



# ACM0001 Flaring or use of landfill gas

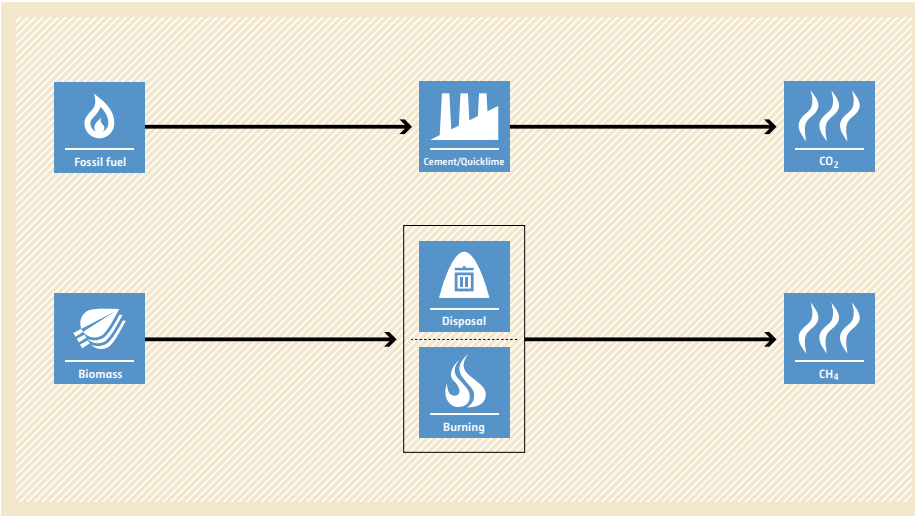
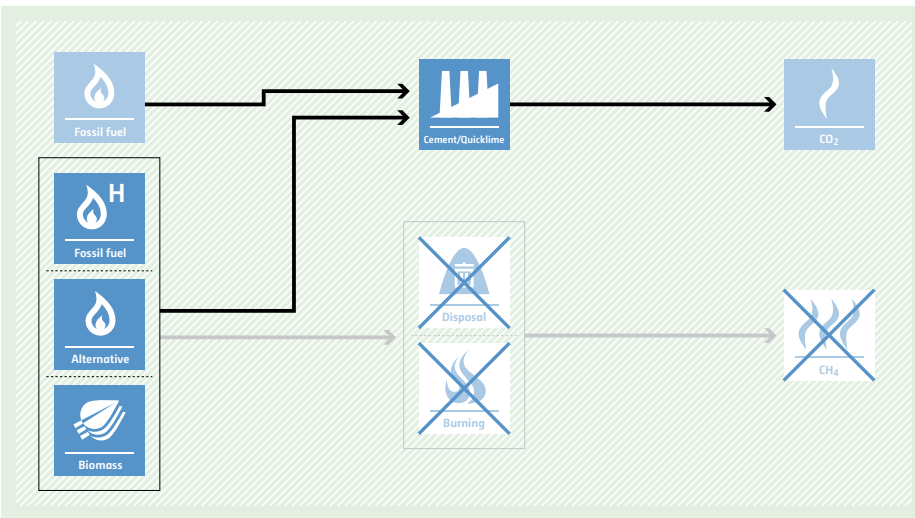
<p><b>Typical project(s)</b></p>	<p>Capture of landfill gas (LFG) and its flaring and/or use to produce energy and/or use to supply consumers through natural gas distribution network or trucks.</p>
<p><b>Type of GHG emissions mitigation action</b></p>	<ul style="list-style-type: none"> <li>• GHG destruction.</li> </ul> <p>Destruction of methane emissions and displacement of a more-GHG-intensive service.</p>
<p><b>Important conditions under which the methodology is applicable</b></p>	<ul style="list-style-type: none"> <li>• Captured landfill gas is flared, and/or;</li> <li>• Captured landfill gas is used to produce energy, and or;</li> <li>• Captured gas is used to supply consumers through natural gas distribution network or trucks.</li> </ul>
<p><b>Important parameters</b></p>	<p>Monitored:</p> <ul style="list-style-type: none"> <li>• Amount of landfill gas captured;</li> <li>• Methane fraction in the landfill gas;</li> <li>• If applicable: electricity generation using landfill gas.</li> </ul>
<p><b>BASELINE SCENARIO</b> LFG from the landfill site is released to the atmosphere.</p>	<pre> graph LR     Waste[Waste] --&gt; Disposal[Disposal]     Disposal --&gt; LandfillGas[Landfill gas]     LandfillGas --&gt; Release[Release]     Release --&gt; CH4[CH4]     </pre>
<p><b>PROJECT SCENARIO</b> LFG from the landfill site is captured and flared; and/or used to produce energy (e.g. electricity/thermal energy); and/or used to supply consumers through natural gas distribution network.</p>	<pre> graph LR     Waste[Waste] --&gt; Disposal[Disposal]     Disposal --&gt; LandfillGas[Landfill gas]     LandfillGas --&gt; Flaring[Flaring]     LandfillGas --&gt; Energy[Energy]     LandfillGas --&gt; NaturalGas[Natural gas]     LandfillGas --&gt; Release[Release]     LandfillGas --&gt; CH4[CH4]     Release --- ReleaseCrossed[<del>Release</del>]     CH4 --- CH4Crossed[<del>CH4</del>]     </pre>

# ACM0002 Grid-connected electricity generation from renewable sources



<p><b>Typical project(s)</b></p>	<p>Construction and operation of a power plant that uses renewable energy sources and supplies electricity to the grid (greenfield power plant). Retrofit, replacement or capacity addition of an existing power plant is also applicable.</p>
<p><b>Type of GHG emissions mitigation action</b></p>	<ul style="list-style-type: none"> <li>• Renewable energy.</li> </ul> <p>Displacement of electricity that would be provided to the grid by more-GHG-intensive means.</p>
<p><b>Important conditions under which the methodology is applicable</b></p>	<ul style="list-style-type: none"> <li>• The project power plant is using one of the following sources: hydro, wind, geothermal, solar, wave or tidal power. Biomass-fired power plants are not applicable;</li> <li>• In the case of capacity additions, retrofits or replacements, the existing power plant started commercial operation prior to the start of a minimum historical reference period of five years, and no capacity expansion or retrofit of the plant has been undertaken between the start of this minimum historical reference period and the implementation of the project;</li> <li>• In case of hydro power, the project has to be implemented in an existing reservoir, with no change in the volume of reservoir, or the project has to be implemented in an existing reservoir, where the volume of reservoir is increased and the power density is greater than 4 W/m<sup>2</sup>, or the project results in new reservoirs and the power density is greater than 4 W/m<sup>2</sup>.</li> </ul>
<p><b>Important parameters</b></p>	<p>At validation:</p> <ul style="list-style-type: none"> <li>• Grid emission factor (can also be monitored ex post).</li> </ul> <p>Monitored:</p> <ul style="list-style-type: none"> <li>• Electricity supplied to the grid by the project;</li> <li>• If applicable: methane emissions of the project.</li> </ul>
<p><b>BASELINE SCENARIO</b> Electricity provided to the grid by more-GHG-intensive means.</p>	<pre> graph LR     FF[Fossil fuel] --&gt; G[Grid]     G --&gt; E1[Electricity]     G --&gt; E2[Electricity]     G --&gt; CO2[CO2]     E1 --&gt; E3[Electricity]     E2 --&gt; E3     </pre>
<p><b>PROJECT SCENARIO</b> Displacement of electricity provided to the grid by more-GHG-intensive means by installation of a new renewable power plant or the retrofit, replacement or capacity addition of an existing renewable power plant.</p>	<pre> graph LR     R[Renewable] --&gt; G[Grid]     FF[Fossil fuel] --&gt; G     G --&gt; E1[Electricity]     G --&gt; E2[Electricity]     G --&gt; CO2[CO2]     E1 --&gt; E3[Electricity]     E2 --&gt; E3     </pre>

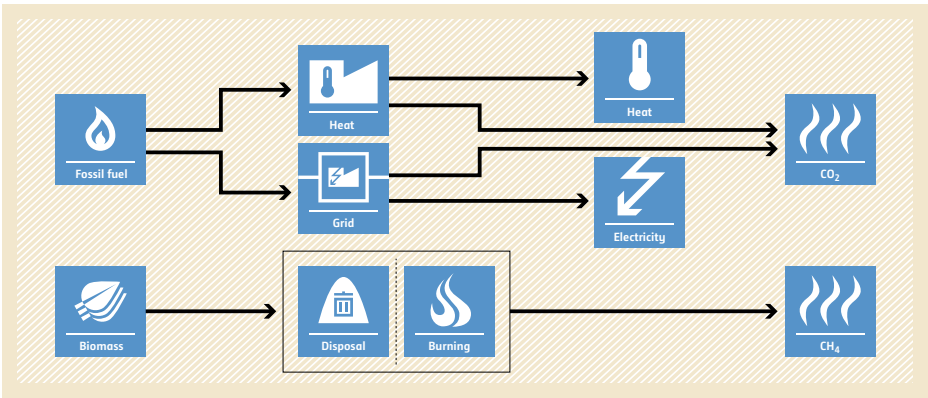
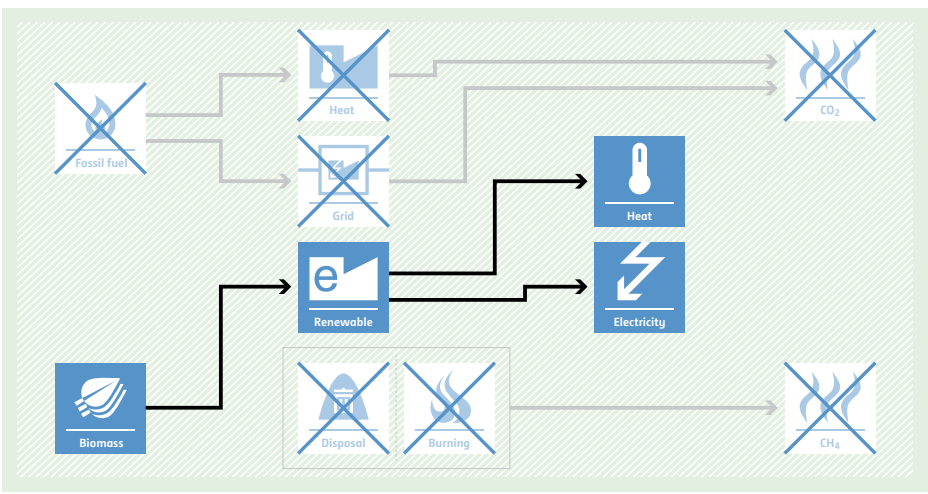
## ACM0003 Emissions reduction through partial substitution of fossil fuels with alternative fuels or less carbon intensive fuels in cement or quicklime manufacture

<p><b>Typical project(s)</b></p>	<p>Partial replacement of fossil fuels in an existing clinker or quicklime production facility by less-carbon-intensive fossil fuel or alternative fuel (e.g. wastes or biomass residues).</p>
<p><b>Type of GHG emissions mitigation action</b></p>	<ul style="list-style-type: none"> <li>• Fuel switch;</li> <li>• Renewable energy.</li> </ul> <p>Reduction of GHG emissions by switching from carbon-intensive fuel to less-carbon-intensive or alternative fuel; GHG emission avoidance by preventing disposal or uncontrolled burning of biomass residues.</p>
<p><b>Important conditions under which the methodology is applicable</b></p>	<ul style="list-style-type: none"> <li>• No alternative fuels have been used in the project facility during the last three years prior to the start of the project;</li> <li>• The biomass to be combusted should not have been processed chemically;</li> <li>• For biomass from dedicated plantations, specific conditions apply.</li> </ul>
<p><b>Important parameters</b></p>	<p>Monitored:</p> <ul style="list-style-type: none"> <li>• Quantity and net calorific value of alternative fuel and/or less-carbon-intensive fossil fuel used in the project plant;</li> <li>• Quantity of clinker or quicklime produced.</li> </ul>
<p><b>BASILINE SCENARIO</b> Clinker or quicklime is produced using more-carbon-intensive fuel and/or decay or uncontrolled burning of biomass leads to CH<sub>4</sub> emissions.</p>	 <p>The baseline scenario flowchart shows two parallel processes. The top process starts with 'Fossil fuel' (flame icon) leading to 'Cement/Quicklime' (factory icon), which then leads to 'CO<sub>2</sub>' (flame icon). The bottom process starts with 'Biomass' (leaf icon) leading to 'Disposal' (trash can icon) and 'Burning' (flame icon). Both 'Disposal' and 'Burning' lead to 'CH<sub>4</sub>' (flame icon). The 'Disposal' and 'Burning' steps are enclosed in a dashed box.</p>
<p><b>PROJECT SCENARIO</b> Clinker or quicklime is produced using less-carbon-intensive fuel and/or alternative fuel and/or biomass is combusted.</p>	 <p>The project scenario flowchart shows a similar process to the baseline. 'Fossil fuel' (flame icon) leads to 'Cement/Quicklime' (factory icon), which leads to 'CO<sub>2</sub>' (flame icon). A dashed box contains 'Fossil fuel' (flame icon), 'Alternative' (flame icon), and 'Biomass' (leaf icon). Arrows from 'Fossil fuel' and 'Alternative' lead to 'Cement/Quicklime'. An arrow from 'Biomass' leads to 'Disposal' (trash can icon) and 'Burning' (flame icon). Both 'Disposal' and 'Burning' lead to 'CH<sub>4</sub>' (flame icon). The 'Disposal' and 'Burning' steps are enclosed in a dashed box with a large 'X' over it, indicating they are avoided or reduced.</p>

