6 billion in 2023, falling far short of the estimated USD 48 billion required per year through to 2030.¹

Sustainable finance taxonomies are required to play a catalytic role in directing finance to methane mitigation. Financial frameworks like taxonomies are key to directing investment toward methane abatement. Beyond helping identify which projects can be classified as sustainable, they support financing instruments, such as green or sustainability-linked bonds, loans, and blended finance, to integrate methane mitigation into broader instruments. By ensuring environmental credibility, taxonomies help raise capital and build investor confidence. Over time, alignment across jurisdictions can also reduce transaction costs and facilitate cross-border investment in methane solutions. By embedding methane abatement activities and measures within their definitions of sustainable investments, taxonomies can (1) accelerate the deployment of funds for mature abatement applications, (2) prioritize harder-to-finance solutions in diffuse sectors, and (3) create consistent signals that reduce perceived risks and funding costs.

A joint report from the Climate Bonds Initiative (Climate Bonds) and Climate Policy Initiative (CPI), entitled “[Methane Abatement in Sustainable Taxonomies](#)”, presents a comparative analysis of how each selected taxonomy incorporates methane abatement activities within its sustainable finance framework. Five taxonomies—those of Colombia, the European Union (EU), Indonesia, South Africa, and Thailand—are examined as case studies to provide a balanced sample reflecting different levels of maturity, complexity, and regional context.

The report offers unique added value to taxonomy developers and the sustainable finance community in general, particularly to Ministries of Finance, Treasuries, and Planning Ministries developing national sustainable finance taxonomies, by providing:

- The first cross-regional comparative analysis of methane abatement coverage in national/regional sustainable finance taxonomies.
- A methane sector-specific gap assessment comparing existing activities in taxonomies against a benchmark list to identify missing or insufficient efforts in methane abatement.
- Recommendations to improve the credibility and impact of green finance.

Importantly **the report provides a framework for incorporating methane abatement into sustainable finance taxonomies in ways that are clear, science-based, and interoperable to maximize integrity and investment potential.**

¹ Based on two-year average values to smooth out annual fluctuations.

The report introduces best-practice measures for methane abatement, consolidating evidence-based and activity-specific criteria drawn from the findings of this report as well as sectoral criteria developed by Climate Bonds. Designed as a practical roadmap for policymakers, taxonomy developers, and industry stakeholders, the identified best practices support more consistent and transparent embedding of methane reduction objectives across jurisdictions.

While the full report was published in December 2025, this paper serves as an summary focused exclusively on the best-practice measures identified in the broader analysis. This narrower focus is intended to provide policymakers and practitioners with a concise, accessible, and implementation-oriented reference that separates the most actionable insights from the full study. By isolating the best-practice elements, this paper allows users to rapidly understand and apply the main criteria without having to navigate the complete comparative and methodological assessment.

Details on the analytical approach, data sources, references, taxonomy selection, and the full comparative methodology can be found in the main report, which should be consulted for comprehensive context and technical underpinnings.

2. BEST PRACTICES: THE APPROACH

A systematic gap analysis revealed common structural challenges that, to date, have limited the integration of robust methane abatement approaches into taxonomies. Addressing these challenges requires a fundamental rethinking of how methane reduction is embedded within sustainable finance taxonomies. At the same time, the analysis showed that such rethinking is constrained by a practical limitation: the absence of a single point of reference or of an easily accessible set of guidelines with sufficient detail ensuring that taxonomy criteria consistently and effectively reflect methane abatement priorities across sectors and activities.

To address this gap, Climate Bonds and Climate Policy Initiative identified best practices for methane abatement with comprehensive, clearly defined, evidence-based criteria tailored to each economic activity. The analysis sought to analyse mature, impactful, and investable methane abatement measures across the four key sectors with the highest mitigation potential: agriculture, energy, solid waste, and wastewater.² These best practices are intended not only to guide taxonomy developers but also to offer a practical tool for policymakers and industry stakeholders seeking to operationalize methane abatement at scale.

The best practices were elicited from two main sources:

- A. Results of the analysis:
 - I. Results of the literature review,
 - II. Review of the current state of inclusion of methane abatement measures across taxonomies, and
 - III. Results of gap analysis.
- B. Inputs from sectoral criteria developed by the Climate Bonds.

