Carbon Credits (Carbon Farming Initiative—Electricity Generation from Landfill Gas) Methodology Determination 2021

made under the

Carbon Credits (Carbon Farming Initiative) Act 2011

Compilation No. 1

Compilation date: 20 January 2022

Includes amendments up to: *Carbon Credits (Carbon Farming Initiative—Electricity Generation from Landfill Gas) Methodology Determination Variation 2022*

Prepared by the Clean Energy Regulator

About this compilation

This compilation

This is a compilation of the *Carbon Credits (Carbon Farming Initiative—Electricity Generation from Landfill Gas) Methodology Determination 2021* that shows the text of the law as amended and in force on 20 January 2022 (the ***compilation date***).

Uncommenced amendments

The effect of uncommenced amendments is not shown in the text of the compiled law. Any uncommenced amendments affecting the law are accessible on the Legislation Register (www.legislation.gov.au). The details of amendments made up to, but not commenced at, the compilation date are underlined in the endnotes. For more information on any uncommenced amendments, see the series page on the Legislation Register for the compiled law.

Application, saving and transitional provisions for provisions and amendments

If the operation of a provision or amendment of the compiled law is affected by an application, saving or transitional provision that is not included in this compilation, details are included in the endnotes.

Modifications

If the compiled law is modified by another law, the compiled law operates as modified but the modification does not amend the text of the law. Accordingly, this compilation does not show the text of the compiled law as modified. For more information on any modifications, see the series page on the Legislation Register for the compiled law.

Self-repealing provisions

If a provision of the compiled law has been repealed in accordance with a provision of the law, details are included in the endnotes.

Contents

Part 1—Preliminary

1 Name

This is the *Carbon Credits (Carbon Farming Initiative—Electricity Generation from Landfill Gas) Methodology Determination 2021*.

2 Commencement

This determination commences on the day after it is registered.

3 Authority

This determination is made under subsection 106(1) of the *Carbon Credits (Carbon Farming Initiative) Act 2011*.

4 Duration

This determination remains in force for the period that:

(a) begins when the determination commences; and

(b) unless the determination is sooner revoked, ends on the day before this determination would otherwise be repealed under subsection 50(1) of the *Legislation Act 2003*.

5 Definitions

In this determination:

2015 LFG determination means the *Carbon Credits (Carbon Farming Initiative—Landfill Gas) Methodology Determination 2015*.

Act means the *Carbon Credits (Carbon Farming Initiative) Act 2011*.

anaerobic digestion means a biological process in which organic matter is broken down by microorganisms in the absence of oxygen.

biogas means a mixture of gases including methane that is generated as a result of anaerobic digestion and includes landfill gas.

biogas source facility, in relation to a project, means a facility that supplies biogas to be treated as part of the project so as to produce biomethane and includes:

(a) a facility producing biogas for a project biomethane facility; and

(b) in cases where the biogas is produced at a project biomethane facility—that project biomethane facility.

Note: A biomethane facility can be its own biogas source facility if the biomethane facility also produces biogas to be treated by carrying out biomethane production.

biogas upgrading means the process by which biogas is refined and stripped of impurities to produce biomethane, which may include (but is not limited to):

(a) pre-treatment processing of biogas; or

(b) the drying or scrubbing of biogas; or

(c) post-treatment processing compression of the refined biomethane produced by the process.

biogas upgrading system means a system of equipment that is capable of undertaking biogas upgrading.

biogas waste means putrescible organic waste material that can be treated through anaerobic digestion to produce biogas.

biomethane means a high-methane content gas that is:

(a) produced by biogas upgrading; and

(b) suitable for use as a natural gas substitute.

biomethane conversion and displacement project has the meaning given by section 12B.

biomethane displacement-only project has the meaning given by section 12C.

biomethane facility means a facility:

(a) at which biomethane production is undertaken or intended to be undertaken; and

(b) from which the resulting biomethane is sent, or is proposed to be sent, to an end use where it can reasonably be expected to be combusted within Australia as a natural gas substitute.

Note 1: If biogas upgrading occurs at the project landfill, the project landfill may also be a biomethane facility.

Note 2: Biomethane facilities that are used in a landfill gas (electricity generation) project that involve landfill gas capture for biomethane become known as project biomethane facilities.

Note 3: The section 22 application or section 128 application for a biomethane conversion and displacement project or a biomethane displacement-only project, and the section 22 application for a restarting biomethane conversion and displacement project or a restarting biomethane displacement-only project, must include details of at least one project biomethane facility (see paragraphs 13B(2)(d)).

biomethane production has the meaning given by subsection 8A(3).

carbon tax waste, in relation to a landfill, means waste that was deposited in the landfill between 1 July 2012 and 30 June 2014.

collection efficiency, of a landfill gas collection system at a landfill, means the proportion of landfill gas generated by the landfill that is collected and combusted by the landfill gas collection system, expressed as a percentage.

combustion device means:

(a) a flare, boiler or internal combustion engine that is operated in accordance with the manufacturer's instructions; or

(b) a device:

(i) that combusts landfill gas with a destruction efficiency of at least 98%; and

(ii) that is operated in accordance with the manufacturer's instructions; and

(iii) the combustion process of which is controlled using a monitoring and control system.

complete, in relation to the combustion of landfill gas or biomethane, is combustion with a destruction efficiency of 98% or more of the methane.

conversion abatement, in relation to a project, means the carbon dioxide equivalent net abatement amount for a reporting period (worked out in accordance with Division 2 of Part 4) attributable to the conversion of methane (CH_4) to carbon dioxide (CO_2) by carrying out:

(a) landfill gas capture for biomethane; or

(b) emissions destruction.