## ACM0005 Increasing the blend in cement production

<p><b>Typical project(s)</b></p>	<p>Use of blending material (e.g. fly ash, gypsum, slag) to decrease the share of clinker in cement.</p>
<p><b>Type of GHG emissions mitigation action</b></p>	<ul style="list-style-type: none"> <li>• Feedstock switch.</li> </ul> <p>CO<sub>2</sub> emissions from clinker production are avoided due to less use of clinker.</p>
<p><b>Important conditions under which the methodology is applicable</b></p>	<ul style="list-style-type: none"> <li>• Applicable to domestically sold blended cement;</li> <li>• Not applicable if blending of cement outside the cement production plant is common in the host country;</li> <li>• Not applicable for grinding only plants.</li> </ul>
<p><b>Important parameters</b></p>	<p>At validation:</p> <ul style="list-style-type: none"> <li>• Clinker ratio at the project plant, clinker ratio at all other plants in the region and in the five highest blended cement brands in the region;</li> <li>• Electricity emission factor.</li> </ul> <p>Monitored:</p> <ul style="list-style-type: none"> <li>• Cement and clinker production;</li> <li>• Raw materials, electricity demand and fuel use in the production of clinker;</li> <li>• Clinker and additives use in the production of cement.</li> </ul>
<p><b>BASELINE SCENARIO</b> Available blending material is not used. Cement is produced with high clinker content, leading to high CO<sub>2</sub> emissions.</p>	
<p><b>PROJECT SCENARIO</b> Available blending material is used in cement to partially replace clinker. Thereby CO<sub>2</sub> emissions from clinker production are avoided.</p>	

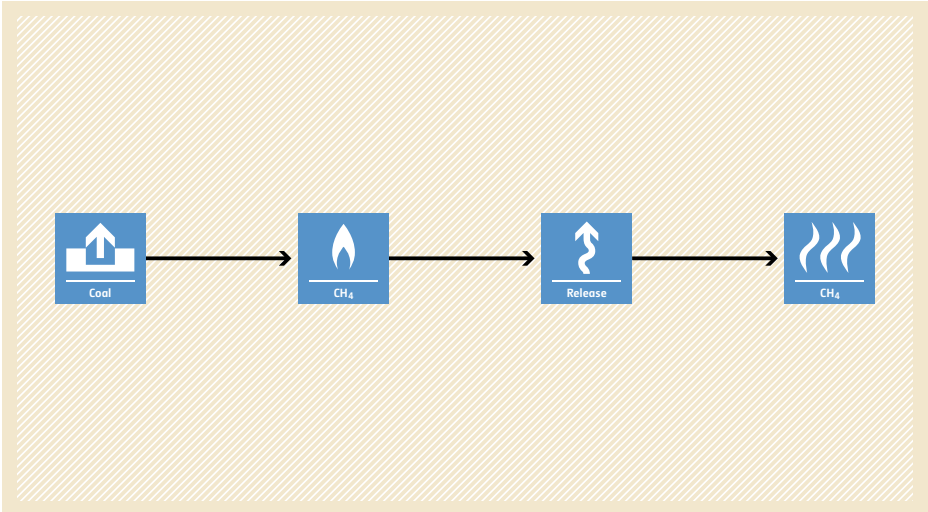
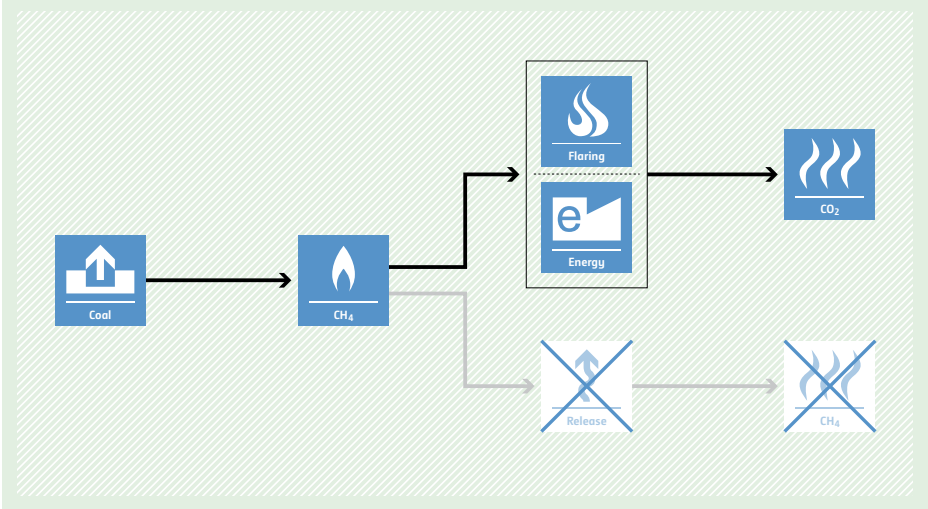
## ACM0006 Electricity and heat generation from biomass

<p><b>Typical project(s)</b></p>	<p>Generation of power and heat in thermal power plants, including cogeneration plants using biomass. Typical activities are new plant, capacity expansion, energy efficiency improvements or fuel switch projects.</p>
<p><b>Type of GHG emissions mitigation action</b></p>	<ul style="list-style-type: none"> <li>• Renewable energy;</li> <li>• Energy efficiency;</li> <li>• Fuel switch;</li> <li>• GHG emission avoidance.</li> </ul> <p>Displacement of more-GHG-intensive electricity generation in grid or heat and electricity generation on-site. Avoidance of methane emissions from anaerobic decay of biomass residues.</p>
<p><b>Important conditions under which the methodology is applicable</b></p>	<ul style="list-style-type: none"> <li>• Only power and heat or cogeneration plants are applicable;</li> <li>• Only biomass residues and biomass from dedicated plantations are eligible;</li> <li>• Fossil fuels may be co-fired in the project plant. The amount of fossil fuels co-fired shall not exceed 80% of the total fuel fired on an energy basis;</li> <li>• In case of biomass from dedicated plantations, the plantations are established either on land that was classified as degraded or degrading or that is included in the project boundary of a registered A/R project activity.</li> </ul>
<p><b>Important parameters</b></p>	<p>At validation:</p> <ul style="list-style-type: none"> <li>• Grid emission factor (can also be monitored ex post).</li> </ul> <p>Monitored:</p> <ul style="list-style-type: none"> <li>• Quantity and moisture content of the biomass used in the project activity;</li> <li>• Electricity and heat generated in the project activity;</li> <li>• Electricity and, if applicable, fossil fuel consumption of the project activity.</li> </ul>
<p><b>BASELINE SCENARIO</b> Electricity and heat would be produced by more-carbon-intensive technologies based on fossil fuel or less-efficient biomass power and heat plants. Biomass could partly decay under anaerobic conditions, bringing about methane emissions.</p>	 <p>The baseline scenario flowchart shows two input streams: Fossil fuel and Biomass. Fossil fuel feeds into Heat and Grid. Biomass feeds into Disposal and Burning. Heat and Grid both feed into Heat and Electricity. Disposal and Burning both feed into CH4. Heat and Electricity both feed into CO2. The Disposal and Burning boxes are crossed out with a large 'X'.</p>
<p><b>PROJECT SCENARIO</b> Use of biomass for power and heat generation instead of fossil fuel or increase of the efficiency of biomass-fuelled power and heat plants. Biomass is used as fuel and decay of biomass is avoided.</p>	 <p>The project scenario flowchart shows Biomass as the primary input, which feeds into a Renewable energy source. Fossil fuel, Disposal, and Burning are all crossed out with a large 'X'. The Renewable energy source feeds into Heat and Electricity. Heat and Electricity both feed into CO2. CH4 emissions are also shown as crossed out.</p>

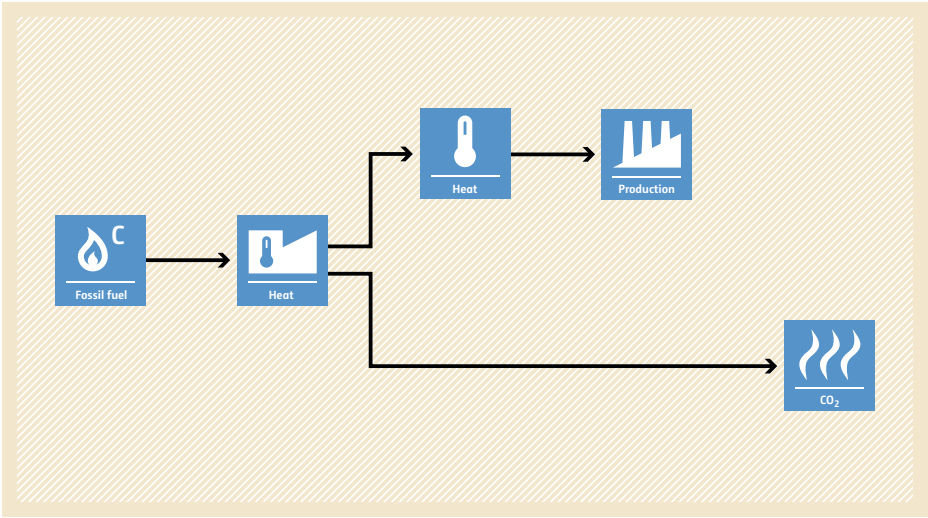
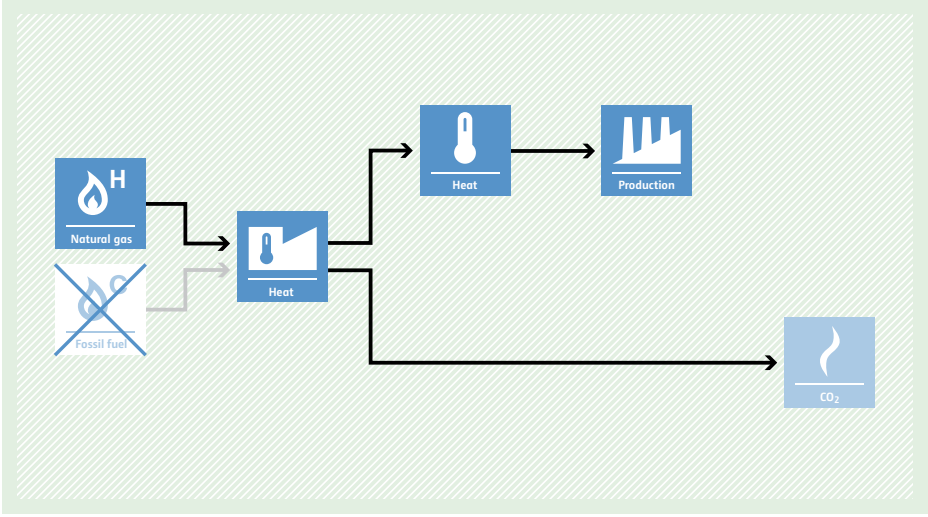
## ACM0007 Conversion from single cycle to combined cycle power generation

<b>Typical project(s)</b>	Conversion from an open-cycle gas power plant to a combined-cycle gas power plant.
<b>Type of GHG emissions mitigation action</b>	<ul style="list-style-type: none"> <li>• Energy efficiency.</li> <li>• Fuel savings through energy efficiency improvement.</li> </ul>
<b>Important conditions under which the methodology is applicable</b>	<ul style="list-style-type: none"> <li>• The project does not increase the lifetime of the existing gas turbine or engine during the crediting period;</li> <li>• Waste heat generated on the project site is not utilizable for any other purpose.</li> </ul>
<b>Important parameters</b>	<p>At validation:</p> <ul style="list-style-type: none"> <li>• Electricity generation of the existing open-cycle gas power plant (can also be monitored ex post);</li> <li>• Fuel consumption of the existing open-cycle gas power plant.</li> </ul> <hr/> <p>Monitored:</p> <ul style="list-style-type: none"> <li>• Electricity generation of the combined-cycle gas power plant;</li> <li>• Fuel consumption of the combined-cycle gas power plant;</li> <li>• Grid emission factor.</li> </ul>
<b>BASELINE SCENARIO</b> Electricity is generated by an open-cycle gas power plant.	
<b>PROJECT SCENARIO</b> The open-cycle gas power plant is converted to a combined-cycle one for more-efficient power generation.	