This two-fold approach ensures that the listed methane reduction methods are both technically rigorous—as they rely on science-based evidence outlined in the literature and provided by Climate Bonds’s technical working groups—and practically implementable—as Climate Bonds Criteria and most taxonomies are reviewed by industry representatives.

² For detailed methodology for identification of methane abatement measures see: <https://www.climatebonds.net/files/documents/publications/Methane-Abatement-in-Sustainable-Taxonomies.pdf>

BOX 1. CONSIDERATIONS FOR USING THE BEST PRACTICES FRAMEWORK

While the table aims to provide a comprehensive framework for mitigating methane emissions across selected economic activities, the capacity to implement specific, more complex measures may vary significantly across jurisdictions. In such cases, adopting these measures may require additional time, phased implementation, or alternative approaches that allow flexibility, such as gradually increasing the level of stringency.

Additionally, the effectiveness of each measure can differ depending on local conditions, including regulatory frameworks, technological readiness, infrastructure, and sectoral characteristics. This variation highlights the importance of context-specific adaptation and implementation strategies.

Furthermore, the methane abatement potential of the measures listed in the table is not uniform, making some a greater priority than others. While this study provides a robust overview of market-ready methane abatement measures, further research is needed to better understand how to prioritize these measures effectively. Methodologies that assess their relative impact, cost-effectiveness, and feasibility will be particularly important for taxonomy developers and policymakers.

Integrating identified best practices across national taxonomies would enhance the credibility and environmental integrity of taxonomies, provide clarity and comparability for investors, and align sustainable finance more closely with global methane reduction goals, such as those set by the Global Methane Pledge. Ultimately, mainstreaming methane abatement across taxonomies is both an environmental imperative and a critical opportunity to unlock high-impact climate finance.

3. RECOMMENDED BEST PRACTICES: METHANE ABATEMENT IN TAXONOMIES

Table 1. Benchmark and best-practice measures for methane abatement – Energy

Subsector	Methane-emission related activities	Safeguard activities	Best-practice abatement measures																
Bioenergy	Electricity generation from bioenergy (ISIC: D3510)	Safeguards around biomass processing	<p>Monitoring and detection:</p> <ul style="list-style-type: none"> Leakage detection and repair (LDAR), including contingency planning and monitoring, reporting, and verification plans that meet minimum requirements outlined in Annex 1. <p>Emissions performance standards:</p> <ul style="list-style-type: none"> Lifecycle GHG emission thresholds taking into account the following maximum specific GHG emissions expressed as CO₂eq per MJ of bioenergy: <p><i>Maximum specific Green House Gases emissions (gCO₂eq per MJ)</i></p>																
	Cogeneration of heat/cool and power from bioenergy (ISIC: D3510/D3530)																		
	Production of heat/cool from bioenergy (ISIC: D3530)		<table border="1"> <thead> <tr> <th>Final product</th> <th>Fossil baseline gCO₂e/MJ</th> <th>Minimum % reduction</th> <th>Maximum gCO₂e/MJ</th> </tr> </thead> <tbody> <tr> <td>Heat/cooling generation*</td> <td>80 (124 for proved coal substitution)</td> <td>80</td> <td>16 (37.2 for proved coal substitution)</td> </tr> <tr> <td>Electricity generation*</td> <td>183</td> <td>80</td> <td>36.6</td> </tr> <tr> <td>Cogeneration (CHP)*</td> <td>80 (heat) / 183 (electricity)</td> <td>80</td> <td>16(heat) / 36.6 (electricity)</td> </tr> </tbody> </table>	Final product	Fossil baseline gCO ₂ e/MJ	Minimum % reduction	Maximum gCO ₂ e/MJ	Heat/cooling generation*	80 (124 for proved coal substitution)	80	16 (37.2 for proved coal substitution)	Electricity generation*	183	80	36.6	Cogeneration (CHP)*	80 (heat) / 183 (electricity)	80	16(heat) / 36.6 (electricity)
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		* MJ of final product (heat, cooling, or electricity)																	