Note : Landfill gas capture for biomethane involves sending landfill gas to a biogas upgrading system to be turned into biomethane. This landfill gas is considered to have its methane component converted to carbon dioxide, as if it had been sent to a combustion device, because subsequent usage of the biomethane results in its combustion.

daily/operational cover, in relation to a landfill, means the area of the landfill normally covered by material used to cover a day's deposition of waste in active landfill waste disposal areas of the landfill.

displacement abatement, in relation to a project, means the carbon dioxide equivalent net abatement amount for a reporting period (worked out in accordance with Division 3 of Part 4) attributable to biomethane production.

eligible biogas means:

(a) biogas produced from eligible biogas waste; or

(b) landfill gas.

eligible biogas waste means biogas waste that is:

(a) eligible animal effluent biogas waste within the meaning of the *Carbon Credits (Carbon Farming Initiative—Animal Effluent Management) Methodology Determination 2019*; or

(b) mixed solid waste within the meaning of the *Carbon Credits (Carbon Farming Initiative—Alternative Waste Treatment) Methodology Determination 2015*; or

(c) eligible organic material within the meaning of the *Carbon Credits (Carbon Farming Initiative—Source Separated Organic Waste) Methodology Determination 2016*; or

(d) domestic or commercial wastewater, or industrial wastewater, within the meaning of the *Carbon Credits (Carbon Farming Initiative—Domestic, Commercial and Industrial Wastewater) Methodology Determination 2015*.

Note : The proportion of eligible waste used to generate biogas to be treated by biomethane production within the project must be able to be determined.

emissions destruction has the meaning given by subsection 8A(4).

final cover, in relation to a landfill, means the area of the landfill normally covered by material used to cover previously active landfill waste disposal areas of the landfill that have reached final height and are unlikely to be used for waste disposal again.

forerunner project:

(a) in relation to a restarting biomethane conversion and displacement project—has the meaning given by paragraph 12D(1)(a); or

(b) in relation to a restarting biomethane displacement-only project—has the meaning given by paragraph 12E(a).

intermediate cover, in relation to a landfill, means the area of the landfill normally covered by material used to cover previously active landfill working areas that will not be used for waste disposal for an extended period of time (typically a few weeks to a few months).

landfill means a site where waste is or was buried under a permission (however described) given under the law of a State or Territory.

landfill gas means gas generated from anaerobic decomposition of biological material at a landfill.

landfill gas capture for biomethane has the meaning given by subsection 8A(2).

landfill gas collection system means a system to collect and combust landfill gas.

landfill gas (electricity generation) project has the meaning given by subsection 7(3).

monitoring and control system has the meaning given by section 5A.

monitoring requirements means the requirements set out in section 36.

National Inventory Report means the report of that name produced by Australia in fulfilment of its obligations under the Climate Change Convention and the Kyoto Protocol, as in force from time to time.

Note: In 2019, the National Inventory Report could be accessed from http://www.environment.gov.au.

natural gas means a substance that:

(a) is in a gaseous state at standard temperature and pressure; and

(b) consists of naturally occurring hydrocarbons, or a naturally occurring mixture of hydrocarbons and non-hydrocarbons, the principal constituent of which is methane; and

(c) is suitable for consumption.

new project has the meaning given by section 9.

NGA Factors document means the document entitled "National Greenhouse Accounts Factors", published by the Department and as in force from time to time.

Note: In December 2021, the NGA Factors document could be viewed on the Department's website (http://www.industry.gov.au).

NGER (Measurement) Determination means the *National Greenhouse and Energy Reporting (Measurement) Determination 2008*.

non-biomethane project has the meaning given by section 12A.

non-monitored period has the meaning given by subsection 37(1).

project activity means an activity of the type listed in subsection 8A(1).

project biomethane facility, in relation to a project that involves biomethane production, means a biomethane facility that is used in carrying out the project.

Note: The section 22 application or section 128 application for a biomethane conversion and displacement project or a biomethane displacement-only project, and the section 22 application for a restarting biomethane conversion and displacement project or a restarting biomethane displacement-only project, must include details of at least one project biomethane facility (see paragraph 13B(2)(d)).

project emissions means project emissions for the purposes of sections 32B and 32P.

project landfill, in relation to a project that involves emissions destruction or landfill gas capture for biomethane, means the landfill at which the project is carried out.

project sub-type means a project of the sub-type listed in subsection 8B(2).

project type means a project of the type listed in subsection 8B(1).

recommencing project has the meaning given by section 10.

regulatory guidelines for landfill means guidelines that:

(a) establish policy and regulatory requirements for sustainable waste management and landfill performance; and

(b) are applied by environment agencies and environmental protection agencies (including such agencies in States and Territories).

Note: These guidelines typically cover the topics of siting, design, management or operation of landfills.

relevant transitioning (upgrade) project means a transitioning (upgrade) project that applied the 2015 LFG determination before the commencement of the *Carbon Credits (Carbon Farming Initiative—Landfill Gas) Methodology Determination Variation 2021*.

restarting biomethane conversion and displacement project has the meaning given by section 12D.

restarting biomethane displacement-only project has the meaning given by section 12E.

section 22 application, in relation to an offsets project, means an application under section 22 of the Act to declare the project as an eligible offsets project under this determination.

section 128 application, in relation to an eligible offsets project, means an application under section 128 of the Act to apply this determination to the project.

sub-facility zone has the same meaning as in section 5.22A of the NGER (Measurement) Determination.

transitioning project has the meaning given by section 12.

transitioning (continued) project has the meaning given by subsection 8B(3).

transitioning (new) project has the meaning given by subsection 8B(4).

transitioning (recommencing) project has the meaning given by subsection 8B(5).

transitioning (upgrade) project has the meaning given by subsection 8B(6).

upgrade project has the meaning given by subsection 11(1).

