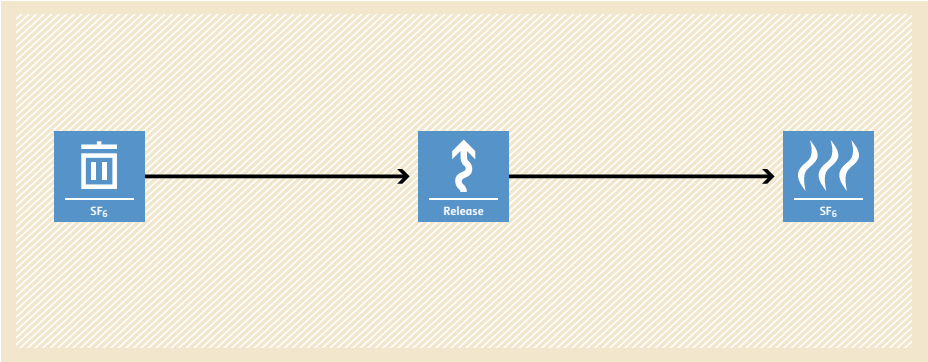
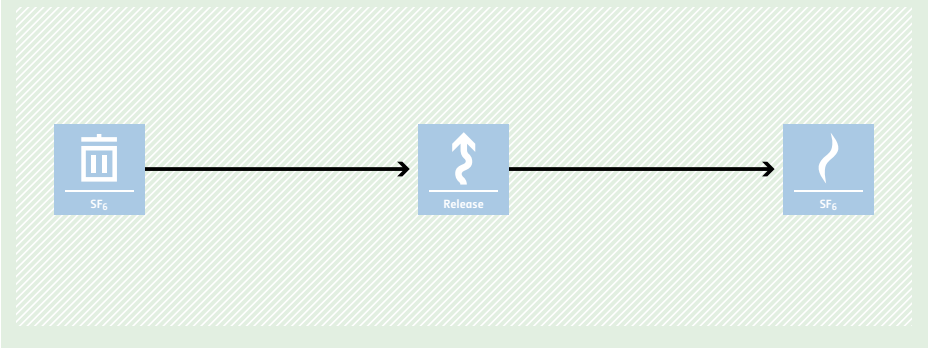
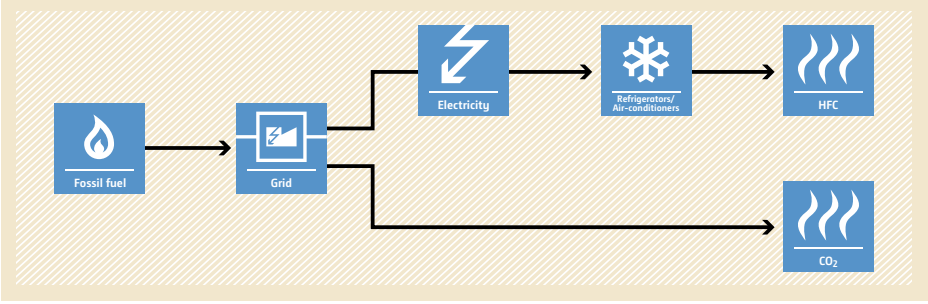
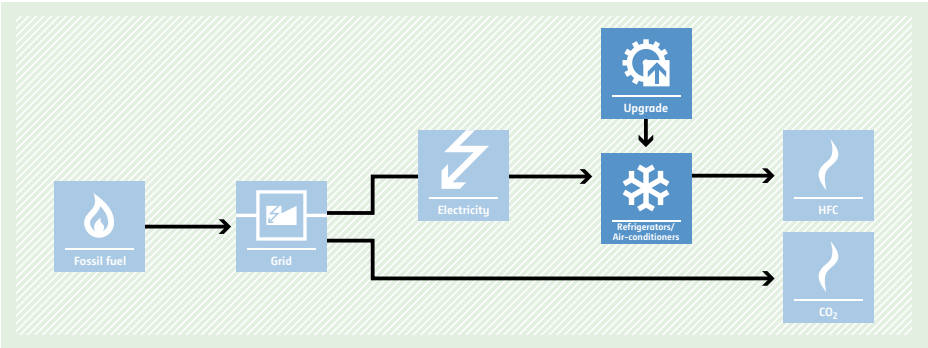
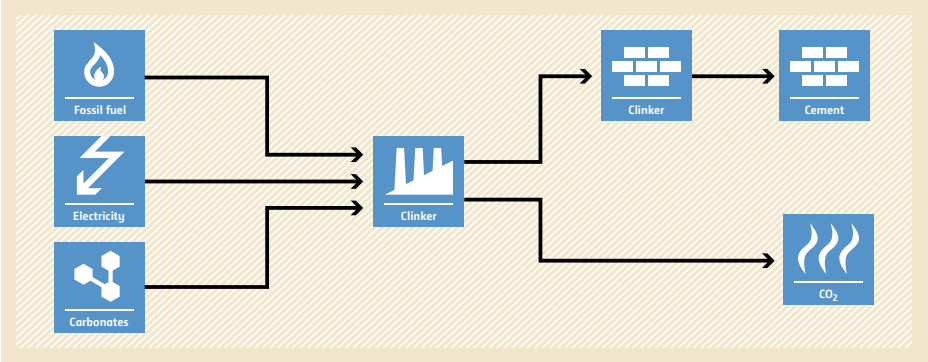
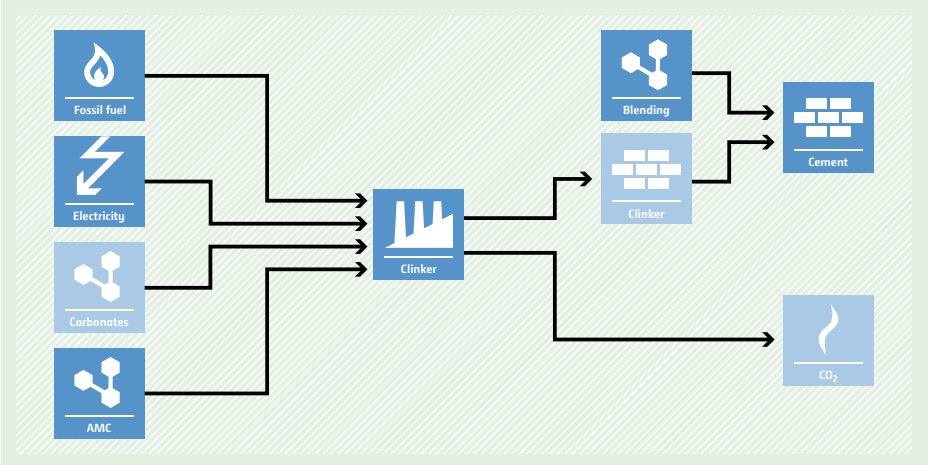
AM0119 SF_6 emission reductions in gas insulated metal enclosed switchgear

Typical project(s)	Introduction of new, or replacement of existing gas insulated switchgear(s) (GIS) with those filled with lower content of SF_6 or SF_6 free.
Type of GHG emissions mitigation action	• GHG emission avoidance. Avoidance of SF_6 fugitive emissions in switchgears.
Important conditions under which the methodology is applicable	• The project equipment shall provide the same or better functional results as the baseline equipment; • Refilling of SF_6 is required to the baseline equipment for its proper operation during its lifetime; • Residual SF_6 of both, the baseline and the project equipment, would have the same fate at the end of its lifetime (e.g. atmosphere venting); • The type of baseline GIS shall be high voltage (> 52kV), closed pressure system for gas; • Emission reductions are claimed only by the project proponent.
Important parameters	At validation: • SF_6 content of baseline equipment; • Annual SF_6 loss rate of the equipment; • Amount of SF_6 recharged to baseline equipment. Monitored: • Amount of SF_6 recharged to project equipment.
BASELINE SCENARIO SF_6 that would have been recharged to the baseline equipment and emitted.	
PROJECT SCENARIO SF_6 is reduced or avoided in SF_6 free equipment or lower volume SF_6 installations	

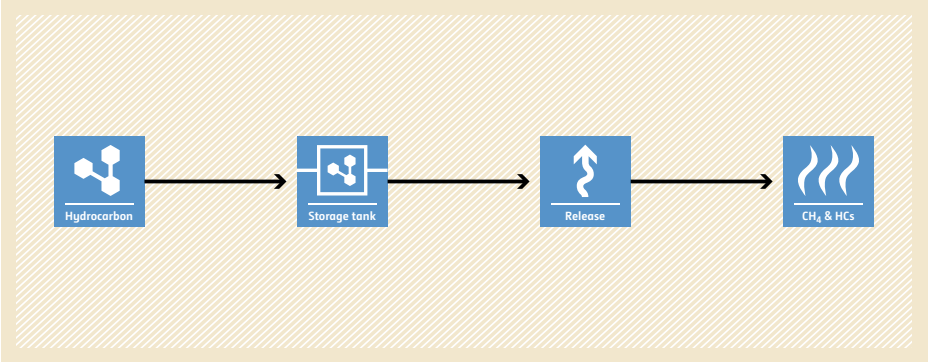
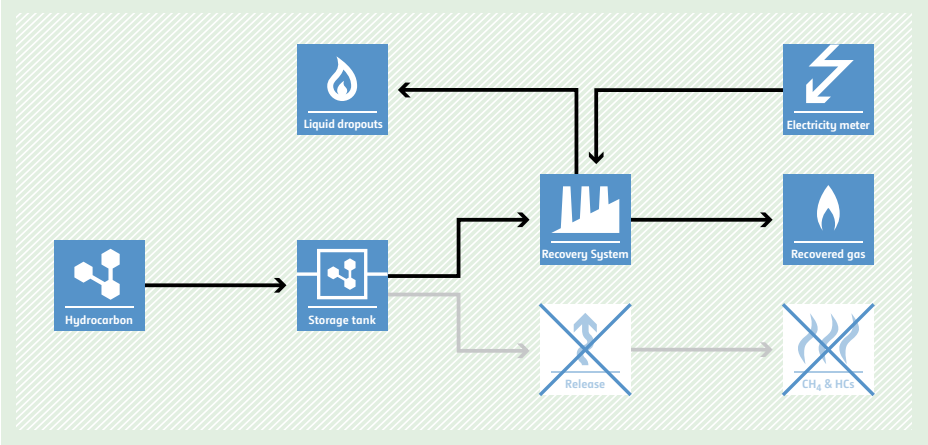
AM0120 Energy-efficient refrigerators and air-conditioners

Typical project(s)	Installation of new energy-efficient refrigerators and air conditioners (RACs) as replacement or new sales projects.
Type of GHG emissions mitigation action	• Energy efficiency. Displacement of more-GHG-intensive service by use of more-efficient technology.
Important conditions under which the methodology is applicable	• Installation of RACs is limited to residential/household applications and households are connected to a national or regional electricity grid; • Project units are Refrigerators and Air Conditioners that use refrigerants and PUR foam blowing agents with no ozone depleting potential (ODP) and low GWP (e.g. Refrigerants and blowing agents such as Hydrofluoroolefins or Hydrocarbons with GWPs<10); • Refrigerant emissions are eligible only when the penetration of air-conditioners which use refrigerants with no ODP and low GWP in the host country if the share of air conditioners using the refrigerant in question is under 20 per cent of all air conditioners.
Important parameters	At validation: Depending upon the application of the options available in the methodology: • Average remaining lifetime of the replaced refrigerators; • Emission factor of the grid; • Transmission and distribution loss; • Baseline electricity intensity factor (kWh/refrigerator/year for refrigerator and kWh/air-conditioner/cooling capacity/year for air conditioners); • Baseline Energy Efficiency Index (dimensionless) by volume class for refrigerator; • Average specific electricity consumption of the existing refrigerators in kWh/litre/y; • Specific refrigerant charge factor of baseline air-conditioners (tCO_2e/kW); • Average physical leakage rates of refrigerants in project air conditioners. Monitored: • Number of RACs by model and by volume class (in the case of refrigerators only) introduced by the project activity operating in year y; • Average volume of refrigerators by volume class introduced in year y; • Cooling capacity of the project air conditioners by model type (kW).
BASELINE SCENARIO For project activities involving replacement of existing RAC units, the baseline scenario is the continuing operation of the existing units. For new installation, the baseline is the performance benchmark established using top 10% or 20% threshold in terms of annual electricity consumption (kWh/yr).	
PROJECT SCENARIO Installation of new, energy-efficient refrigerators and air conditioners (RACs) for residential/ household applications as replacement or new sales projects.	

AM0121 Emission reduction from partial switching of raw materials and increasing the share of additives in the production of blended cement

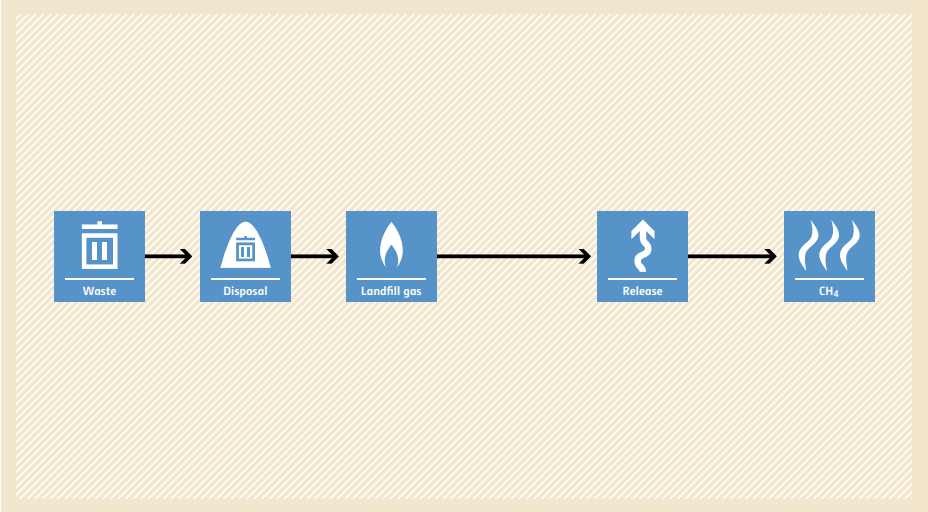
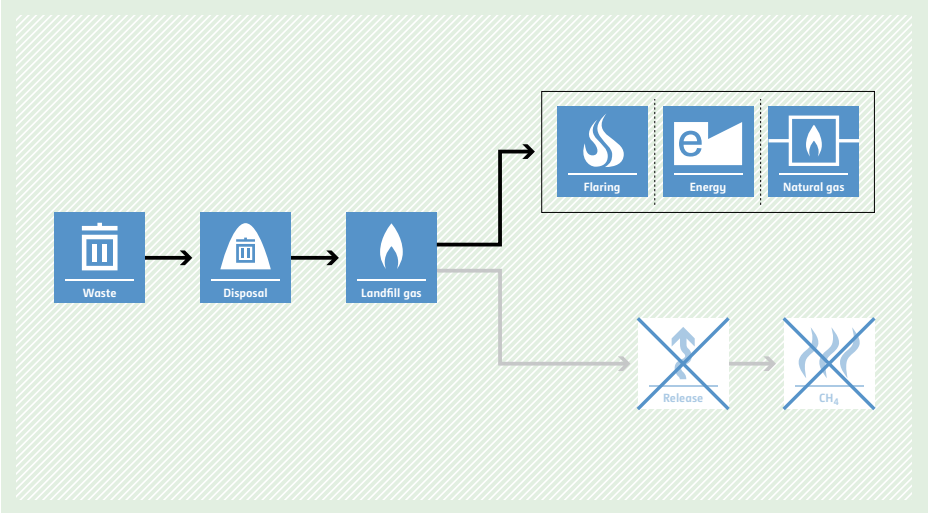
Typical project(s)	Partial or full switch to alternative raw materials that do not contain carbonates (AMC) in the production of clinker in cement kilns and production of blended cement (BC) beyond current practices in the host country.
Type of GHG emissions mitigation action	• Type of mitigation action: Avoidance of CO_2 emissions by switching to carbonate free feedstock in the production of clinker and blending cement (BC) beyond current practices in the host country.
Important conditions under which the methodology is applicable	• The quality of the produced clinker is not reduced, as compared to the baseline scenario; • Applicable to domestically sold blended cement; • No alternative raw materials have been used prior to the implementation of the project activity (except for any test trials not exceeding 90 days).
Important parameters	At validation: • Clinker ratio at the project plant, clinker ratio at other plants in the region; • Emission factors for electricity and fossil fuels; • Quality of produced clinker/blended cement produced. Monitored: • Cement and clinker production; • Use of raw materials and additives; • Use of electricity and fossil fuels.
BASELINE SCENARIO Use of raw materials that contain calcium and/or magnesium carbonates (e.g. limestone) to produce clinker. Production of blended cement (BC) as per current practices in the host country.	
PROJECT SCENARIO Switch to alternative raw materials that do not contain carbonates (AMC) in the production of clinker. Production of blended cement (BC) beyond current practices in the host country.	

AM0122 Recovery of methane-rich vapours from hydrocarbon storage tanks

Typical project(s)	Project activities that recover the methane-rich vapours that were previously vented into the atmosphere from the hydrocarbon storage tanks located within existing oil production facilities, oil and gas pre-treatment facilities, gas processing plants, oil treatment facilities, and liquid hydrocarbon storage tanks and loading stations. The recovered methane may be flared or utilized to generate energy.
Type of GHG emissions mitigation action	• Type of mitigation action: GHG destruction – combustion of methane.
Important conditions under which the methodology is applicable	• In the absence of the project activity, the methane-containing vapour is vented into the atmosphere; • The hydrocarbon facilities must have started operating prior to 31 December 2020; • Stabilization containers are not eligible under this methodology; • The pressure and temperature of the last stage of separation from which the liquids are sent to the project storage tanks remain the same before and after the project implementation; • For projects implemented in oil production facilities, the associated gas has been separated from the oil stream prior to entering the storage facilities (hydrocarbon storage tanks).
Important parameters	At validation: • Pressure and temperature in separator. Monitored: • Quantity of recovered methane; • Quantify of electricity and fossil fuels consumed by the project activity; • Pressure and temperature in separator.
BASELINE SCENARIO The baseline scenario comprises the emission of methane-rich vapours from hydrocarbon storage tanks included as part of the project activity.	
PROJECT SCENARIO Under the project activity, the previously vented methane-rich vapour is recovered and utilized through combustion.	

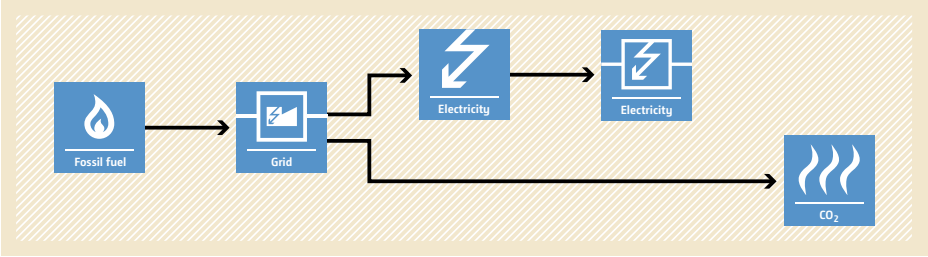
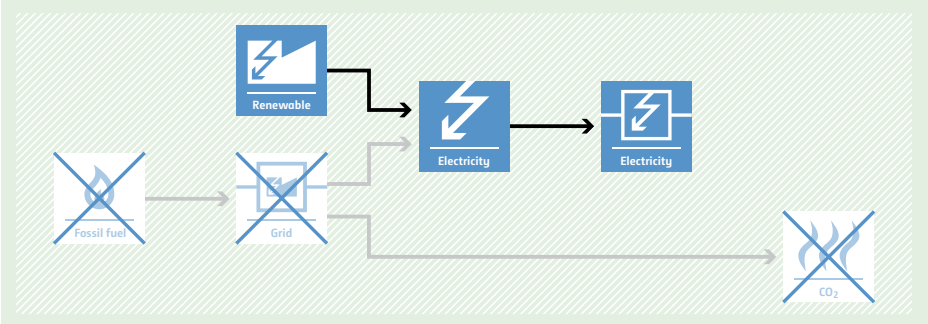
ACM0001 Flaring or use of landfill gas

Women and children

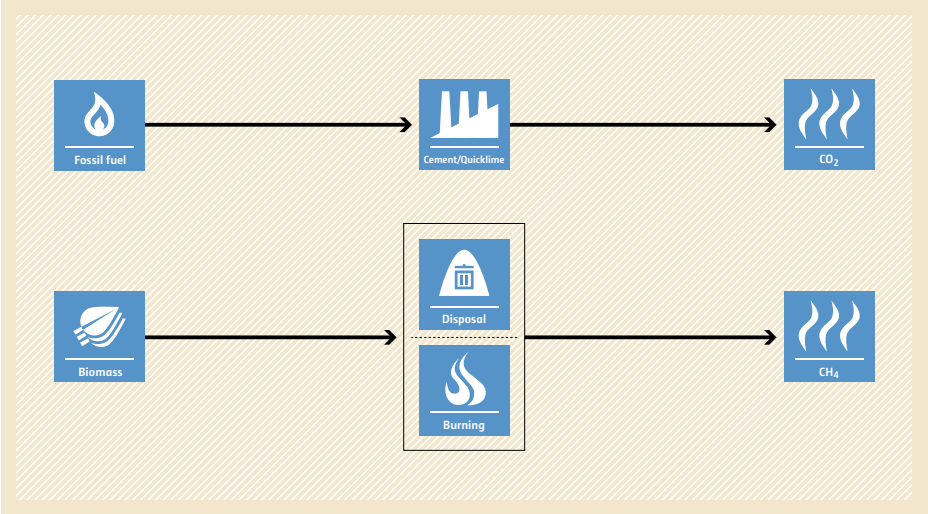
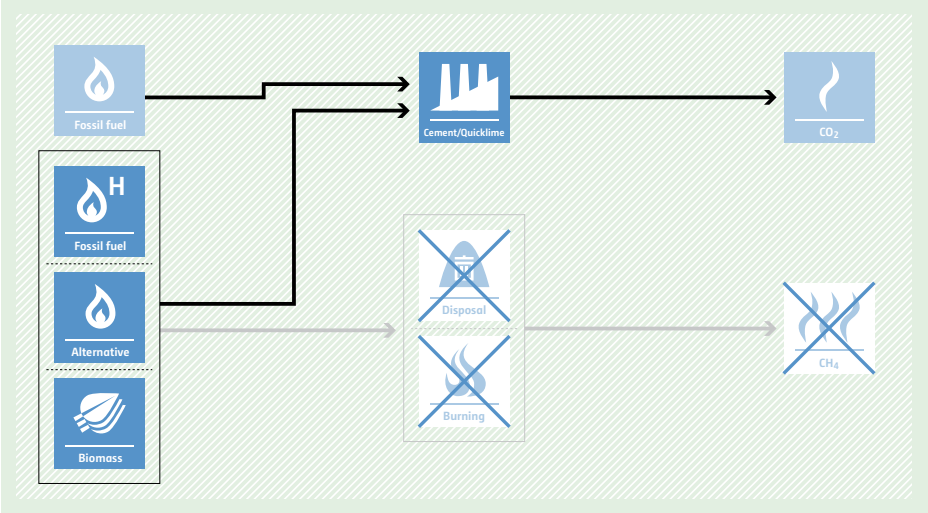
Typical project(s)	Capture of landfill gas (LFG) and its flaring and/or use to produce energy and/or use to supply consumers through natural gas distribution network or trucks.
Type of GHG emissions mitigation action	• GHG destruction. Destruction of methane emissions and displacement of a more-GHG-intensive service.
Important conditions under which the methodology is applicable	• Captured landfill gas is flared, and/or; • Captured landfill gas is used to produce energy, and or; • Captured gas is used to supply consumers through natural gas distribution network, trucks or the dedicated pipeline.
Important parameters	Monitored: • Amount of landfill gas captured; • Methane fraction in the landfill gas; • If applicable: electricity generation using landfill gas.
BASELINE SCENARIO LFG from the landfill site is released to the atmosphere.	
PROJECT SCENARIO 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, trucks or the dedicated pipeline.	

ACM0002 Grid-connected electricity generation from renewable sources

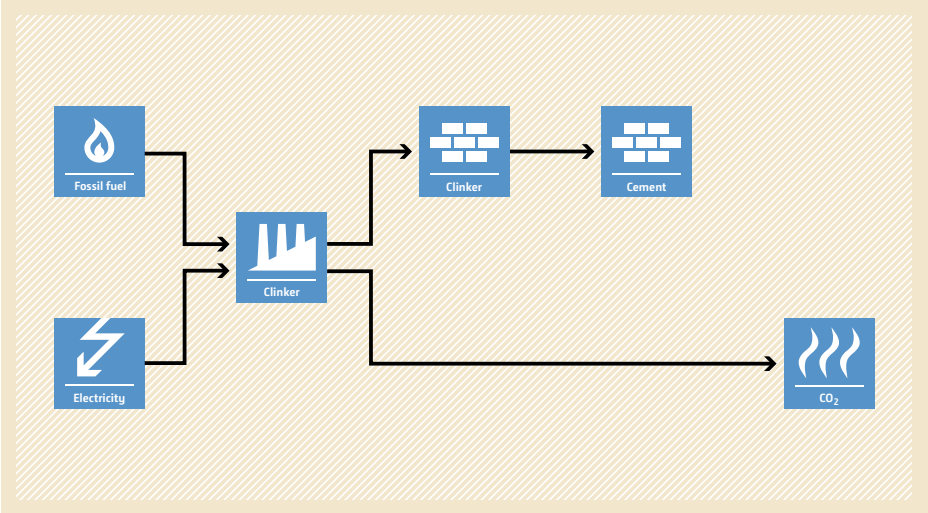
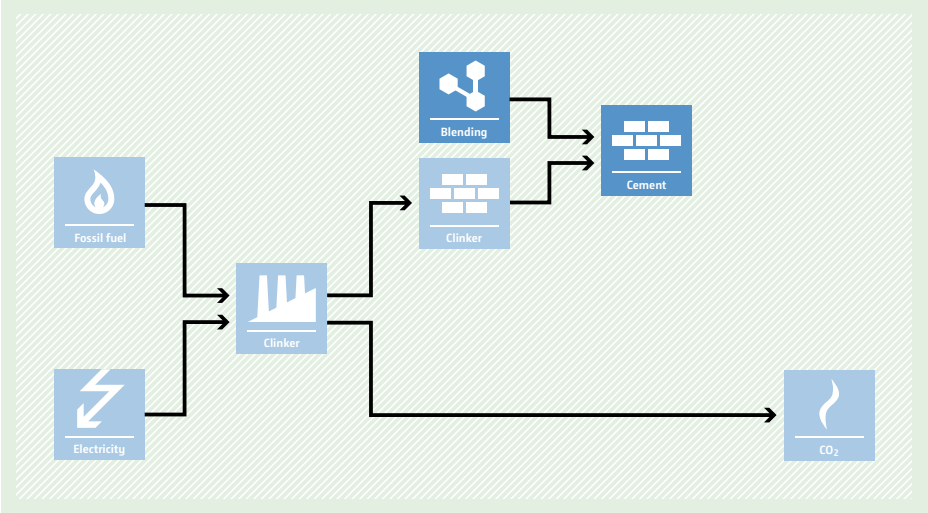
Women and children

Typical project(s)	Retrofit, rehabilitation (or refurbishment), replacement or capacity addition of an existing power plant or construction and operation of a new power plant/unit that uses renewable energy sources and supplies electricity to the grid. Battery energy storage system can be integrated under certain conditions.
Type of GHG emissions mitigation action	• Renewable energy. Displacement of electricity that would be provided to the grid by more-GHG-intensive means.
Important conditions under which the methodology is applicable	• 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; • In the case of capacity additions, retrofits, rehabilitation 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, rehabilitation or replacement of the plant has been undertaken between the start of this minimum historical reference period and the implementation of the project; • In case of hydro power: – The project has to be implemented in an existing reservoir, with no change in the volume of reservoir; – 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^2; – The project results in new reservoirs and the power density is greater than 4 W/m^2; or – The project activity is an integrated hydro power project involving multiple reservoirs; • Integration with a Battery Energy Storage System is possible for a Greenfield renewable energy generation technology or an existing solar photovoltaic or wind power plant.
Important parameters	At validation: • Grid emission factor (can also be monitored ex post). Monitored: • Electricity supplied to the grid by the project; • If applicable: methane emissions of the project.
BASELINE SCENARIO Electricity provided to the grid by more-GHG-intensive means.	
PROJECT SCENARIO 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.	