Subsector	Methane-emission related activities	Safeguard activities	Best-practice abatement measures																		
			<p>To demonstrate compliance, it is necessary to conduct a life cycle assessment (LCA) of GHG emissions. The following GHG calculation tools ensure compliance with best practices:</p> <table border="1" data-bbox="801 311 2107 719"> <thead> <tr> <th data-bbox="801 311 1211 368">Name</th> <th data-bbox="1211 311 1805 368">Technical scope</th> <th data-bbox="1805 311 2107 368">Origin</th> </tr> </thead> <tbody> <tr> <td data-bbox="801 368 1211 426">BIOGRACE II[1]</td> <td data-bbox="1211 368 1805 426">Biomass for electricity, heating, and cooling</td> <td data-bbox="1805 368 2107 426">EU</td> </tr> <tr> <td data-bbox="801 426 1211 483">RSB GHG Calculator[2]</td> <td data-bbox="1211 426 1805 483">Liquid biofuels</td> <td data-bbox="1805 426 2107 483">International</td> </tr> <tr> <td data-bbox="801 483 1211 572">UK Solid and Gaseous Biomass Carbon Calculator[3]</td> <td data-bbox="1211 483 1805 572">Solid biomass and biogas used for heat and electricity generation</td> <td data-bbox="1805 483 2107 572">UK</td> </tr> <tr> <td data-bbox="801 572 1211 630">GREET[4]</td> <td data-bbox="1211 572 1805 630">Alternative fuels in transport</td> <td data-bbox="1805 572 2107 630">US</td> </tr> <tr> <td data-bbox="801 630 1211 719">RenovaCalc[5]</td> <td data-bbox="1211 630 1805 719">Ethanol, biodiesel, aviation biokerosene, and biogas from waste</td> <td data-bbox="1805 630 2107 719">Brazil</td> </tr> </tbody> </table>	Name	Technical scope	Origin	BIOGRACE II[1]	Biomass for electricity, heating, and cooling	EU	RSB GHG Calculator[2]	Liquid biofuels	International	UK Solid and Gaseous Biomass Carbon Calculator[3]	Solid biomass and biogas used for heat and electricity generation	UK	GREET[4]	Alternative fuels in transport	US	RenovaCalc[5]	Ethanol, biodiesel, aviation biokerosene, and biogas from waste	Brazil
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			<p>The scope of the LCA should include:</p> <ul style="list-style-type: none"> ▪ Feedstock production ▪ Feedstock processing ▪ Biomass-based fuel/bioenergy production ▪ Biomass-based fuel storage and blending ▪ Intermediate and final transport steps: transportation of feedstock to processing facilities, and transportation of biomass-based fuel to the point of consumption (final step for transport) ▪ Use of the biomass-based fuel (final step for heat/cooling and electricity generation) *For guidelines on Specific Methane emissions calculation guidelines for biogas and biomethane value chain see Climate Bonds Criteria for bioenergy <p>Best practices for methane management in biogas and biomethane value chain</p> <ul style="list-style-type: none"> ▪ Biogas processing: <ul style="list-style-type: none"> ○ automatically activated flare connected to all pressure release valves and venting systems; and ○ installation of leak detection alarms or other detecting devices in closed environments. ▪ Digestate management: <ul style="list-style-type: none"> ○ Storage: <ul style="list-style-type: none"> ◆ keeping the feedstock or digestate in an airtight environment (combined time in digester and closed digestate storage) for at least 50 + x days, where “50” represents the minimum retention time of 50 days and “x” is the number calculated as additional 2 days for each mass percent of non-manure-based feedstock (max 150 days); or 																		