## ACM0008 Consolidated methodology for coal bed methane, coal mine methane and ventilation air methane capture and use for power (electrical or motive) and heat and/or destruction through flaring or flameless oxidation

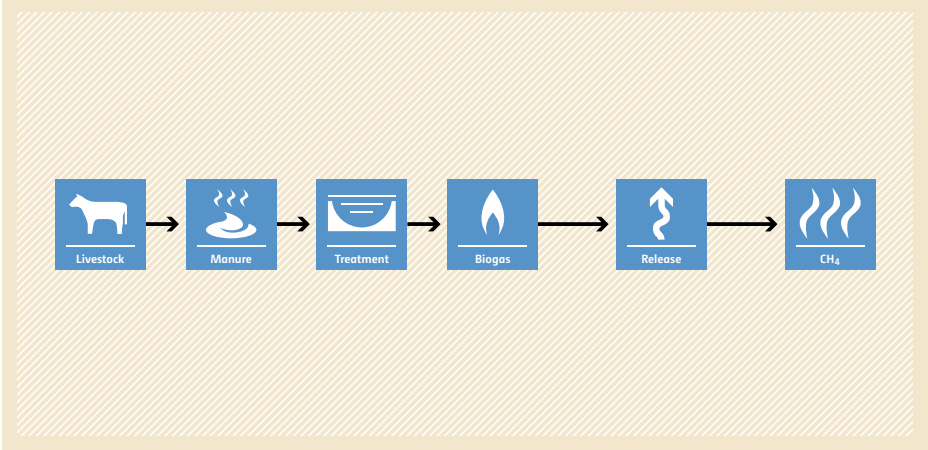
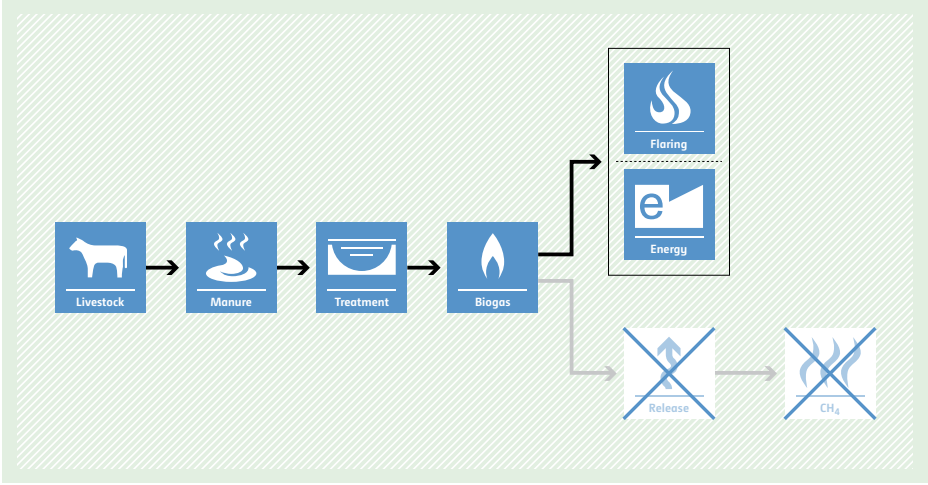
<b>Typical project(s)</b>	Capture and destruction of coal bed methane, coal mine methane or ventilation air methane through oxidation or energy generation, from new or existing coal mines.
<b>Type of GHG emissions mitigation action</b>	<ul style="list-style-type: none"> <li>• GHG destruction.</li> </ul> Destruction of methane emissions and displacement of more-GHG-intensive service.
<b>Important conditions under which the methodology is applicable</b>	<ul style="list-style-type: none"> <li>• Project participants must be able to supply the necessary data for ex ante projections of methane demand;</li> <li>• All methane captured by the project should either be used or destroyed;</li> <li>• Not applicable for abandoned/decommissioned coalmines.</li> </ul>
<b>Important parameters</b>	Monitored: <ul style="list-style-type: none"> <li>• Methane destroyed or used;</li> <li>• Concentration of methane in extracted gas;</li> <li>• If applicable: electricity generated by project;</li> </ul>
<b>BASELINE SCENARIO</b> Methane from coal mining activities is vented into the atmosphere.	 <p>The baseline scenario flowchart shows a linear process: 'Coal' (represented by a mine icon) leads to 'CH<sub>4</sub>' (represented by a flame icon), which then leads to 'Release' (represented by an upward arrow icon), and finally to 'CH<sub>4</sub>' (represented by a flame icon) in the atmosphere.</p>
<b>PROJECT SCENARIO</b> Methane from coal mining activities is captured and destroyed using oxidation or used for power or heat generation.	 <p>The project scenario flowchart shows 'Coal' leading to 'CH<sub>4</sub>'. From 'CH<sub>4</sub>', the flow splits into two paths: one leading to 'Flaring' (flame icon) and 'Energy' (e icon), which then leads to 'CO<sub>2</sub>' (flame icon); the other path leads to 'Release' (upward arrow icon) and 'CH<sub>4</sub>' (flame icon). The 'Release' and 'CH<sub>4</sub>' steps are crossed out with a large 'X', indicating they do not occur in the project scenario.</p>

## ACM0009 Fuel switching from coal or petroleum fuel to natural gas

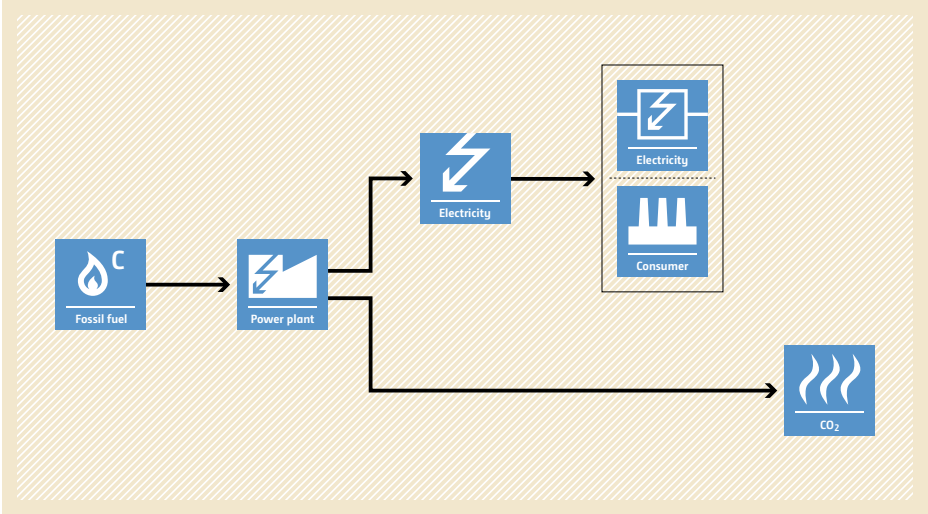
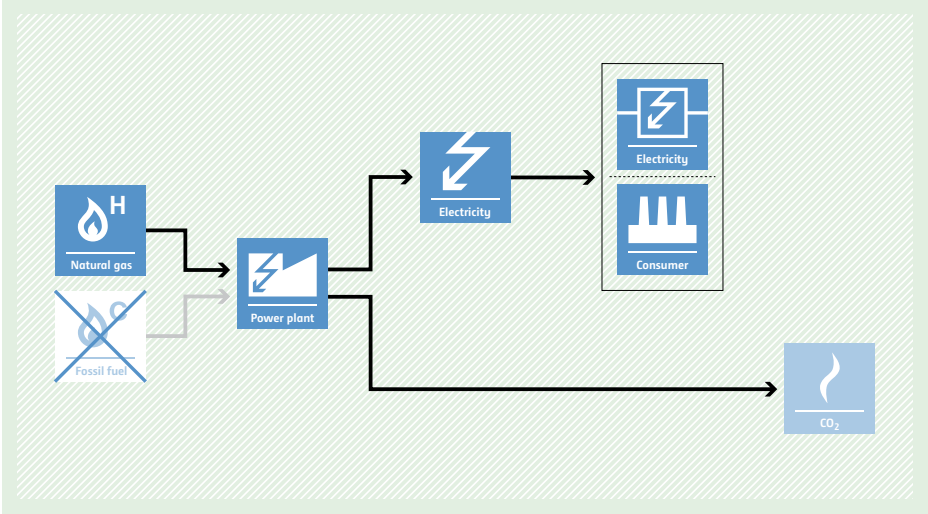
<p><b>Typical project(s)</b></p>	<p>Switching from coal or petroleum fuel to natural gas in the generation of heat for industrial processes.</p>
<p><b>Type of GHG emissions mitigation action</b></p>	<ul style="list-style-type: none"> <li>• Fuel switch.</li> </ul> <p>Reduction of GHG emissions by switching from carbon-intensive to a less-carbon-intensive fuel in the generation of heat.</p>
<p><b>Important conditions under which the methodology is applicable</b></p>	<ul style="list-style-type: none"> <li>• No natural gas has previously been used;</li> <li>• The fuel is neither used for cogeneration of electricity nor as an oxidant but generates heat for district heating or an industrial output other than heat;</li> <li>• The project does not increase the capacity of thermal output or lifetime of the element processes or does not result in integrated process change.</li> </ul>
<p><b>Important parameters</b></p>	<p>At validation:</p> <ul style="list-style-type: none"> <li>• Quantity, net calorific value and CO<sub>2</sub> emission factor of baseline fuels;</li> <li>• Energy efficiency of the element process(es) fired with coal or petroleum fuel.</li> </ul> <p>Monitored:</p> <ul style="list-style-type: none"> <li>• Quantity, net calorific value and CO<sub>2</sub> emission factor of natural gas combusted in the element process(es) in the project;</li> <li>• Energy efficiency of the element process(es) if fired with natural gas.</li> </ul>
<p><b>BASELINE SCENARIO</b> Coal or petroleum fuel is used to generate heat.</p>	 <p>The diagram illustrates the baseline scenario. It starts with a box labeled 'Fossil fuel' with a flame icon and a 'C' (for carbon). An arrow points to a 'Heat' box with a thermometer icon. From this 'Heat' box, two arrows branch out: one points to another 'Heat' box with a thermometer icon, which then points to a 'Production' box with a factory icon; the other arrow points directly to a 'CO<sub>2</sub>' box with a flame icon.</p>
<p><b>PROJECT SCENARIO</b> Natural gas replaces coal or petroleum fuel</p>	 <p>The diagram illustrates the project scenario. It shows a 'Natural gas' box with a flame icon and an 'H' (for hydrogen) next to it. An arrow points from 'Natural gas' to a 'Heat' box with a thermometer icon. A 'Fossil fuel' box with a flame icon and a 'C' is shown below, crossed out with a large 'X', indicating it is no longer used. From the 'Heat' box, two arrows branch out: one points to another 'Heat' box with a thermometer icon, which then points to a 'Production' box with a factory icon; the other arrow points to a 'CO<sub>2</sub>' box with a flame icon.</p>