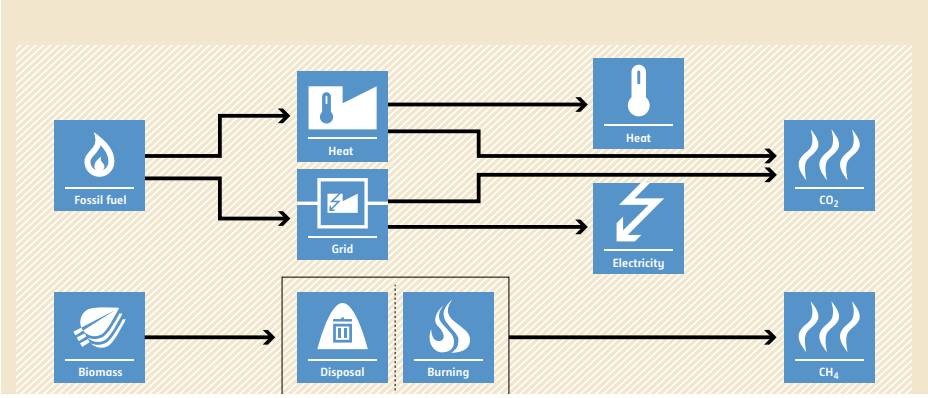
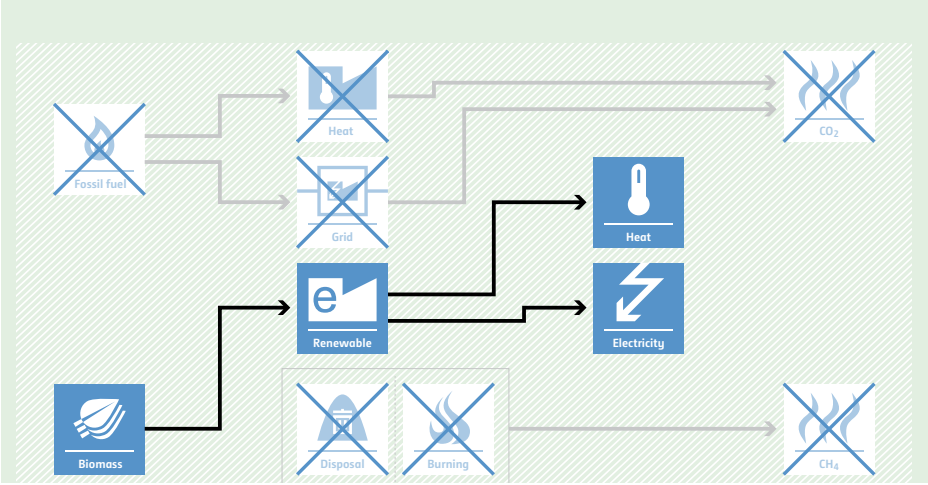
ACM0003 Partial substitution of fossil fuels in cement or quicklime manufacture

Typical project(s)	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).
Type of GHG emissions mitigation action	• Fuel switch; • Renewable energy. 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.
Important conditions under which the methodology is applicable	• No alternative fuels have been used in the project facility during the last three years prior to the start of the project; • The biomass to be combusted should not have been processed chemically; • For biomass from dedicated plantations, specific conditions apply.
Important parameters	Monitored: • Quantity and net calorific value of alternative fuel and/or less-carbon-intensive fossil fuel used in the project plant; • Quantity of clinker or quicklime produced.
BASELINE SCENARIO Clinker or quicklime is produced using more-carbon-intensive fuel and/or decay or uncontrolled burning of biomass leads to CH_4 emissions.	
PROJECT SCENARIO Clinker or quicklime is produced using less-carbon-intensive fuel and/or alternative fuel and/or biomass is combusted.	

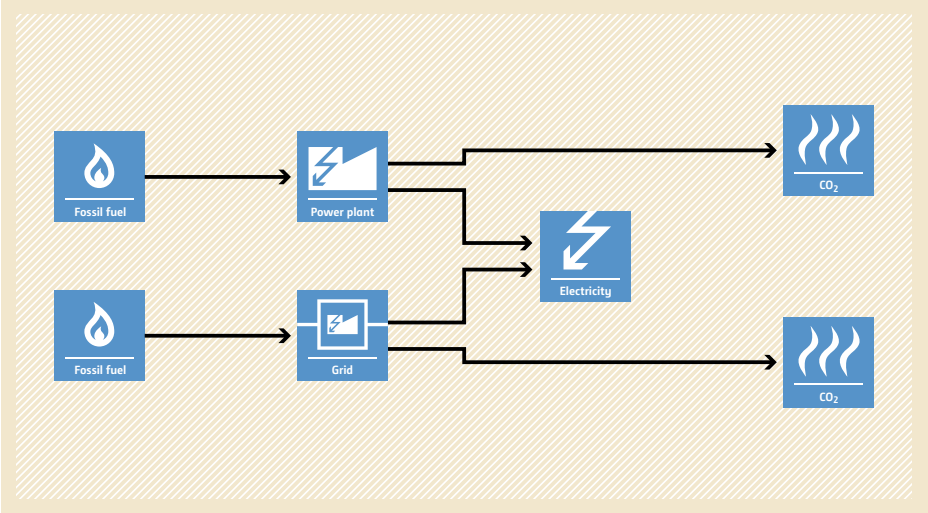
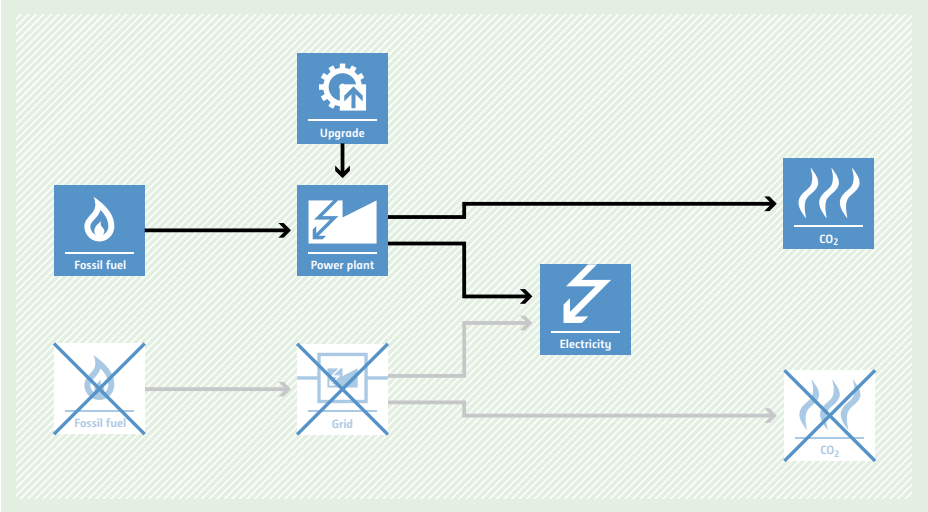
ACM0005 Increasing the blend in cement production

Typical project(s)	Use of blending material (e.g. fly ash, gypsum, slag) to decrease the share of clinker in cement.
Type of GHG emissions mitigation action	• Feedstock switch. CO_2 emissions from clinker production are avoided due to less use of clinker.
Important conditions under which the methodology is applicable	• Applicable to domestically sold blended cement; • Not applicable if blending of cement outside the cement production plant is common in the host country; • Not applicable for grinding only plants.
Important parameters	At validation: • 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; • Electricity emission factor.
	Monitored: • Cement and clinker production; • Raw materials, electricity demand and fuel use in the production of clinker; • Clinker and additives use in the production of cement.
BASELINE SCENARIO Available blending material is not used. Cement is produced with high clinker content, leading to high CO_2 emissions.	
PROJECT SCENARIO Available blending material is used in cement to partially replace clinker. Thereby CO_2 emissions from clinker production are avoided.	

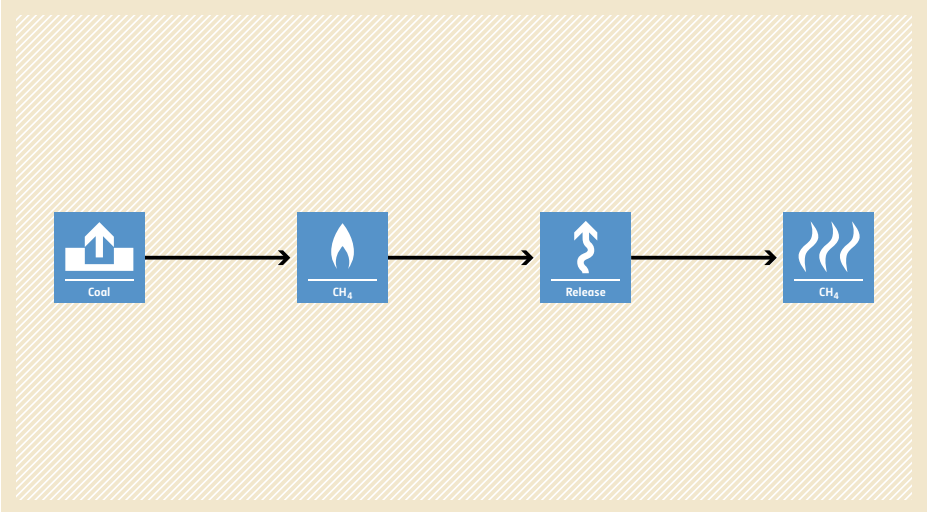
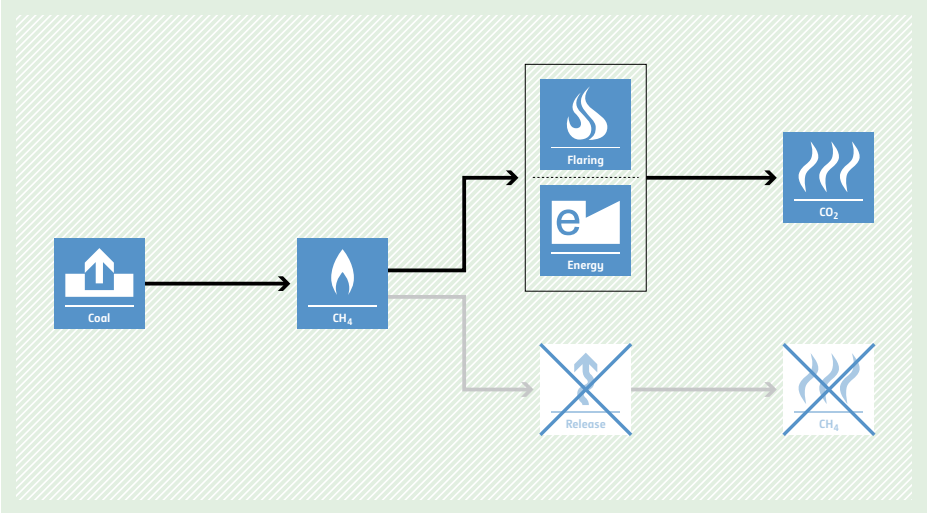
ACM0006 Electricity and heat generation from biomass

Typical project(s)	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.
Type of GHG emissions mitigation action	• Renewable energy; • Energy efficiency; • Fuel switch; • GHG emission avoidance. 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.
Important conditions under which the methodology is applicable	• Only power and heat or cogeneration plants are applicable; • Only biomass residues, biogas and biomass from dedicated plantations are eligible; • 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; • Planted biomass is eligible if specific conditions elaborated in "Project and leakage emissions from biomass" are met.
Important parameters	At validation: • Grid emission factor (can also be monitored ex post). Monitored: • Quantity and moisture content of the biomass used in the project activity; • Electricity and heat generated in the project activity; • Electricity and, if applicable, fossil fuel consumption of the project activity.
BASELINE SCENARIO 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.	
PROJECT SCENARIO 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.	

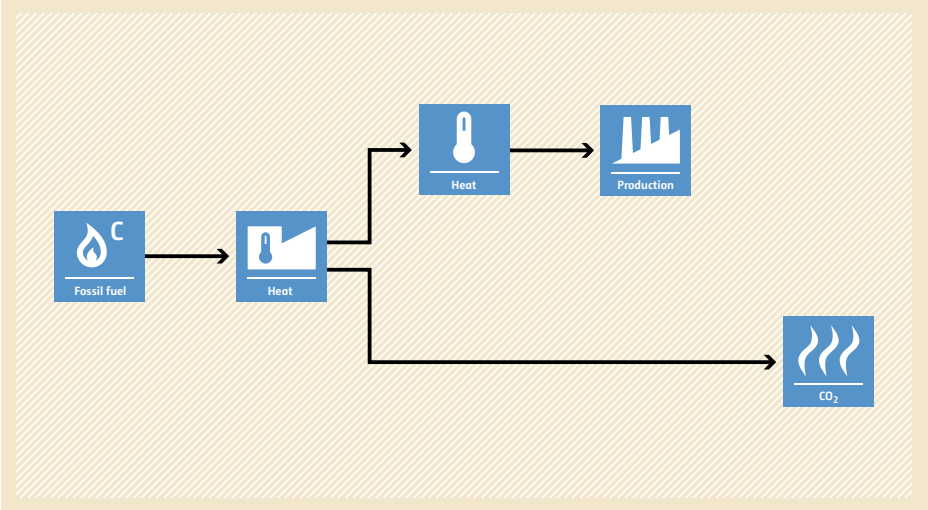
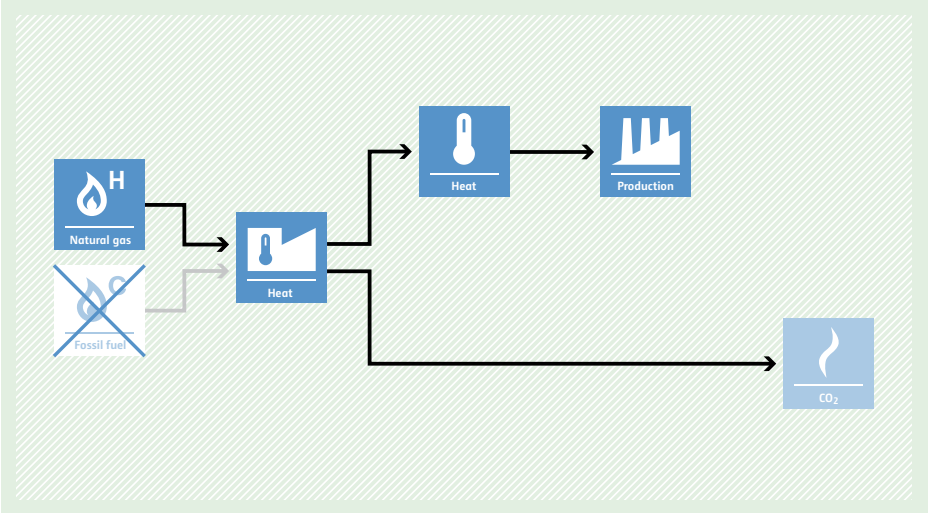
ACM0007 Conversion from single cycle to combined cycle power generation

Typical project(s)	Conversion from an open-cycle gas power plant to a combined-cycle gas power plant.
Type of GHG emissions mitigation action	• Energy efficiency. Fuel savings through energy efficiency improvement.
Important conditions under which the methodology is applicable	• The project does not increase the lifetime of the existing gas turbine or engine during the crediting period; • Waste heat generated on the project site is not utilizable for any other purpose.
Important parameters	At validation: • Electricity generation of the existing open-cycle gas power plant (can also be monitored ex post); • Fuel consumption of the existing open-cycle gas power plant.
	Monitored: • Electricity generation of the combined-cycle gas power plant; • Fuel consumption of the combined-cycle gas power plant; • Grid emission factor.
BASELINE SCENARIO Electricity is generated by an open-cycle gas power plant.	
PROJECT SCENARIO The open-cycle gas power plant is converted to a combined-cycle one for more-efficient power generation.	

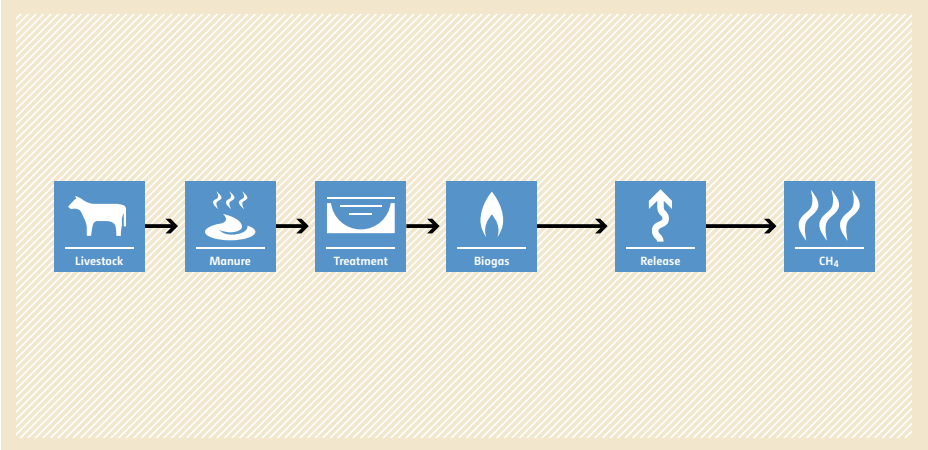
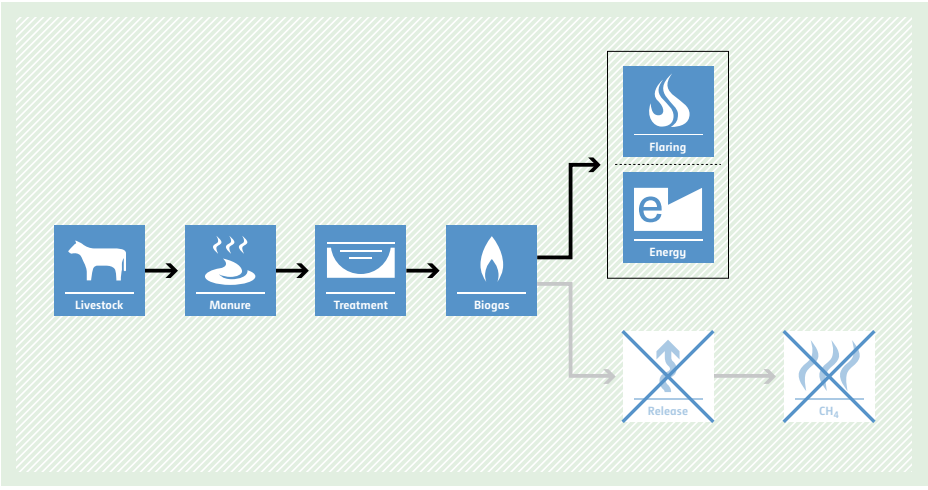
ACM0008 Abatement of methane from coal mines

Typical project(s)	Capture and destruction and/or use of coal bed methane, coal mine methane or ventilation air methane from new, existing or abandoned coal mine(s).
Type of GHG emissions mitigation action	• GHG destruction. Destruction of methane emissions and displacement of more-GHG-intensive service.
Important conditions under which the methodology is applicable	• All methane captured by the project should either be used or destroyed; • Not applicable to capture/use of virgin coal bed methane, e.g. methane extracted from coal seams for which there is no valid coal mining concession; • Not applicable to methane extraction from abandoned mines that are flooded due to regulation.
Important parameters	Monitored: • Methane destroyed or used; • Concentration of methane in extracted gas; • If applicable: electricity generated by project;
BASELINE SCENARIO Methane from coal mining activities is vented into the atmosphere.	
PROJECT SCENARIO Methane from coal mining activities is captured and destroyed using oxidation or used for power or heat generation.	

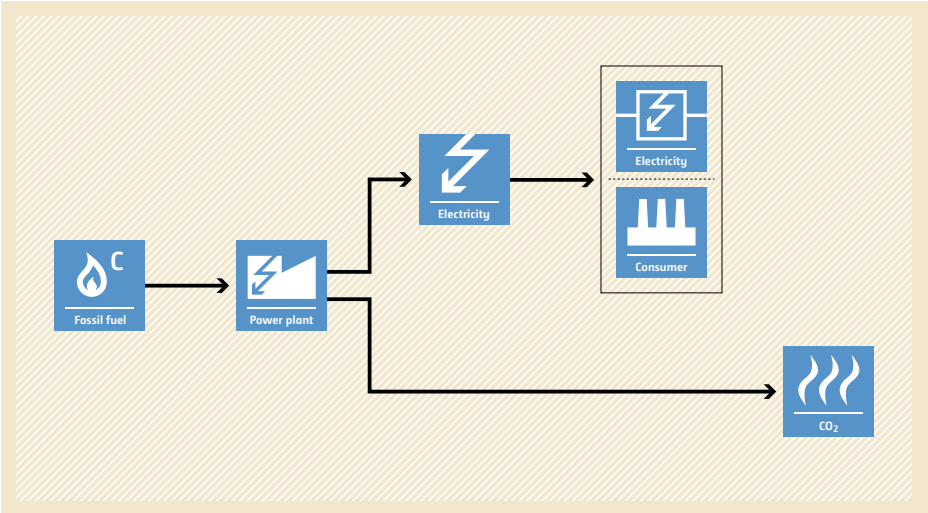
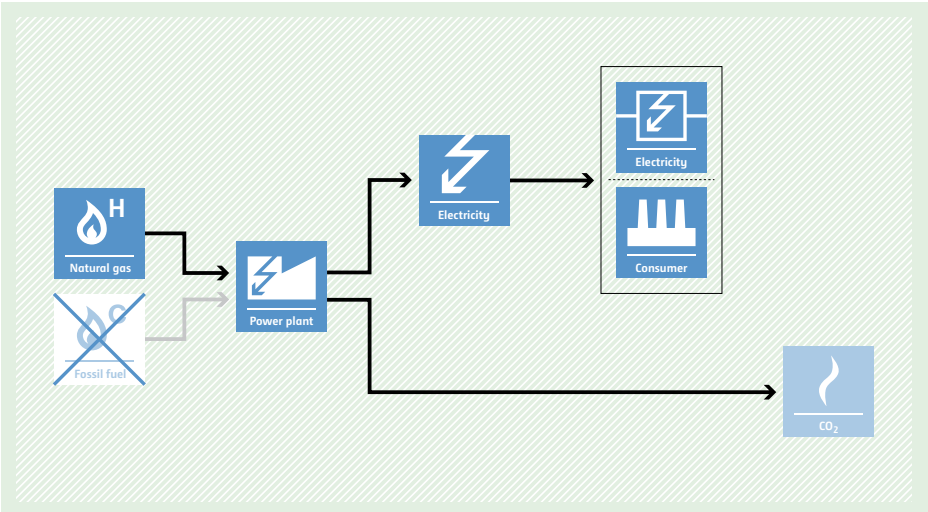
ACM0009 Fuel switching from coal or petroleum fuel to natural gas

Typical project(s)	Switching from coal or petroleum fuel to natural gas in the generation of heat for industrial processes.
Type of GHG emissions mitigation action	• Fuel switch. Reduction of GHG emissions by switching from carbon-intensive to a less-carbon-intensive fuel in the generation of heat.
Important conditions under which the methodology is applicable	• No natural gas has previously been used; • 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; • The project does not increase the capacity of thermal output or lifetime of the element processes or does not result in integrated process change.
Important parameters	At validation: • Quantity, net calorific value and CO_2 emission factor of baseline fuels; • Energy efficiency of the element process(es) fired with coal or petroleum fuel. Monitored: • Quantity, net calorific value and CO_2 emission factor of natural gas combusted in the element process(es) in the project; • Energy efficiency of the element process(es) if fired with natural gas.
BASELINE SCENARIO Coal or petroleum fuel is used to generate heat.	
PROJECT SCENARIO Natural gas replaces coal or petroleum fuel.	

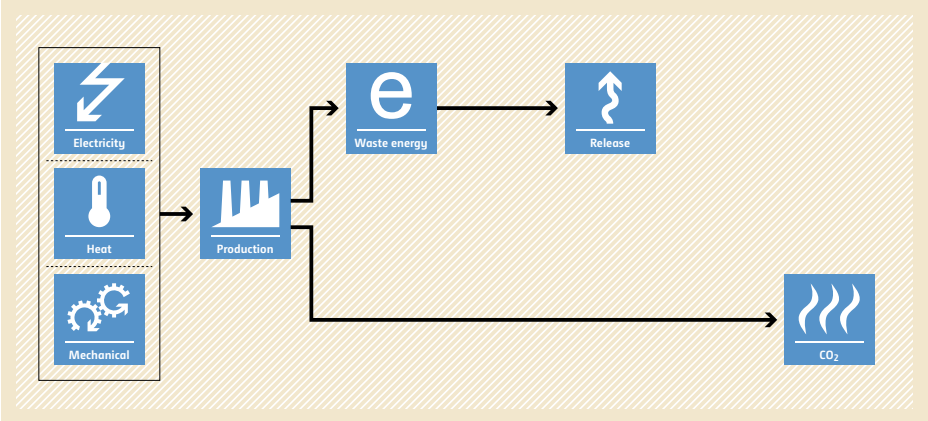
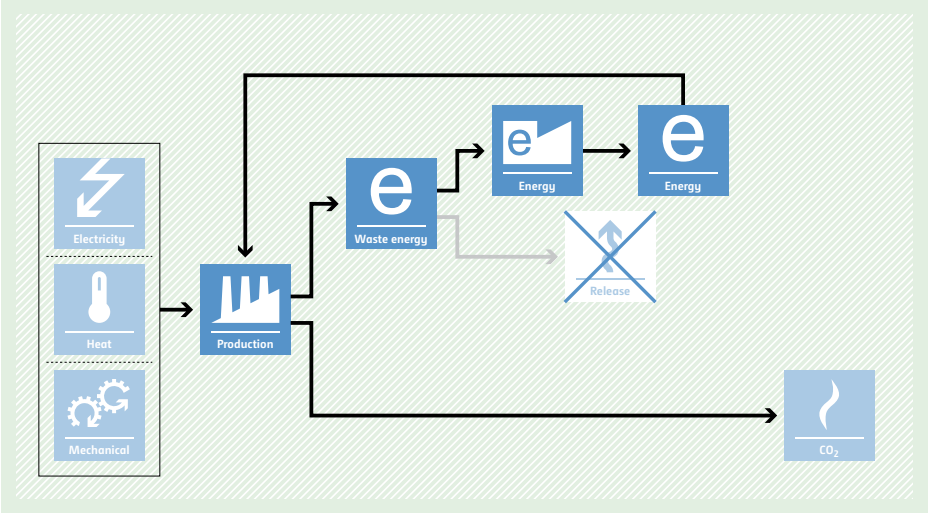
ACM0010 GHG emission reductions from manure management systems

Typical project(s)	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.
Type of GHG emissions mitigation action	• GHG destruction. Destruction of methane emissions and displacement of a more-GHG-intensive service.
Important conditions under which the methodology is applicable	• Farms where livestock populations are managed under confined conditions; • Farms where manure is not discharged into natural water resources (e.g. rivers or estuaries); • 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; • The annual average ambient temperature at the treatment site is higher than 5°C; • In the baseline case, the minimum retention time of manure waste in the anaerobic treatment system is greater than one month.
Important parameters	Monitored: • Number of heads of each population and the average animal weight in each population; • If dietary intake method is used, daily average gross energy intake has to be monitored; • Electricity and fossil fuel consumption.
BASELINE SCENARIO Existing manure management system or system to be installed in the absence of the project activity results in release of methane into the atmosphere.	
PROJECT SCENARIO 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.	