Subsector	Methane-emission related activities	Safeguard activities	Best-practice abatement measures																	
			<ul style="list-style-type: none"> ◆ storage with remaining methane potential (RMP) measurement below the proposed default emission factor, expressed in percentage of produced methane, for standard digestate management when the temperature inside the digestate storage remains below 20°C during the whole storage period. ○ Composting: the whole process is done in complete closed environment, actively aerated cells in a closed environment, direct mixing, and cooling of digestate with substrate at the exit of the airtight section, monitoring and measurement of methane content in the off-gas. ▪ Raw biogas upgrading: <ul style="list-style-type: none"> ○ off-gas oxidation: combustion of off-gas is performed; or ○ no off-gas emitted: the CO₂ separated from the biogas is captured and no off-gases are released. <p>Feedstock and resource Sustainability:</p> <ul style="list-style-type: none"> ▪ Sustainable feedstock sourcing. Best-practice standards include: <table border="1" data-bbox="801 651 2107 954" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th data-bbox="801 651 1496 707">Type of biomass feedstock</th> <th data-bbox="1496 651 2107 707">Pre-approved best-practice standards</th> </tr> </thead> <tbody> <tr> <td data-bbox="801 707 1496 762">1. Agricultural biomass</td> <td data-bbox="1496 707 2107 762">ISCC, CORSIA, RSB, SBP and Better Biomass</td> </tr> <tr> <td data-bbox="801 762 1496 818">2. Forest biomass</td> <td data-bbox="1496 762 2107 818">ISCC, FSC, PEFC and SBP</td> </tr> <tr> <td data-bbox="801 818 1496 874">3. Waste from processing</td> <td data-bbox="1496 818 2107 874">NA</td> </tr> <tr> <td data-bbox="801 874 1496 954">4. Aquatic biomass</td> <td data-bbox="1496 874 2107 954">ASC-MS and JAS (Japanese Agricultural Standard for algae)</td> </tr> </tbody> </table> <ul style="list-style-type: none"> ▪ Sustainable management of biomass fuel supply ▪ Compliance with digestate standards (see anaerobic digestion of sewage sludge and biowaste) 				Type of biomass feedstock	Pre-approved best-practice standards	1. Agricultural biomass	ISCC, CORSIA, RSB, SBP and Better Biomass	2. Forest biomass	ISCC, FSC, PEFC and SBP	3. Waste from processing	NA	4. Aquatic biomass	ASC-MS and JAS (Japanese Agricultural Standard for algae)				
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Manufacturing of biofuels	Manufacture of biogas and biofuels for use in transport and of bioliquids contribution to climate mitigation (ISIC: D3520)		<p>All as above, but taking into account the following emissions performance standards</p> <p><i>Maximum specific Green House Gases emissions (gCO₂e_q per MJ)</i></p> <table border="1" data-bbox="801 1153 2107 1353" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th data-bbox="801 1153 1160 1201">Final product</th> <th data-bbox="1160 1153 1496 1201">Fossil baseline gCO₂e/MJ</th> <th data-bbox="1496 1153 1809 1201">Minimum % reduction</th> <th data-bbox="1809 1153 2107 1201">Maximum gCO₂e/MJ</th> </tr> </thead> <tbody> <tr> <td data-bbox="801 1201 1014 1257" rowspan="3">Transport*</td> <td data-bbox="1014 1201 1160 1257">Road</td> <td data-bbox="1496 1201 1809 1257">50</td> <td data-bbox="1809 1201 2107 1257">22.75</td> </tr> <tr> <td data-bbox="1014 1257 1160 1305">Shipping</td> <td data-bbox="1496 1257 1809 1305">70</td> <td data-bbox="1809 1257 2107 1305">27.3</td> </tr> <tr> <td data-bbox="1014 1305 1160 1353">Aviation</td> <td data-bbox="1496 1305 1809 1353">70</td> <td data-bbox="1809 1305 2107 1353">26.7</td> </tr> </tbody> </table> <p>*MJ of energy contained in the fuel</p>				Final product	Fossil baseline gCO ₂ e/MJ	Minimum % reduction	Maximum gCO ₂ e/MJ	Transport*	Road	50	22.75	Shipping	70	27.3	Aviation	70	26.7
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Subsector	Methane-emission related activities	Safeguard activities	Best-practice abatement measures
Transmission and distribution	Transmission and distribution networks for renewable and low-carbon gases (ISIC: 3520/D4930)	Leak detection and repair (LDAR)	<p>Monitoring and detection:</p> <ul style="list-style-type: none"> Leakage detection and repair (LDAR), including contingency planning and monitoring, reporting, and verification plans that meet minimum requirements outlined in Annex 1 <p>Emissions performance standards:</p> <ul style="list-style-type: none"> Lifecycle GHG emission thresholds <p>Transport of biogas:</p> <ul style="list-style-type: none"> Methane mitigation in pipeline infrastructure involves the systematic reduction of emissions across transmission, storage, and distribution systems. Effective mitigation strategies include the deployment of advanced leak detection and quantification technologies such as continuous monitoring sensors, optical gas imaging, and satellite-based surveillance. Preventive maintenance programs, combined with rapid leak detection and repair (LDAR) protocols, are essential to minimize fugitive emissions. Equipment upgrades—particularly replacing high-bleed pneumatic devices, valves, and compressors with low- or zero-emission alternatives—further enhance system performance. Comprehensive data collection, transparent reporting, and third-party verification are also critical to ensure the credibility and effectiveness of methane mitigation actions in line with global reduction commitments.
Energy generation from fossil gaseous fuels	<p>Electricity generation from fossil gaseous fuels (ISIC: D3510)</p> <p>High-efficiency cogeneration of heat/cool and power from fossil gaseous fuels (ISIC: D3510/D3530)</p> <p>Production of heat/cool from fossil gaseous fuels in an efficient district heating and cooling system (ISIC: D3530)</p>	Leak detection and repair (LDAR)	<p>Monitoring and detection:</p> <ul style="list-style-type: none"> Leakage detection and repair (LDAR), including contingency planning and monitoring, reporting, and verification plans that meet minimum requirements outlined in Annex 1 <p>Emissions performance standards:</p> <ul style="list-style-type: none"> Lifecycle GHG emission thresholds