Note: Other words and expressions used in this determination have the meaning given by the Act. These terms include:

carbon abatement

carbon dioxide equivalent

crediting period

eligible carbon abatement

eligible offsets project

emission

greenhouse gas

offsets project

offsets report

project

project proponent

Regulator

reporting period.

5A Meaning of monitoring and control system

(1) For this determination, a ***monitoring and control system*** for a flare, means a system that consists of:

(a) a monitoring system that detects the flame of a flare and monitors if the flare is operating at the manufacturer's specifications for the complete combustion of methane; and

(b) an associated control system that shuts down landfill gas flow to the flare either when no flame is detected or when the flare is not operating at the manufacturer's specifications for the complete combustion of methane.

Note: An example of a monitoring and control system for a flare is a flare management system that incorporates a UV detection sensor.

(2) For this determination, a ***monitoring and control system*** for a biogas upgrading system is a system that:

(a) monitors the flow rate of landfill gas and biomethane; and

(b) monitors the operation and output of biogas upgrading systems; and

(c) is capable of automatically stopping biogas flow to the biogas upgrading system if it is not operating at the manufacturer's specification to enable biogas upgrading.

6 References to factors and parameters from external sources

(1) If a calculation in this determination includes a factor or parameter that is defined or calculated by reference to another instrument or writing, the factor or parameter to be used for a reporting period is the factor or parameter referred to in, or calculated by reference to, the instrument or writing as in force at the end of the reporting period.

(2) Subsection (1) does not apply if:

(a) the determination specifies otherwise; or

(b) it is not possible to define or calculate the factor or parameter by reference to the instrument or writing as in force at the end of the reporting period.

Part 2—Landfill gas (electricity generation) projects

7 Landfill gas (electricity generation) projects

(1) For aragraph 106(1)(a) of the Act, this determination applies to an offsets project in which either or both of the following occur, in a way that can be reasonably expected to result in eligible carbon abatement:

(a) landfill gas is collected and treated in a way that destroys methane; or

(b) landfill gas, with or without biogas produced from other biogas waste, is treated by biogas upgrading at a biomethane facility to produce biomethane which is then sent to an end use where it can reasonably be expected to be combusted within Australia as a natural gas substitute.

(2) However, an offsets project that collects landfill gas and combusts it with a flare is not covered by subsection (1) if the project:

(a) was previously an eligible offsets project covered by a methodology determination (**the first determination**) other than this determination; and

(b) during its crediting period or periods under the first determination, generated electricity by collecting and combusting landfill gas from a landfill; and

(c) was declared as an eligible offsets project under the first determination on the basis that:

(i) it would not generate electricity from landfill gas after its declaration as an eligible offsets project under the first determination; and

(ii) it would have a crediting period greater than zero under the first determination.

(3) A project covered by subsection (1) is a ***landfill gas (electricity generation) project***.

Part 3—Project requirements

Division 1—Operation of this Part

8 Operation of this Part

(1) For paragraph 106(1)(b) of the Act, Division 2 sets out the eligibility and project-specific requirements that must be met for each different type of landfill gas (electricity generation) project mentioned in section 7 to be an eligible offsets project.

(2) Division 3 specifies the information that is required to be included in a section 22 or section 128 application relating to a landfill gas (electricity generation) project.

(3) Division 4 sets out:

(a) for subparagraph 27(4A)(a)(ii) of the Act, requirements in lieu of the newness requirement for certain projects; and

(b) for subparagraph 27(4A)(b)(ii) of the Act, a requirement in lieu of the regulatory additionality requirement.

(4) For paragraph 69(3)(b) and subparagraph 70(3)(d)(ii) of the Act, Division 5 specifies the crediting period for a landfill gas (electricity generation) project.

Division 2—Project specific requirements

8A Project activities

(1) A landfill gas (electricity generation) project must include one or more of the following types of activities (which are called ***project activities*** in this determination):

(a) landfill gas capture for biomethane;

(b) biomethane production;

(c) emissions destruction.

(2) ***Landfill gas capture for biomethane*** involves:

(a) collecting landfill gas; and

(b) sending that landfill gas to a biogas upgrading system that is part of a project biomethane facility.

Note: Conversion abatement from landfill gas capture for biomethane only occurs when biomethane produced from landfill gas as part of the project can reasonably be expected to be combusted within Australia as a natural gas substitute.

(3) ***Biomethane production*** involves:

(a) treating biogas, which includes landfill gas, by biogas upgrading to produce biomethane at a project biomethane facility, with or without biogas produced from other biogas waste; and

(b) sending the biomethane to an end use where it can reasonably be expected to be combusted within Australia as a natural gas substitute.

Note 1: Acceptable end uses may include sale and transport to a gas retailer or gas consumer, or on-site combustion for heat or power.

Note 2: Combustion of biomethane may occur on-site at the biomethane facility, or off-site if the biomethane is transported from the biomethane facility to an end user. This may be through injection into a gas distribution or transmission network, transport via road, or another gas transport mechanism.

(4) ***Emissions destruction*** involves:

(a) collecting landfill gas; and

(b) destroying the proportion of the biogas that is methane using a combustion device.

8B Project types and sub-types

(1) A landfill gas (electricity generation) project that is an eligible offsets project may be of one of the following types (which are called ***project types*** in this determination):

(a) a non-biomethane project;

(b) a biomethane conversion and displacement project;

(c) a biomethane displacement-only project;

(d) a restarting biomethane conversion and displacement project;

(e) a restarting biomethane displacement-only project.

(2) A non-biomethane project or a biomethane conversion and displacement project must be of one of the following types (which are called ***project sub-types*** in this determination):

(a) a new project;
(b) a recommencing project;
(c) an upgrade project;
(d) a transitioning project;
(e) a transitioning (continued) project;
(f) a transitioning (new) project;
(g) a transitioning (recommencing) project;
(h) a transitioning (upgrade) project.