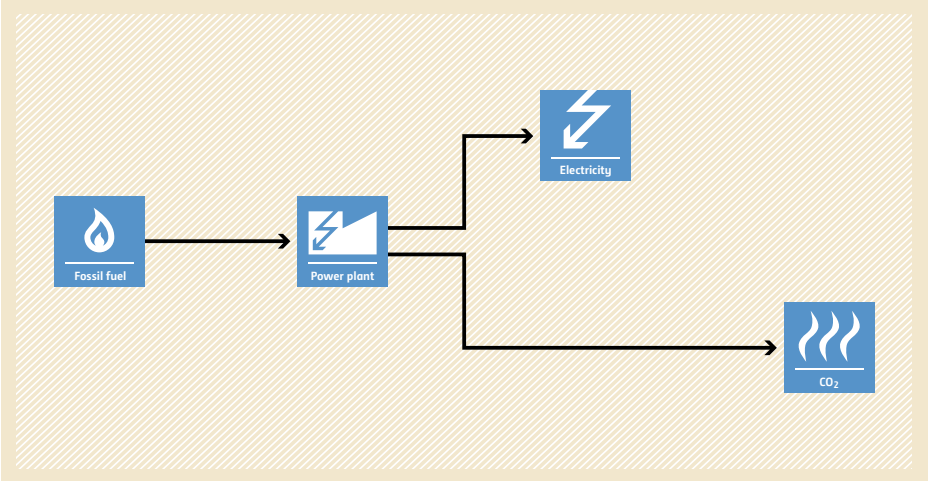
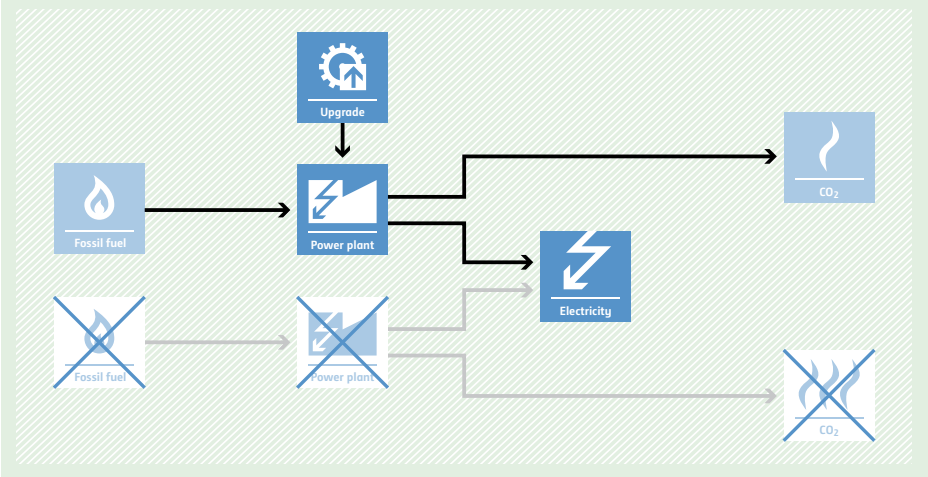
ACM0011 Fuel switching from coal and/or petroleum fuels to natural gas in existing power plants for electricity generation

Typical project(s)	Switch from coal or petroleum derived fuel to natural gas at an existing power plant.
Type of GHG emissions mitigation action	• Fuel switch. Switch from coal or petroleum fuel to natural gas.
Important conditions under which the methodology is applicable	• At least three years of operation history are available; • The fuel switch is from only coal and/or petroleum fuels to only natural gas; • Only power is generated, for either only the grid or only a captive consumer; • The project does not involve major retrofits/modifications of the power plant.
Important parameters	At validation: • Historical fuel consumption and power generation; • Electricity emission factor (can also be monitored ex post). Monitored: • Quantity, calorific value and emission factor of fuels consumed in the project; • Electricity supplied to the electric power grid or consuming facility.
BASELINE SCENARIO Coal and/or petroleum fuel is used to generate electricity.	
PROJECT SCENARIO Natural gas is used to generate electricity.	

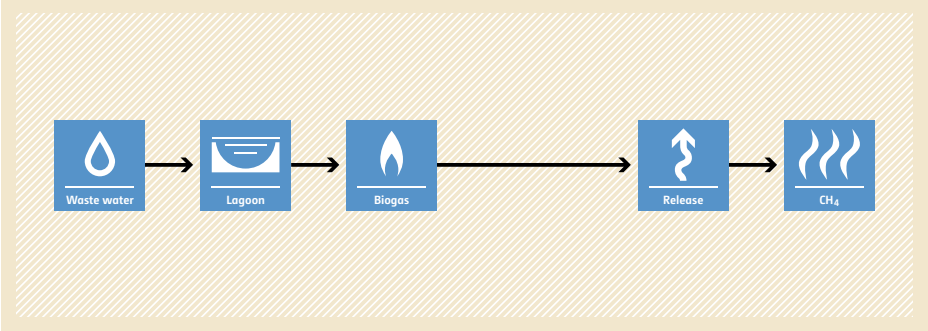
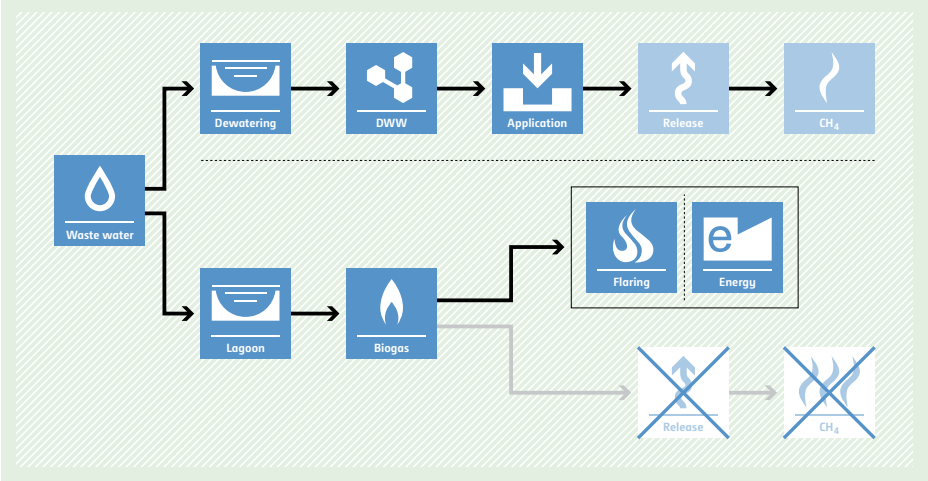
ACM0012 Waste energy recovery

Typical project(s)	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, or by upgrade of existing equipment but with better efficiency of recovery.
Type of GHG emissions mitigation action	• Energy efficiency. Waste energy recovery in order to displace more-carbon-intensive energy/technology.
Important conditions under which the methodology is applicable	• In the absence of the project, the waste energy carrying medium would remain unutilized (e.g. flared or released to the atmosphere). In case of partial use of the waste energy carrying medium in the baseline situation, the project increases the share of used waste energy by means of enhance or improved energy recovery of the waste energy carrying medium; • 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; • Project activities can generate electricity and/or mechanical energy beyond the maximum capacity of the pre-project equipment of existing recipient facilities.
Important parameters	Monitored: • Quantity of electricity/mechanical energy/heat supplied to the recipient plant(s); • Quantity and parameters of waste energy streams during project.
BASELINE SCENARIO 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.	
PROJECT SCENARIO Heat/electricity/mechanical energy are generated by recovery of energy from a waste energy source and are supplied to the grid and/or applications in the recipient facility.	

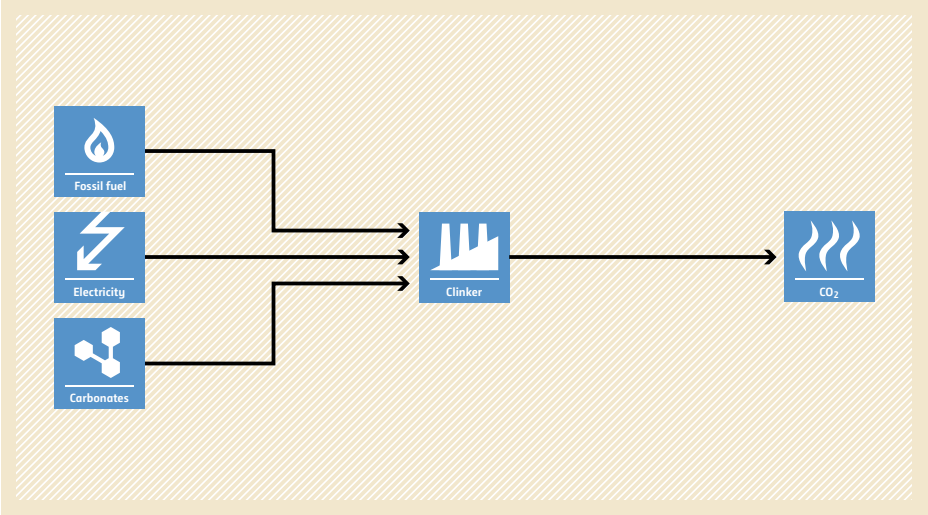
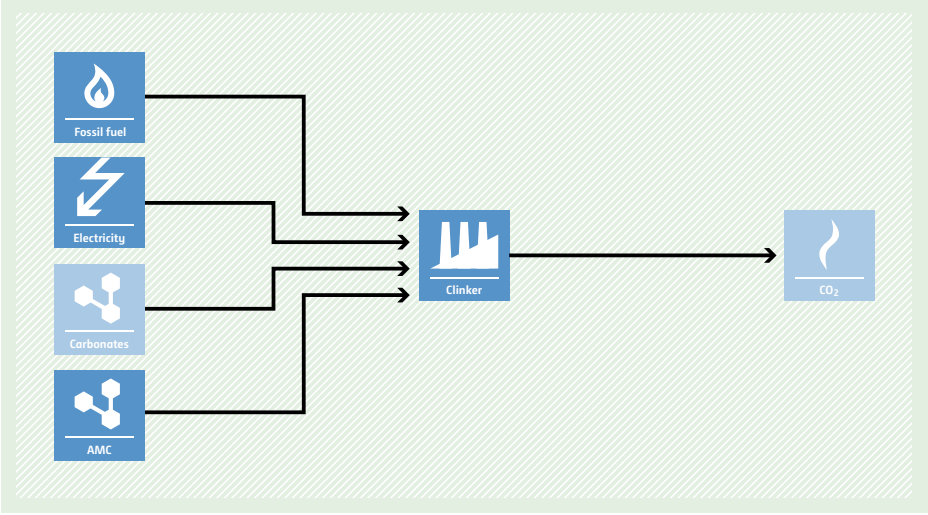
ACM0013 Construction and operation of new grid connected fossil fuel fired power plants using a less GHG intensive technology

Typical project(s)	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).
Type of GHG emissions mitigation action	• Energy efficiency. Construction of a highly efficient new grid-connected fossil-fuel-fired power plant.
Important conditions under which the methodology is applicable	• Only supply of power to the grid is applicable (no cogeneration); • 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; • At least five new power plants can be identified as similar to the project plant (in the baseline identification procedure).
Important parameters	At validation: • Energy efficiency of the power generation technology that has been identified as the most likely baseline scenario. Monitored: • Quantity, calorific value and emission factor of fuels consumed in the project activity; • Electricity supplied to the electric power grid.
BASELINE SCENARIO Electricity is generated by a less-efficient new grid-connected power plant using fossil fuel.	
PROJECT SCENARIO Electricity is generated by a more-efficient new grid-connected power plant using less fossil fuel.	

ACM0014 Treatment of wastewater

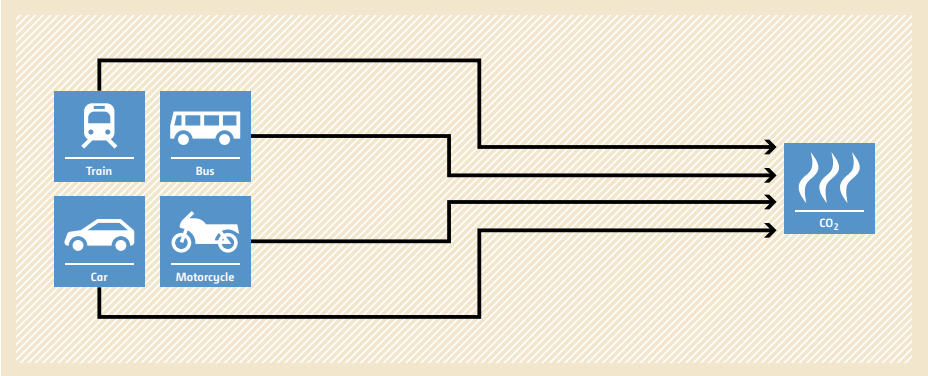
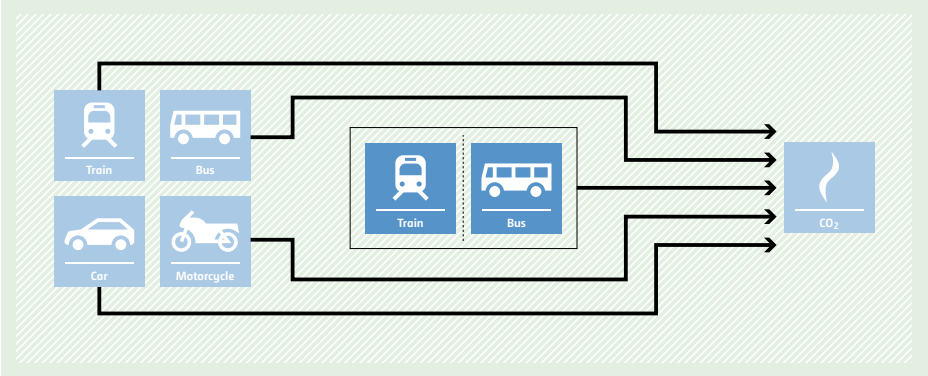
Typical project(s)	Treatment of wastewater in a new anaerobic digester, capture and flaring or utilizing of the generated biogas for electricity or heat generation; dewatering of wastewater and application to land; and treatment of wastewater in the same treatment plant as in the baseline situation but treatment of the sludge from primary and/or secondary settler either in a new anaerobic digester or treatment of sludge under clearly aerobic conditions.
Type of GHG emissions mitigation action	• GHG destruction. Destruction of methane emissions and displacement of more-GHG-intensive service.
Important conditions under which the methodology is applicable	• The average depth of the open lagoons or sludge pits in the baseline scenario is at least 1 m; • The residence time of the organic matter in the open lagoon or sludge pit system should be at least 30 days; • Inclusion of solid materials in the project activity is only applicable where: – Such solid materials are generated by the industrial facility producing the wastewater; and – The solid materials would be generated both in the project and in the baseline scenario; • 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.
Important parameters	Monitored: • Quantity and chemical oxygen demand (COD) of wastewater or sludge that is treated in the project; • Quantity of biogas collected and concentration of methane in the biogas; • Net quantity of electricity or heat generated in the project; • Quantity of dewatered sludge/wastewater applied to land.
BASELINE SCENARIO Existing wastewater treatment system results in release of methane into the atmosphere.	
PROJECT SCENARIO 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.	

ACM0015 Emission reductions from raw material switch in clinker production

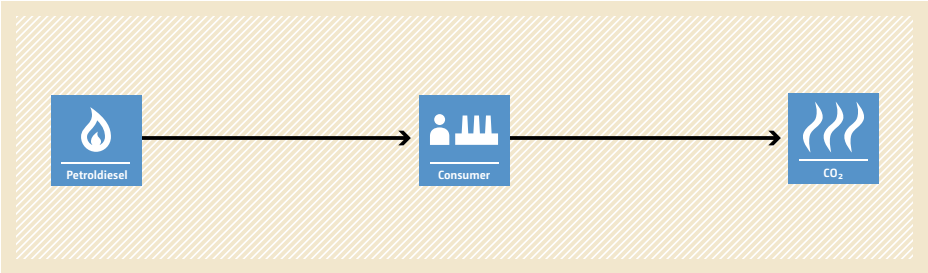
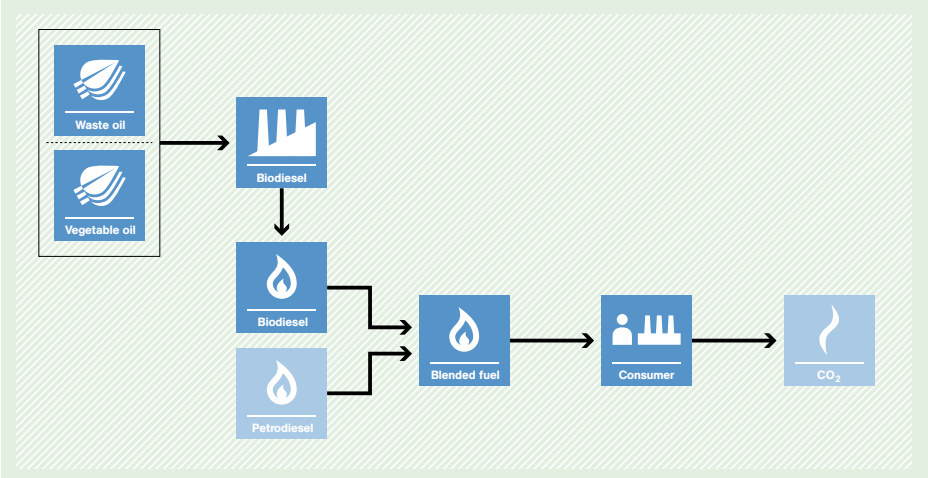
Typical project(s)	Partial or full switch to alternative raw materials that do not contain carbonates (AMC) in the production of clinker in cement kilns in existing and Greenfield cement plants, with or without additional energy efficiency measures.
Type of GHG emissions mitigation action	• Feedstock switch; • Energy efficiency. Avoidance of process CO_2 emissions by switching to carbonate free feedstock in the production of clinker. Additional energy efficiency measures may be implemented.
Important conditions under which the methodology is applicable	• Installed capacity of clinker production, lifetime of equipment, quality and types of clinker are not changed; • No AMC have previously been used in the clinker production at the plant; • At least 1.5 times the quantity of AMC required for meeting the aggregate demand of the proposed project activity and all existing users consuming the same AMC in the project area is available.
Important parameters	At validation: • Historical raw material use and clinker production and quality for existing plants. Monitored: • Quantity of alternative materials consumed in the project; • Quantity and quality of clinker produced in the project; • Specific Kiln Calorific Consumption; • Electricity consumption.
BASELINE SCENARIO Raw materials that contain calcium and/or magnesium carbonates (e.g. limestone) are used to produce clinker.	
PROJECT SCENARIO Alternative raw materials that do not contain carbonates (AMC) are used to produce clinker.	

ACM0016 Mass Rapid Transit Projects

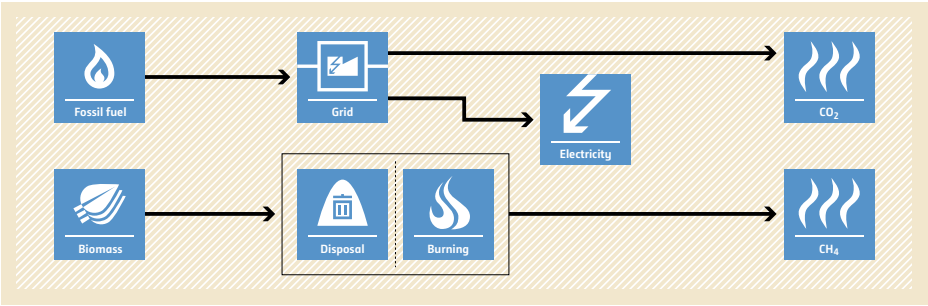
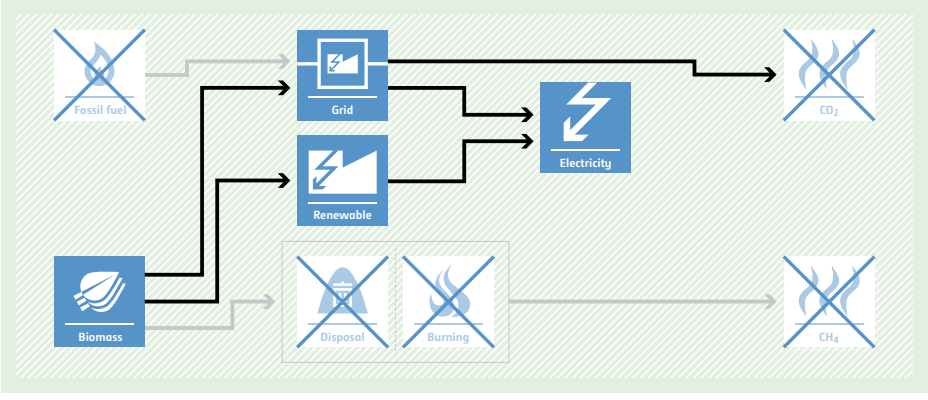
Women and children

Typical project(s)	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.
Type of GHG emissions mitigation action	• Energy efficiency. Displacement of more-GHG and, if gaseous fuels are used, CH_4-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).
Important conditions under which the methodology is applicable	• 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 AM0031 is recommended; • The project activity involves urban or suburban transport projects. It is not applicable for inter-urban transport; • 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.
Important parameters	At validation: • Baseline distance and transport mode, which are obtained through a comprehensive survey involving the users of the project transport system; • Occupancy rates and travelled distances of different transport modes; • If expected emissions per passenger kilometer is less than or equal to 50 gCO_2/pkm (for road based MRTS) and 0.1 kWh/pkm (for rail based MRTS), the project is considered automatically additional. Monitored: • The number of passengers transported in the project; • Specific fuel consumption, occupancy rates and travelled distances of different transport modes as well as the speed of vehicles on affected roads.
BASELINE SCENARIO Passengers are transported using a diverse transport system involving buses, trains, cars, non-motorized transport modes, etc. operating under mixed traffic conditions.	
PROJECT SCENARIO 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.	

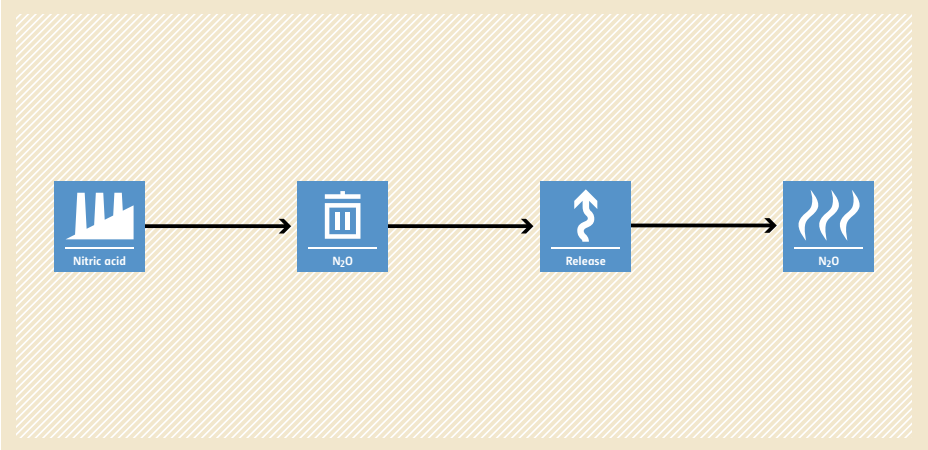
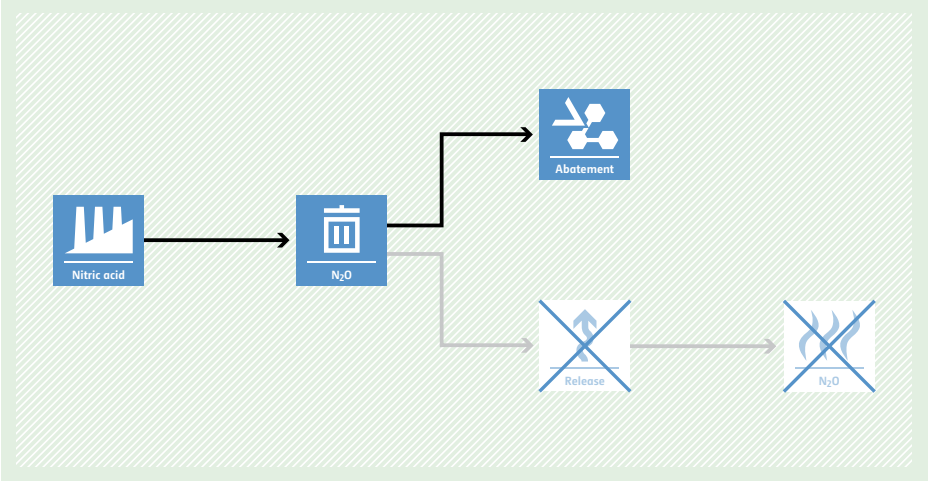
ACM0017 Production of biodiesel for use as fuel

Typical project(s)	Construction and operation of a biofuel production plant for production of blended biofuel that is used as fuel in existing stationary installations (e.g. captive generators) and/or in vehicles. Biofuel is produced from waste oil/fat seeds or crops that are cultivated on dedicated plantations.
Type of GHG emissions mitigation action	• Renewable energy. Displacement of more-GHG-intensive fossil fuel for combustion in vehicles and/or stationary installations.
Important conditions under which the methodology is applicable	• The alcohol used for esterification (production of biodiesel) is methanol from fossil fuel origin; • No modifications in the consumer stationary installations or in the vehicles engines are necessary to consume/combust the (blended) biofuel; • Planted biomass is eligible if specific conditions elaborated in "Project and leakage emissions from biomass" are met; • Consumers and producers of the (blended) biofuel are bound by a contract that allows the producer to monitor consumption/sale/blending of (blended) biofuel and that states that the consumer shall not claim CERs resulting from its consumption.
Important parameters	Monitored: • Quantity of biofuel from waste oil/fat, biomass residues or feedstock from dedicated plantations consumed by host country consumers to substitute fossil fuel; • Project emissions from transport of oilseeds, biomass residues, vegetable oil, waste oil/fats, biofuel if distances of more than 50 km are covered; fossil fuel (including methanol) and electricity consumption; • If applicable, parameters to monitor project emissions (CO_2, CH_4, N_2O) associated with the cultivation of seeds or crops.
BASELINE SCENARIO Consumption of fossil fuel.	
PROJECT SCENARIO Production of blended biofuel and consumption in existing stationary installations (e.g. captive generators) and/or in vehicles.	

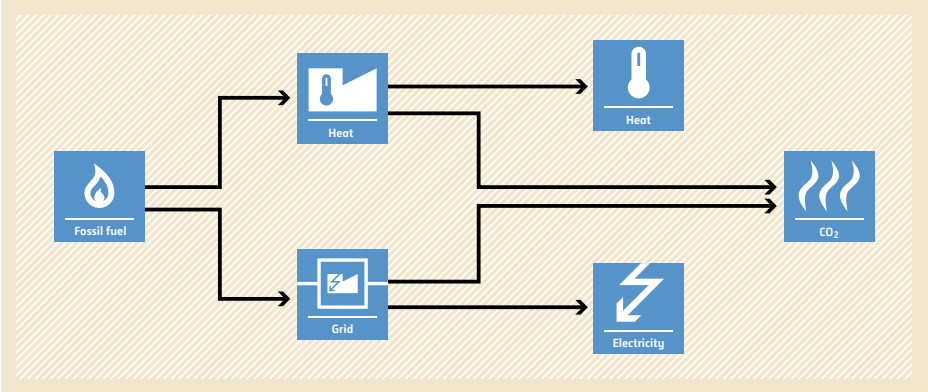
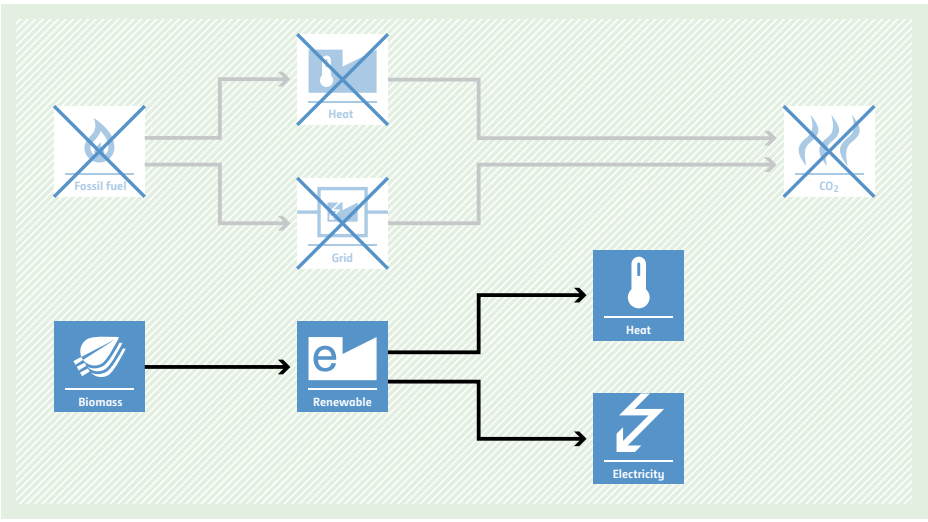
ACM0018 Electricity generation from biomass in power-only plants

Typical project(s)	Generation of power using biomass 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 in existing power plants (fuel switch projects). The biomass based power generation may be combined with solar thermal power generation.
Type of GHG emissions mitigation action	• Renewable energy; • Energy efficiency; • Fuel switch. Displacement of more GHG-intensive electricity generation in the grid or on-site. Avoidance of methane emissions from anaerobic decay of biomass residues. Displacement of more-GHG-intensive fossil fuel for combustion in stationary installations.
Important conditions under which the methodology is applicable	• 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; • The methodology is applicable to power-only plants; • Planted biomass is eligible if specific conditions elaborated in "Project and leakage emissions from biomass" are met; • 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; • In case of existing facilities, three years of historical data is required for the calculation of emissions reductions; • Projects that chemically process the biomass prior to combustion (e.g. by means of esterification of waste oils, fermentation and gasification, etc.) are not eligible under this methodology. The biomass can however be processed physically such as by means of drying, pelletization, shredding and briquetting.
Important parameters	At validation: • If applicable: grid emission factor (can also be monitored ex post). Monitored: • Electricity generated in the project; • Quantity and moisture content of the biomass used in the project and electricity and fossil fuel consumption of the project.
BASELINE SCENARIO Electricity would be produced by more-carbon-intensive technologies based on fossil fuel or less efficient power plants. Biomass could partially decay under anaerobic conditions, resulting in methane emissions.	
PROJECT SCENARIO Use of biomass residues replaces fossil fuel use. Decay of biomass residues used as fuel is avoided.	