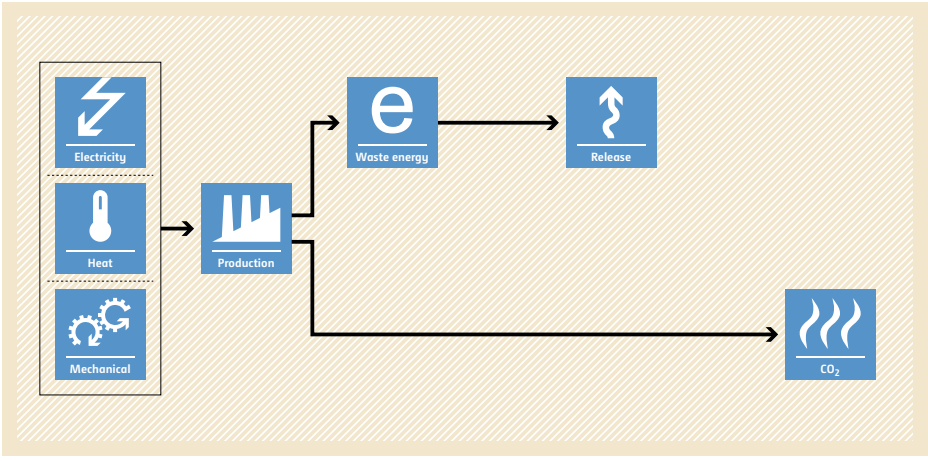
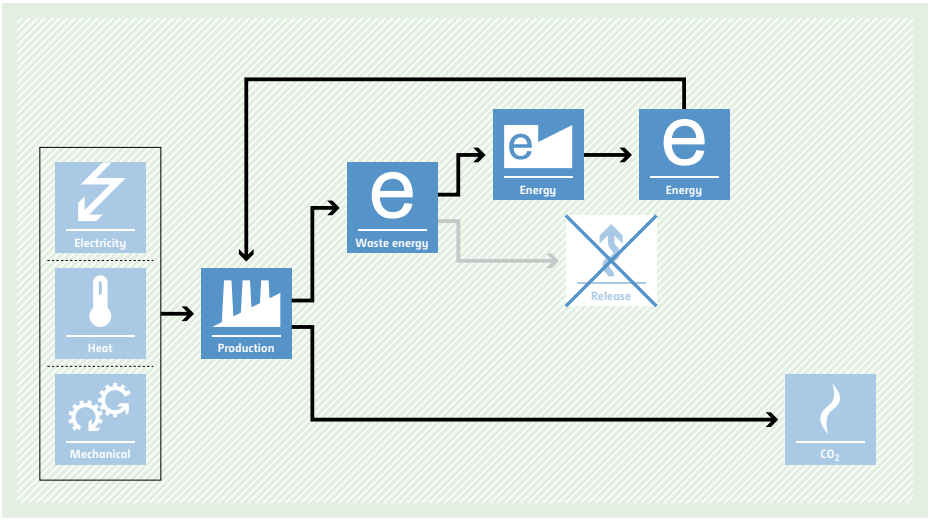
## ACM0010 GHG emission reductions from manure management systems

<p><b>Typical project(s)</b></p>	<p>Manure management on livestock farms (cattle, buffalo, swine, sheep, goats, and/or poultry) where the existing anaerobic manure treatment system is replaced by, or a new system is constructed as, one or a combination of more than one animal waste management systems that result in less GHG emissions.</p>
<p><b>Type of GHG emissions mitigation action</b></p>	<ul style="list-style-type: none"> <li>• GHG destruction.</li> </ul> <p>Destruction of methane emissions and displacement of a more-GHG-intensive service.</p>
<p><b>Important conditions under which the methodology is applicable</b></p>	<ul style="list-style-type: none"> <li>• Farms where livestock populations are managed under confined conditions;</li> <li>• Farms where manure is not discharged into natural water resources (e.g. rivers or estuaries);</li> <li>• In case of anaerobic lagoon treatment systems, the depth of the lagoons used for manure management under the baseline scenario should be at least 1 m;</li> <li>• The annual average ambient temperature at the treatment site is higher than 5°C;</li> <li>• In the baseline case, the minimum retention time of manure waste in the anaerobic treatment system is greater than one month.</li> </ul>
<p><b>Important parameters</b></p>	<p>Monitored:</p> <ul style="list-style-type: none"> <li>• Number of heads of each population and the average animal weight in each population;</li> <li>• If dietary intake method is used, daily average gross energy intake has to be monitored;</li> <li>• Electricity and fossil fuel consumption.</li> </ul>
<p><b>BASELINE SCENARIO</b> Existing manure management system or system to be installed in the absence of the project activity results in release of methane into the atmosphere.</p>	 <p>The diagram illustrates the baseline scenario for manure management. It shows a linear process starting with 'Livestock' (represented by a cow icon), which produces 'Manure' (represented by a puddle icon). The manure undergoes 'Treatment' (represented by a lagoon icon), producing 'Biogas' (represented by a flame icon). From the biogas stage, the process branches into two paths: one leading to 'Flaring' (represented by a flame icon) and another leading to 'Energy' (represented by an 'e' icon). The 'Release' (represented by an upward arrow icon) and 'CH4' (represented by a flame icon) boxes are crossed out with a large 'X', indicating that methane is not released into the atmosphere in this scenario.</p>
<p><b>PROJECT SCENARIO</b> Capture of methane in the animal waste management systems results in less GHG emissions. In case of energetic use of methane, displacement of more-GHG-intensive energy generation.</p>	 <p>The diagram illustrates the project scenario for manure management. It shows a linear process starting with 'Livestock' (represented by a cow icon), which produces 'Manure' (represented by a puddle icon). The manure undergoes 'Treatment' (represented by a lagoon icon), producing 'Biogas' (represented by a flame icon). From the biogas stage, the process branches into two paths: one leading to 'Flaring' (represented by a flame icon) and another leading to 'Energy' (represented by an 'e' icon). The 'Release' (represented by an upward arrow icon) and 'CH4' (represented by a flame icon) boxes are crossed out with a large 'X', indicating that methane is captured and used for energy instead of being released into the atmosphere.</p>

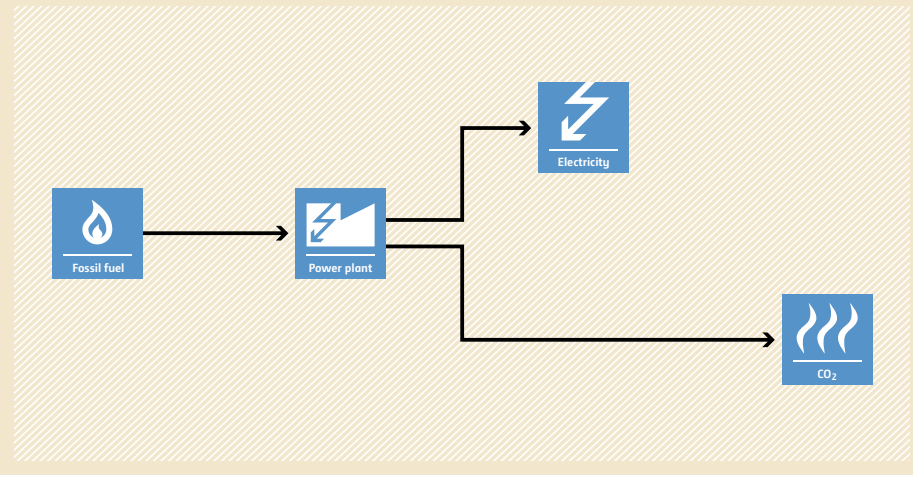
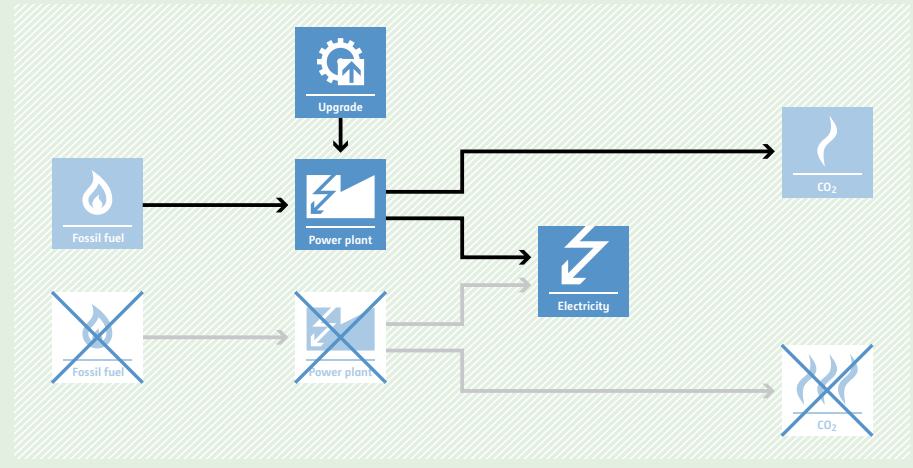
## ACM0011 Consolidated baseline methodology for fuel switching from coal and/or petroleum fuels to natural gas in existing power plants for electricity generation

<b>Typical project(s)</b>	Switch from coal or petroleum derived fuel to natural gas at an existing power plant.
<b>Type of GHG emissions mitigation action</b>	<ul style="list-style-type: none"> <li>Fuel switch.</li> </ul> Switch from coal or petroleum fuel to natural gas.
<b>Important conditions under which the methodology is applicable</b>	<ul style="list-style-type: none"> <li>At least three years of operation history are available;</li> <li>The fuel switch is from only coal and/or petroleum fuels to only natural gas;</li> <li>Only power is generated, for either only the grid or only a captive consumer;</li> <li>The project does not involve major retrofits/modifications of the power plant.</li> </ul>
<b>Important parameters</b>	At validation: <ul style="list-style-type: none"> <li>Historical fuel consumption and power generation;</li> <li>Electricity emission factor (can also be monitored ex post).</li> </ul>
	Monitored: <ul style="list-style-type: none"> <li>Quantity, calorific value and emission factor of fuels consumed in the project;</li> <li>Electricity supplied to the electric power grid or consuming facility.</li> </ul>
<b>BASELINE SCENARIO</b> Coal and/or petroleum fuel is used to generate electricity.	 <p>The diagram illustrates the baseline scenario. It starts with a box labeled 'Fossil fuel' with a 'C' and a flame icon. An arrow points to a 'Power plant' box with a lightning bolt icon. From the power plant, two arrows branch out: one points to another 'Electricity' box (lightning bolt icon), which then points to a 'Consumer' box (factory icon); the other arrow points directly to a 'CO2' box (flame icon).</p>
<b>PROJECT SCENARIO</b> Natural gas is used to generate electricity.	 <p>The diagram illustrates the project scenario. It shows a 'Natural gas' box (flame icon with 'H') and a 'Fossil fuel' box (flame icon with 'C') both with arrows pointing to a 'Power plant' box (lightning bolt icon). The 'Fossil fuel' box has a large 'X' over it, indicating it is no longer used. From the power plant, two arrows branch out: one points to another 'Electricity' box (lightning bolt icon), which then points to a 'Consumer' box (factory icon); the other arrow points directly to a 'CO2' box (flame icon).</p>

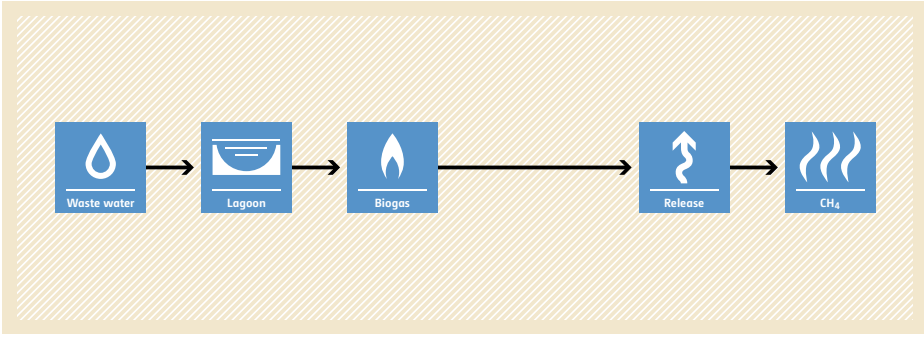
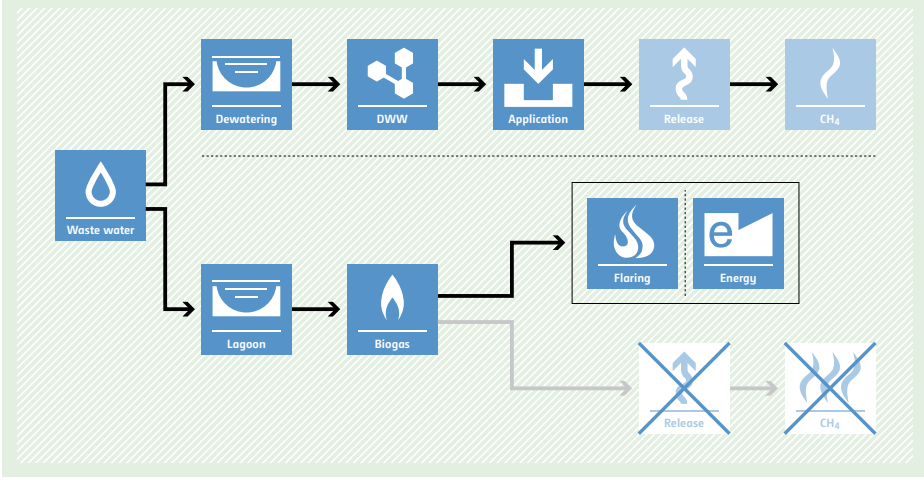
## ACM0012 Consolidated baseline methodology for GHG emission reductions from waste energy recovery projects