Note 1: Section 12D sets out which project sub-type a restarting biomethane conversion and displacement project is to be credited as, based on its forerunner project.

Note 2: The project sub-type is relevant for working out the baseline conversion abatement in accordance with Subdivision 4 of Division 2 of Part 4.

Note 3: Biomethane displacement-only projects and restarting biomethane displacement-only projects do not have project sub-types as the net abatement for these project types does not involve conversion abatement.

(3) If the Regulator approves a section 128 application for an eligible offsets project that was a transitioning project (within the meaning of the 2015 LFG determination) when the application was made, that project is a ***transitioning (continued) project*** (with effect from the start of the reporting period in which the application was made).

(4) If the Regulator approves a section 128 application for an eligible offsets project that was a new project (within the meaning of the 2015 LFG determination) when the application was made, that project is a ***transitioning (new) project*** (with effect from the start of the reporting period in which the application was made).

(5) If the Regulator approves a section 128 application for an eligible offsets project that was a recommencing project (within the meaning of the 2015 LFG determination) when the application was made, that project is a ***transitioning (recommencing) project*** (with effect from the start of the reporting period in which the application was made).

(6) If the Regulator approves a section 128 application for an eligible offsets project that was an upgrade project (within the meaning of the 2015 LFG determination) when the application was made, that project is a ***transitioning (upgrade) project*** (with effect from the start of the reporting period in which the application was made).

Note: Crediting for relevant transitioning (upgrade) projects would consider 2 years or, if data is available to the project proponent for that period, 3 years of previous data under section 32, if the project proponent does not have 4 years of previous data available.

8C Requirement for projects involving landfill gas capture for biomethane

A landfill gas (electricity generation) project that involves landfill gas capture for biomethane or emissions destruction may involve only one project landfill.

9 Requirements for new projects

A ***new project*** must:

(a) collect landfill gas by installing a landfill gas collection system at a landfill for which no such system has previously been installed; and

(b) treat collected gas by emissions destruction or landfill gas capture for biomethane.

10 Requirements for recommencing projects

A ***recommencing project*** must:

(a) recommence landfill gas collection, using either a new or existing landfill gas collection system, at a landfill that meets both of the following requirements:

(i) no landfill gas collection system has operated at the landfill since 24 April 2014;

(ii) no landfill gas collection system has operated at the landfill during the 3 years before the application for the declaration of the project as an eligible offsets project is made; and

(b) treat collected gas by emissions destruction or landfill gas capture for biomethane.

11 Requirements for upgrade projects

(1) An ***upgrade project*** must:

(a) upgrade an existing landfill gas collection system at a landfill to increase its collection efficiency to a higher annual level than previously measured at the landfill over each year covered by subsection (2); and

(b) install new gas wells to increase landfill gas collection; and

(c) treat collected gas by emissions destruction or landfill gas capture for biomethane.

(2) An application for declaration of an upgrade project as an eligible offsets project must include operational records that:

(a) support the calculation of the collection efficiency of the existing landfill gas collection system; and

(b) cover the 4-year period before the application is made.

(3) The first reporting period for an upgrade project must end not less than 12 months after the landfill gas collection system, as upgraded, begins to collect landfill gas.

12 Requirements for transitioning projects

A ***transitioning project*** must:

(a) collect landfill gas by continuing to operate a landfill gas collection system that was operated as part of a project that was operating under:

(i) the *Carbon Farming (Capture and Combustion of Methane in Landfill Gas from Legacy Waste) Methodology Determination 2012*; or

(ii) the *Carbon Credits (Carbon Farming Initiative) (Capture and Combustion of Methane in Landfill Gas from Legacy Waste: Upgrade Projects) Methodology Determination 2012*; and

(b) treat collected gas by emissions destruction or landfill gas capture for biomethane.

12A Requirements for non-biomethane projects

A ***non-biomethane project*** must involve the carrying out of emissions destruction.

Note: A non-biomethane project will only earn credits for the conversion abatement attributable to emissions destruction (see paragraph 17A(a)).

12B Requirements for biomethane conversion and displacement projects

A ***biomethane conversion and displacement project*** must:

(a) involve the installation of one or more biogas upgrading systems at a project biomethane facility; and

(b) if it involves landfill gas capture for biomethane, also involve biomethane production; and

(c) not be a restarting biomethane conversion and displacement project.

Note: A biomethane conversion and displacement project will only earn credits for the conversion abatement attributable to landfill gas capture for biomethane and emissions destruction, and displacement abatement attributable to biomethane production (see paragraph 17A(b)).

12C Requirements for biomethane displacement-only projects

A ***biomethane displacement-only project*** must:

(a) involve the installation of one or more biogas upgrading systems at a project biomethane facility; and

(b) involve biomethane production; and

(c) not be a restarting biomethane displacement-only project.

Note: A biomethane displacement-only project will only earn credits for the displacement abatement attributable to biomethane production (see paragraph 17A(c)). Such a project may also involve landfill gas capture for biomethane or emissions destruction, but no credits will be issued in relation to those project activities.

12D Requirements for restarting biomethane conversion and displacement projects

(1) A ***restarting biomethane conversion and displacement project***:

(a) must occur at a project landfill that was part of an eligible offsets project (the ***forerunner project***):

(i) that did not involve landfill gas capture for biomethane during its crediting period or periods; and

(ii) for which the applicable methodology determination was:

(A) this determination; or

(B) the *Carbon Farming (Capture and Combustion of Methane in Landfill Gas from Legacy Waste) Methodology Determination 2012*; or

(C) the *Carbon Credits (Carbon Farming Initiative) (Capture and Combustion of Methane in Landfill Gas from Legacy Waste: Upgrade Projects) Methodology Determination 2012*; or

(D) the 2015 LFG determination; or

(E) an earlier version of a determination referred to in sub-subparagraph (A) to (D) applicable in accordance with section 125, 126, 127 or 130 of the Act; and

(iii) the only or last crediting period for which has expired; and

(b) must involve the installation of one or more biogas upgrading systems at a project biomethane facility; and

(c) must, if it involves landfill gas capture for biomethane, also involve biomethane production; and

(d) must have a crediting period greater than zero under section 16A.