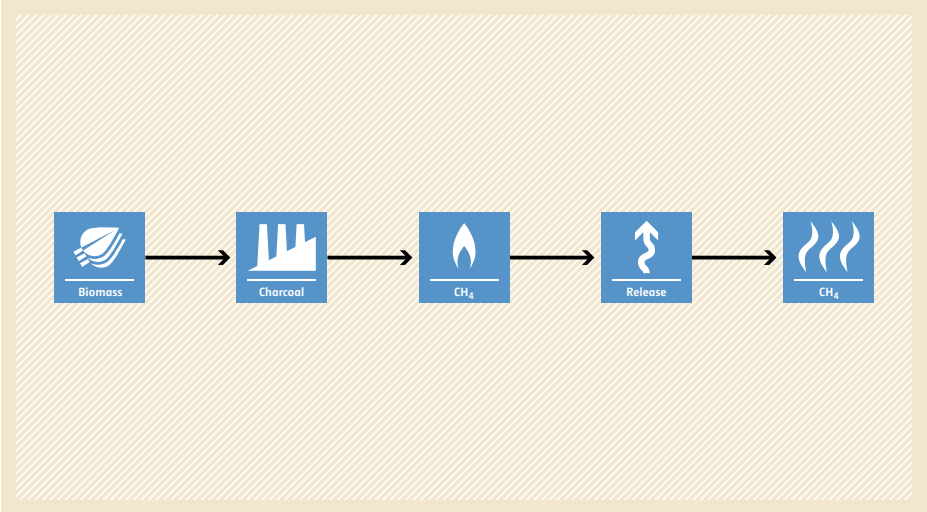
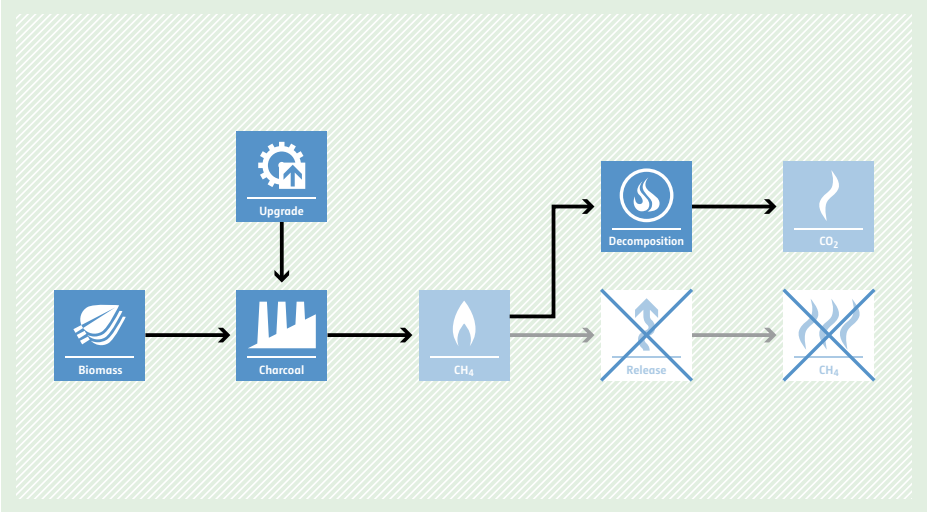
ACM0019 N_2O abatement from nitric acid production

Typical project(s)	Project activities that introduce N_2O abatement measures in nitric acid plants.
Type of GHG emissions mitigation action	• Destruction of GHG. Destruction of N_2O emissions through abatement measures.
Important conditions under which the methodology is applicable	• Continuous real-time measurements of the N_2O concentration and the total gas volume flow can be carried out in the tail gas stream after the abatement of N_2O emissions throughout the crediting period of the project activity; • No law or regulation is in place mandating the complete or partial destruction of N_2O from nitric acid plant.
Important parameters	At validation: • Nitric acid produced. Monitored: • Mass flow of N_2O in the gaseous stream of the tail gas; • Nitric acid produced; • Fraction of time during which the by-pass valve on the line feeding the tertiary N_2O abatement facility was open.
BASELINE SCENARIO Venting of N_2O generated during the production of nitric acid to the atmosphere.	
PROJECT SCENARIO Implementation of different abatement measures to destroy N_2O emissions (i.e. installation of secondary or tertiary abatement systems).	

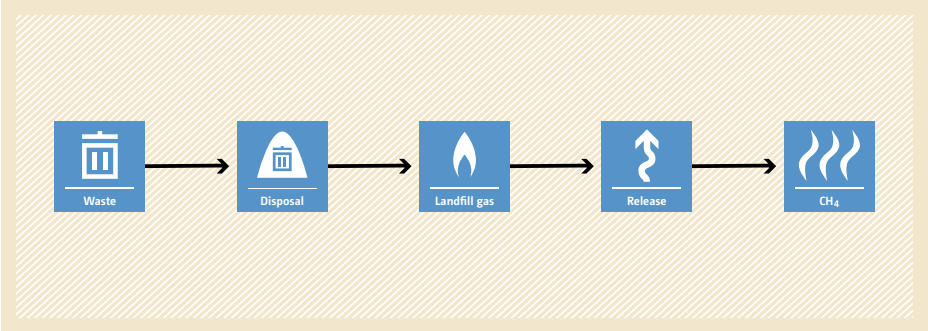
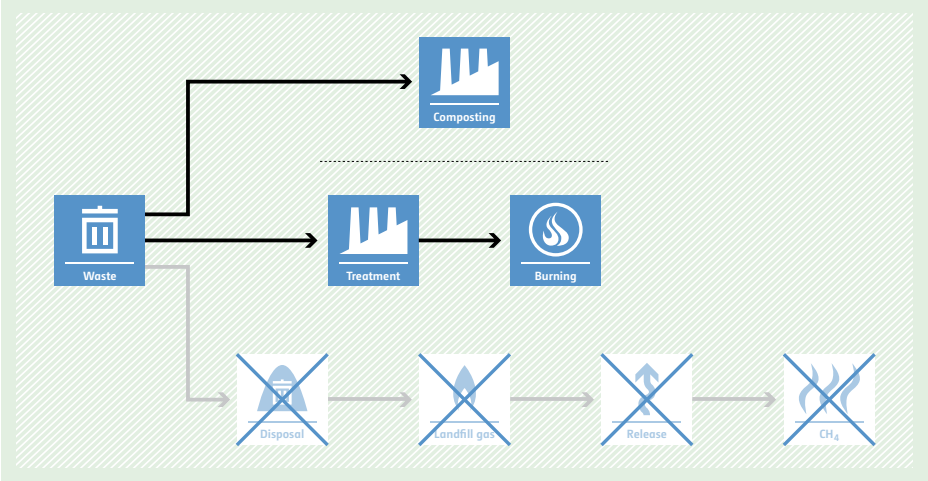
ACM0020 Co-firing of biomass residues for heat generation and/or electricity generation in grid connected power plants

Typical project(s)	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.
Type of GHG emissions mitigation action	• Renewable Energy. Displacement of more-GHG-intensive electricity generation in grid or heat and electricity generation on-site.
Important conditions under which the methodology is applicable	• 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; • Only biomass residues, not biomass in general, are eligible; • The amount of biomass residues co-fired shall not exceed 50% of the total fuel fired on an energy basis; • 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.
Important parameters	At validation: • If applicable: grid emission factor (can also be monitored ex post). Monitored: • Quantity and moisture content of the biomass residues used in the project; • Electricity and/or heat generated in the project activity; • Electricity and fossil fuel consumption of the project activity.
BASELINE SCENARIO Electricity or heat would be produced by more-carbon-intensive technologies based on fossil fuel.	
PROJECT SCENARIO Use of biomass residues for power or heat generation instead of fossil fuel.	

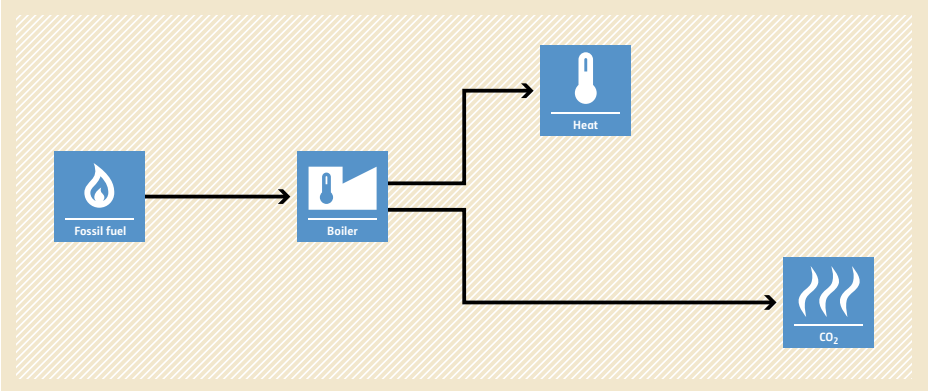
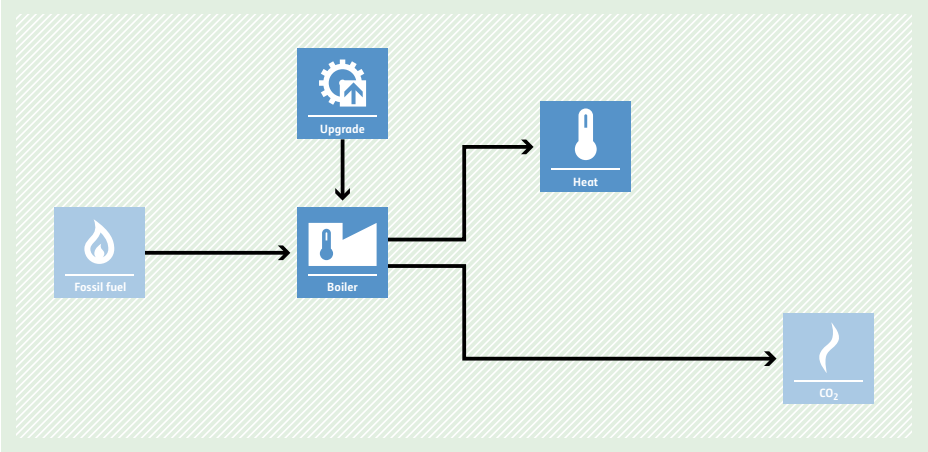
ACM0021 Reduction of emissions from charcoal production by improved kiln design and/or abatement of methane

Typical project(s)	Installation of charcoal kilns of enhanced design to replace existing kilns, and/or installation of methane abatement units at existing or new kilns.
Type of GHG emissions mitigation action	• GHG emission avoidance. Avoidance or reduction of CH_4 emissions in charcoal production process.
Important conditions under which the methodology is applicable	• The project does not change the type and sources of input for charcoal production; • There are no regulations that prevent venting of methane generated from charcoal production facility; • All the existing kilns affected by the project activity shall have the same mechanical design.
Important parameters	Monitored: • Charcoal production of each kiln; • Start time and end time of each carbonization cycle of each kiln; • Combustion status of each methane abatement unit (if applicable).
BASELINE SCENARIO High CH_4 emissions associated with the production of charcoal.	
PROJECT SCENARIO Decreased or avoided CH_4 emissions associated with production of charcoal.	

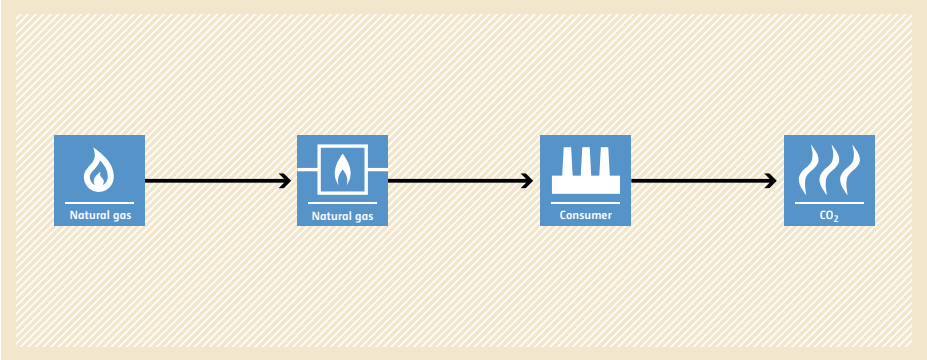
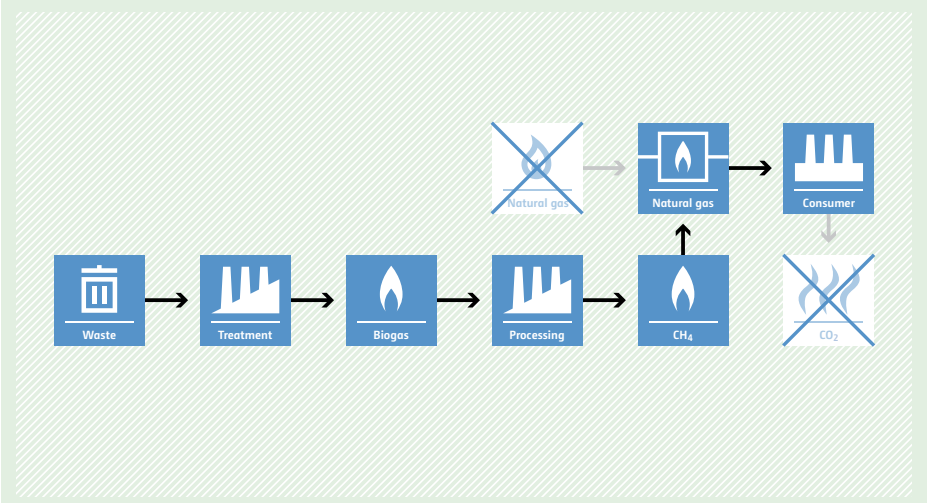
ACM0022 Alternative waste treatment processes

Typical project(s)	Project activities involve the installation and operation of new plants for the treatment of fresh waste through any combination of the following processes: a) Composting process under aerobic conditions; b) Gasification process to produce syngas and its use; c) Anaerobic digestion with biogas recovery and flaring and/or its use); d) Mechanical/thermal treatment to produce refuse-derived fuel (RDF)/stabilized biomass (SB) and its use; e) Incineration of fresh waste to produce thermal/electric energy; f) Co-composting/anaerobic digestion of wastewater in combination with solid waste.
Type of GHG emissions mitigation action	• GHG emission avoidance. CH4 emissions due to anaerobic decay of organic waste are avoided by alternative waste treatment processes; • Renewable energy. Organic waste is used as renewable source of energy.
Important conditions under which the methodology is applicable	• The project activity does not reduce the amount of waste that would be recycled in the absence of the project; • When applicable regulations mandate any waste treatment process implemented under the project activity, the rate of compliance with such regulations is below 50 per cent; • Hazardous wastes/wastewater are not eligible.
Important parameters	Monitored: • Weight fraction of the different waste types in a sample (where applicable); • Total amount of waste prevented from disposal; • Electricity and fossil fuel consumption in the project site.
BASELINE SCENARIO Disposal of the waste in a landfill site without capturing landfill gas or with partly capturing and subsequently flaring it.	
PROJECT SCENARIO Alternative waste treatment process, such as 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.	

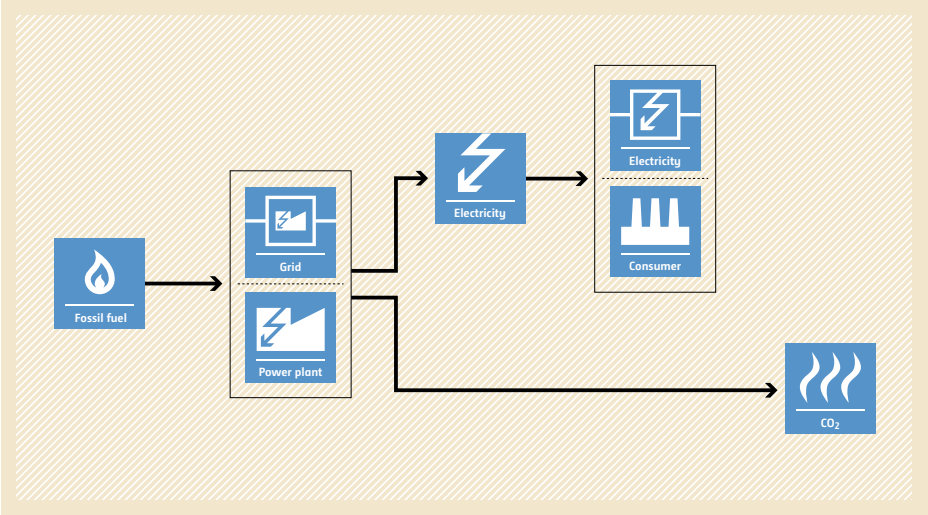
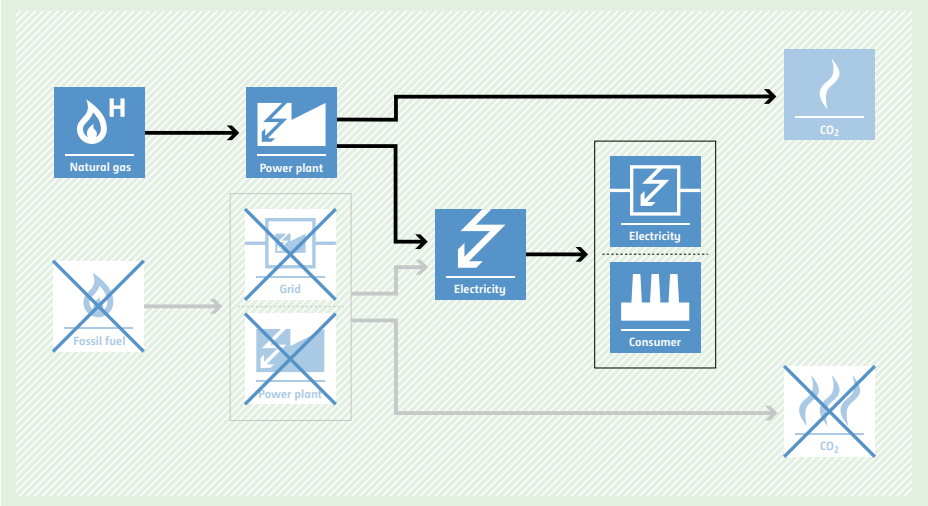
ACM0023 Introduction of an efficiency improvement technology in a boiler

Typical project(s)	Improvement of the boiler efficiency through introduction of efficiency improvement technology.
Type of GHG emissions mitigation action	• Energy efficiency. Switch to more-energy-efficient technology.
Important conditions under which the methodology is applicable	• The boiler has an operating history of at least three years; • 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; • 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; • The technologies allowed are oil/water emulsion technology, fire side cleaning technology and coal catalyst technology.
Important parameters	At validation: • Historical fuel consumption in boiler.
	Monitored: • Fuel consumption in the boiler; • Energy generation from the boiler.
BASELINE SCENARIO Operation of boilers at lower efficiency of combustion in absence of efficiency improvement technology.	
PROJECT SCENARIO Efficiency improvement technology is introduced to improve the efficiency of boilers.	

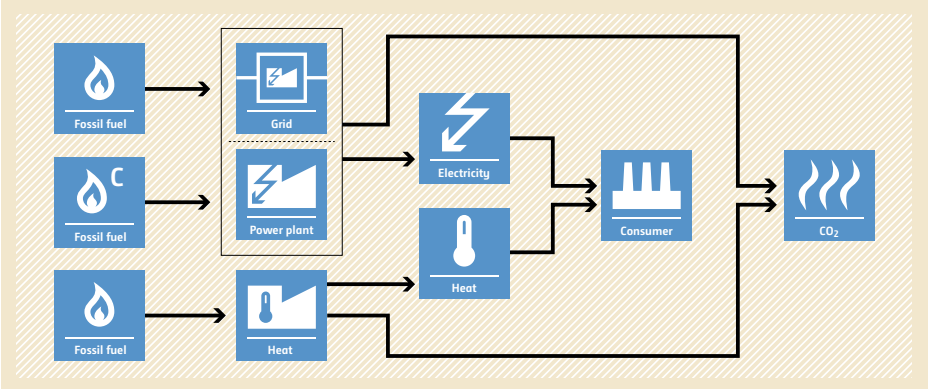
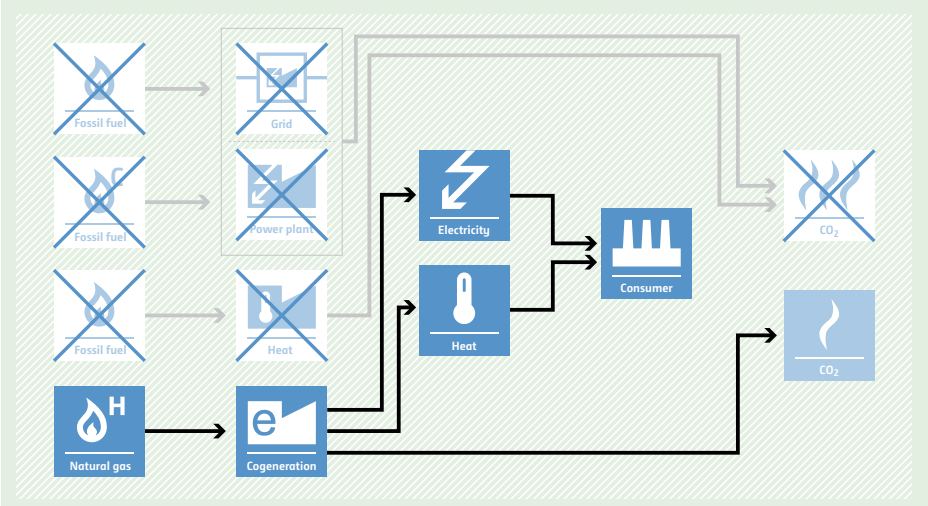
ACM0024 Natural gas substitution by biogenic methane produced from the anaerobic digestion of organic waste

Typical project(s)	Project activities where organic waste (e.g. vinasse, organic MSW, etc.) is treated by anaerobic digestion. The resulted output is upgraded and used to replace natural gas in a natural gas distribution system.
Type of GHG emissions mitigation action	• Renewable Energy. Organic waste is used as renewable energy source by the displacement of natural gas in a natural gas distribution system.
Important conditions under which the methodology is applicable	• The project does not reduce the amount of waste that would be recycled in the absence of the project activity; • Resulting digestate is further stabilized aerobically (e.g. composted), applied to land or sent to a solid waste disposal site; • Neither organic waste nor products and by-products from the anaerobic digester established under the project activity are stored on-site under anaerobic conditions.
Important parameters	Monitored: • Amount of methane produced in the anaerobic digester before upgrading; • Amount of biogenic methane which is sent to the natural gas distribution system after upgrading.
BASELINE SCENARIO Supply of natural gas to a natural gas distribution system.	
PROJECT SCENARIO Organic waste is treated by anaerobic digestion. The resulted output is upgraded and used to replace natural gas in a natural gas distribution system.	

ACM0025 Construction of a new natural gas power plant

Typical project(s)	Installation of a natural-gas-fired power plant that supplies electricity to a grid and/or an existing facility that is also connected to the grid.
Type of GHG emissions mitigation action	• Low carbon intensive electricity generation. Displacement of electricity that would be provided by more-carbon-intensive means.
Important conditions under which the methodology is applicable	• If the project activity power plant co-generates heat, no emission reductions can be claimed for the generated heat; • Natural gas is sufficiently available in the region or country; • In case electricity is supplied to an existing facility: the sources of electricity as well as average historical energy consumption should be presented in the CDM-PDD, and the electricity is supplied through a dedicated electric line.
Important parameters	At validation: • Emission factor of baseline electricity, derived from: (i) An emission factor of the power grid; (ii) The power generation technology that would most likely be used in the absence of the project, or the one currently used at the existing facility.
	Monitored: • Fuel consumption of the project power plant; • Electricity supplied to the electric power grid and/or an existing facility.
BASELINE SCENARIO Power generation using: 1. Natural gas, but with different technologies than the project, 2. Fossil fuels other than natural gas or renewable energy.	
PROJECT SCENARIO Power supply to the grid and/ or an existing facility by a new natural-gas-fired power plant.	

ACM0026 Fossil fuel based cogeneration for identified recipient facility(ies)

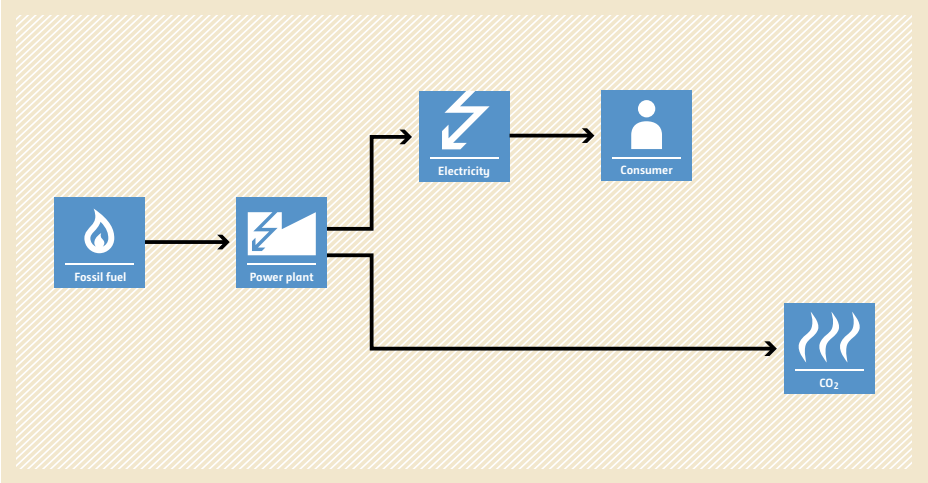
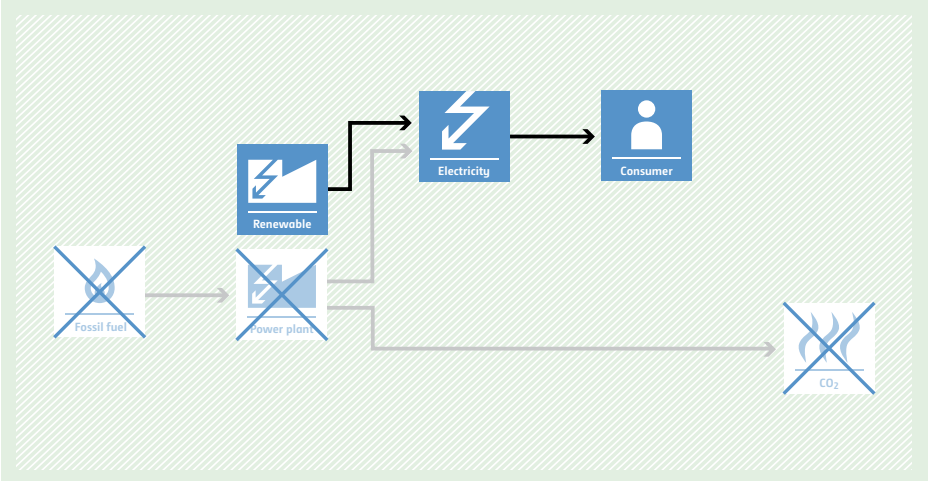
Typical project(s)	Construction and operation of a fossil fuel cogeneration plant that supplies electricity and heat to a consuming facility(ies).
Type of GHG emissions mitigation action	• Energy efficiency. Technology switch.
Important conditions under which the methodology is applicable	• The electricity and heat requirement of the facility that the project cogeneration plant supplies to (consuming facility) would be generated in separate systems in the absence of the project; • All recipient facilities, existing and Greenfield, shall be clearly identified prior to the implementation of the project activity. Where the project participant plans to claim emission reductions from the electricity supplied to the grid, the grid may be considered as one single recipient facility.
Important parameters	At validation: • Fuel consumption for heat supply by the existing heat-only generation units; • Electricity generation by the grid or the existing power-only generation units; • Emission factor of the grid or the existing power-only generation units.
	Monitored: • Fossil fuel consumption by the project cogeneration plant; • Electricity supplied by the project cogeneration plant to the consuming facility; • Heat supplied by the project cogeneration plant to the consuming facility.
BASELINE SCENARIO The electricity demand of a facility(ies) is satisfied via either power-only generation units, or the grid and heat from heat-only generation units.	
PROJECT SCENARIO The recipient facility(ies) is supplied electricity and heat from a fossil fuel based cogeneration plant.	