<p><b>Typical project(s)</b></p>	<p>Energy from waste heat, waste gas or waste pressure in an existing or new industrial facility is recovered and used for in-house consumption or for export, by installation of a new power and/or heat and/or mechanical energy generation equipment, or by installation of a more-efficient electricity generation equipment than already existing.</p>
<p><b>Type of GHG emissions mitigation action</b></p>	<ul style="list-style-type: none"> <li>• Energy efficiency.</li> </ul> <p>Waste energy recovery in order to displace more-carbon-intensive energy/technology.</p>
<p><b>Important conditions under which the methodology is applicable</b></p>	<ul style="list-style-type: none"> <li>• In the absence of the project, all waste energy would be flared or released into the atmosphere. In case of partial use of the waste energy in the baseline situation, the project increases the share of used waste energy;</li> <li>• For capacity expansion projects, the new capacity should be treated as new facility and therefore the applicable guidance for baseline scenario determination, capping of baseline emissions and demonstration of use of waste energy in absence of the CDM project, should be followed;</li> <li>• An official agreement is required between the generating facility and the recipient facility of energy generated by project, in case they are different entities.</li> </ul>
<p><b>Important parameters</b></p>	<p>Monitored:</p> <ul style="list-style-type: none"> <li>• Quantity of electricity/ heat supplied to the recipient plant(s);</li> <li>• Quantity and parameters of waste energy streams during project.</li> </ul>
<p><b>BASILINE SCENARIO</b> Carbon-intensive sources will continue to supply heat/electricity/mechanical energy to the applications of the recipient facility and unrecovered energy from waste energy source will continue to be wasted.</p>	 <p>The diagram illustrates the baseline scenario. On the left, three boxes labeled 'Electricity', 'Heat', and 'Mechanical' are grouped together, with arrows pointing to a central 'Production' box. From the 'Production' box, three arrows branch out: one to a 'Waste energy' box (containing an 'e' icon), one to a 'Release' box (containing a wavy arrow icon), and one to a 'CO<sub>2</sub>' box (containing a flame icon). The 'Waste energy' box has an arrow pointing to the 'Release' box.</p>
<p><b>PROJECT SCENARIO</b> Heat/electricity/mechanical energy are generated by recovery of energy from a waste energy source and are supplied to the grid an/or applications in the recipient facility.</p>	 <p>The diagram illustrates the project scenario. On the left, three boxes labeled 'Electricity', 'Heat', and 'Mechanical' are grouped together, with arrows pointing to a central 'Production' box. From the 'Production' box, three arrows branch out: one to a 'Waste energy' box (containing an 'e' icon), one to a 'CO<sub>2</sub>' box (containing a flame icon), and one to a 'Release' box (containing a wavy arrow icon). The 'Waste energy' box has an arrow pointing to a 'Energy' box (containing an 'e' icon). This 'Energy' box has an arrow pointing to another 'Energy' box (containing an 'e' icon). The second 'Energy' box has an arrow pointing to the 'Release' box. The 'Release' box is crossed out with a large 'X', indicating that energy is being reused instead of released. The 'Waste energy' box also has a greyed-out arrow pointing to the 'Release' box, indicating that this path is no longer active.</p>

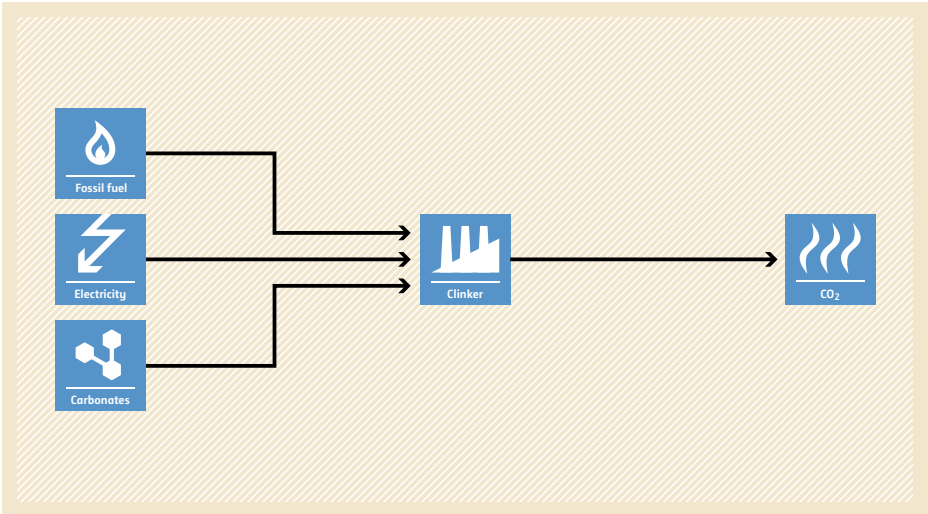
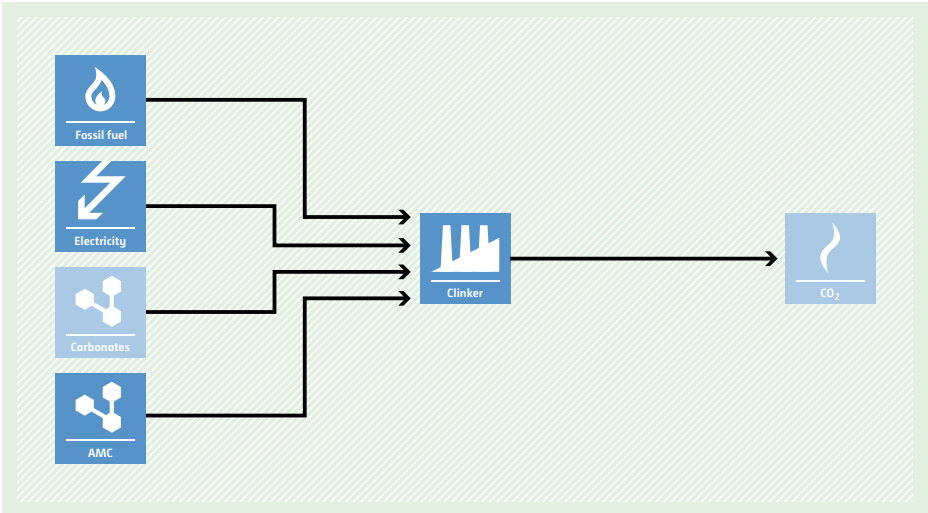
## ACM0013 Construction and operation of new grid connected fossil fuel fired power plants using a less GHG intensive technology

<p><b>Typical project(s)</b></p>	<p>Construction and operation of a new fossil fuel fired power plant that supplies electricity to the grid using more-efficient power generation technology than would otherwise be used with the given fossil fuel (e.g. construction of a supercritical coal fired power plant).</p>
<p><b>Type of GHG emissions mitigation action</b></p>	<ul style="list-style-type: none"> <li>• Energy efficiency.</li> </ul> <p>Construction of a highly efficient new grid-connected fossil-fuel-fired power plant.</p>
<p><b>Important conditions under which the methodology is applicable</b></p>	<ul style="list-style-type: none"> <li>• Only supply of power to the grid is applicable (no cogeneration);</li> <li>• The identified baseline fuel category is used as the main fuel category in more than 50% of the total rated capacity of power plants which were commissioned for commercial operation in the most recent five calendar/fiscal years prior to the publication of the PDD for global stakeholder consultation, within the electric grid to which the project plant will be connected;</li> <li>• At least five new power plants can be identified as similar to the project plant (in the baseline identification procedure).</li> </ul>
<p><b>Important parameters</b></p>	<p>At validation:</p> <ul style="list-style-type: none"> <li>• Energy efficiency of the power generation technology that has been identified as the most likely baseline scenario.</li> </ul> <p>Monitored:</p> <ul style="list-style-type: none"> <li>• Quantity, calorific value and emission factor of fuels consumed in the project activity;</li> <li>• Electricity supplied to the electric power grid.</li> </ul>
<p><b>BASELINE SCENARIO</b> Electricity is generated by a less-efficient new grid-connected power plant using fossil fuel.</p>	 <p>The diagram illustrates the baseline scenario. It shows a flow from 'Fossil fuel' (represented by a flame icon) to a 'Power plant' (represented by a lightning bolt icon). From the power plant, two arrows branch out: one to 'Electricity' (lightning bolt icon) and another to 'CO<sub>2</sub>' (flame icon).</p>
<p><b>PROJECT SCENARIO</b> Electricity is generated by a more-efficient new grid-connected power plant using less fossil fuel.</p>	 <p>The diagram illustrates the project scenario. It shows an 'Upgrade' (gear icon) leading to a 'Power plant' (lightning bolt icon). This upgraded power plant receives 'Fossil fuel' (flame icon) and produces 'Electricity' (lightning bolt icon) and 'CO<sub>2</sub>' (flame icon). Below this, a faded version of the baseline scenario is shown with a large 'X' over it, indicating that the project scenario results in less fossil fuel input and less CO<sub>2</sub> output.</p>

## ACM0014 Treatment of wastewater

<p><b>Typical project(s)</b></p>	<p>Treatment of wastewater in a new anaerobic digester, capture and flaring or utilizing of the generated biogas for electricity or heat generation; Dewatering of wastewater and application to land; Treatment of wastewater in the same treatment plant as in the baseline situation but treatment of the sludge from primary and/or secondary settler either in a new anaerobic digester or treatment of sludge under clearly aerobic conditions.</p>
<p><b>Type of GHG emissions mitigation action</b></p>	<ul style="list-style-type: none"> <li>• GHG destruction.</li> </ul> <p>Destruction of methane emissions and displacement of more-GHG-intensive service.</p>
<p><b>Important conditions under which the methodology is applicable</b></p>	<ul style="list-style-type: none"> <li>• The average depth of the open lagoons or sludge pits in the baseline scenario is at least 1 m;</li> <li>• The residence time of the organic matter in the open lagoon or sludge pit system should be at least 30 days;</li> <li>• Inclusion of solid materials in the project activity is only applicable where:             <ul style="list-style-type: none"> <li>(i) Such solid materials are generated by the industrial facility producing the wastewater; and</li> <li>(ii) The solid materials would be generated both in the project and in the baseline scenario;</li> </ul> </li> <li>• The sludge produced during the implementation of the project activity is not stored onsite before land application to avoid any possible methane emissions from anaerobic degradation.</li> </ul>
<p><b>Important parameters</b></p>	<p>Monitored:</p> <ul style="list-style-type: none"> <li>• Quantity and chemical oxygen demand (COD) of wastewater or sludge that is treated in the project;</li> <li>• Quantity of biogas collected and concentration of methane in the biogas;</li> <li>• Net quantity of electricity or heat generated in the project;</li> <li>• Quantity of dewatered wastewater applied to land.</li> </ul>
<p><b>BASELINE SCENARIO</b> Existing wastewater treatment system results in release of methane into the atmosphere.</p>	 <pre> graph LR     A[Waste water] --&gt; B[Lagoon]     B --&gt; C[Biogas]     C --&gt; D[Release]     D --&gt; E[CH4]     </pre>
<p><b>PROJECT SCENARIO</b> Capture of methane in the wastewater treatment system results in less GHG emissions. In case of energetic use of methane, displacement of more-GHG-intensive energy generation. In cases where wastewater is dewatered (DWW) and the output is used for land application less methane is emitted into the atmosphere.</p>	 <pre> graph LR     A[Waste water] --&gt; B[Dewatering]     A --&gt; C[Lagoon]     B --&gt; D[DWW]     D --&gt; E[Application]     E --&gt; F[Release]     F --&gt; G[CH4]     C --&gt; H[Biogas]     H --&gt; I[Flaring]     H --&gt; J[Release]     I --&gt; K[Energy]     J --&gt; L[CH4]     style F stroke-dasharray: 5 5     style G stroke-dasharray: 5 5     style J stroke-dasharray: 5 5     style L stroke-dasharray: 5 5     </pre>

## ACM0015 Consolidated baseline and monitoring methodology for project activities using alternative raw materials that do not contain carbonates for clinker production in cement kilns