Note: A restarting biomethane conversion and displacement project will only earn credits for conversion abatement attributable to landfill gas capture for biomethane and the displacement abatement attributable to biomethane production (see paragraph 17A(d)). Such a project may also involve emissions destruction, but no credits will be issued in relation to those project activities.

(2) If:

(a) a project is a restarting biomethane conversion and displacement project; and

(b) at the expiry of its forerunner project's crediting period, the applicable methodology determination for the forerunner project was:

(i) this determination; or

(ii) the 2015 LFG determination;

the project is credited under this determination as a new project, a recommencing project, an upgrade project, a transitioning project, a transitioning (continued) project, a transitioning (new) project, a transitioning (recommencing) project and a transitioning (upgrade) project as it was previously credited as the forerunner project.

(3) If:

(a) a project is a restarting biomethane conversion and displacement project; and

(b) at the expiry of its forerunner project's crediting period the applicable methodology determination for the forerunner project was:

(i) the *Carbon Farming (Capture and Combustion of Methane in Landfill Gas from Legacy Waste) Methodology Determination 2012*; or

(ii) the *Carbon Credits (Carbon Farming Initiative) (Capture and Combustion of Methane in Landfill Gas from Legacy Waste: Upgrade Projects) Methodology Determination 2012*;

the project is credited under this determination as a transitioning project.

Note: Section 31 specifies how the proportion of methane that would have been combusted without the project is worked out for transitioning projects.

12E Requirements for restarting biomethane displacement-only projects

A ***restarting biomethane displacement-only project*** must:

(a) occur at a biomethane facility that was part of an eligible offsets project (the ***forerunner project***):

(i) that involved the carrying out of biomethane production; and

(ii) for which the applicable methodology determination was:

(A) this determination; or

(B) an earlier version of this determination applicable in accordance with section 125, 126, 127 or 130 of the Act; and

(iii) the crediting period for which has expired; and

(b) involve biomethane production; and

(c) have a crediting period greater than zero under section 16B.

Note: A restarting biomethane displacement-only project will only earn credits for the displacement abatement attributable to biomethane production (see paragraph 17A(e)). Such a project may also involve landfill gas capture for biomethane or emissions destruction, but no credits will be issued in relation to those project activities.

12F Changing project type

A project of a particular type may change to a project of a different type if it satisfies the requirements for that type immediately before the change.

Note: See Division 1 of Part 5 for the documentation of the change required in the offsets report for the project.

Division 3—Information required for a section 22 or a section 128 application

13 Applications for landfill gas (electricity generation) projects

The section 22 application or section 128 application for a landfill gas (electricity generation) project must provide written evidence of the intention of the project proponent to:

(a) combust landfill gas to generate electricity for use on-site, for supply to the grid or both; or

(b) treat landfill gas, with or without biogas produced from other biogas waste, by biogas upgrading at a biomethane facility to produce biomethane which is then sent to an end use where it can reasonably be expected to be combusted within Australia as a natural gas substitute.

13A Applications about non-biomethane projects

(1) This section applies to the section 22 application or section 128 application for a non-biomethane project.

(2) An application to which this section applies must include the following information:

(a) which project type and project sub-type the project will be;

(b) which project activities will be carried out as part of the project;

(c) a description of the project landfill that will be used in the project;

(d) a description as to how the project can reasonably be expected to result in eligible carbon abatement.

13B Applications about other projects

(1) This section applies to the following:

(a) the section 22 application or section 128 application for a biomethane conversion and displacement project or biomethane displacement-only project;

(b) the section 22 application for a restarting biomethane conversion and displacement project or restarting biomethane displacement-only project.

(2) An application to which this section applies must include the following information:

(a) which project type and project sub-type the project will be;

(b) which project activities will be carried out as part of the project;

(c) if the application relates to a biomethane conversion and displacement project or a restarting biomethane conversion and displacement project—a description of the project landfill that will be used in the project;

(d) a description of at least one of the project biomethane facility that will be used in the project and the following details about each project biomethane facility that will be used in the project:

(i) a brief description of the facility;

(ii) the location of the facility;

(iii) the capacity of the facility, in m^3 of biomethane produced by the facility per year;

(iv) any known proposal for the expansion of the facility over the course of the project;

(v) the intended recipients of biomethane produced by the facility;

(vi) the basis upon which the facility is expected to comply with the requirements of this Part and section 7;

Note: Project biomethane facilities may also be adopted later, provided that they are documented in accordance with Part 5.

(e) a description of at least one biogas upgrading system that will be used in the project and the following details of each biogas upgrading system that will be used in the project:

(i) a brief description of the system;

(ii) the location of the system;

(f) a declaration from the project proponent that biomethane produced by project biomethane facilities can reasonably be expected to be combusted within Australia as a natural gas substitute;

(g) a description as to how the project can reasonably be expected to result in eligible carbon abatement.

Division 4—Additionality and in lieu of newness requirements for certain projects

15 Additionality requirements

For subparagraph 27(4A)(b)(ii) of the Act, a requirement in lieu of the regulatory additionality requirement is that the project is a non-biomethane project, biomethane conversion and displacement project or restarting biomethane conversion and displacement project.