CDM Methodology Booklet

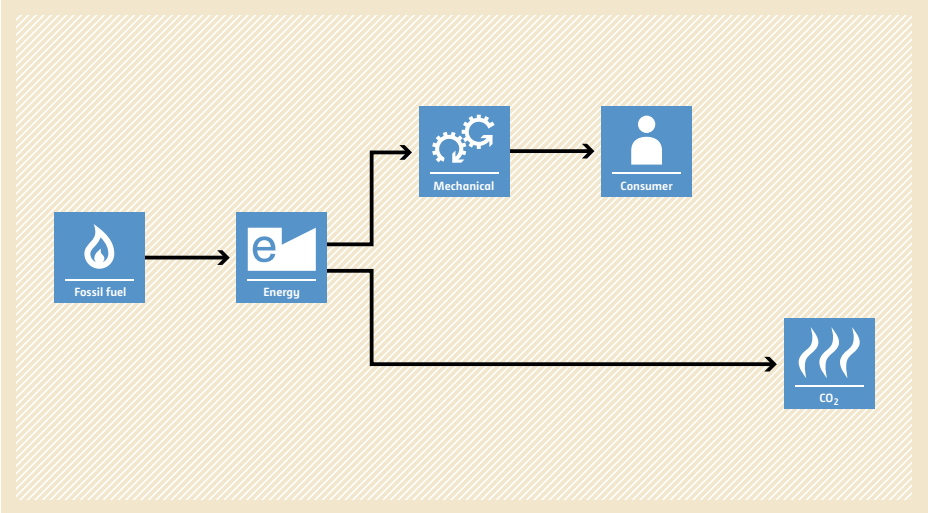
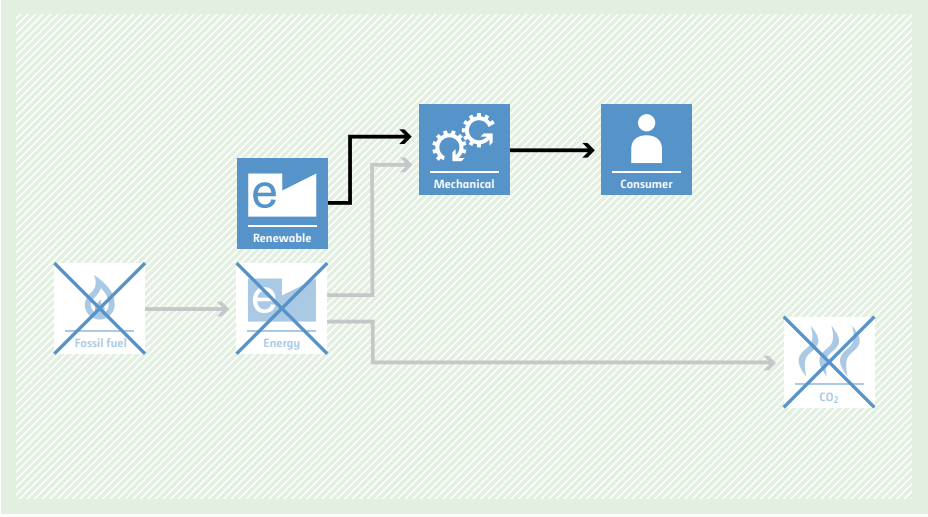
Chapter III

3.4. METHODOLOGIES FOR SMALL-SCALE CDM PROJECT ACTIVITIES

AMS-I.A. Electricity generation by the user

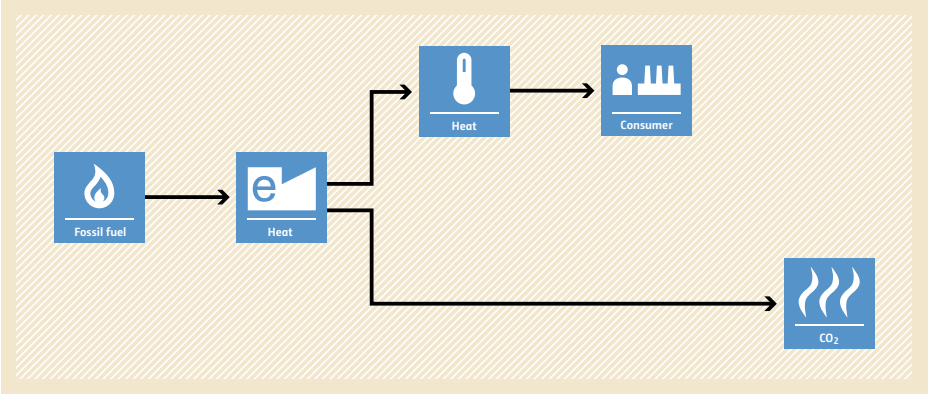
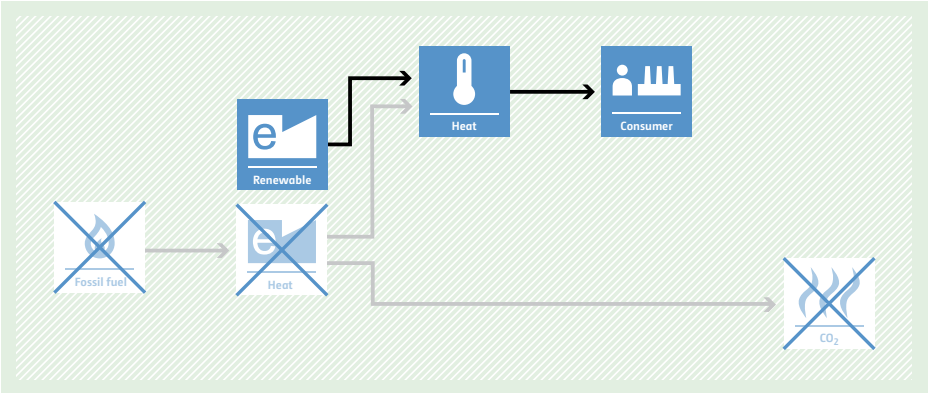
Typical project(s)	Renewable electricity generation such as solar, hydro, wind or biomass gasification are implemented by the users as new installations (Greenfield) or replacement of existing onsite fossil-fuel-fired generation.
Type of GHG emissions mitigation action	• Renewable energy. Displacement of more-GHG-intensive, non-renewable electricity applications by introducing renewable energy technologies.
Important conditions under which the methodology is applicable	• Users are in off-grid locations, i.e. they do not have connection to a national/ regional grid, unless exceptional situations, e.g. weak grids; • Users are included in the project boundary; • Conditions apply for reservoir-based hydro plants.
Important parameters	At validation: • Trend-adjusted projection of historical fuel consumption if an existing technology is replaced (e.g. for lighting, daily use duration can be applied). Monitored: • An annual check of all systems or a sample thereof to ensure that they are still operating, or metering of generated electricity; • If applicable, consumption of energy sources (e.g. biomass, fossil fuel); • If applicable, availability of connected grid.
BASELINE SCENARIO Services (e.g. lighting, refrigeration) are provided using fossil-fuel-based technologies (e.g. kerosene lamps and diesel generators).	
PROJECT SCENARIO Electricity is produced by users using renewable energy technologies (e.g. solar home systems for lighting, wind battery chargers for powering domestic appliances).	

AMS-I.B. Mechanical energy for the user with or without electrical energy

Typical project(s)	Installation of renewable energy technologies such as hydropower, wind power and other technologies that provide mechanical energy that otherwise would have been supplied with fossil-fuel-based energy. Mechanical energy is used on-site by individual household(s) or user(s). Typical applications are wind-powered pumps, water mills and wind mills. The project may also produce electricity in addition to mechanical energy.
Type of GHG emissions mitigation action	• Renewable energy. Displacement of more-GHG-intensive fossil-fuel-based generation of mechanical power.
Important conditions under which the methodology is applicable	• Operating characteristics of the project system (e.g. head vs. discharge and efficiency of irrigation pump) should be similar to or better than the system being replaced or that would have been replaced.
Important parameters	Monitored: • An annual check of all systems or a sample thereof to ensure that they are still operating; • Annual hours of operation can be estimated from total output (e.g. tonnes of grain milled); • If applicable: quantity of each type of energy sources consumed (e.g. biomass, fossil fuel). Net calorific value and moisture content of biomass.
BASELINE SCENARIO Mechanical energy would be produced using fossil-fuel-based technologies. Under a suppressed demand scenario, diesel based generator(s) or pump(s) is deemed to be the baseline.	
PROJECT SCENARIO Mechanical energy is produced (with or without electricity) using renewable energy technologies.	

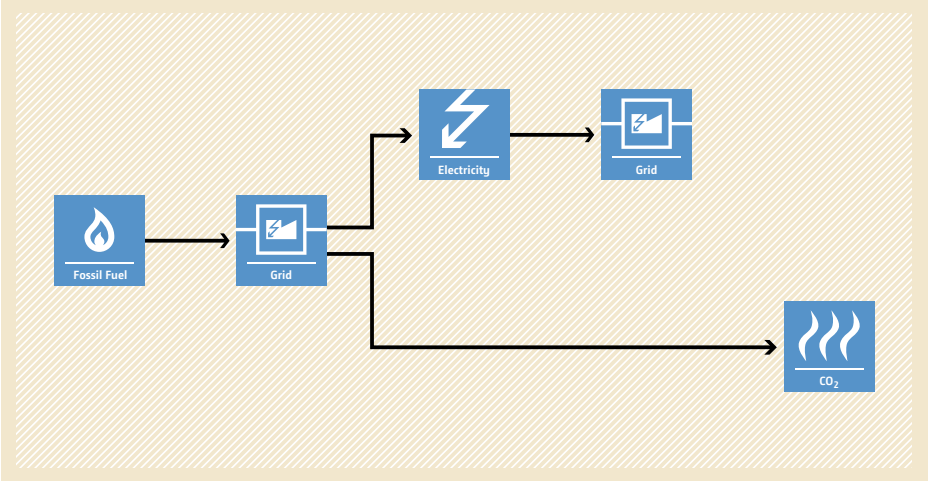
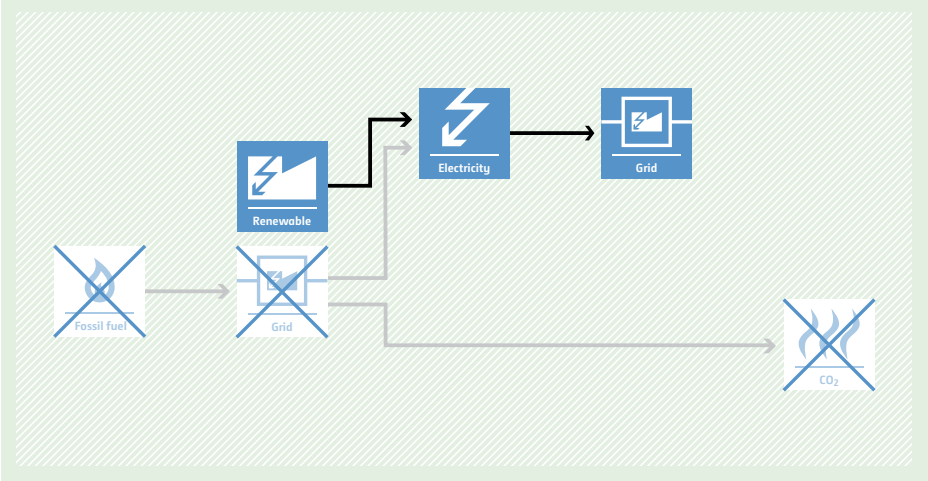
AMS-I.C. Thermal energy production with or without electricity

Women and children

Typical project(s)	Thermal energy production using renewable energy sources including biomass-based cogeneration and/or trigeneration. Projects that seek to retrofit or modify existing facilities for renewable energy generation are also applicable.
Type of GHG emissions mitigation action	• Renewable energy. Displacement of more-GHG-intensive thermal energy production, displacement of more-GHG-intensive thermal energy and/or electricity generation.
Important conditions under which the methodology is applicable	• Thermal energy and/or electricity production using biomass-based cogeneration and trigeneration system is eligible; • If solid biomass is used, it has to be demonstrated that solely renewable biomass is used. If charcoal or biomass fuel is used, all project or leakage emissions (e.g. release of methane) from the fuel production have to be considered; • If project equipment contains refrigerants, then the refrigerant used in the project case shall have no ozone depleting potential (ODP).
Important parameters	Monitored: • The moisture content of biomass of homogeneous quality may be fixed ex ante or monitored for each batch of biomass if the emission reductions are calculated based on energy input; • Thermal energy (mass flow, temperature, pressure for heat/cooling) delivered by the project and the amount of grid and/or captive electricity displaced; • Quantity of biomass and fossil fuel consumed; • Net calorific value of biomass shall be determined once in the first year of the crediting period; • The chilled water mass flow-rate for chiller(s); • Cooling output of baseline chiller displaced as a result of the installation of project activity; • Quantity of refrigerant used to replace refrigerant that has leaked.
BASELINE SCENARIO Energy generation (thermal heat and / or electricity) by more-carbon-intensive technologies based on fossil fuel. In case of retrofits or capacity addition, operation of existing renewable power units without retrofit and capacity addition.	
PROJECT SCENARIO Energy generation by installation of new renewable energy generation units, by retrofitting or replacement of existing renewable energy generation units as well as by switch from fossil fuel to biomass in modified existing facilities.	

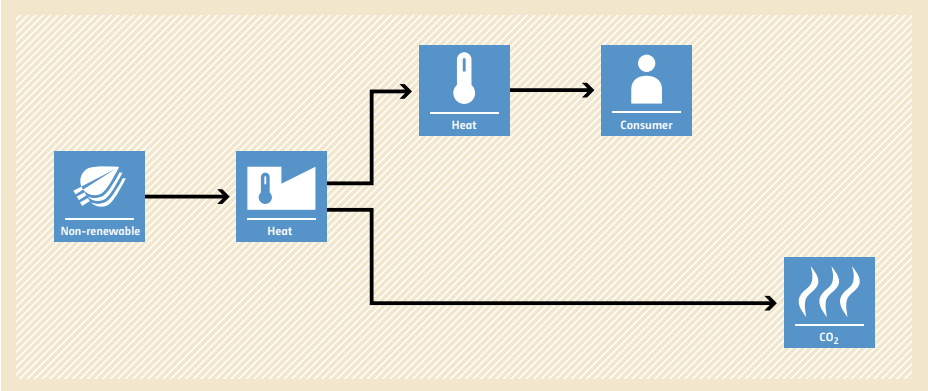
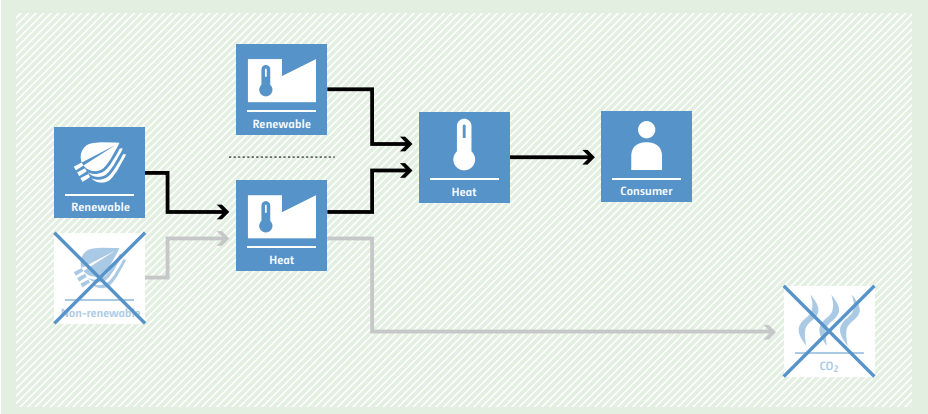
AMS-I.D. Grid connected renewable electricity generation

Women and children

Typical project(s)	Construction and operation of a power plant that uses renewable energy sources and supplies electricity to the grid (Greenfield power plant) or retrofit, replacement or capacity addition of an existing power plant that uses renewable energy sources and supplies electricity to the grid.
Type of GHG emissions mitigation action	• Renewable energy. Displacement of electricity that would be provided to the grid by more-GHG-intensive means.
Important conditions under which the methodology is applicable	• Combined heat and power generation is not eligible (AMS-I.C. can be used here); • Special conditions apply for reservoir-based hydro plants.
Important parameters	At validation: • Grid emission factor (can also be monitored ex post); • Moisture content of biomass of homogeneous quality shall be determined ex ante. Monitored: • Quantity of net electricity supplied to the grid; • Quantity of biomass/fossil fuel consumed; • Net calorific value of biomass shall be determined once in the first year of the crediting period.
BASELINE SCENARIO Electricity provided to the grid by more-GHG-intensive means.	
PROJECT SCENARIO Electricity is generated and supplied to the grid using renewable energy technologies.	

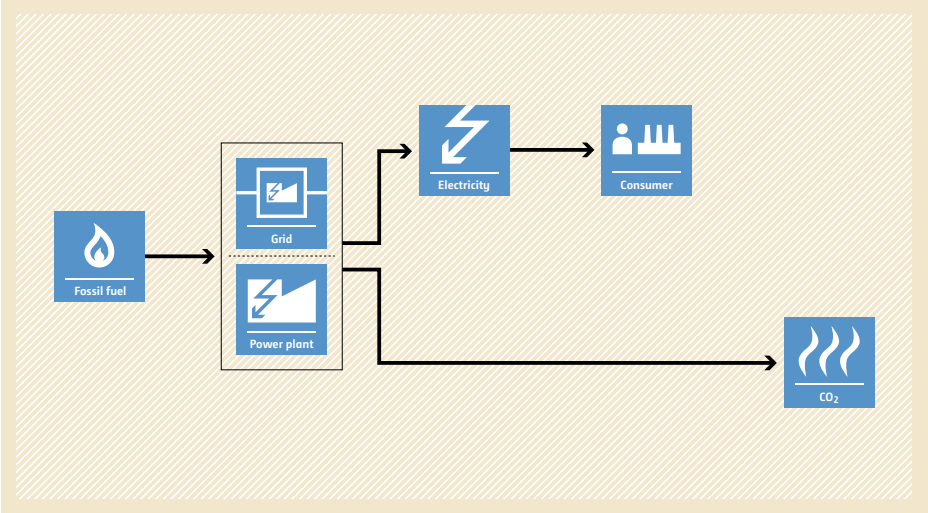
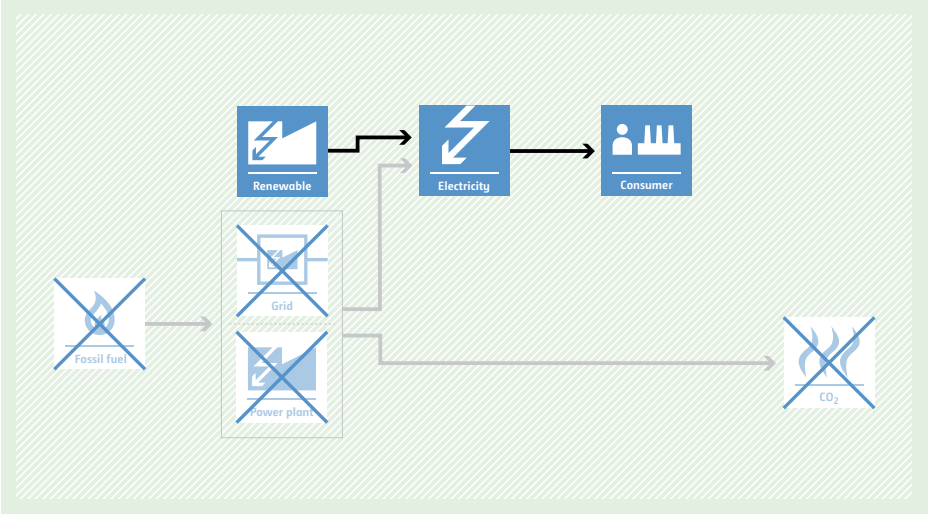
AMS-I.E. Switch from non-renewable biomass for thermal applications by the user

Women and children

Typical project(s)	Generation of thermal energy by introducing renewable energy technologies for end-users that displace the use of non-renewable biomass. Examples of these technologies include, but are not limited to, Cookstoves using renewable biomass, such as briquettes, pellets, and woodchips; Biogas stoves; Bio-ethanol stoves; Electric cookstoves including induction cookstoves powered by renewable energy.
Type of GHG emissions mitigation action	• Renewable energy. Displacement of more-GHG-intensive, non-renewable biomass-fueled applications by introducing renewable energy technologies.
Important conditions under which the methodology is applicable	• It shall be demonstrated that non-renewable biomass has been used since 31 December 1989; • Project appliances are continuously operated or replaced by equivalent service appliances.
Important parameters	Monitored: • Average annual consumption of woody biomass per household or per person in the pre-project devices during the project activity, if it is found that pre-project devices were not completely displaced but continue to be used to some extent; • Fraction of woody biomass saved by the project activity that can be established as non-renewable biomass, as per the methodological tool "calculation of fraction of non-renewable biomass"; • Average consumption of electricity by electric cooking appliance(s); • Leakage: the amount of woody biomass saved under the project that is used by non-project households/users (who previously used renewable energy sources) shall be assessed from surveys.
BASELINE SCENARIO Thermal energy would be produced by more-GHG-intensive means based on the use of non-renewable biomass.	
PROJECT SCENARIO Use of renewable energy technologies for thermal energy generation, displacing nonrenewable biomass use.	

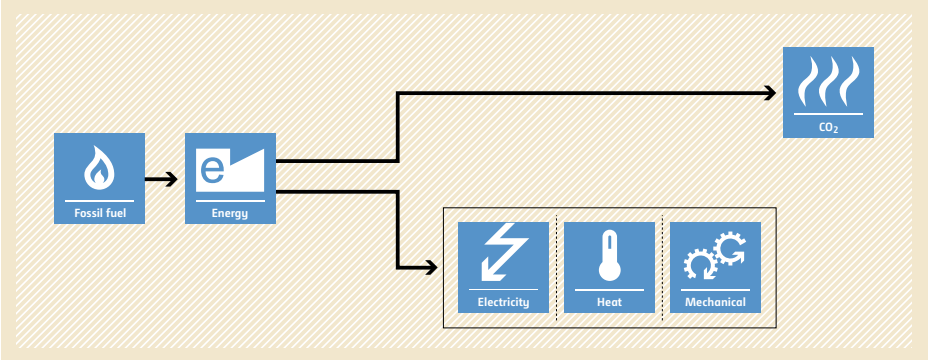
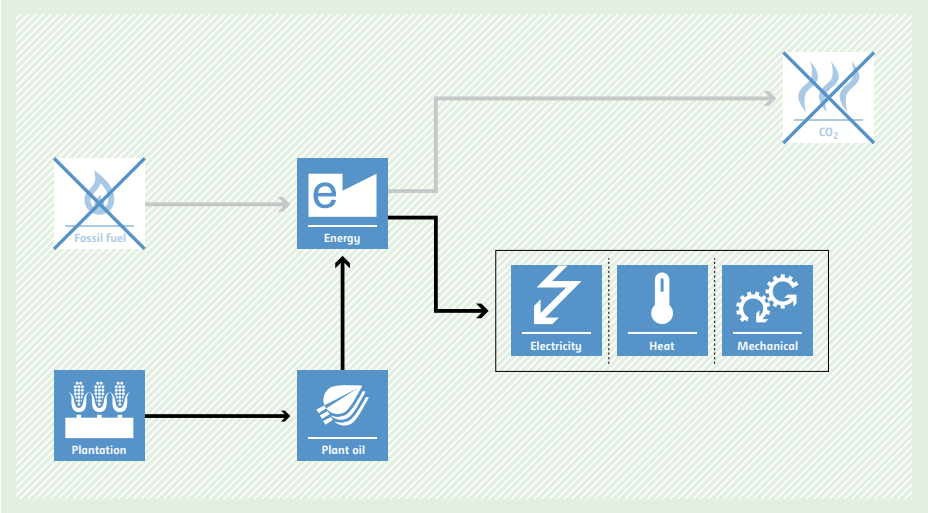
AMS-I.F. Renewable electricity generation for captive use and mini-grid

Women and children

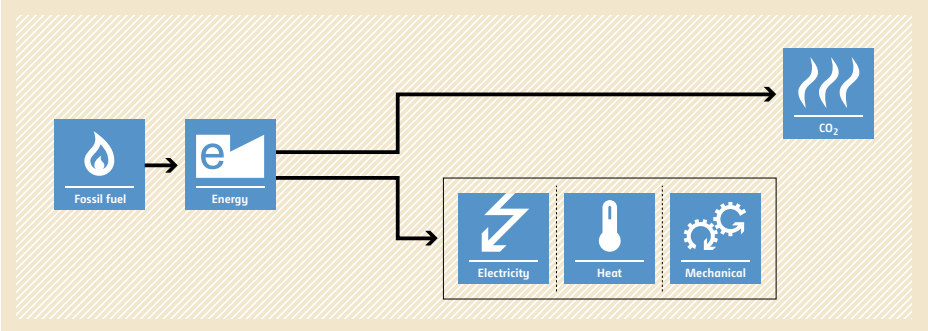
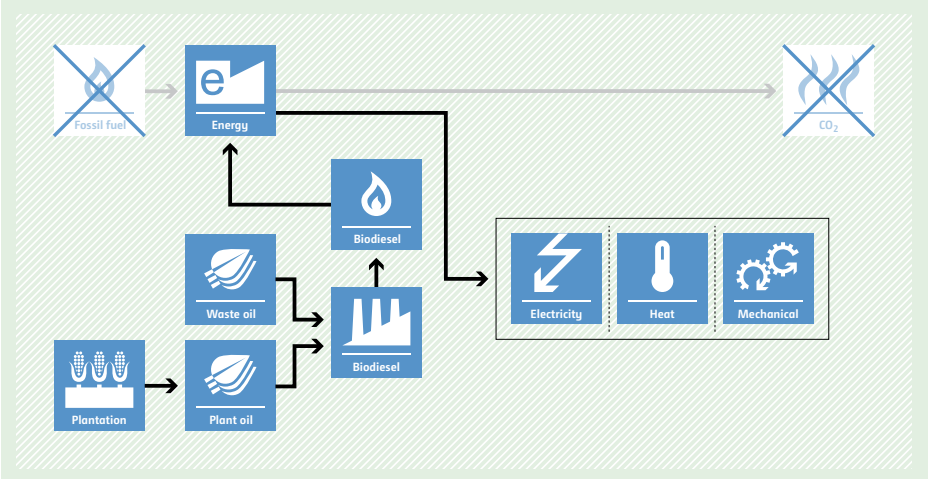
Typical project(s)	Production of electricity using renewable energy technologies such as photovoltaic, hydro, tidal/wave, wind, geothermal and renewable biomass that supply electricity to user(s).
Type of GHG emissions mitigation action	• Renewable energy. Displacement of electricity that would be provided to the user(s) by more-GHG-intensive means.
Important conditions under which the methodology is applicable	• The project will displace electricity from an electricity distribution system that is or would have been supplied by at least one fossil fuel fired generating unit; • Electricity is produced by installing a new power plant (Greenfield) or by capacity addition/retrofit/replacement of (an) existing plant(s); • Special conditions apply for reservoir-based hydro plants; • Cogeneration projects are not eligible.
Important parameters	At validation: • If applicable: grid emission factor (can also be monitored ex post). Monitored: • Net electricity generation, quantity of fossil fuel and biomass consumption.
BASELINE SCENARIO Electricity would have been supplied by one or more energy sources such as a national or a regional grid or a fossil-fuel-fired captive power plant or a carbon-intensive mini-grid.	
PROJECT SCENARIO Electricity is supplied using renewable energy technologies.	