[1] <http://www.biograce.net/home>

[2] <http://rsb.org/services-products/ghg-calculator/>

[3] <https://www.ofgem.gov.uk/guidance/uk-biomass-and-bioliquid-carbon-calculator>

[4] <https://greet.es.anl.gov/>

[5] <https://www.gov.br/anp/pt-br/assuntos/renovabio/renovacalc>

Table 2. Benchmark and best-practice measures for methane abatement - Agriculture

Subsector	Safeguard activities	Best-practice abatement measures
Livestock (ISIC: A014)	<ul style="list-style-type: none"> ▪ Enteric fermentation (dietary manipulation - plant alterations, feeding frequency, additives) ▪ Selective breeding to improve productivity and animal health/fertility ▪ Anaerobic Digestion/ composting/treatment in biogas digesters/manure to energy ▪ Slurry acidification (acidification in barns, in slurry tanks, during application to fields) ▪ Storage covers and manure management (decreased manure storage time; improve manure storage covering; improve housing systems and bedding) 	<p>Improved feed and diet strategies:</p> <ul style="list-style-type: none"> ▪ Enteric fermentation mitigation (dietary manipulation - plant alterations, feeding frequency, additives) ▪ Selective breeding to improve productivity and animal health/fertility - improved breeds ▪ Feed management plans with peer-reviewed/verified additives to achieve ≥10% methane reduction per treated animal, with progressive adoption targets and ongoing monitoring <p>Manure and waste management:</p> <ul style="list-style-type: none"> ▪ Anaerobic Digestion/composting/treatment in biogas digesters/manure to energy ▪ Slurry acidification (in barns, in slurry tanks, during application to fields) ▪ Storage covers and manure management (reduced storage time, improved covers, improved housing systems and bedding) ▪ Crop residue utilization <p>Pasture and forage management:</p> <ul style="list-style-type: none"> ▪ Organic and green manure, use of manure and fertilizers, where demonstration of compliance should include: <ul style="list-style-type: none"> ○ A farm management plan which evidences the significance of the measure to reduce emissions, including the following: <ol style="list-style-type: none"> 1. Volume of on-farm organic fertilizer or compost/biochar produced, AND 2. Sustainability of source and volume of farm residues utilized, AND 3. Intended use of the organic fertilizer production, OR ○ Measurable reduction of GHG emissions relative to a baseline of at least 1.5%²⁰ per year (measured following GHG Protocol guidance). ▪ Intensive silvopastoral systems where stocking density is reduced and that production is increased while emissions do not increase. ▪ Improved forage systems (e.g., forage quality and composition, mixed forage/fodder hedges) to improve digestibility and reduce enteric fermentation, hence reducing methane emissions per kilo of product. <p>Animal welfare and capacity building:</p> <ul style="list-style-type: none"> ▪ Animal welfare incl. vaccination ▪ Compliance with agricultural standards ▪ Capacity building on sustainable livestock models <p>Livestock systems transition</p> <ul style="list-style-type: none"> ▪ Reduced livestock operation to be at least 50% of LSU, OR ▪ Measurable reduction of CH₄ emissions relative to a baseline of at least 1.5% per year (measured following GHG Protocol guidance³)

³ This target value is based on the previous Climate Bonds Criteria that had a yearly 2% GHG reduction 2020-2030 and 1.5% reduction 2030-2050 (in-line with EU Taxonomy TEG recommendation).