15A Requirements in lieu of newness requirement—recommencing project

For subparagraph 27(4A)(a)(ii) of the Act, a requirement in lieu of the newness requirement for a recommencing project that is not a restarting biomethane conversion and displacement project is that the project complies with subparagraph 27(4A)(a)(i) of the Act, disregarding any operation of the landfill gas collection system before the earliest of the following:

(a) the beginning of the period of 3 years before the application for the declaration of the project as an eligible offsets project was made;

(b) the end of the day that is 24 April 2014.

15B Requirement in lieu of newness requirement—restarting biomethane conversion and displacement project

(1) For subparagraph 27(4A)(a)(ii) of the Act, the requirement in subsection (2) is in lieu of the newness requirement for a restarting biomethane conversion and displacement project.

(2) The project must be a restarting biomethane conversion and displacement project.

15C Requirement in lieu of newness requirement—restarting biomethane displacement-only project

(1) For subparagraph 27(4A)(a)(ii) of the Act, the requirement in subsection (2) is in lieu of the newness requirement for a restarting biomethane displacement-only project.

(2) The project must be a restarting biomethane displacement-only project.

Division 5—Crediting period

16 Crediting period for project other than restarting biomethane conversion and displacement project or restarting biomethane displacement-only project

For paragraph 69(3)(b) and subsection 70(3)(d) of the Act, if a landfill gas (electricity generation) project during its crediting period or periods is not:

(a) a restarting biomethane conversion and displacement project; or

(b) a restarting biomethane displacement-only project;

the period of 12 years is specified.

16A Crediting period for restarting biomethane conversion and displacement project

For paragraph 69(3)(b) and subsection 70(3)(d) of the Act, if a landfill gas (electricity generation) project is a restarting biomethane conversion and displacement project, the period of 12 years minus the length of the last or only crediting period for the project's forerunner project is specified.

Note: For this section, ***forerunner project*** has the meaning given by paragraph 12D(1)(a).

16B Crediting period for restarting biomethane displacement-only project

For paragraph 69(3)(b) and subsection 70(3)(d) of the Act, if a landfill gas (electricity generation) project is a restarting biomethane displacement-only project, the period specified is 12 years minus the length of time between:

(a) the start date of the first reporting period in which the project's forerunner project first treated biogas by biogas upgrading to produce biomethane; and

(b) the end date of the crediting period of that forerunner project.

Note: For this section, ***forerunner project*** has the meaning given by paragraph 12E(a).

Part 4—Net abatement amounts

Division 1—Operation of this Part

17 Operation of this Part

For paragraph 106(1)(c) of the Act, this Part specifies the method for working out the carbon dioxide equivalent net abatement amount for a reporting period for a landfill gas (electricity generation) project that is an eligible offsets project.

17A What can be included in calculating net abatement

For the purposes of working out the total carbon dioxide equivalent net abatement amount for a reporting period for a landfill gas (electricity generation) project A_{tot} (in tonnes CO_2-e):

(a) the calculations for a non-biomethane project must include only the conversion abatement attributable to emissions destruction worked out using the method set out in Division 2; and

(b) the calculation for a biomethane conversion and displacement project must include only:

(i) the conversion abatement attributable to landfill gas capture for biomethane, worked out using the method set out in Division 2; and

(ii) if the project also involves emissions destruction—the conversion abatement attributable to that emissions destruction, worked out using the method set out in Division 2; and

(iii) the displacement abatement attributable to biomethane production, worked out using the method set out in Division 3; and

(c) the calculation for a biomethane displacement-only project must include only the displacement abatement attributable to biomethane production, worked out using the method set out in Division 3; and

(d) the calculation for a restarting biomethane conversion and displacement project must include only:

(i) the conversion abatement attributable to landfill gas capture for biomethane, worked out using the method set out in Division 2; and

(ii) the displacement abatement attributable to biomethane production, worked out using the method set out in Division 3; and

(e) the calculation for a restarting biomethane displacement-only project must include only the displacement abatement attributable to biomethane production, worked out using the method set out in Division 3.

17B Working out net abatement

Subject to section 17A, the total carbon dioxide equivalent net abatement amount for a reporting period for landfill gas (electricity generation) project $\boldsymbol{A_{tot}}$ (in tonnes CO_2-e), is worked out using the formula (***equation 1***):

$$A_{tot} = A_{conversion} + A_{displacement}$$

where:

$A_{conversion}$ is the carbon dioxide equivalent net abatement amount attributable to the treatment of landfill gas from the project landfill by emissions destruction or landfill gas capture for biomethane for the reporting period, in tonnes CO2-e, worked out using ***equation 2*** or ***equation 2A*** (section 21).

$A_{displacement}$ is the carbon dioxide equivalent net abatement amount attributable to biogas upgrading at project biomethane facilities for the reporting period, in tonnes CO_2-e, worked out using ***equation 24*** (section 32G).

Division 2—Working out conversion abatement

Subdivision 1—Overview

18 Overview of gases accounted for in conversion abatement calculations

The following table provides an overview of the greenhouse gas abatement and emissions that are relevant to working out the carbon dioxide equivalent net abatement amount for a landfill gas (electricity generation) project that involves landfill gas capture for biomethane or emissions destruction.