AMS-I.G. Plant oil production and use for energy generation in stationary applications

Women and children

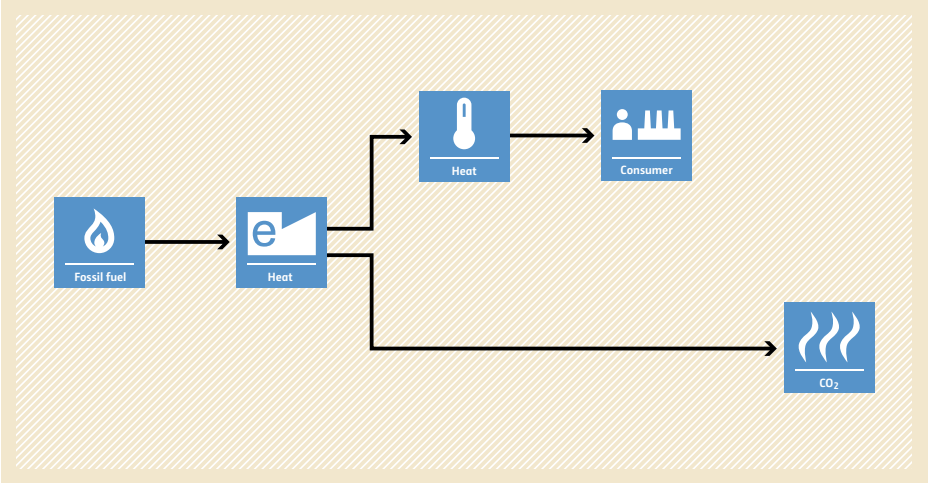
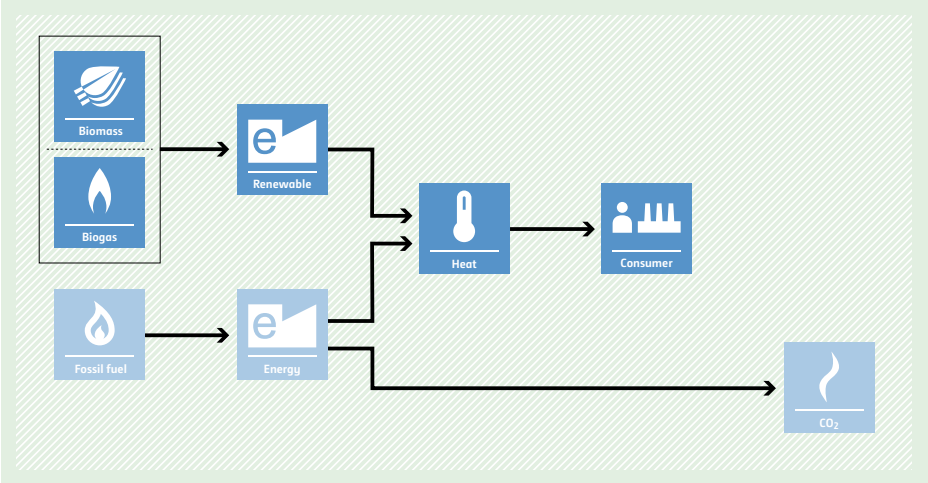
Typical project(s)	Plant oil production that is used for generation of thermal, mechanical and electrical energy in stationary equipment including cogeneration. The plant oil is produced from pressed and filtered oilseeds from plants that are cultivated on dedicated plantations.
Type of GHG emissions mitigation action	• Renewable energy. Displacement of more-GHG-intensive fossil fuel for combustion in stationary installations.
Important conditions under which the methodology is applicable	• The pure plant oil and its blends above 10% is used in specially built or modified equipment; • Export of produced plant oil is not allowed; • If the biomass feedstock is sourced from dedicated plantation, the pre-project activities such as grazing and collection of biomass must be accommodated for within the project activity.
Important parameters	Monitored: • Energy consumption of the combustion processes (e.g. plant oil, fossil fuel); • Parameters to estimate project emissions from the cultivation of oil crops; • If applicable: leakage emissions due to a shift of pre-project activities and the competing uses of biomass; • Quantity of the electricity produced; of the thermal energy (mass flow, temperature, pressure for heat/cooling) generated by the project; • Project emissions from fossil fuel and electricity consumption as well as from the transport of oilseeds if distances of more than 200 km are covered.
BASELINE SCENARIO Services (e.g. electricity, thermal and mechanical energy supply) are provided using fossil-fuel-based technologies.	
PROJECT SCENARIO Oil crops are cultivated, plant oil is produced and used for the generation of electricity, thermal or mechanical energy displacing fossil fuel.	

AMS-I.H. Biodiesel production and use for energy generation in stationary applications

Typical project(s)	Biofuel is produced from biomass residues, biomass cultivated on dedicated plantations and from waste oil/fat and used to generate thermal; mechanical or electrical energy in equipment including cogeneration.
Type of GHG emissions mitigation action	• Renewable energy. Displacement of more-GHG-intensive fossil fuel for combustion in stationary installations.
Important conditions under which the methodology is applicable	• Pure biofuel and its blends above 10% are used in specially built or modified equipment; • Any alcohol used for esterification is methanol from fossil fuel origin or alcohol produced with biomass from dedicated plantations; • Export of produced biofuel is not allowed; • If the biomass feedstock is sourced from dedicated plantation, the project and leakage emissions shall be considered.
Important parameters	Monitored: • Biofuel production and consumption by the project activity; • Electricity and fuel consumption of the combustion by the project activity; • Parameters to estimate project emissions from the cultivation of biomass; • Quantity of the electricity and/or the thermal energy generated by the project activity.
BASELINE SCENARIO Services (e.g. electricity, thermal and mechanical energy supply) are provided using fossil fuel based technologies.	
PROJECT SCENARIO Biofuel is produced from biomass residues, cultivated biomass or from waste oil/fat and used for the generation of electricity, thermal or mechanical energy displacing fossil fuel.	

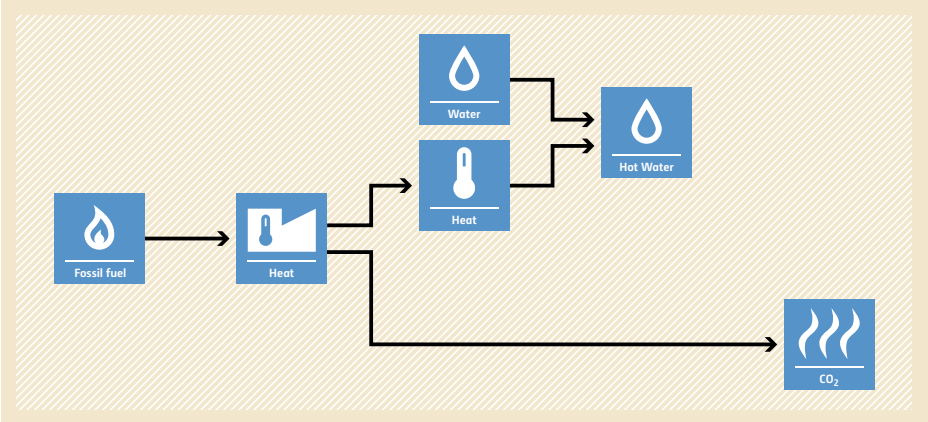
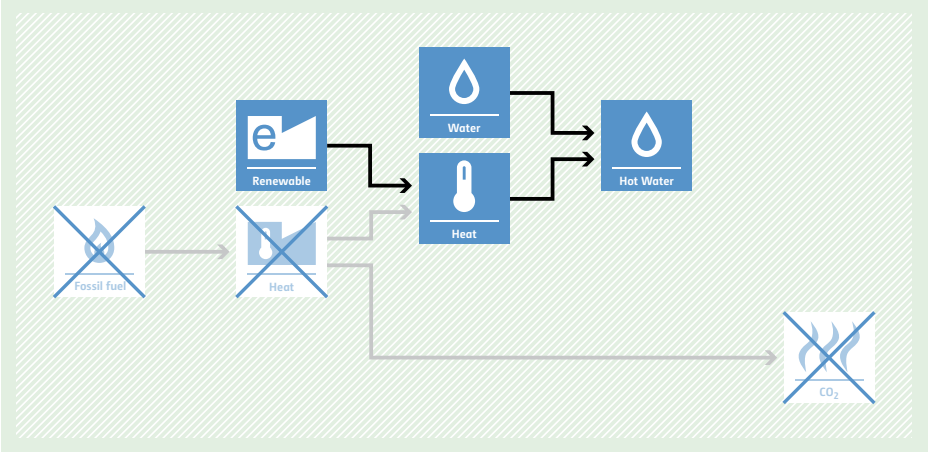
AMS-I.I. Biogas/biomass thermal applications for households/small users

Women and children

Typical project(s)	Activities for generation of renewable thermal energy using renewable biomass or biogas for use in residential, commercial and institutional applications. Examples of these technologies that displace or avoid fossil fuel use include, but are not limited to, biogas cook stoves, biomass briquette cook stoves, small-scale baking and drying systems, water heating, or space heating systems.
Type of GHG emissions mitigation action	• Renewable energy. Displacement of more-GHG-intensive thermal energy generation.
Important conditions under which the methodology is applicable	• Each unit (e.g. cook stove, heater) shall have a rated capacity equal to or less than 150 kW thermal.
Important parameters	Monitored: • Number of thermal applications commissioned; • The net quantity of renewable biomass or biogas consumed by the thermal application in year y; • Net calorific value of biomass type.
BASELINE SCENARIO Thermal energy production based on fossil fuel.	
PROJECT SCENARIO Thermal energy generation by renewable biomass or biogas. Fossil fuel may continue to be used.	

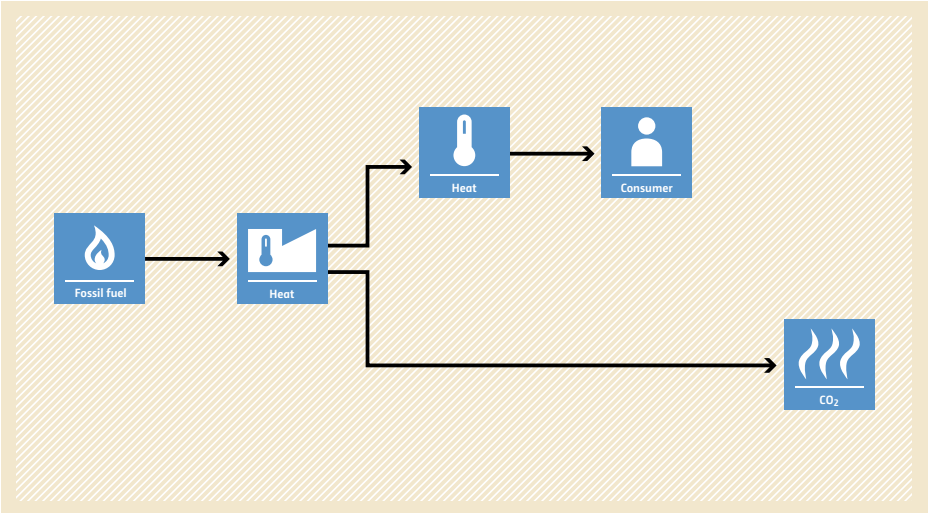
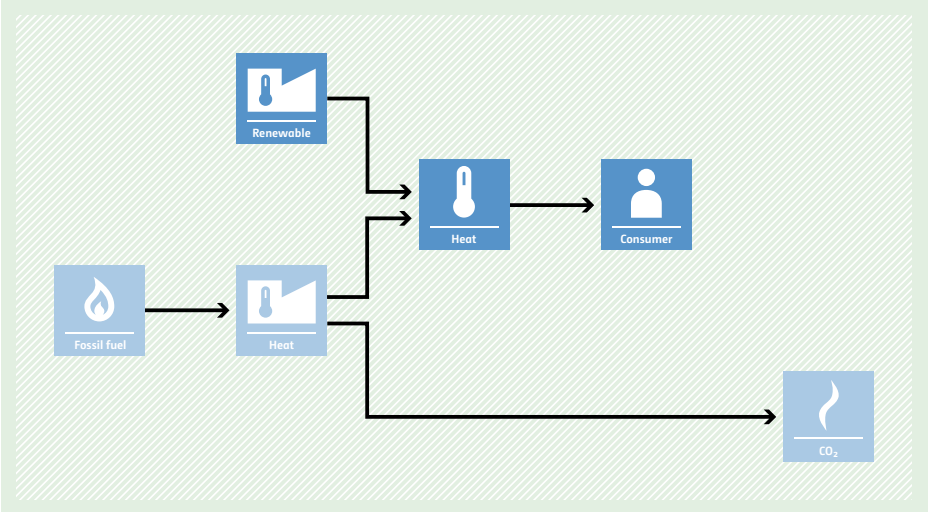
AMS-I.J. Solar water heating systems (SWH)

Women and children

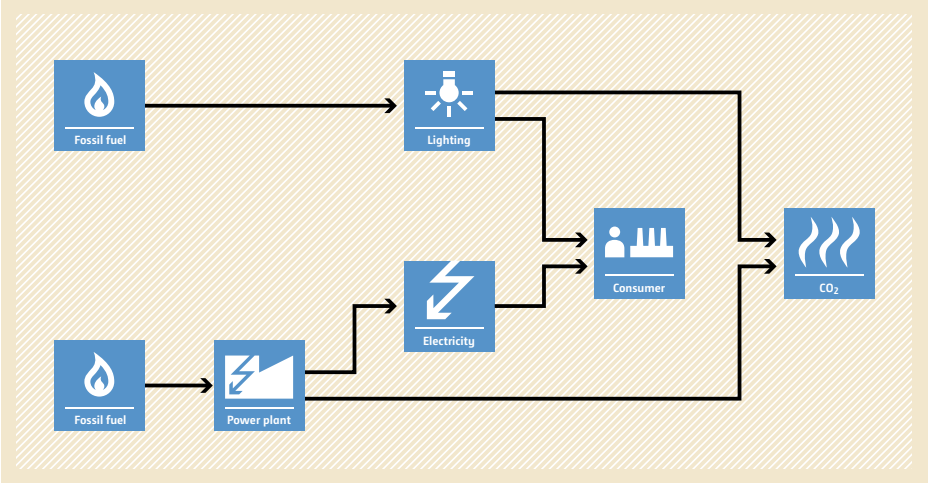
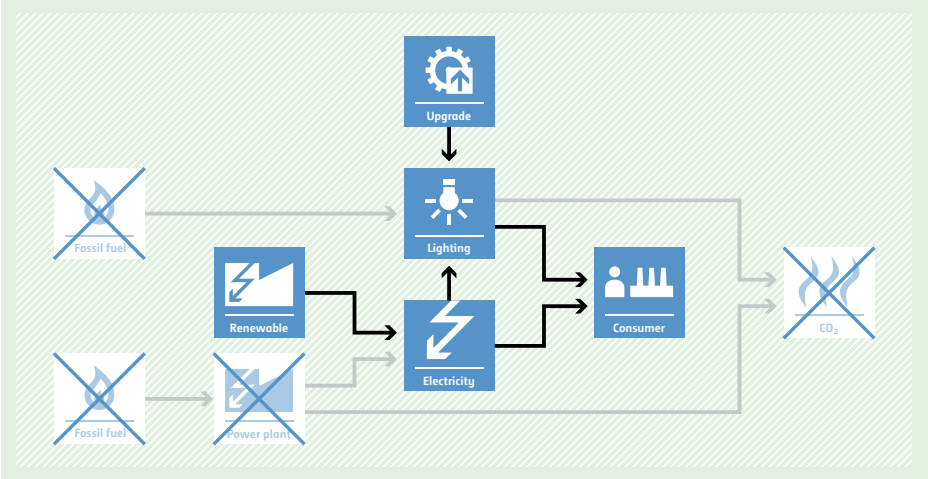
Typical project(s)	The installation of residential and commercial solar water heating (SWH) systems for hot water production.
Type of GHG emissions mitigation action	• Renewable energy. Displacement of electricity or fossil fuel that would otherwise have been used to produce hot water.
Important conditions under which the methodology is applicable	• Two types of projects included in this category: retrofits and new construction; • Commercial SWH systems shall include operational indicators that may be easily interpreted by the intended users of the systems and that indicate that water is being heated by solar energy.
Important parameters	At validation: • Emission factor of the baseline fuel and/or grid; • Where applicable: – Efficiency of the baseline unit which is consuming fossil fuel or electricity; – Solar insolation level; – Time of hot water demand. Monitored: • Where applicable, hot water consumption pattern, inlet/outlet temperature, characteristics/specifications of the project system; • Retention rate of the project system; • Collecting area of the solar panel; • Auxiliary fuel consumption by the project system, where applicable.
BASELINE SCENARIO Hot water production is based on fossil fuel/electricity consumption.	
PROJECT SCENARIO Hot water is produced by solar energy.	

AMS-I.K. Solar cookers for households

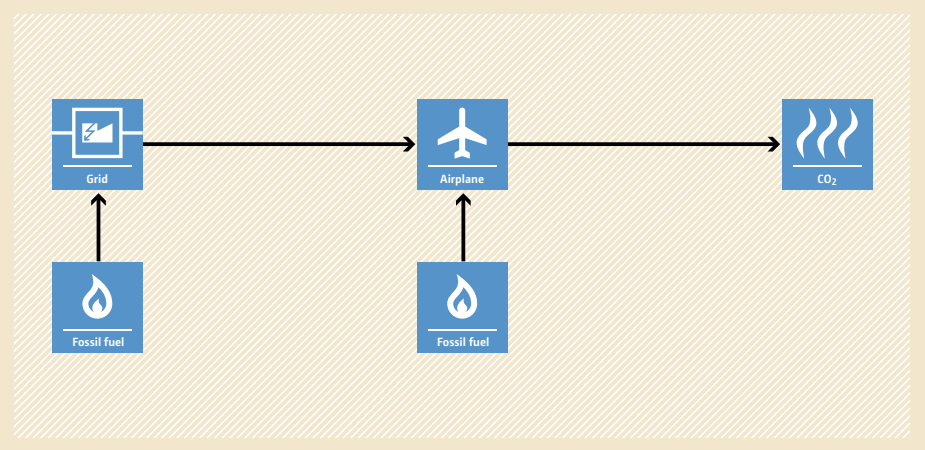
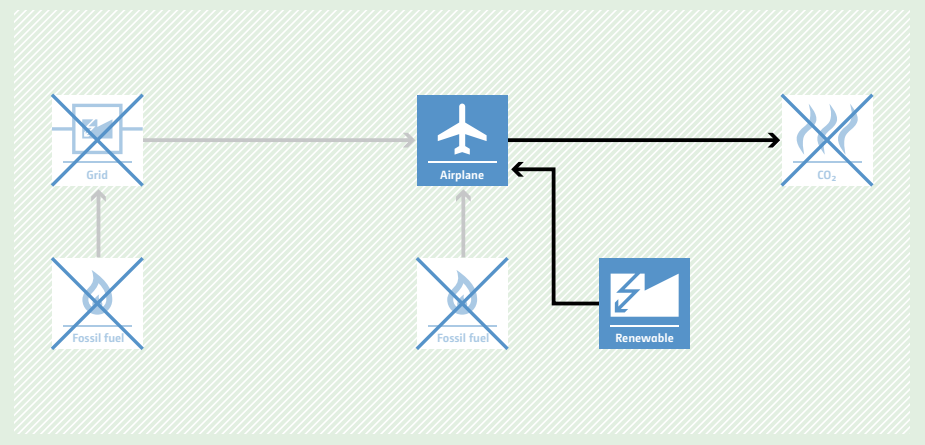
Women and children

Typical project(s)	Project activities that introduce solar cookers to individual households to be used for household cooking purpose.
Type of GHG emissions mitigation action	• Renewable energy. Use of solar cookers will reduce or displace use of fossil fuels or non-renewable biomass.
Important conditions under which the methodology is applicable	• Solar cookers shall be demonstrated to be designed and constructed according to the requirements of a relevant national or international standard; • A local organization shall be involved on an ongoing basis to assist in promoting and facilitating the continued use of the cookers.
Important parameters	At validation: • Annual consumption of baseline fossil fuel (can also be monitored). Monitored: • Number of households provided with solar cookers; • Proportion of provided solar cookers still operating.
BASELINE SCENARIO Fossil fuel(s) or non-renewable biomass are used for cooking purposes.	
PROJECT SCENARIO Fossil fuel(s) or non renewable biomass are replaced by solar energy.	

AMS-I.L. Electrification of rural communities using renewable energy

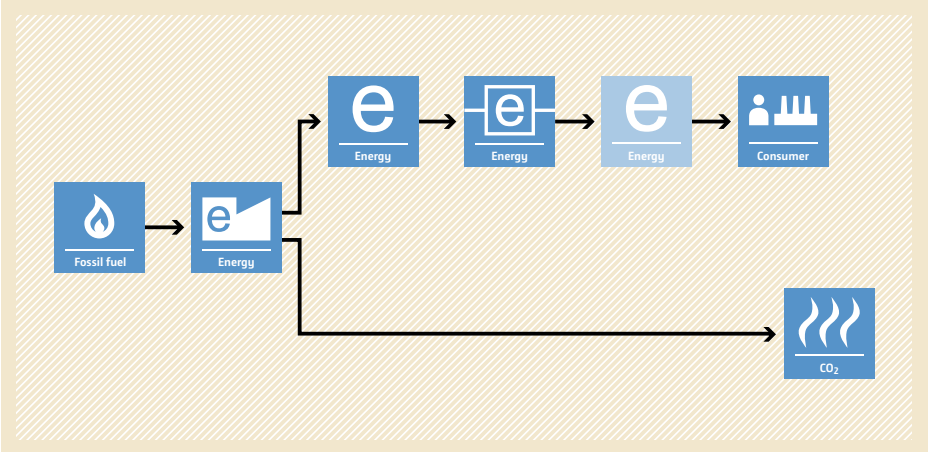
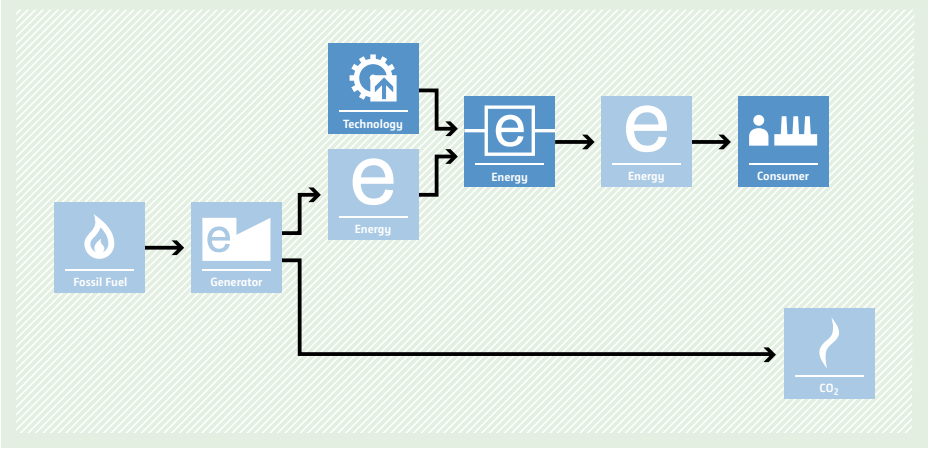
Typical project(s)	After the project implementation, rural communities are supplied with electricity from renewable-based systems (e.g. solar home systems, renewable mini-grid).
Type of GHG emissions mitigation action	• Renewable energy. Displacement of fossil fuel use.
Important conditions under which the methodology is applicable	• 75 % (by numbers) of the end-users shall be households; • End-users were not connected to a national/regional grid; • Project equipment complies with international standards or comparable national, regional or local standards/guidelines.
Important parameters	At validation: • The number of facilities (e.g. households, SMMEs, public buildings) supplied with renewable electricity by the project activity.
	Monitored: • Measure or estimate the net amount of renewable electricity delivered to all the end-use facilities; • Installed capacity of renewable electricity generation systems.
BASELINE SCENARIO In the absence of the project activity, the end users would have used fossil fuel based lighting and stand-alone diesel electricity generators for appliances other than lighting (e.g. TV).	
PROJECT SCENARIO End users are supplied with electricity from renewable based energy systems (e.g. solar home systems or renewable mini-grid).	

AMS-I.M. Solar power for domestic aircraft at-gate operations

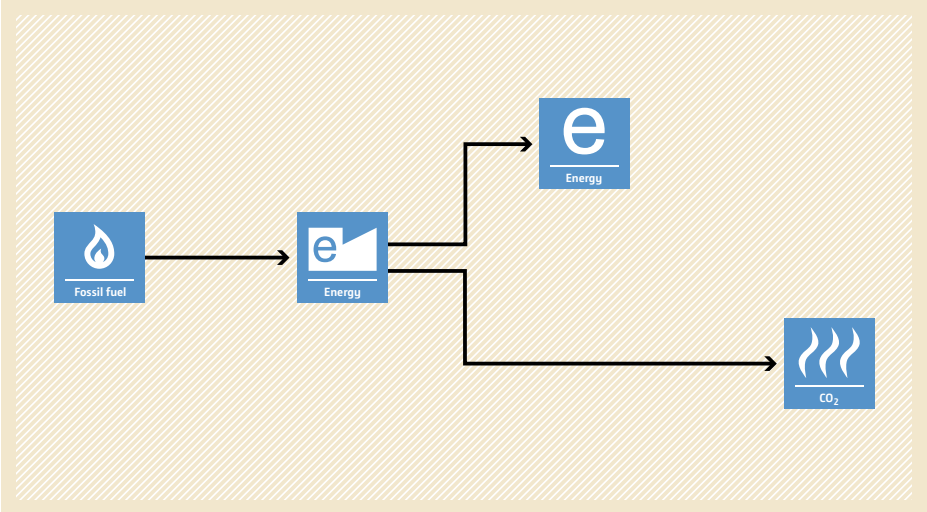
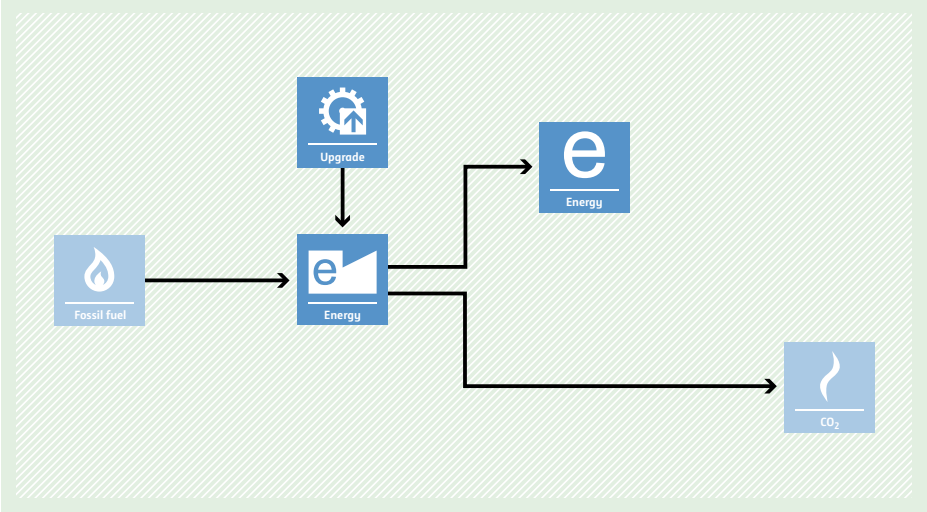
Typical project(s)	Production of electricity using solar photovoltaic technology that supply electrical energy for aircraft at-gate operations in airports.
Type of GHG emissions mitigation action	• Renewable energy.
Important conditions under which the methodology is applicable	• Install a new solar photovoltaic system (Greenfield plant) at an airport facility where no onsite renewable energy power generation capacities existed prior to the implementation of the project activity that supplied power to the airport's at-gate operations; • Electricity generated from the solar photovoltaic system is supplied to airports for domestic aircraft at-gate operations. Aircrafts that operate on international routes are not included in this methodology.
Important parameters	At validation: • Emission factor of the baseline source (e.g. jet fuel, diesel, grid and/or captive generation) of emission used by the airport to provide electricity and pre-conditioned air to aircrafts at-gate. Monitored: • Quantity of electricity consumed by aircraft electrical components for the domestic aircraft at-gate operation, which is supplied by the solar power in year y; • Quantity of electricity consumed by an aircraft to obtain pre-conditioned air for a domestic aircraft's at-gate operation which is supplied by the solar power, in year y.
BASELINE SCENARIO The energy required for the at-gate operation are supplied by energy generated from grid and/or fossil fuels.	
PROJECT SCENARIO The energy generated from the solar source would replace partially or fully the energy supplied by fossil fuel and/or grid for at-gate operations.	