Subsector	Safeguard activities	Best-practice abatement measures
Rice production (ISIC: A0112)	<ul style="list-style-type: none"> ▪ Change in irrigation practices (improved water management or alternate flooding/drainage wetland rice; direct wet seeding; midseason drying events, shallow flooding, phosphogypsum and sulfate addition to inhibit methanogenesis; composting rice straw) ▪ Controlled release of fertilizer ▪ Biochar derived from leftover rice straw ▪ Breeding of low-GHG and more resilient rice varieties 	<p>Water and irrigation management:</p> <ul style="list-style-type: none"> ▪ Change in irrigation practices (improved water management, alternate flooding/drainage wetland rice, midseason drying events, shallow flooding) - implementing practices aimed at reducing days of flooding by at least 10% ▪ Direct wet seeding - planting rice directly in the field for improved establishment ▪ Water resource management ▪ Alternative wetting and drying - alternating between wet and dry conditions to conserve water and improve rice quality, OR ▪ Measurable reduction of CH₄ emissions relative to a baseline of at least 1.5% per year (measured following GHG Protocol guidance) <p>Soil and nutrient management:</p> <ul style="list-style-type: none"> ▪ Controlled release of fertilizer ▪ Biochar derived from leftover rice straw ▪ Phosphogypsum and sulfate addition to inhibit methanogenesis ▪ Organic or green manures ▪ Composting ▪ Straw and stubble management – incl. off-season straw management: properly managing straw during the off-season to benefit soil health ▪ Reduction of waste-burning of agriculture residues <p>Crop and genetic improvements:</p> <ul style="list-style-type: none"> ▪ Breeding of low-GHG and more resilient rice varieties ▪ Rice variety diversification and rotation—short-duration, high-yielding varieties: selecting varieties that mature quickly while maximizing yield <p>Waste and residue utilization:</p> <ul style="list-style-type: none"> ▪ Biodigester ▪ Composting rice straw

Subsector	Safeguard activities	Best-practice abatement measures
Perennial and non-perennial crops (ISIC: A011/A012)	<ul style="list-style-type: none"> ▪ Prevent peatland, forest, and biomass intentional burning ▪ Agricultural and forestry residues-to-energy 	<p>Fire prevention and biomass utilization:</p> <ul style="list-style-type: none"> ▪ Prevent peatland, forest, and biomass intentional burning ▪ Agricultural and forestry residues-to-energy ▪ Management and processing of agricultural residues <p>Soil and nutrient management:</p> <ul style="list-style-type: none"> ▪ Organic or green manure, where demonstration of compliance should include: <ul style="list-style-type: none"> ○ A farm management plan which evidences the significance of the measure to reduce emissions, including the following: <ol style="list-style-type: none"> 1. Volume of on-farm organic fertilizer or compost/biochar produced, AND 2. Sustainability of source and volume of farm residues utilized, AND 3. Intended use of the organic fertilizer production, OR ○ Measurable reduction of GHG emissions relative to a baseline of at least 1.5% per year (measured following GHG Protocol guidance). ▪ Soil conservation ▪ Crop rotation ▪ Improved harvest, post-harvest, and/or storage must aim at achieving a level of food loss no higher than 10% of total food production from post-harvest to distribution, except for cereals and grains which should aim toward less than 5% food loss). <p>Waste and water management (see waste criteria)</p> <ul style="list-style-type: none"> ▪ Waste management and treatment of water contaminated with organic wastes ▪ Biodigesters <p>Sustainable practices and standards:</p> <ul style="list-style-type: none"> ▪ Shift from high methane emitting systems (rice, intensive livestock) to low methane alternatives (alternative crops, agroforestry, silvopastoral systems) ▪ Compliance with agricultural standards and sustainability certifications
Aquaculture (ISIC: A032)	<ul style="list-style-type: none"> ▪ Aeration ▪ Water exchange ▪ High-quality feed ▪ Sludge removal ▪ Organic waste removal ▪ Dredging 	<ul style="list-style-type: none"> ▪ Closed-system aquaculture technology with recirculating water and wastewater management ▪ Integrated multi-trophic aquaculture system ▪ Production and feeding to produce low-carbon aquatic animals ▪ Dredging