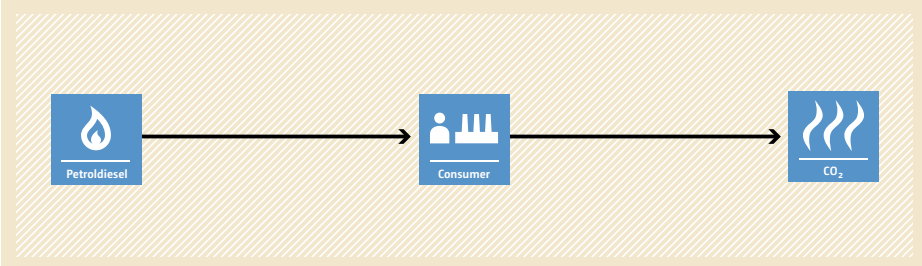
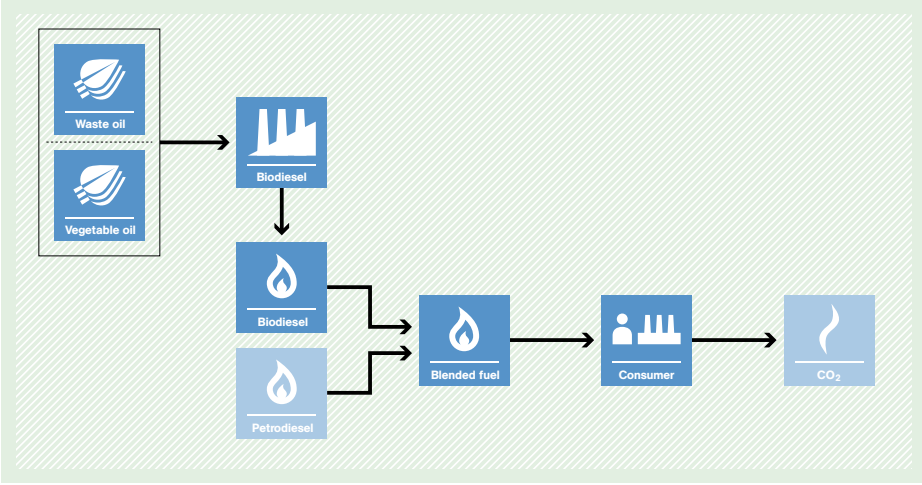
<p><b>Typical project(s)</b></p>	<p>Partial or full switch to alternative raw materials that do not contain carbonates (AMC) in the production of clinker in cement kilns.</p>
<p><b>Type of GHG emissions mitigation action</b></p>	<ul style="list-style-type: none"> <li>• Feedstock switch.</li> </ul> <p>Avoidance of process CO<sub>2</sub> emissions by switching to carbonate free feedstock in the production of clinker.</p>
<p><b>Important conditions under which the methodology is applicable</b></p>	<ul style="list-style-type: none"> <li>• Quality and types of clinker, energy efficiency and fuel used are not changed;</li> <li>• No AMC have previously been used in the clinker production at the plant;</li> <li>• At least 1.5 times the quantity of AMC required for meeting the demand of all existing users in the project area is available.</li> </ul>
<p><b>Important parameters</b></p>	<p>At validation:</p> <ul style="list-style-type: none"> <li>• Historical raw material use and clinker production.</li> </ul> <p>Monitored:</p> <ul style="list-style-type: none"> <li>• Quantity of alternative materials consumed in the project;</li> <li>• Quantity of clinker produced in the project;</li> <li>• Specific Kiln Calorific Consumption;</li> <li>• Electricity consumption.</li> </ul>
<p><b>BASILINE SCENARIO</b> Raw materials that contain calcium and/or magnesium carbonates (e.g. limestone) are used to produce clinker.</p>	 <p>The diagram illustrates the baseline scenario for clinker production. It features three input boxes on the left: 'Fossil fuel' (represented by a flame icon), 'Electricity' (represented by a lightning bolt icon), and 'Carbonates' (represented by a molecular structure icon). Arrows from these three boxes converge and point to a central box labeled 'Clinker' (represented by a factory icon). An arrow from the 'Clinker' box points to a final box on the right labeled 'CO<sub>2</sub>' (represented by a flame icon with wavy lines), indicating the emission of carbon dioxide.</p>
<p><b>PROJECT SCENARIO</b> Alternative raw materials that do not contain carbonates (AMC) are used to produce clinker.</p>	 <p>The diagram illustrates the project scenario for clinker production. It features four input boxes on the left: 'Fossil fuel' (flame icon), 'Electricity' (lightning bolt icon), 'Carbonates' (molecular structure icon), and 'AMC' (molecular structure icon). Arrows from these four boxes converge and point to a central box labeled 'Clinker' (factory icon). An arrow from the 'Clinker' box points to a final box on the right labeled 'CO<sub>2</sub>' (flame icon with wavy lines), indicating the emission of carbon dioxide.</p>

# ACM0016 Baseline methodology for mass rapid transit projects



<p><b>Typical project(s)</b></p>	<p>Establishment and operation of rail-based or bus-based mass rapid transit systems in urban or suburban regions for passenger transport by replacing a traditional urban bus-driven public transport system.</p>
<p><b>Type of GHG emissions mitigation action</b></p>	<ul style="list-style-type: none"> <li>• Energy efficiency.</li> </ul> <p>Displacement of more-GHG and, if gaseous fuels are used, CH<sub>4</sub>-intensive transport modes (existing fleet of buses operating under mixed traffic conditions) by less-GHG-intensive ones (newly developed rail-based systems or segregated bus lanes).</p>
<p><b>Important conditions under which the methodology is applicable</b></p>	<ul style="list-style-type: none"> <li>• The project either installs new railways or segregated bus lanes in order to replace existing bus routes (e.g. by scrapping buses, closing or rescheduling bus routes). For bus rapid transit systems with feeder plus trunk routes, methodology <a href="#">AM0031</a> is recommended;</li> <li>• The methodology is applicable for urban or suburban trips. It is not applicable for inter-urban transport;</li> <li>• The methodology is not applicable for operational improvements (e.g. new or larger buses) of an already existing and operating bus lane or rail-based system.</li> </ul>
<p><b>Important parameters</b></p>	<p>At validation:</p> <ul style="list-style-type: none"> <li>• An extensive survey with the passengers using the project is required in order to determine the baseline scenario (i.e. the distance and mode of transport that the passengers using the project would have used in the baseline).</li> </ul> <p>Monitored:</p> <ul style="list-style-type: none"> <li>• The number of passengers transported in the project;</li> <li>• Specific fuel consumption, occupancy rates and travelled distances of different transport modes as well as the speed of vehicles on affected roads.</li> </ul>
<p><b>BASELINE SCENARIO</b> Passengers are transported using a diverse transport system involving buses, trains, cars, non-motorized transport modes, etc. operating under mixed traffic conditions.</p>	<p>The diagram illustrates the baseline scenario where four transport modes—Train, Bus, Car, and Motorcycle—are shown in separate boxes on the left. Arrows from each of these boxes converge and point towards a single box on the right labeled 'CO<sub>2</sub>' with a flame icon, representing the total emissions from this diverse system.</p>
<p><b>PROJECT SCENARIO</b> Passengers are transported using newly developed rail-based systems or segregated bus lanes that partially displace the existing bus-driven transport system operated under mixed traffic conditions.</p>	<p>The diagram illustrates the project scenario. It features a central box containing icons for 'Train' and 'Bus', indicating that these modes are now partially displaced or integrated. Arrows from the 'Car' and 'Motorcycle' boxes on the left point towards a 'CO<sub>2</sub>' emissions box on the right. The 'Train' and 'Bus' box also has an arrow pointing to the 'CO<sub>2</sub>' box, but it is smaller than the arrows from the 'Car' and 'Motorcycle' boxes, suggesting a reduction in overall emissions compared to the baseline scenario.</p>

## ACM0017 Production of biodiesel for use as fuel

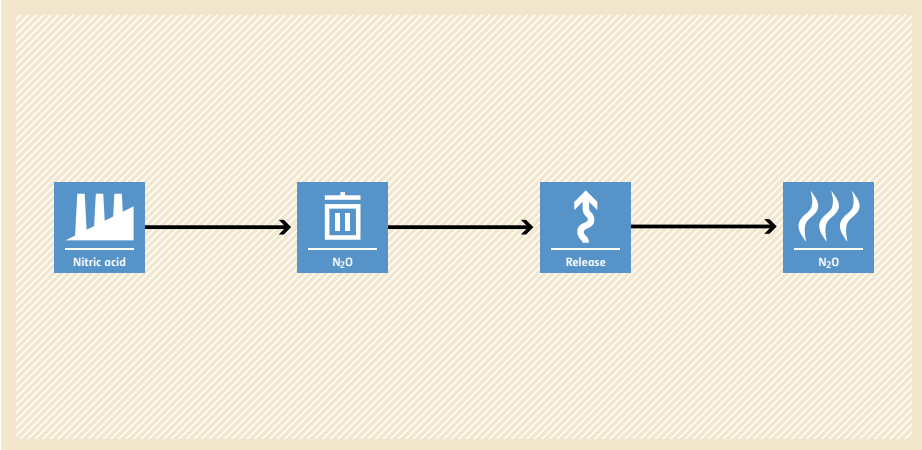
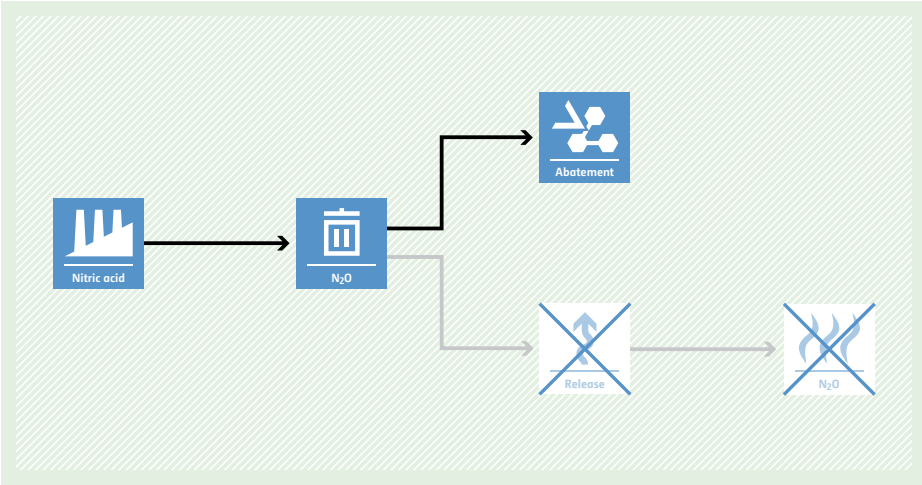
<p><b>Typical project(s)</b></p>	<p>Construction and operation of a biodiesel production plant for production of blended biodiesel that is used as fuel in existing stationary installations (e.g. diesel generators) and/or in vehicles. Biodiesel is produced from waste oil/fat and/or vegetable oil that is produced from oilseeds from plants that are cultivated on dedicated plantations established on lands that are degraded or degrading at the start of the project.</p>
<p><b>Type of GHG emissions mitigation action</b></p>	<ul style="list-style-type: none"> <li>• Renewable energy.</li> </ul> <p>Displacement of more-GHG-intensive fossil fuel for combustion in vehicles and/or stationary installations.</p>
<p><b>Important conditions under which the methodology is applicable</b></p>	<ul style="list-style-type: none"> <li>• The alcohol used for esterification (production of biodiesel) is methanol from fossil fuel origin;</li> <li>• No modifications in the consumer stationary installations or in the vehicles engines are necessary to consume/combust the (blended) biodiesel;</li> <li>• If applicable, the plantations are established on land classified as degraded or degrading or on a land area that is included in the project boundary of one or several registered A/R CDM project activities;</li> <li>• Consumer and producer of the (blended) biodiesel are bound by a contract that allows the producer to monitor consumption of (blended) biodiesel and that states that the consumer shall not claim CERs resulting from its consumption.</li> </ul>
<p><b>Important parameters</b></p>	<p>Monitored:</p> <ul style="list-style-type: none"> <li>• Quantity of biodiesel from waste oil/fat or feedstock from dedicated plantations consumed by host country consumers to substitute petrodiesel;</li> <li>• Project emissions from transport of oilseeds, biomass residues, vegetable oil, waste oil/fats, biodiesel if distances of more than 50 km are covered; fossil fuel (including methanol) and electricity consumption;</li> <li>• If applicable, parameters to monitor project emissions (CO<sub>2</sub>, CH<sub>4</sub>, N<sub>2</sub>O) associated with the cultivation of oilseeds.</li> </ul>
<p><b>BASELINE SCENARIO</b> Consumption of petrodiesel.</p>	 <p>The baseline scenario flowchart shows a linear process. It starts with a blue square icon containing a flame and the text 'Petrodiesel'. An arrow points to a blue square icon containing a factory and the text 'Consumer'. A second arrow points to a blue square icon containing three wavy lines and the text 'CO<sub>2</sub>'.</p>
<p><b>PROJECT SCENARIO</b> Production of blended biodiesel and consumption in existing stationary installations (e.g. diesel generators) and/or in vehicles.</p>	 <p>The project scenario flowchart is more complex. It begins with a box containing two leaf icons labeled 'Waste oil' and 'Vegetable oil'. An arrow points to a factory icon labeled 'Biodiesel'. From there, an arrow points down to a flame icon labeled 'Biodiesel'. Another arrow points down to a flame icon labeled 'Petrodiesel'. Arrows from both 'Biodiesel' and 'Petrodiesel' icons point to a flame icon labeled 'Blended fuel'. An arrow then points to a factory icon labeled 'Consumer', and finally to a flame icon labeled 'CO<sub>2</sub>'.</p>