TASOL
Solar Energy Solutions

AMS-II.A. Supply side energy efficiency improvements – transmission and distribution

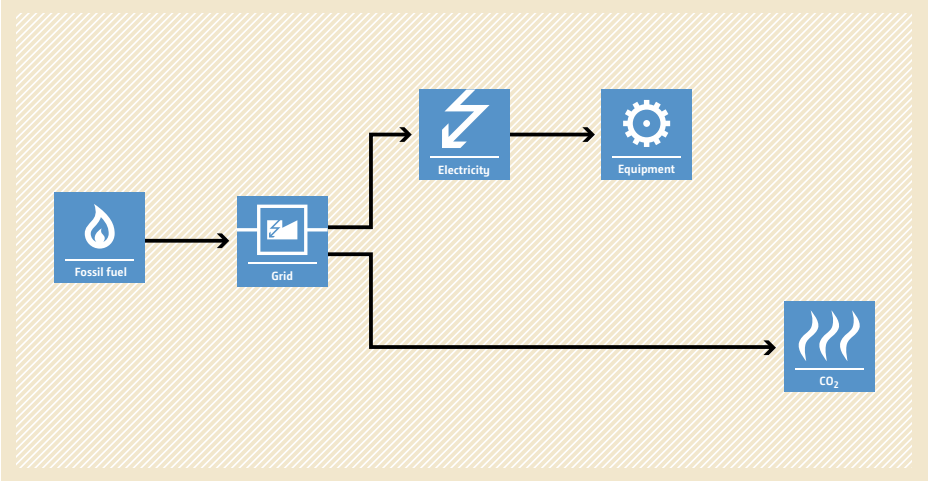
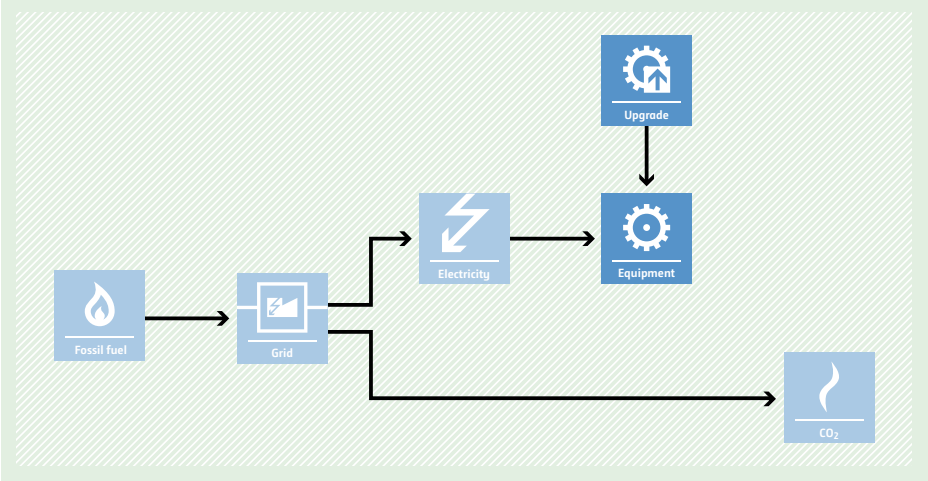
Typical project(s)	Technical energy losses are reduced through energy efficiency measures such as upgrading the voltage on a transmission/distribution system, replacing existing transformers with more efficient transformers (e.g. replacement of a silicon steel core transformer with an amorphous metal transformer) in electrical transmission/distribution system or improving pipe insulation in a district heating system. The project may be the upgrade/replacement of an existing distribution system or be part of an expansion of an existing system.
Type of GHG emissions mitigation action	• Energy efficiency. Technology with higher efficiency reduces electrical or thermal energy losses and thereby GHG emissions.
Important conditions under which the methodology is applicable	• Measures that reduce technical losses solely by improving operations and/or maintenance practices are not eligible; • Introduction of capacitor banks and tap changing transformers for reducing losses in an electricity distribution is not covered; • For retrofit projects, historical data is required to determine technical losses of the existing equipment.
Important parameters	Monitored: • Technical energy losses of the project equipment; • If applicable: for radial electricity distribution systems for which no performance-measuring standards are available, technical losses shall be determined by a peer reviewed method.
BASELINE SCENARIO Electrical/thermal energy is transmitted and distributed using less-efficient energy system.	
PROJECT SCENARIO Reducing technical losses and thereby GHG emissions through installation of a new energy-efficient distribution/transmission equipment/system and/or retrofit of the existing less-efficient equipment/system.	

AMS-II.B. Supply side energy efficiency improvements – generation

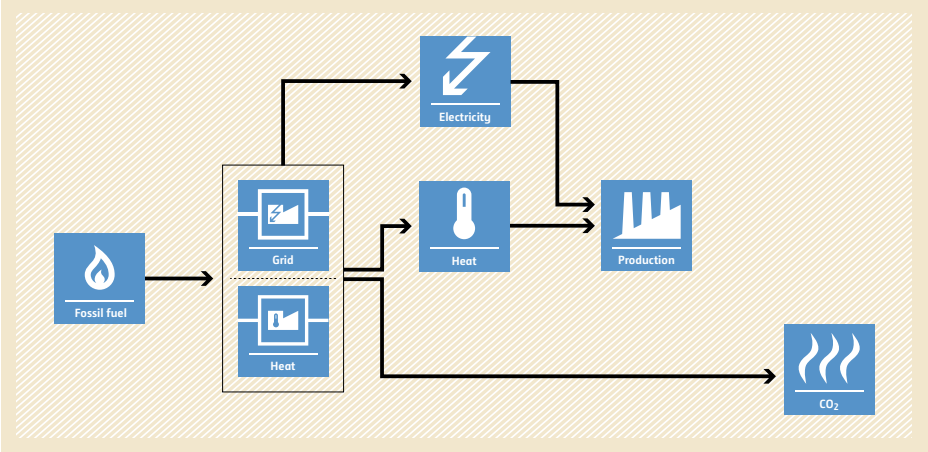
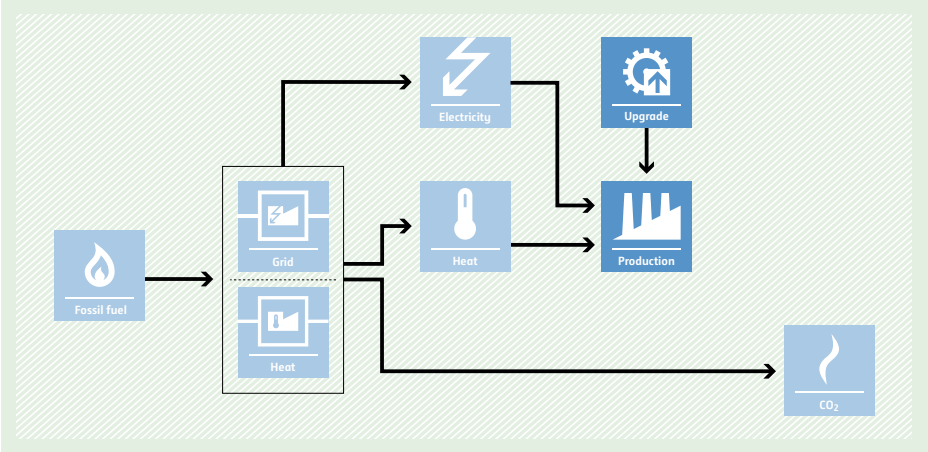
Typical project(s)	Introduction of more-efficient electricity and/or thermal energy generation units or complete replacement of existing power stations, district heating plants and cogeneration units by new equipment with a higher efficiency or retrofitting of existing fossil-fuel-fired generating units in order to increase their efficiency.
Type of GHG emissions mitigation action	• Energy efficiency. Technology with higher efficiency reduces fossil fuel consumption for energy generation and thereby reduces GHG emissions.
Important conditions under which the methodology is applicable	• Baseline and project technologies utilize fossil fuels to produce energy; • Renewable energy projects are not applicable (type I methodologies, e.g. AMS-I.C. or AMS-I.D. may be explored).
Important parameters	Monitored: • Quantity of fuel used in the energy generating equipment; • Quantity of energy output.
BASELINE SCENARIO Continuation of the current situation, i.e. use of the existing fossil-fuel-fired energy generation equipment with lower efficiency.	
PROJECT SCENARIO Installation of more-efficient energy generation technology and/or complete replacement of existing less-efficient equipment and/or retrofitting of an existing energy generation system reduces fossil fuel consumption and GHG emissions.	

AMS-II.C. Demand-side energy efficiency activities for specific technologies

Women and children

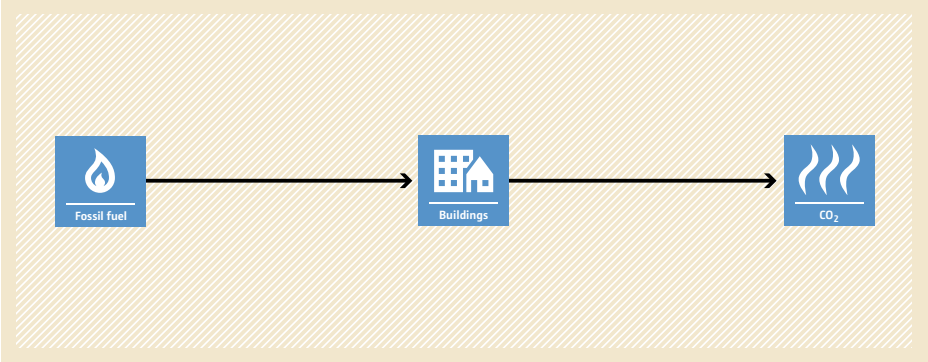
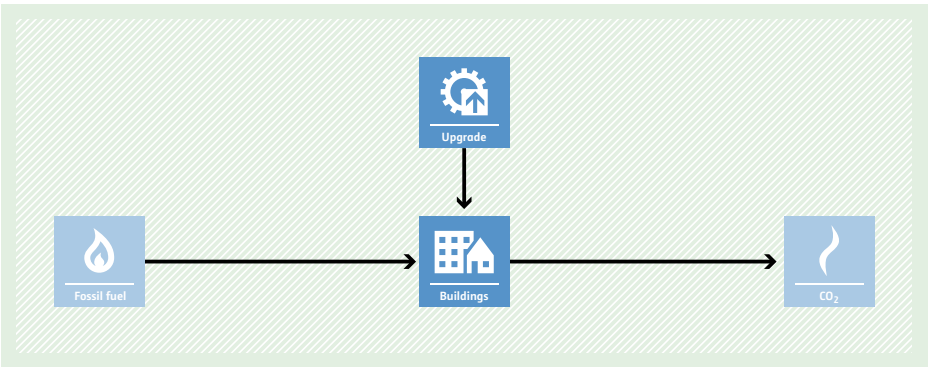
Typical project(s)	Installation of new energy-efficient equipment (e.g. lamps, ballasts, refrigerators, motors, fans, air conditioners, pumping systems and chillers) at one or more project sites, as retrofit or new construction (Greenfield) projects.
Type of GHG emissions mitigation action	• Energy efficiency. Displacement of more-GHG-intensive service by use of more-efficient technology.
Important conditions under which the methodology is applicable	• The service level (e.g. rated capacity or output) of the installed project energy-efficient equipment is between 90% and 150% of the service level of the baseline equipment; • If applicable: refrigerant used in the project activity shall have no ozone depleting potential (ODP).
Important parameters	At validation: • If applicable: grid emission factor (can also be monitored ex post). Monitored: • Monitoring shall include annual checks of a sample of non-metered systems to ensure that they are still operating; • Recording the "power" of the equipment installed and metering a sample of the units installed for their operating hours using run time meters; or metering the "energy use" of an appropriate sample of the equipment installed.
BASELINE SCENARIO Less-efficient equipment (e.g. lamps, refrigerators, motors, fans, air conditioners, pumping systems, chillers) consume more energy, thus resulting in higher GHG emissions.	
PROJECT SCENARIO More-efficient equipment (e.g. lamps, refrigerators, motors, fans, air conditioners, pumping systems, chillers) consume less energy, thus resulting in lower GHG emissions.	

AMS-II.D. Energy efficiency and fuel switching measures for industrial facilities

Typical project(s)	Process energy efficiency improvement(s) affecting either a single production step/ element process (e.g. furnace, kiln) or a series of production steps/element processes (e.g. industrial process involving many machines); and energy efficiency improvement in energy conversion equipment (e.g. boiler, motor) that supplies thermal/electrical/ mechanical energy within a facility.
Type of GHG emissions mitigation action	· Energy efficiency. Increase in energy efficiency with, optionally, a switch to less-carbon-intensive fuel.
Important conditions under which the methodology is applicable	· Energy use within the project boundary can be directly measured or can be determined using national/international standards; · Improvements in efficiency by the project can be clearly distinguished from efficiency changes/improvements not attributable to the project; · The project output is equivalent to the output produced in the baseline.
Important parameters	At validation: · Energy consumption, emission intensity of energy types, output service level in the baseline; · Documenting of the technical specification of the equipment/systems. Monitored: · Metering the energy use of equipments; · Output; · In case the output parameter cannot be measured, the quantity of input material (feedstock).
BASELINE SCENARIO Consumption of electricity, heat and/or fossil fuel leads to CO_2 emissions.	
PROJECT SCENARIO Consumption of less electricity, heat and/or fossil fuel leads to decreased CO_2 emissions.	

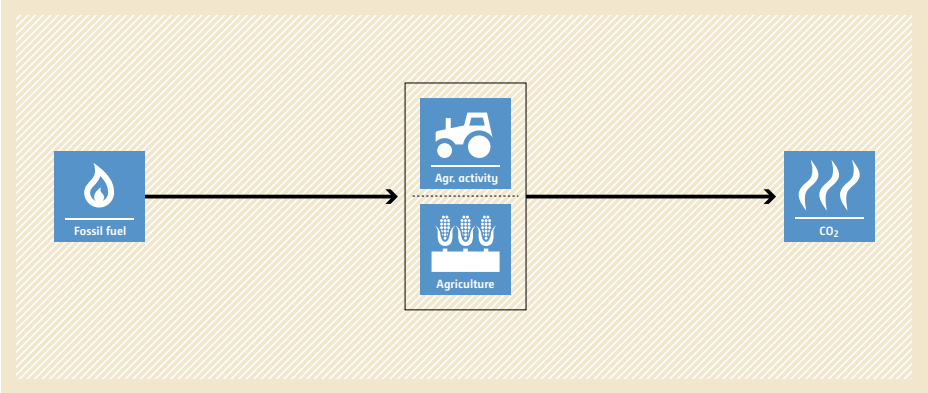
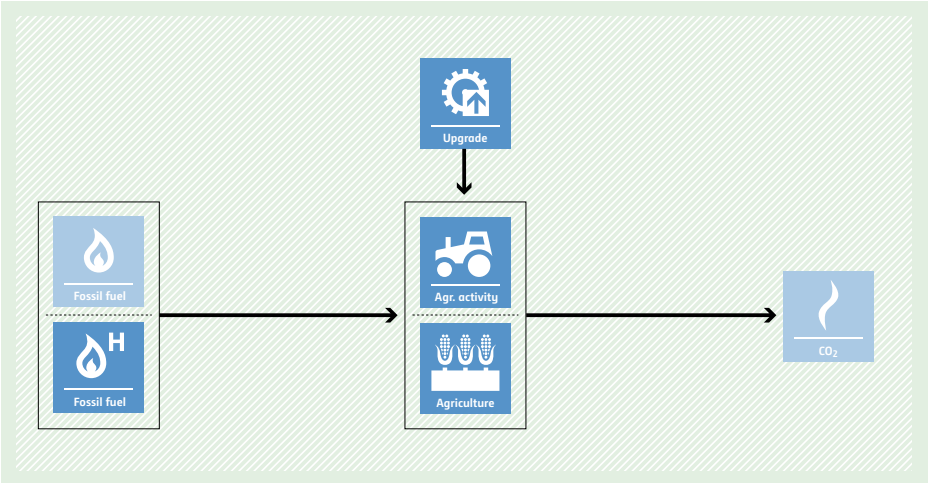
AMS-II.E. Energy efficiency and fuel switching measures for buildings

Women and children

Typical project(s)	Implementation of energy efficiency measures in new or existing residential, commercial or institutional building units, e.g. use of efficient appliances, better insulation and optimal arrangement of equipment, BEMS (Building Energy Management Systems) and switching from oil to gas.
Type of GHG emissions mitigation action	• Energy efficiency. Electricity and/or fuel savings through energy efficiency improvement. Optionally, use of less-carbon-intensive fuel.
Important conditions under which the methodology is applicable	• Energy use within the project boundary shall be directly measured; • The impact of the implemented measures (improvements in energy efficiency) can be clearly distinguished from changes in energy use due to other variables not influenced by the project.
Important parameters	At validation: • Electricity and fuel that would have been consumed by the baseline building unit; • Number of occupants of residential baseline building unit; • Hours of operation of commercial and institutional baseline building unit; • Heating Degree Days (HDD) and Cooling Degree Days of the region where the building is located; • Specific CO_2 emissions per occupant; • Specific CO_2 emissions per m^2 (if standardized baseline is applied). Monitored: • Electricity and fuel consumed by the building; • Number of occupants of residential baseline building unit; • Hours of operation of commercial and institutional baseline building unit; • Heating Degree Days (HDD) and Cooling Degree Days of the region where the building is located; • Floor area of the building.
BASELINE SCENARIO Consumption of electricity and heat due to (i) less-efficient and/or more-carbon-intensive equipment and (ii) less-efficient construction features in buildings.	
PROJECT SCENARIO Consumption of less electricity and heat due to (i) more-efficient and/or less-carbon-intensive equipment and (ii) more-efficient construction features in buildings.	

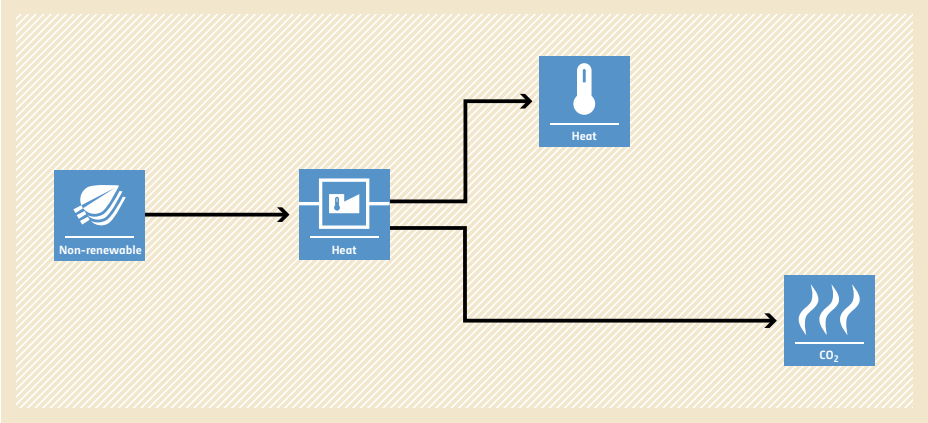
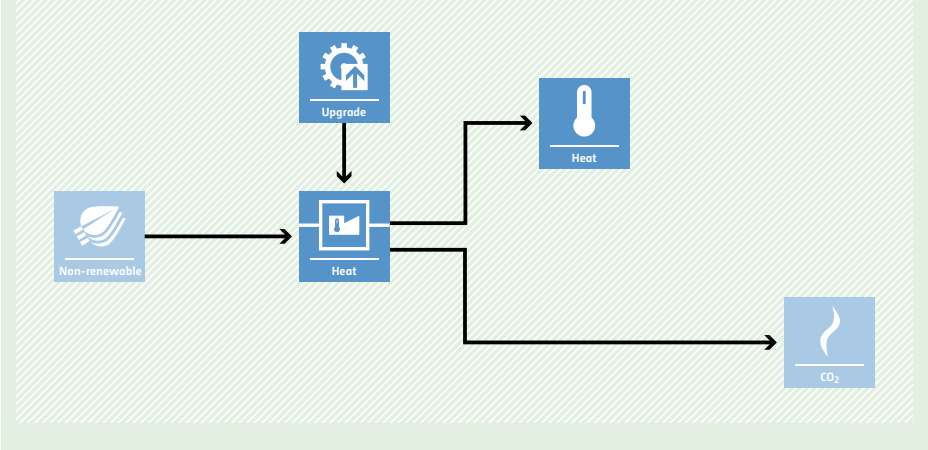
AMS-II.F. Energy efficiency and fuel switching measures for agricultural facilities and activities

Women and children

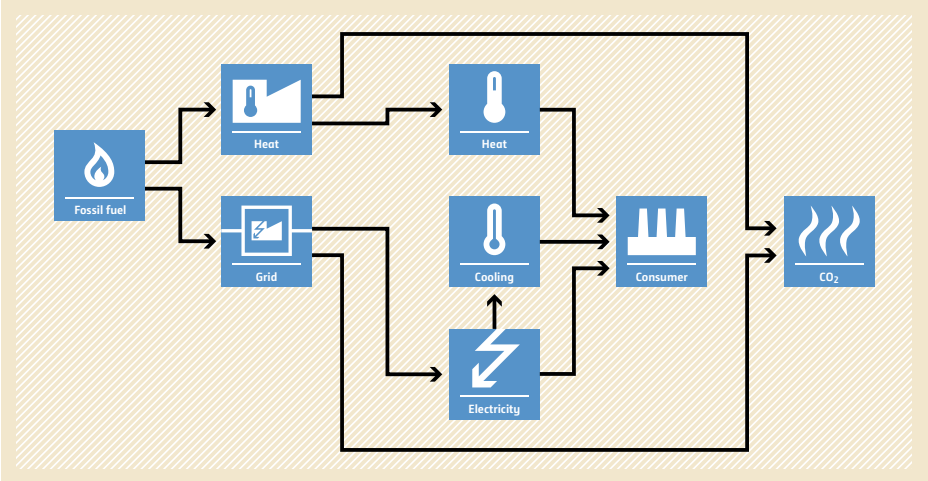
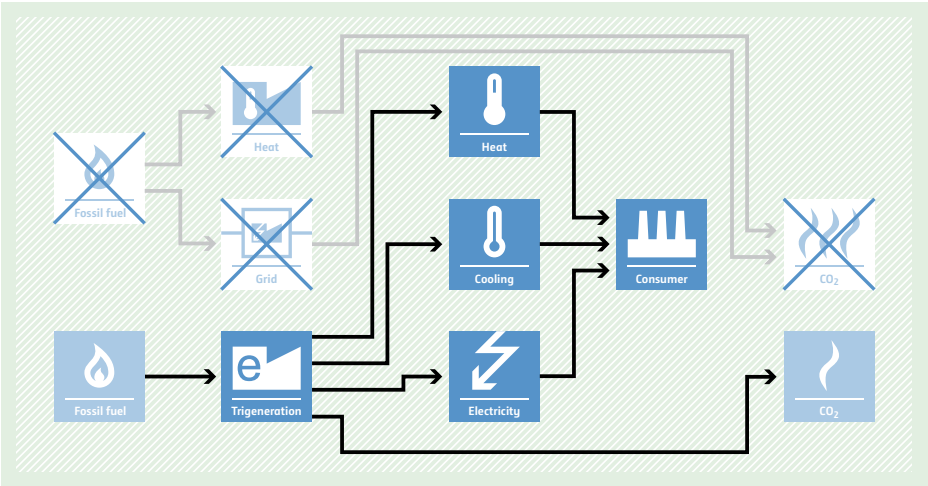
Typical project(s)	Energy efficiency and fuel switching measures implemented in agricultural activities or facilities or processes. Examples for such measures are efficient irrigation (e.g. adoption of drip/sprinkler irrigation to substitute flood irrigation), measures leading to a reduced requirement of farm power per unit area of land, as well as reducing fuel consumption in agriculture, such as reduced machinery use through, (e.g. elimination of tillage operations).
Type of GHG emissions mitigation action	• Energy efficiency; • Fuel switch. Displacement of more-GHG-intensive agricultural service(s).
Important conditions under which the methodology is applicable	• Installation of new equipment and/or retrofit of existing equipment is eligible; • Baseline and project scenarios of fuel consumption shall be demonstrated against reference agriculture activities, including cultivated average and crop yield.
Important parameters	Monitored: • Applicable for retrofits: the energy use of the agriculture facility, processes or the equipment affected; • Applicable for installation of new equipment: the energy use of the agriculture facility, processes or the equipment installed; • The characteristics and scale of the agriculture activities such as number of ha cultivated, crop yield.
BASELINE SCENARIO Installation and use of less-efficient agriculture facilities, processes and equipment.	
PROJECT SCENARIO Due to retrofitting and/or new installations, more-efficient agriculture facilities, processes and equipment are utilized resulting in reduced GHG emissions.	

AMS-II.G. Energy efficiency measures in thermal applications of non-renewable biomass

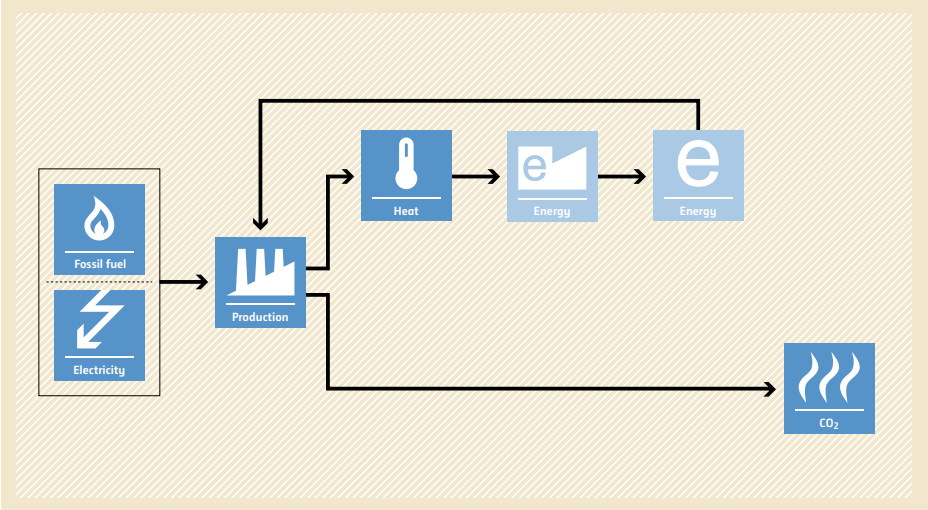
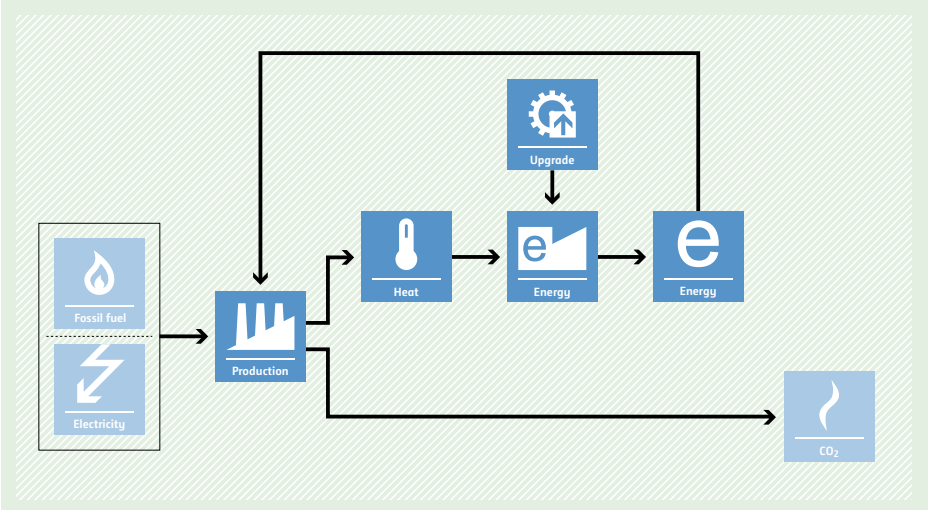
Women and children

Typical project(s)	Introduction of new efficient thermal energy generation units, e.g. efficient biomass fired cook stoves or ovens or dryers or retrofitting of existing units to reduce the use of nonrenewable biomass for combustion.
Type of GHG emissions mitigation action	• Energy efficiency. Displacement or energy efficiency enhancement of existing heat generation units results in saving of non-renewable biomass and reduction of GHG emissions.
Important conditions under which the methodology is applicable	• It shall be demonstrated that non-renewable biomass has been used since 31 December 1989; • The methodology is applicable to single pot or multi pot portable or in-situ cook stoves with rated efficiency of at least 25 per cent.
Important parameters	Monitored: • Annual or biennial check of operation of the project appliances (e.g. by representative sample); • Annual check of the efficiency of the project appliances (e.g. by representative sample). Other options to determine efficiency include a sample survey of the devices in the first batch and applying default annual efficiency drop values; • Fraction of woody biomass saved by the project activity that can be established as non-renewable biomass, as per the methodological tool "Calculation of fraction of non-renewable biomass"; • Leakage: the amount of woody biomass saved under the project that is used by non-project households/users (who previously used renewable energy sources) shall be assessed from surveys.
BASELINE SCENARIO Continuation of the current situation, i.e. use of nonrenewable biomass as fuel for the existing, less-efficient thermal applications.	
PROJECT SCENARIO Installation of more-efficient thermal energy generation units utilizing non-renewable biomass and/or complete replacement of existing less-efficient thermal applications and/or retrofitting of existing thermal energy generating appliances reduces GHG emissions by saving nonrenewable biomass.	