Greenhouse gas abatement and emissions

Item	Relevant calculation	Emissions source	Greenhouse gas
1	Baseline abatement	Destruction of methane in landfill gas by combustion	Methane (CH_4)
2	Baseline abatement	Destruction of methane in landfill gas by oxidation in the near surface conditions of the landfill	Methane (CH_4)
3	Project abatement	Destruction of methane in landfill gas by combustion, or destruction of methane in landfill gas from the sending of landfill gas to a biogas upgrading system	Methane (CH_4)
4	Project emissions	Combustion of landfill gas	Methane (CH_4)
5	Project emissions	Fuel consumption attributable to project landfill gas capture for biomethane activities	Carbon dioxide (CO_2) Methane (CH_4) Nitrous oxide (N_2O)
6	Project emissions	Consumption of purchased electricity attributable to project landfill gas capture for biomethane activities	Carbon dioxide (CO_2) Methane (CH_4) Nitrous oxide (N_2O)

Subdivision 2—Method for calculating net conversion abatement amount

20 Summary

Net conversion abatement is calculated as project abatement minus baseline abatement

If a project is a biomethane conversion and displacement project or restarting biomethane conversion and displacement project and involves upgrading biogas that is solely sourced from the project landfill, an alternative net abatement calculation approach may be used that determines methane destroyed after being sent to a biomethane facility for biogas upgrading based on the quantity and composition of biomethane produced.

From this is deducted any emissions generated by operation of the project landfill from undertaking landfill gas capture for biomethane activities (eg fuel use).

21 Net conversion abatement amount

(1) The carbon dioxide equivalent net abatement amount attributable to the treatment of landfill gas from the project landfill by emissions destruction or landfill gas capture for biomethane for a reporting period, in tonnes CO_2-e, is worked out:

(a) for a biomethane conversion and displacement project or restarting biomethane conversion and displacement project that only undertakes biogas upgrading of landfill gas from the project landfill—using either Method 1 (set out in subsections (2) to (3)) or Method 2 (set out in subsections (4) to (6)); and

(b) otherwise—using Method 1 (set out in subsections (2) to (3)).

Method 1—project landfill-only calculation

(2) The carbon dioxide equivalent net abatement amount attributable to the treatment of landfill gas from the project landfill by emissions destruction or landfill gas capture for biomethane at the project landfill for a reporting period, $A_{conversion}$, in tonnes CO_2-e, is worked out using the formula (***equation 2***):

$$A_{conversion} = A_P - A_B - PE_{LFG-BM}$$

where:

$A_{conversion}$ means the carbon dioxide equivalent net abatement amount for the project landfill in the reporting period, in tonnes CO_2-e.

A_P means the project conversion abatement for the project landfill in the reporting period, in tonnes CO_2-e, worked out using equation 3.

A_B means the baseline conversion abatement for the project landfill in the reporting period, in tonnes CO_2-e, worked out using equation 15.

PE_{LFG-BM} means the emissions from landfill gas capture for biomethane activities for the reporting period for the project landfill in the reporting period, in tonnes CO_2-e, worked out using equation 23A.

(3) If, during a reporting period, the project landfill:

(a) sends landfill gas to a biogas upgrading system; and

(b) either:

(i) the landfill gas is used for a purpose other than biogas upgrading to produce biomethane that can reasonably be expected to be combusted within Australia as a natural gas substitute; or

(ii) the biomethane produced from biogas upgrading cannot be reasonably expected to be combusted within Australia as a natural gas substitute;

$A_{conversion}$ for the project landfill is taken to be zero.

Method 2—project landfill and project biomethane facility calculation

(4) The carbon dioxide equivalent net abatement amount attributable to the treatment of landfill gas from the project landfill by emissions destruction or landfill gas capture for biomethane for a reporting period, $A_{conversion}$, in tonnes CO_2-e, is worked out using the formula (***equation 2A***):

$$A_{conversion} = A_{P,\,ED} - A_B - PE_{LFG-BM} + \gamma\left(\sum_f BC_f\right)$$

where:

$A_{conversion}$ means the carbon dioxide equivalent net abatement amount for the project landfill in the reporting period, in tonnes CO_2-e.

$A_{P,\,ED}$ means the project conversion abatement from emissions destruction activities for the project landfill in the reporting period, in tonnes CO_2-e, worked out using equation 4.

Note: $A_{P,\,ED}$ excludes the abatement associated with methane sent to biogas upgrading systems during the reporting period.

A_B means the baseline conversion abatement for the project landfill in the reporting period, in tonnes CO_2-e, worked out using equation 15.

PE_{LFG-BM} means the emissions from landfill gas capture for biomethane activities for the reporting period for the project landfill in the reporting period, in tonnes CO_2-e, worked out using equation 23A.

γ is the factor, used in Part 5.3 of the NGER (Measurement) Determination, that converts cubic metres of methane to tonnes CO_2-e at standard conditions.

Note: In 2021, γ was 6.784 x 10^{-4} x 28.

f is a project biomethane facility.

BC_f (biomethane combusted) is the volume of methane sent out from project biomethane facility *f* during the reporting period, calculated using equation 14 (section 28A).

(5) If, during a reporting period, the project landfill:

(a) sends landfill gas to a biogas upgrading system; and

(b) either:

(i) the landfill gas is used for a purpose other than biogas upgrading to produce biomethane that can reasonably be expected to be combusted within Australia as a natural gas substitute; or

(ii) the biomethane produced from biogas upgrading cannot be reasonably expected to be combusted within Australia as a natural gas substitute;

$A_{conversion}$ for the project landfill is taken to be zero.

(6) If, during a reporting period, a project biomethane facility produces biomethane that cannot be reasonably expected to be combusted within Australia as a natural gas substitute, BC_f for the project biomethane facility is taken to be zero.

21A Inputs and parameters

(1) For the purposes of calculating the net conversion abatement amount, inputs for this method must cover the whole of the project landfill.

Note: This subsection prevents a proponent from operating a project only in relation to a selected portion of the project landfill where, for example, gas might be easier to extract.

(2) If a parameter in an equation is worked out, or determined, in a particular way for a reporting period, then, it must be worked out, or determined, in the same way for all other equations in which it is used for the reporting period.

Subdivision 3—Method for calculating project conversion abatement

22 Summary

Project conversion abatement is calculated as the amount of methane combusted by the project that was not generated by carbon tax waste minus the amount that would have been oxidised in the near surface conditions of the project landfill had it not been collected during the project.