Table 3. Benchmark and best-practice measures for methane abatement: Solid Waste and Wastewater

Sector	Methane-emission related activities	Best-practice abatement measures
Solid Waste	Landfill gas capture and utilization or energy recovery (ISIC: E3821/E3822)	<ul style="list-style-type: none"> ▪ Landfill gas capture or energy recovery ▪ The landfill implements a minimum “working face” approach that considers technical indicators such as daily waste tonnage, waste types, and site-specific design conditions to minimize odor control, pest control, litter, fire risks, and fugitive CH₄ emissions. ▪ Restricting ability to closed landfills or cells no longer receiving waste ▪ Productive use of captured methane through energy recovery or industrial applications ▪ Monitoring and control plans to minimize methane leakage (see requirements in Annex 1) ▪ Flaring systems disallowed (unless part of time-bound transition plan) ▪ Real-time methane monitoring at vent stacks
	Anaerobic digestion of biowaste (ISIC: E3821)	<ul style="list-style-type: none"> ▪ Source segregation ▪ The solid and liquid products are not landfilled and replace non-waste materials in the market. ▪ Methane leakage control <ul style="list-style-type: none"> ○ Methane leakage monitoring and leakage control (see requirements in Annex 1). For anaerobic or anoxic components of the treatment plants, a monitoring and mitigation plan must be in place to identify and manage possible GHG emissions from the treatment process. ○ The project must provide a yearly quantification of GHG emission intensity (ton CO₂e/ton of treated wastewater), compared against baseline results. This may be achieved using carbon accounting methodologies like the GHG Protocol, the ISO 14067:2018 or a life cycle assessment (LCA). ▪ Productive biogas utilization: <ul style="list-style-type: none"> ○ Investment in biogas infrastructure ○ Flaring-only systems must transition to value-added use within 3 years ○ Upgrade to biomethane ▪ Digestate management: <ul style="list-style-type: none"> ○ No landfilling of biowaste digestate ○ Energy recovery allowed ○ Detailed plan on end-use of digestate

Sector	Methane-emission related activities	Best-practice abatement measures
		<p>Storage:</p> <ul style="list-style-type: none"> ○ Keeping the feedstock or digestate in an airtight environment (combined time in digester and closed digestate storage) for at least 50 + x days, where "50" represents the minimum retention time of 50 days and "x" is the number calculated as additional 2 days for each mass percent of non-manure-based feedstock (max 150 days); or ○ Storage with RMP measurement below the proposed default emission factor, expressed in percentage of produced methane, for standard digestate management when the temperature inside the digestate storage remains below 20°C during the whole storage period. ▪ Feedstock composition thresholds limiting share of food and feeds crops used as input feedstock.
	Collection and transport of nonhazardous waste in source segregated fractions (ISIC: E3811)	<ul style="list-style-type: none"> ▪ Source separation with recycling/reuse ▪ Material recovery of non-hazardous waste (at least 50% by weight of the separately collected waste must be converted into secondary raw materials).
	Material recovery from nonhazardous waste (ISIC: E3830)	
	Composting of biowaste (ISIC: E3821)	<ul style="list-style-type: none"> ▪ Monitoring and control plans to minimize methane leakage (see requirements in Annex 1) - no measurable methane emissions are desired. ▪ An aeration or a composting pile mixing plan has been established to avoid anaerobic pockets in the pile. ▪ Source segregation ▪ Composting and reuse ▪ Compost must meet fertilizer standards
	Waste-to-energy (ISIC: E3821/E3822)	<ul style="list-style-type: none"> ▪ Waste incinerators ▪ Upstream source separation - removal of recyclable and hazardous waste prior to thermal treatment ▪ Pre-operation environmental assessments ▪ Ongoing emissions monitoring (see requirements in Annex 1)