AMS-II.H. Energy efficiency measures through centralization of utility provisions of an industrial facility

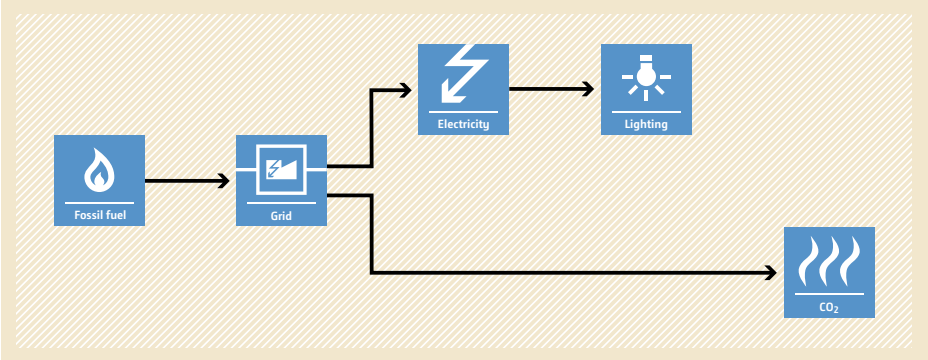
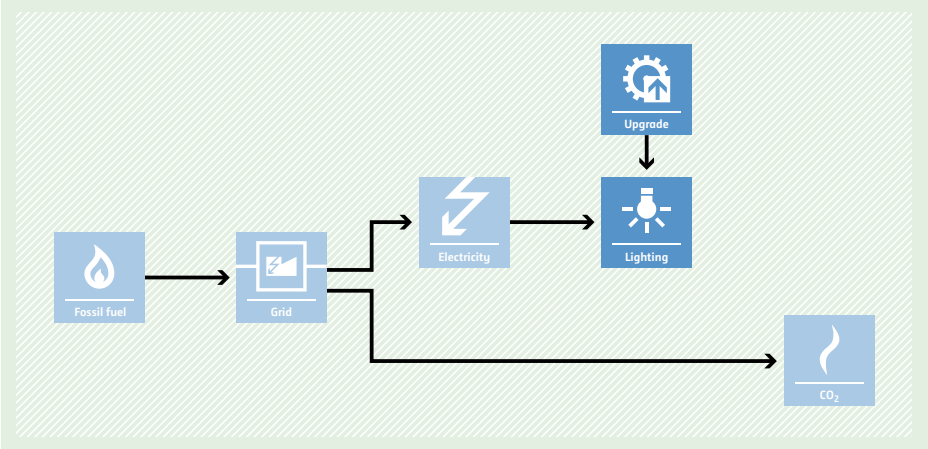
Typical project(s)	Energy efficiency measures implemented through integration of a number of utility provisions into one single utility to produce power and heat and/or cooling (i.e. cogeneration/trigeneration systems) in an existing or new industrial facility.
Type of GHG emissions mitigation action	• Energy efficiency. Displacement of several more-GHG-intensive utilities by a single, centralized utility.
Important conditions under which the methodology is applicable	• Displacement of cogeneration or trigeneration systems is not allowed; • For existing system, three years of historical data is required; • Definition of natural gas applies; • Project equipment containing refrigerants shall have no global warming potential and no ozone depleting potential.
Important parameters	At validation: • Definition of a reference baseline plant that would have been built in absence of the project; • Grid emission factor (can also be monitored ex post). Monitored: • Amount of electricity supplied to the industrial facility and/or the grid; • Quantity of fossil fuel and grid electricity consumed by the project; • Electrical and thermal energy delivered by the project.
BASELINE SCENARIO Production of power/heat/cooling in separate element processes, e.g. grid and/or captive fossil-fuel-fired power plant, fossil-fuel-fired boiler for heat and electrical compression chillers for cooling.	
PROJECT SCENARIO Simultaneous production of power/heat/cooling energy using cogeneration/trigeneration system, thus saving energy and reducing GHG emissions.	

AMS-II.I. Efficient utilization of waste energy in industrial facilities

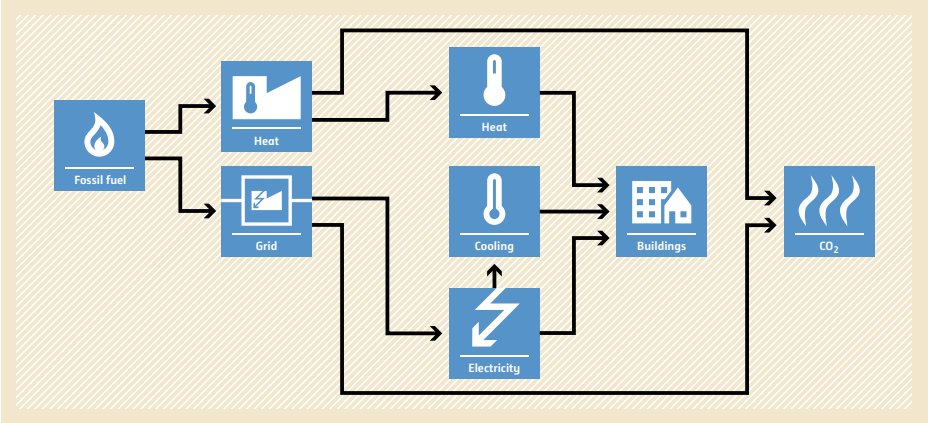
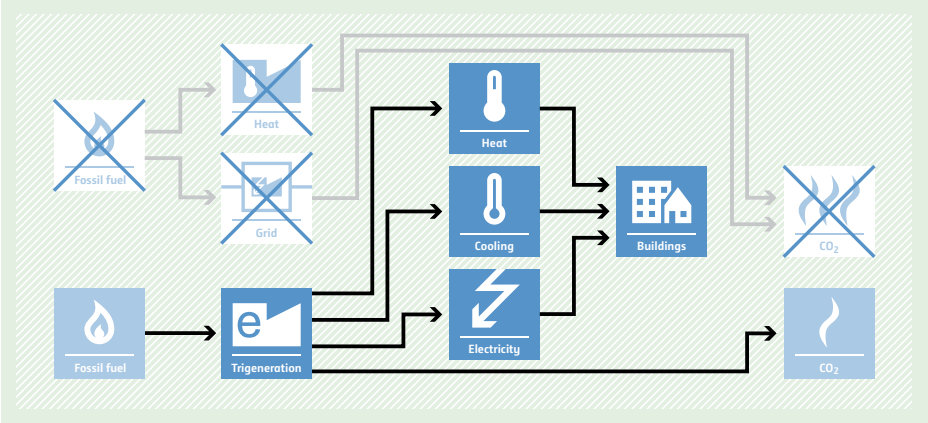
Typical project(s)	Energy efficiency improvement of an electricity or thermal energy generation unit, which is based on recovery of waste energy from a single source at an industrial, mining or mineral production facility.
Type of GHG emissions mitigation action	• Energy efficiency. Enhancement of waste energy recovery to replace more-GHG-intensive service.
Important conditions under which the methodology is applicable	• Production process and production outputs are homogenous in the baseline and project scenario; • Improvements in efficiency in the project are clearly distinguishable from other variables not attributable to the project; • There is no auxiliary fuel and/or co-firing for energy generation; • Methodology is not applicable to retrofitting of existing facilities to increase production outputs.
Important parameters	At validation: • Energy generation ratio of baseline equipment. Monitored: • Energy produced and consumed by the generating unit; • Production output of the facility.
BASELINE SCENARIO Continuation of the use of a less-efficient waste energy recovery system.	
PROJECT SCENARIO Use of a more-efficient waste energy recovery system, thus leading to higher energy gains and thereby replacement of energy provided by more-GHG-intensive means.	

AMS-II.J. Demand-side activities for efficient lighting technologies

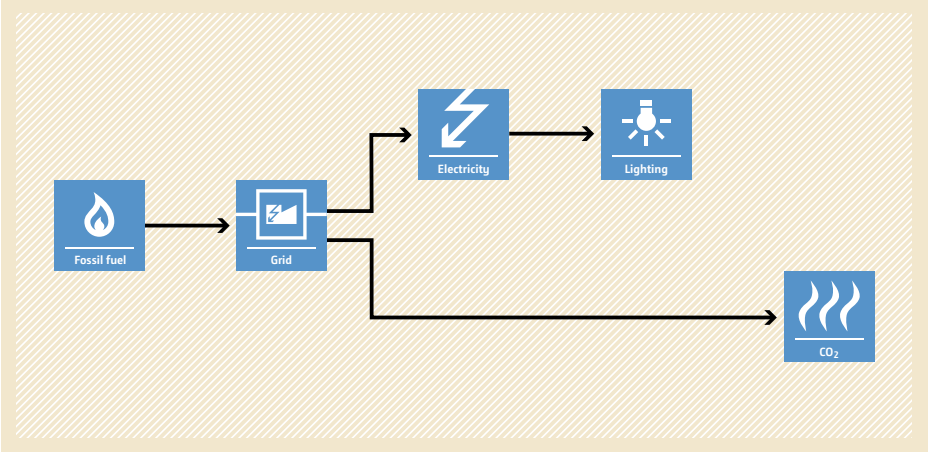
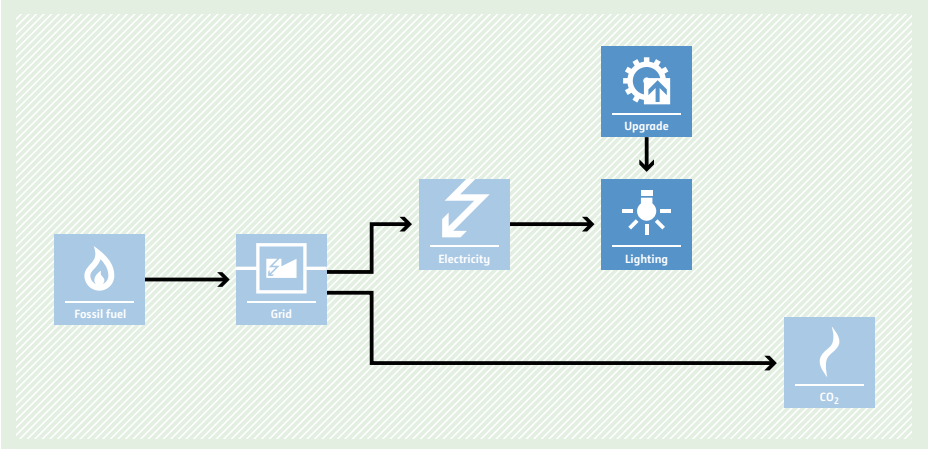
Women and children

Typical project(s)	Activities for adoption of energy efficient light bulbs (e.g. CFLs and LED lamps) to replace less efficient light bulbs in residential applications.
Type of GHG emissions mitigation action	• Energy efficiency. Displacement of more-GHG-intensive lighting by technology switch.
Important conditions under which the methodology is applicable	• Total light output of the project lamp should be equal to or more than that of the baseline lamp being replaced and project lamps shall, in addition to the standard lamp specifications, be marked for clear unique identification for the project; • Rated average life of the efficient light bulbs shall be known ex ante and the CDM PDD shall cite the standard used by the manufacturer; • Determination of daily operating hours: either default value of 3.5 hours or measured value.
Important parameters	At validation: • Average life time of the project lamp (can also be monitored ex post); • The number and power of the replaced baseline lamps; • Number of project lamps distributed under the project, identified by the type of project lamps and the date of supply; • Grid emission factor (can also be monitored ex post). Monitored: • If applicable: measurement of average daily operating hours; • Lamp failure rate surveys.
BASELINE SCENARIO Incandescent lamps (ICLs) are used for lighting in households.	
PROJECT SCENARIO Efficient light bulbs for lighting replace less efficient light bulbs thus reducing electricity consumption and GHG emissions.	

AMS-II.K. Installation of co-generation or tri-generation systems supplying energy to commercial buildings

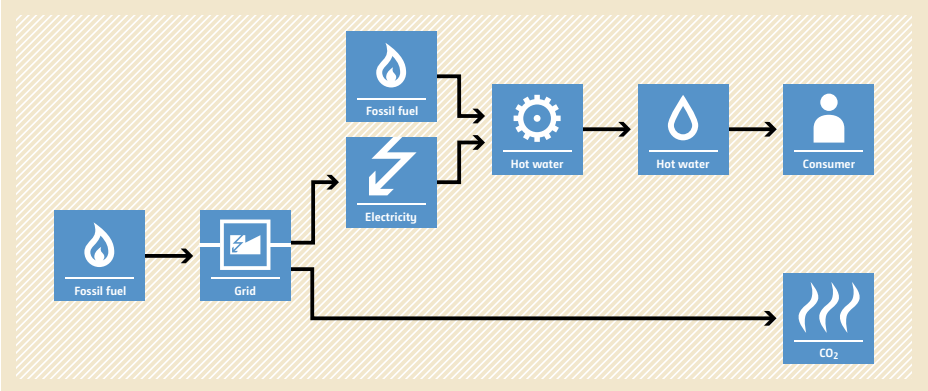
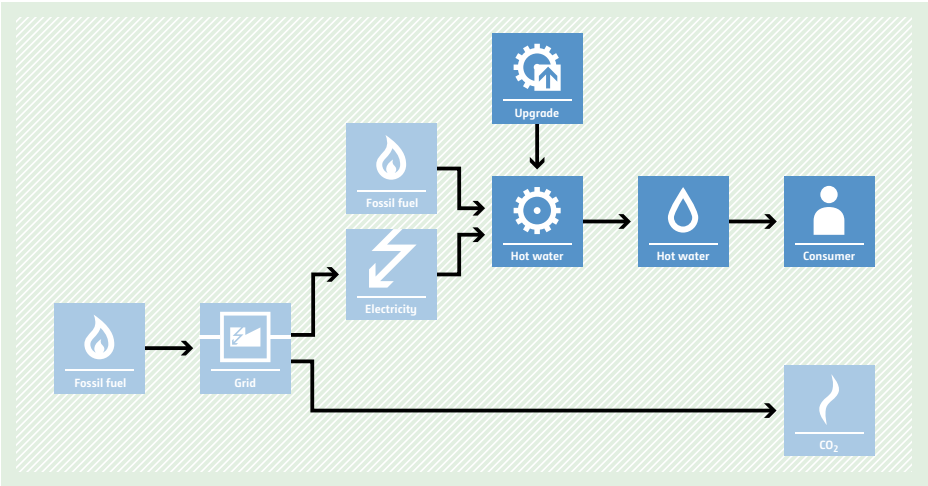
Typical project(s)	Installation of fossil-fuel-based cogeneration or trigeneration systems. Generated electricity and cooling, and/or heating are supplied to commercial, non-industrial buildings.
Type of GHG emissions mitigation action	• Energy efficiency. Electricity and/or fuel savings through energy efficiency improvement.
Important conditions under which the methodology is applicable	• Applicable to installation of new systems that replace or supplement existing systems that supply electricity (grid or on-site generation) and cooling (e.g. chillers) and/or heating systems (e.g. boilers) or electricity and cooling and/or heating systems that would have been built and utilized; • Not applicable to the replacement of existing cogeneration or trigeneration systems; • If it is identified that the baseline situation is the continued use of an existing system then the existing system must have been in operation for at least the immediately prior three years; • If project equipment contains refrigerants, these refrigerants shall have no ozone depleting potential.
Important parameters	At validation: • Grid emission factor (can also be monitored ex post) and/or baseline captive power plants; • Coefficient of Performance (COP) of baseline chillers; • Efficiency of baseline steam generation systems. Monitored: • Amount of grid and/or captive power supplied by the project; • Amount of cooling and/or heating energy supplied by the project.
BASELINE SCENARIO Separate generation of power/ heat/cooling supplied to commercial, non-industrial buildings.	
PROJECT SCENARIO Simultaneous production of power/heat/cooling using a co- or trigeneration system for supplying commercial, non-industrial buildings.	

AMS-II.L. Demand-side activities for efficient outdoor and street lighting technologies

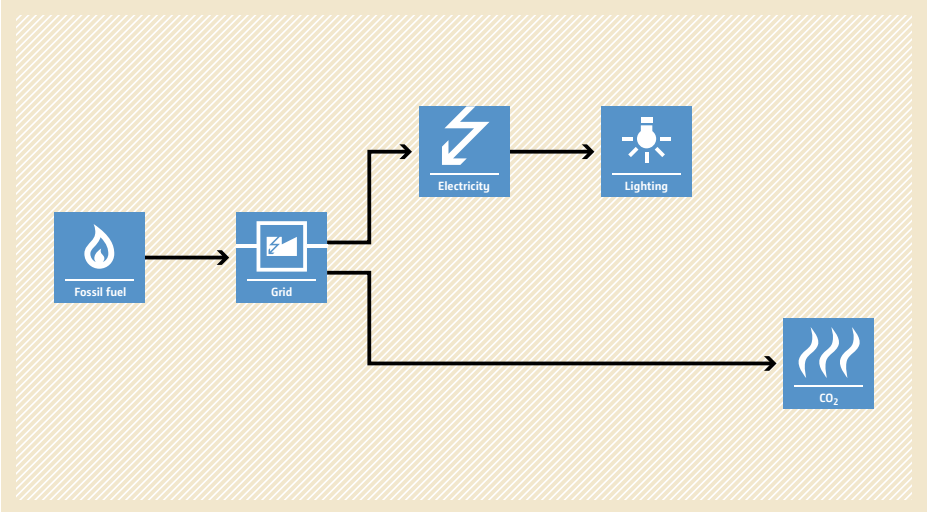
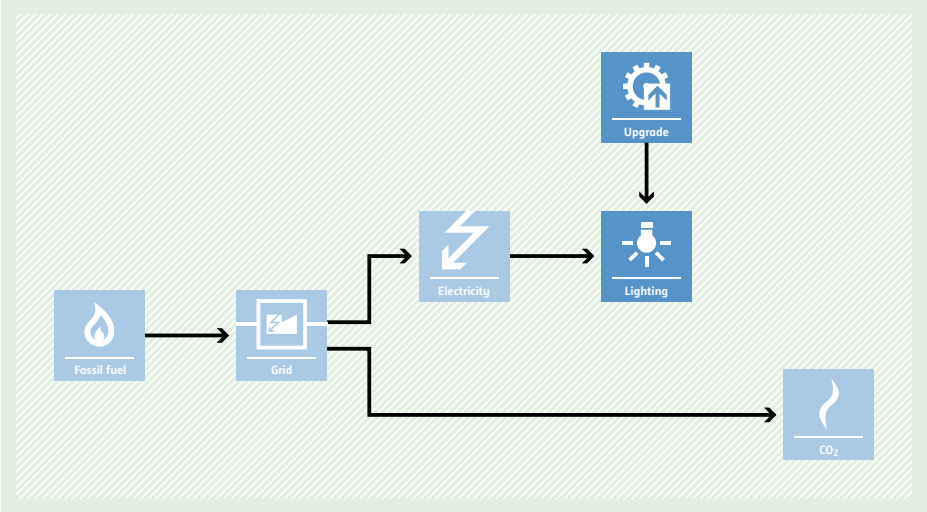
Typical project(s)	Adoption of energy efficient lamps and/or fixture combinations to replace less efficient lamps and/or fixture combinations in public- or utility-owned street lighting systems.
Type of GHG emissions mitigation action	• Energy Efficiency. Displacement of less-efficient lighting by more-efficient technology.
Important conditions under which the methodology is applicable	• Limited to public- or utility-owned street lighting systems; • Allows multiple-for-multiple lamps replacements; • Requires continuous replacement of failed lamps; • Includes new construction (Greenfield) installations; • Identify baseline technology for Greenfield, using the data from the region • Ensure that lighting performance quality of project lamps be equivalent or better than the baseline or applicable standard; • No mandatory destruction of replaced lamps required.
Important parameters	Monitored: • Average time elapsed between failure of luminaires and their replacement; • Annual failure rate; • Average annual operating hours; • Average project equipment power; • Number of project luminaires placed in service and operating under the project activity.
BASELINE SCENARIO Less efficient lamps are used in street lighting systems.	
PROJECT SCENARIO Efficient lighting replaces less efficient lighting thus reducing electricity consumption and GHG emissions.	

AMS-II.M. Demand-side energy efficiency activities for installation of low-flow hot water savings devices

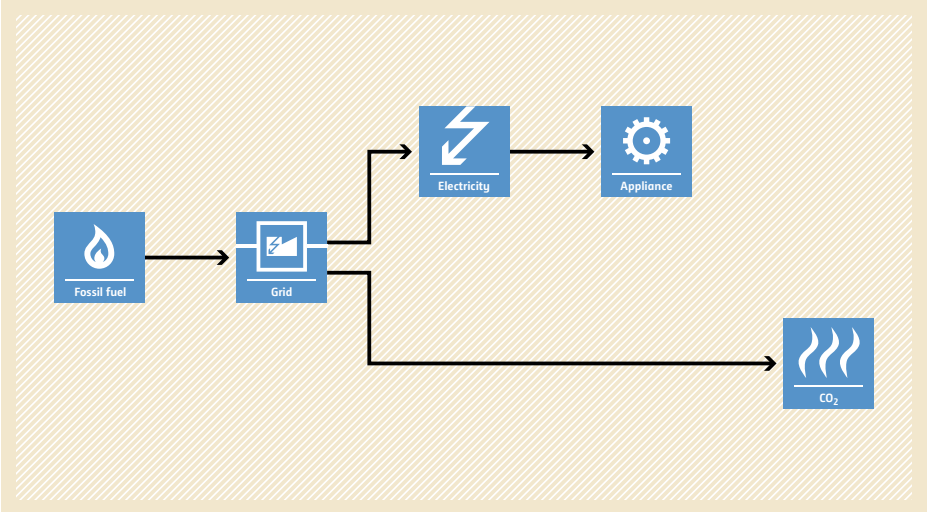
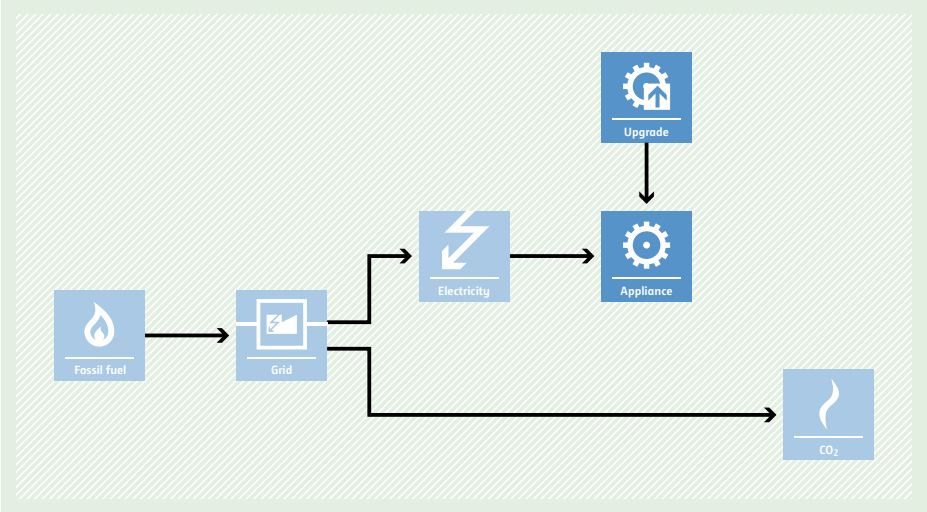
Women and children

Typical project(s)	Activities for direct installation of low-flow hot water savings devices used in residential buildings, e.g. low-flow showerheads, kitchen faucets and bathroom faucets.
Type of GHG emissions mitigation action	Energy Efficiency. • Fuel or electricity savings through the installation of low-flow hot water savings devices.
Important conditions under which the methodology is applicable	• The project devices (PD) must contain integral, non-removable flow restrictions; • Only retrofit projects are allowable; • One year warranty of the PD; • Compliance to applicable standards of the PD; • Equivalent level of service (functional comfort and cleaning performance); • PD are directly installed and tested to be functional; • PD are marked for clear unique identification; • Method for collection, destruction and/or recycling of baseline devices; • Procedures to eliminate double counting are explained.
Important parameters	At validation: • Measured flow rate of baseline device (litres/minute). Monitored: • Measured flow rate of project device (litres/minute); • Measured amount of water used by project device (litres); • Temperature of hot water (Maximum 40°C); • Temperature of cold water (Minimum 10°C); • Determine the number of low-flow devices installed and operating.
BASELINE SCENARIO Less efficient hot water devices are used in residential buildings. More water, that requires heating by electricity or fossil fuel, is consumed.	
PROJECT SCENARIO Efficient (low-flow) hot water devices replace less efficient hot water devices thus reducing the amount of water that requires heating by electricity or fossil fuel.	

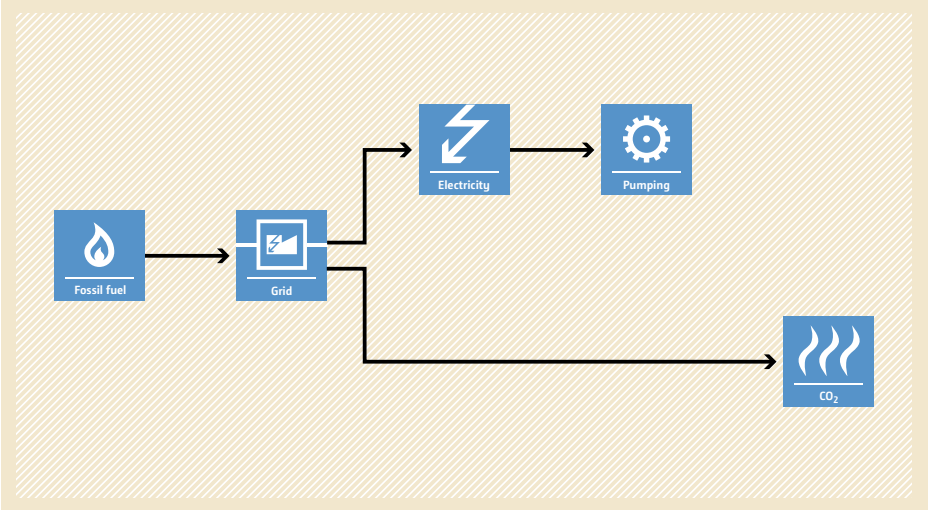
AMS-II.N. Demand-side energy efficiency activities for installation of energy efficient lighting and/or controls in buildings

Typical project(s)	Retrofits of existing electric lighting fixtures, lamps, and/or ballasts with more energy-efficient fixtures, lamps, and/or ballasts; and installation of lighting controls.
Type of GHG emissions mitigation action	• Energy efficiency. Displacement of more-GHG intensive service.
Important conditions under which the methodology is applicable	• Only retrofit projects involving direct installation (or delamping) of equipment are allowable; • This methodology is applicable to non-residential and multi-family residential buildings supplied with grid electricity; • Collection, destruction and/or recycling of baseline devices are required.
Important parameters	Monitored: • Number, type and wattage of project fixtures/lamps/ballasts/ballast factors and/or control systems installed under the project activity; • Grid emission factor.
BASELINE SCENARIO Electricity is used for inefficient commercial lighting.	
PROJECT SCENARIO Installation of energy efficient lighting and/or controls in commercial buildings.	

AMS-II.O. Dissemination of energy efficient household appliances

Typical project(s)	Project activities that increase sales dissemination of new household appliances, specifically refrigerating appliances (refrigerators) that have very high efficiencies.
Type of GHG emissions mitigation action	• Energy efficiency. Displacement of more-GHG intensive service.
Important conditions under which the methodology is applicable	• Only appliance models utilising refrigerants and foam blowing agents having no ozone depleting potential (ODP) and low global warming potential (GWP <15); • The project refrigerators are designed to run on electricity; • The manufacturers of the project refrigerators are ISO 9001 certified at the time of validation to ensure data reliability.
Important parameters	• Number of refrigerators of each model type disseminated, and their serial and model numbers; • Electricity consumption of each refrigerator model disseminated; • Historical sales of the project appliances.
BASELINE SCENARIO Electricity is consumed by inefficient household appliances.	
PROJECT SCENARIO Installation of energy efficient household appliances in households consuming less electricity.	

AMS-II.P. Energy efficient pump-set for agriculture use

Typical project(s)	Project activities that adopt energy efficient pump-sets that run on grid electricity at one or more agricultural sites.
Type of GHG emissions mitigation action	• Energy efficiency. Electricity (and fossil fuel) savings through energy efficiency improvement.
Important conditions under which the methodology is applicable	• The project pump-set efficiency shall be higher than the baseline pump-set for the whole range of operating conditions; • The methodology is not applicable for retrofitting pump-sets (e.g. replacement of impellers); • Water output corresponding to the initial head shall be higher or at least equal to that of the baseline pump-set water output at the initial head.
Important parameters	At validation: • Water flow rate and head of replaced pump-sets; • Performance curves of replaced pump-sets.
	Monitored: • Number of pump-sets installed and remain operating; • Performance curves of project pump-sets; • Operating hours of project pump-sets.
BASELINE SCENARIO Inefficient pump-sets are used for agricultural irrigation.	
PROJECT SCENARIO Introduction of efficient pump-set for agricultural irrigation.