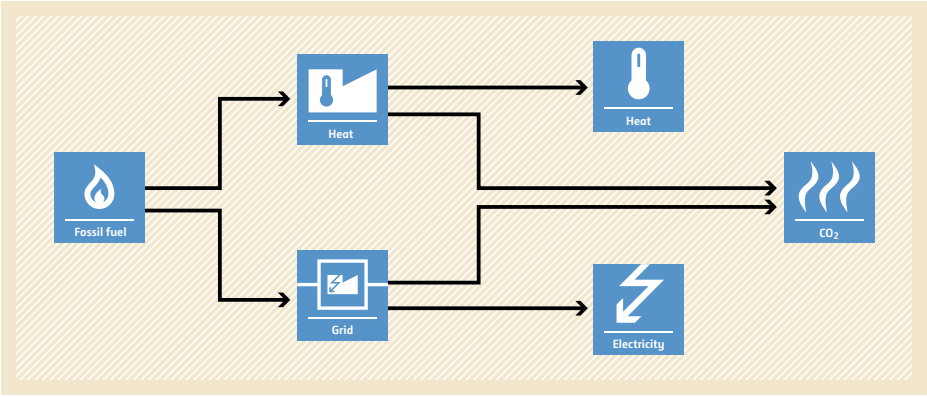
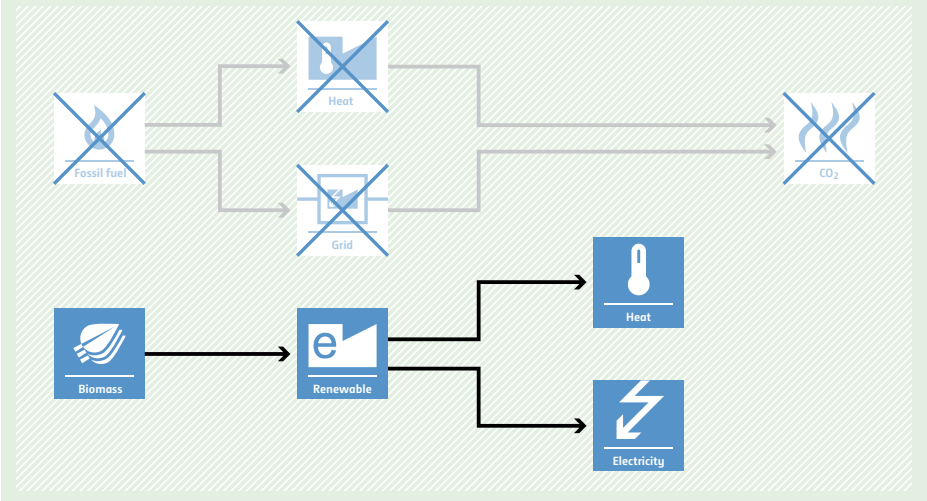
## ACM0018 Consolidated methodology for electricity generation from biomass residues in power-only plants

<p><b>Typical project(s)</b></p>	<p>Generation of power using biomass residues as fuel, in new biomass based power plants at sites where currently no power generation occurs (greenfield), replacement or installation of operation units next to existing power plants (capacity expansion projects), energy efficiency improvement projects or replacement of fossil fuel by biomass residues in existing power plants (fuel switch projects).</p>
<p><b>Type of GHG emissions mitigation action</b></p>	<ul style="list-style-type: none"> <li>• Renewable energy;</li> <li>• Energy efficiency;</li> <li>• Fuel switch.</li> </ul> <p>Displacement of more GHG-intensive electricity generation in the grid or on-site. Avoidance of methane emissions from anaerobic decay of biomass residues.</p>
<p><b>Important conditions under which the methodology is applicable</b></p>	<ul style="list-style-type: none"> <li>• If biomass from a production process is used, the implementation of the project shall not result in an increase of the processing capacity of raw input;</li> <li>• The methodology is applicable to power-only plants;</li> <li>• Only biomass residues, not biomass in general, are eligible;</li> <li>• Fossil fuels may be co-fired in the project plant. However, the amount of fossil fuels co-fired shall not exceed 80% of the total fuel fired on an energy basis;</li> <li>• In case of existing facilities, three years of historical data is required for the calculation of emissions reductions;</li> <li>• Projects that chemically process the biomass residues prior to combustion (e.g. by means of esterification of waste oils, fermentation and gasification, etc.) are not eligible under this methodology. The biomass residues can however be processed physically such as by means of drying, pelletization, shredding and briquetting.</li> </ul>
<p><b>Important parameters</b></p>	<p>At validation:</p> <ul style="list-style-type: none"> <li>• If applicable: grid emission factor (can also be monitored ex post).</li> </ul> <p>Monitored:</p> <ul style="list-style-type: none"> <li>• Electricity generated in the project;</li> <li>• Quantity and moisture content of the biomass residues used in the project and electricity and fossil fuel consumption of the project.</li> </ul>
<p><b>BASELINE SCENARIO</b> Electricity would be produced by more-carbon-intensive technologies based on fossil fuel or less efficient power plants. Biomass residues could partially decay under anaerobic conditions, resulting in methane emissions.</p>	<p>The diagram shows a flowchart for the baseline scenario. On the left, 'Fossil fuel' and 'Biomass' are represented by icons. Arrows from both point to a 'Grid' icon. From the 'Grid', an arrow points to an 'Electricity' icon, which then points to a 'CO<sub>2</sub>' icon. Another arrow from the 'Grid' points to a 'Burning' icon. From the 'Burning' icon, an arrow points to a 'CH<sub>4</sub>' icon. A 'Disposal' icon is also shown, with an arrow from 'Biomass' pointing to it, and another arrow from 'Disposal' pointing to 'CH<sub>4</sub>'. The 'Disposal' and 'Burning' icons are enclosed in a box.</p>
<p><b>PROJECT SCENARIO</b> Use of biomass residues replaces fossil fuel use. Decay of biomass residues used as fuel is avoided.</p>	<p>The diagram shows a flowchart for the project scenario. On the left, 'Fossil fuel' and 'Biomass' are represented by icons. The 'Fossil fuel' icon is crossed out with a large 'X'. An arrow from 'Biomass' points to a 'Grid' icon. Another arrow from 'Biomass' points to a 'Renewable' icon. From the 'Grid', an arrow points to an 'Electricity' icon, which then points to a 'CO<sub>2</sub>' icon. Another arrow from the 'Grid' points to a 'Burning' icon. From the 'Burning' icon, an arrow points to a 'CH<sub>4</sub>' icon. A 'Disposal' icon is also shown, with an arrow from 'Biomass' pointing to it, and another arrow from 'Disposal' pointing to 'CH<sub>4</sub>'. The 'Disposal' and 'Burning' icons are enclosed in a box and both are crossed out with large 'X's.</p>

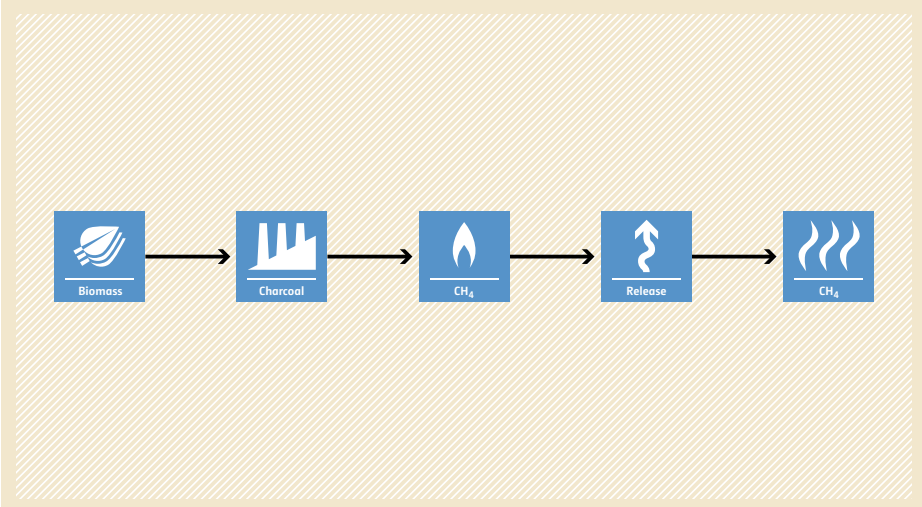
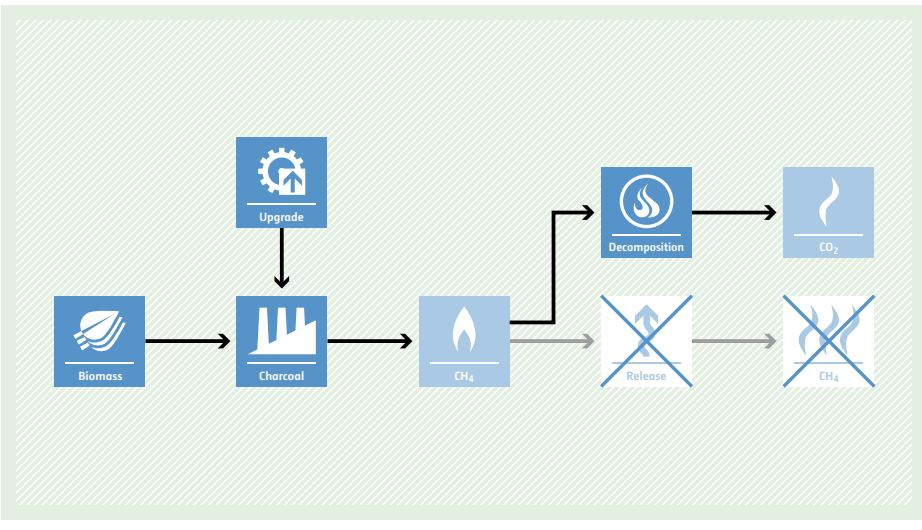
## ACM0019 N<sub>2</sub>O abatement from nitric acid production

<b>Typical project(s)</b>	Project activities that introduce N <sub>2</sub> O abatement measures in nitric acid plants.
<b>Type of GHG emissions mitigation action</b>	<ul style="list-style-type: none"> <li>• Destruction of GHG.</li> </ul> Destruction of N <sub>2</sub> O emissions through abatement measures.
<b>Important conditions under which the methodology is applicable</b>	<ul style="list-style-type: none"> <li>• Continuous real-time measurements of the N<sub>2</sub>O concentration and the total gas volume flow can be carried out in the tail gas stream after the abatement of N<sub>2</sub>O emissions throughout the crediting period of the project activity;</li> <li>• No law or regulation is in place mandating the complete or partial destruction of N<sub>2</sub>O from nitric acid plant.</li> </ul>
<b>Important parameters</b>	At validation: <ul style="list-style-type: none"> <li>• Nitric acid produced.</li> </ul>
	Monitored: <ul style="list-style-type: none"> <li>• Mass flow of N<sub>2</sub>O in the gaseous stream of the tail gas;</li> <li>• Nitric acid produced;</li> <li>• Fraction of time during which the by-pass valve on the line feeding the tertiary N<sub>2</sub>O abatement facility was open.</li> </ul>
<b>BASELINE SCENARIO</b> Venting of N <sub>2</sub> O generated during the production of nitric acid to the atmosphere.	 <p>The diagram illustrates the baseline scenario. It starts with a 'Nitric acid' icon (factory) on the left. An arrow points to an 'N<sub>2</sub>O' icon (gas cylinder). Another arrow points to a 'Release' icon (upward arrow). A final arrow points to an 'N<sub>2</sub>O' icon (flames), representing the gas being vented into the atmosphere.</p>
<b>PROJECT SCENARIO</b> Implementation of different abatement measures to destroy N <sub>2</sub> O emissions (i.e. installation of secondary or tertiary abatement systems).	 <p>The diagram illustrates the project scenario. It starts with a 'Nitric acid' icon (factory) on the left. An arrow points to an 'N<sub>2</sub>O' icon (gas cylinder). From this point, the path splits: one arrow goes up to an 'Abatement' icon (circular arrows), and another arrow goes down to a 'Release' icon (upward arrow) which is crossed out with a large 'X'. A final arrow points to an 'N<sub>2</sub>O' icon (flames) which is also crossed out with a large 'X', indicating that emissions are significantly reduced compared to the baseline.</p>

## ACM0020 Co-firing of biomass residues for heat generation and/or electricity generation in grid connected power plants