Sector	Methane-emission related activities	Best-practice abatement measures
Wastewater	<p>Anaerobic digestion of sewage sludge (ISIC: E3821)</p> <ul style="list-style-type: none"> ▪ <i>Residential:</i> Upgrade to secondary/tertiary anaerobic treatment with biogas recovery and utilization ▪ <i>Industrial:</i> Anaerobic treatment with biogas recovery followed by aerobic treatment 	<p>Methane leakage monitoring & control:</p> <ul style="list-style-type: none"> ▪ Methane leakage monitoring and leakage control (see requirements in Annex 1). For anaerobic or anoxic components of the treatment plants, a monitoring and mitigation plan must be in place to identify and manage possible GHG emissions from the treatment process. ▪ The project must provide a yearly quantification of GHG emission intensity (ton CO₂e/ton of treated wastewater), compared against baseline results. This may be achieved using carbon accounting methodologies like the GHG Protocol, the ISO 14067:2018 or a life cycle assessment (LCA). <p>Productive biogas utilization:</p> <ul style="list-style-type: none"> ▪ Investment in biogas infrastructure ▪ Flaring-only systems must transition to value-added use within 3 years. ▪ Upgrade to biomethane <p>Digestate management:</p> <ul style="list-style-type: none"> ▪ The generated digestate is stabilized and used as a soil fertilizer and/or soil improver, or as feedstock for biochar production. ▪ No landfilling of sewage sludge digestate ▪ Energy recovery allowed ▪ Detailed plan on end-use of digestate <p>Storage:</p> <ul style="list-style-type: none"> ▪ keeping the feedstock or digestate in an airtight environment (combined time in digester and closed digestate storage) for at least 50 + x days, where "50" represents the minimum retention time of 50 days and "x" is the number calculated as additional 2 days for each mass percent of non-manure-based feedstock (max 150 days); or ▪ storage with RMP measurement below the proposed default emission factor, expressed in percentage of produced methane, for standard digestate management when the temperature inside the digestate storage remains below 20°C during the whole storage period.
	<p>Construction, renewal, extension and operation of wastewater collection and treatment (ISIC: E3700)</p>	<p>Methane leakage monitoring and biogas utilization:</p> <ul style="list-style-type: none"> ▪ Methane leakage monitoring (see requirements in Annex 1), productive biogas use, digestate handling ▪ Transition plan for flaring-only systems <p>Energy and emissions performance standards:</p> <ul style="list-style-type: none"> ▪ Net energy thresholds (by plant size) ▪ GHG emissions assessment required when replacing high-emission systems ▪ Renewal requires 20% improvement in energy efficiency <p>Replacement of high-emission systems:</p> <ul style="list-style-type: none"> ▪ Wastewater treatment plants instead of latrines and disposal

ANNEX 1: MONITORING AND DETECTION MINIMUM REQUIREMENTS

Table 4. Leakage detection and repair (LDAR) that meet minimum requirements

Area	Minimum requirement
Ownership and purpose of the voluntary system	<ul style="list-style-type: none"> ▪ The voluntary system should have clear ownership. ▪ The voluntary system should have a clear purpose.
System boundaries	<ul style="list-style-type: none"> ▪ The accepted boundaries of the system should be well described.
Performing leak detections	<ul style="list-style-type: none"> ▪ Self-control should be the focus of leak detection. Install detection systems for increased indoor methane concentrations and for pressure relief valve openings. ▪ Third-party revision for credibility is required.
Quantifying emissions	<ul style="list-style-type: none"> ▪ At least one monthly visual inspection (with no detecting instruments) of high-risk components (pressure relief valve, moving components). ▪ At least once a year, regular leak detection (and quantification) by an external professional. The methods to quantify emissions should be well described.
Remediating of found leaks	<ul style="list-style-type: none"> ▪ A maintenance and repair plan defining the intervals when components need maintenance and how to repair components that show leaks. ▪ If the leaks exceed 2% of the annual production or 50 tonnes per year, a mandatory repair should be scheduled, and an additional test within 6 months of the leak detection should confirm the effectiveness of the repair.
Reporting of emissions data	<ul style="list-style-type: none"> ▪ A documentation system to report each inspection, leak detection, maintenance, and repair. ▪ There should be an easy access to annual or periodical results with benchmark possibilities. ▪ Short- and long-term goals on leak detection performance and emission reduction should be set.
Knowledge buildup and skills development	<ul style="list-style-type: none"> ▪ Training courses for introducing and maintaining leak detection programs should be organized or a written best management practice document available.

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