<p><b>Typical project(s)</b></p>	<p>Operation of a single piece of biomass-residue co-fired heat generation equipment. The heat output of the heat generators may be used onsite to produce electric power in power-only plants, or cogenerate electric power in cogeneration plants. Typical activities are partial replacement of fossil fuels by biomass residues in existing or new heat generation equipment.</p>
<p><b>Type of GHG emissions mitigation action</b></p>	<ul style="list-style-type: none"> <li>• Renewable Energy.</li> </ul> <p>Displacement of more-GHG-intensive electricity generation in grid or heat and electricity generation on-site.</p>
<p><b>Important conditions under which the methodology is applicable</b></p>	<ul style="list-style-type: none"> <li>• If biomass from a production process is used, the implementation of the project shall not result in an increase of the processing capacity of raw input;</li> <li>• Only biomass residues, not biomass in general, are eligible;</li> <li>• The amount of biomass residues co-fired shall not exceed 50% of the total fuel fired on an energy basis;</li> <li>• No biomass is co-fired in the identified baseline scenario and the same type of fossil fuel is fired in the identified baseline scenario as in the project activity.</li> </ul>
<p><b>Important parameters</b></p>	<p>At validation:</p> <ul style="list-style-type: none"> <li>• If applicable: grid emission factor (can also be monitored ex post).</li> </ul> <p>Monitored:</p> <ul style="list-style-type: none"> <li>• Quantity and moisture content of the biomass residues used in the project;</li> <li>• Electricity and/or heat generated in the project activity;</li> <li>• Electricity and fossil fuel consumption of the project activity.</li> </ul>
<p><b>BASELINE SCENARIO</b> Electricity or heat would be produced by more-carbon-intensive technologies based on fossil fuel</p>	 <p>The diagram illustrates the baseline scenario. It starts with a 'Fossil fuel' icon (flame) on the left. Two arrows lead to 'Heat' (thermometer icon) and 'Grid' (power plug icon). From 'Heat', two arrows lead to 'Heat' (thermometer icon) and 'CO2' (flame icon). From 'Grid', two arrows lead to 'Electricity' (lightning bolt icon) and 'CO2' (flame icon).</p>
<p><b>PROJECT SCENARIO</b> Use of biomass residues for power or heat generation instead of fossil fuel.</p>	 <p>The diagram illustrates the project scenario. It starts with a 'Biomass' icon (leaf) on the left. An arrow leads to 'Renewable' (e icon). From 'Renewable', two arrows lead to 'Heat' (thermometer icon) and 'Electricity' (lightning bolt icon). The 'Heat' and 'Electricity' outputs are shown to displace the corresponding outputs from the baseline scenario, which are crossed out with large 'X' marks. This results in a significant reduction in 'CO2' emissions, also shown as a crossed-out icon.</p>

## ACM0021 Reduction of emissions from charcoal production by improved kiln design and/or abatement of methane

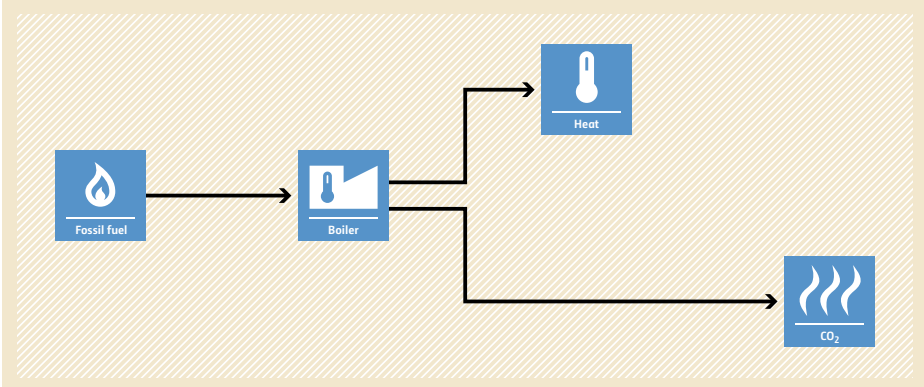
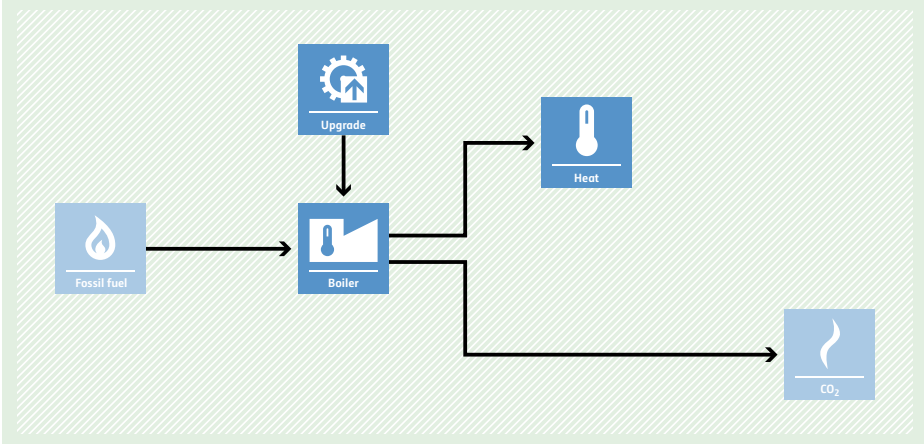
<p><b>Typical project(s)</b></p>	<p>Installation of charcoal kilns of enhanced design to replace existing kilns, and/or installation of methane abatement units at existing or new kilns.</p>
<p><b>Type of GHG emissions mitigation action</b></p>	<ul style="list-style-type: none"> <li>• GHG emission avoidance.</li> </ul> <p>Avoidance or reduction of CH<sub>4</sub> emissions in charcoal production process.</p>
<p><b>Important conditions under which the methodology is applicable</b></p>	<ul style="list-style-type: none"> <li>• The project does not change the type and sources of input for charcoal production;</li> <li>• There are no regulations that prevent venting of methane generated from charcoal production facility;</li> <li>• All the existing kilns affected by the project activity shall have the same mechanical design.</li> </ul>
<p><b>Important parameters</b></p>	<p>Monitored:</p> <ul style="list-style-type: none"> <li>• Charcoal production of each kiln;</li> <li>• Start time and end time of each carbonization cycle of each kiln;</li> <li>• Combustion status of each methane abatement unit (if applicable).</li> </ul>
<p><b>BASELINE SCENARIO</b> High CH<sub>4</sub> emissions associated with the production of charcoal.</p>	 <p>The baseline scenario flowchart illustrates the process of charcoal production and methane emissions. It starts with 'Biomass' (represented by a leaf icon), which is processed into 'Charcoal' (represented by a factory icon). The charcoal is then used to produce 'CH<sub>4</sub>' (represented by a flame icon). This CH<sub>4</sub> is then 'Released' (represented by an upward arrow icon) into the atmosphere, where it is shown as 'CH<sub>4</sub>' emissions (represented by a flame icon).</p>
<p><b>PROJECT SCENARIO</b> Decreased or avoided CH<sub>4</sub> emissions associated with production of charcoal.</p>	 <p>The project scenario flowchart illustrates the process of charcoal production with improved kiln design and methane abatement. It starts with 'Biomass' (represented by a leaf icon), which is processed into 'Charcoal' (represented by a factory icon). The charcoal is then used to produce 'CH<sub>4</sub>' (represented by a flame icon). This CH<sub>4</sub> is then captured by an 'Upgrade' unit (represented by a gear icon) and sent to a 'Decomposition' unit (represented by a flame icon). The decomposition unit produces 'CO<sub>2</sub>' (represented by a flame icon). The 'Release' unit (represented by an upward arrow icon) is crossed out with a large 'X', indicating that methane release is avoided. The 'CH<sub>4</sub>' emissions (represented by a flame icon) are also crossed out with a large 'X', indicating that methane emissions are avoided.</p>

## ACM0022 Alternative waste treatment processes



<p><b>Typical project(s)</b></p>	<p>The project involves one or a combination of the following waste treatment options: Composting process in aerobic conditions; Gasification to produce syngas and its use; Anaerobic digestion with biogas collection and flaring and/or its use (this includes processing and upgrading biogas and then distribution of it via a natural gas distribution grid); Mechanical/thermal treatment process to produce refuse-derived fuel (RDF)/stabilized biomass (SB) and its use; Incineration of fresh waste for energy generation, electricity and/or heat; Treatment of wastewater in combination with solid waste, by co-composting or in an anaerobic digester.</p>
<p><b>Type of GHG emissions mitigation action</b></p>	<ul style="list-style-type: none"> <li>• GHG emission avoidance;</li> <li>• Renewable energy.</li> </ul> <p>CH<sub>4</sub> emissions due to anaerobic decay of organic waste are avoided by alternative waste treatment processes. Organic waste is used as renewable energy source.</p>
<p><b>Important conditions under which the methodology is applicable</b></p>	<ul style="list-style-type: none"> <li>• The proportions and characteristics of different types of organic waste processed in the project can be determined;</li> <li>• Neither hospital nor industrial waste may be treated through anaerobic digestion, thermal treatment or mechanical treatment;</li> <li>• The project activity does not reduce the amount of waste that would be recycled in the absence of the project;</li> <li>• The baseline scenario is the disposal of the waste in a landfill site without capturing landfill gas or with partly capturing it and subsequently flaring it.</li> </ul>
<p><b>Important parameters</b></p>	<p>Monitored:</p> <ul style="list-style-type: none"> <li>• Weight fraction of the different waste types in a sample and total amount of organic waste prevented from disposal;</li> <li>• Electricity and fossil fuel consumption in the project site.</li> </ul>
<p><b>BASELINE SCENARIO</b> Disposal of the waste in a landfill site without capturing landfill gas or with partly capturing and subsequently flaring it.</p>	<pre> graph LR     Waste[Waste] --&gt; Disposal[Disposal]     Disposal --&gt; LandfillGas[Landfill gas]     LandfillGas --&gt; Release[Release]     Release --&gt; CH4[CH4]     </pre>
<p><b>PROJECT SCENARIO</b> Alternative waste treatment process. Such processes could be composting, gasification, anaerobic digestion with biogas collection and flaring and/or its use, mechanical/thermal treatment process to produce RDF or SB and its use, or incineration of fresh waste for energy generation.</p>	<pre> graph TD     Waste[Waste] --&gt; Composting[Composting]     Waste --&gt; Treatment[Treatment]     Treatment --&gt; Burning[Burning]     Waste -.-&gt; Disposal[Disposal]     Disposal -.-&gt; LandfillGas[Landfill gas]     LandfillGas -.-&gt; Release[Release]     Release -.-&gt; CH4[CH4]     Disposal, LandfillGas, Release, CH4     </pre>

## ACM0023 Introduction of an efficiency improvement technology in a boiler

<p><b>Typical project(s)</b></p>	<p>Improvement of the boiler efficiency through introduction of efficiency improvement technology.</p>
<p><b>Type of GHG emissions mitigation action</b></p>	<ul style="list-style-type: none"> <li>• Energy efficiency.</li> </ul> <p>Switch to more-energy-efficient technology.</p>
<p><b>Important conditions under which the methodology is applicable</b></p>	<ul style="list-style-type: none"> <li>• The boiler has an operating history of at least three years;</li> <li>• The efficiency improvement technology to be used under the project activity was not used at the project facility on a commercial basis prior to the implementation of the project activity;</li> <li>• The type of fossil fuel used by the project during the crediting period was also used during the most recent three years prior to the implementation of the project activity;</li> <li>• The technologies allowed are oil/water emulsion technology, fire side cleaning technology and coal catalyst technology.</li> </ul>
<p><b>Important parameters</b></p>	<p>At validation:</p> <ul style="list-style-type: none"> <li>• Historical fuel consumption in boiler.</li> </ul> <p>Monitored:</p> <ul style="list-style-type: none"> <li>• Fuel consumption in the boiler;</li> <li>• Energy generation from the boiler.</li> </ul>
<p><b>BASELINE SCENARIO</b> Operation of boilers at lower efficiency of combustion in absence of efficiency improvement technology.</p>	 <p>The diagram shows a flowchart for the baseline scenario. On the left, a blue box labeled 'Fossil fuel' with a flame icon has an arrow pointing to a central blue box labeled 'Boiler' with a thermometer icon. From the 'Boiler' box, two arrows branch out: one points up to a blue box labeled 'Heat' with a thermometer icon, and the other points down to a blue box labeled 'CO<sub>2</sub>' with a flame icon. The entire diagram is set against a light orange background with a diagonal hatching pattern.</p>
<p><b>PROJECT SCENARIO</b> Efficiency improvement technology is introduced to improve the efficiency of boilers.</p>	 <p>The diagram shows a flowchart for the project scenario. On the left, a blue box labeled 'Fossil fuel' with a flame icon has an arrow pointing to a central blue box labeled 'Boiler' with a thermometer icon. Above the 'Boiler' box is another blue box labeled 'Upgrade' with a gear icon, and an arrow points from 'Upgrade' down to the 'Boiler' box. From the 'Boiler' box, two arrows branch out: one points up to a blue box labeled 'Heat' with a thermometer icon, and the other points down to a blue box labeled 'CO<sub>2</sub>' with a flame icon. The entire diagram is set against a light green background with a diagonal hatching pattern.</p>