23 Project conversion abatement

(1) The project conversion abatement for the project landfill in a reporting period, in tonnes CO_2-e, is worked out using the formula (***equation 3***):

$$A_P = M_{Com,\,NCT} - M_{Com,\,Ox}$$

where:

A_P means the project conversion abatement for the project landfill in the reporting period, in tonnes CO_2-e.

$M_{Com,\,NCT}$ means the methane combusted or taken to be combusted for the project landfill during the reporting period that was not generated from carbon tax waste, in tonnes CO_2-e, worked out using equation 5.

$M_{Com, Ox}$ means the methane combusted or taken to be combusted for the project landfill during the reporting period that was not generated from carbon tax waste and that, without the project, would have been oxidised in near surface conditions of landfill, in tonnes CO_2-e, worked out using equation 13.

(2) The project conversion abatement from emissions destruction activities for the project landfill in a reporting period, in tonnes CO_2-e, is worked out using the formula (***equation 4***):

Note: This equation is used for projects that work out net conversion abatement using Method 2 in section 21.

$$A_{P,\,ED} = M_{Com,\,NCT,\,ED} - M_{Com,\,Ox}$$

where:

$A_{P, ED}$ means the project conversion abatement from emissions destruction activities for the project landfill in the reporting period, in tonnes CO_2-e.

$M_{Com, NCT, ED}$ means the methane combusted through emissions destruction activities for the project landfill during the reporting period that was not generated from carbon tax waste, in tonnes CO_2-e, worked out using equation 6.

$M_{Com, Ox}$ means the methane combusted or taken to be combusted for the project landfill during the reporting period that was not generated from carbon tax waste and that, without the project, would have been oxidised in near surface conditions of landfill, in tonnes CO_2-e, worked out using equation 13.

24 Methane combusted or taken to be combusted that was not generated from carbon tax waste

(1) The methane combusted or taken to be combusted for the project landfill during a reporting period that was not generated from carbon tax waste, in tonnes CO_2-e, is worked out using the formula (***equation 5***):

$$M_{Com,\,NCT} = \gamma \times W_{NCT} \times M_{Com}$$

where:

$M_{Com, NCT}$ means the methane combusted or taken to be combusted for the project landfill during the reporting period that was not generated from carbon tax waste, in tonnes CO_2-e.

γ means the factor to convert cubic metres of methane at standard conditions to tonnes of CO_2-e worked out using subsection 5.4(1) of the NGER (Measurement) Determination.

Note: In 2021, γ was $6.784 \times 10^{-4} \times 28$.

W_{NCT} means the proportion of the methane combusted or taken to be combusted for the project landfill during the reporting period that was not generated from carbon tax waste worked out using equation 7.

M_{Com} means the methane that was combusted or taken to be combusted for the project landfill during the reporting period, in cubic metres, worked out using equation 8.

(2) The methane combusted through emissions destruction activities for the project landfill during a reporting period that was not generated from carbon tax waste, in tonnes CO_2-e, is worked out using the formula (***equation 6***):

Note: This equation is used for projects that work out net conversion abatement using Method 2 in section 21.

$$M_{Com,\,NCT,\,ED} = \gamma \times W_{NCT} \times M_{Com}$$

where:

$M_{Com,\,NCT,\,ED}$ means the methane combusted through emissions destruction activities for the project landfill during the reporting period that was not generated from carbon tax waste, in tonnes CO_2-e.

γ means the factor to convert cubic metres of methane at standard conditions to tonnes of CO_2-e worked out using subsection 5.4(1) of the NGER (Measurement) Determination.

Note: In 2021, γ was $6.784 \times 10^{-4} \times 28$.

W_{NCT} means the proportion of the methane combusted or taken to be combusted for the project landfill during the reporting period that was not generated from carbon tax waste worked out using equation 7.

M_{Com} means the methane that was combusted for the project landfill during the reporting period, in cubic metres, worked out using equation 8 subject to section 26(1A).

25 Proportion of methane combusted or taken to be combusted that was not generated from carbon tax waste

(1) The proportion of the methane combusted or taken to be combusted for the project landfill during a reporting period that was not generated from carbon tax waste, in cubic metres, is worked out using the formula (***equation 7***):

$$W_{NCT} = \sum_{y} \frac{M_{Com,\,y}}{M_{Com}} \left(1 - \frac{M_{CTW,\,y}}{M_{Gen,\,y}}\right)$$

where:

W_{NCT} means the proportion of the methane combusted or taken to be combusted for the project landfill during the reporting period that was not generated from carbon tax waste.

$M_{Com,\,y}$ means the methane combusted or taken to be combusted in financial year *y* for the project landfill, in cubic metres, worked out using equation 8 as if a reporting period were a financial year.

M_{Com} means the methane combusted or taken to be combusted for the project landfill during the reporting period, in cubic metres, worked out using equation 8.

$M_{CTW, y}$ means the methane generated in the project landfill from carbon tax waste in financial year *y* for the project landfill in tonnes of CO_2-e calculated in accordance with subsection (2).

$M_{Gen, y}$ means the methane generated in the project landfill in financial year *y*, in tonnes CO_2-e, calculated in accordance with subsection (3).

y means a financial year covered (either partly or fully) by the reporting period.

Note: The summation of this equation over financial years is to cover circumstances where reporting periods span financial years.

Methane generated from carbon tax waste in financial year y

(2) The methane generated by the project landfill from carbon tax waste in financial year *y*, in tonnes of CO_2-e, is equivalent to parameter CH_{4gen} calculated:
  (a) under Part 5.2 of the NGER (Measurement) Determination; and
  (b) in accordance with the following:
    (i) the year *y* for working out $M_{CTW,y}$ is a financial year that the reporting period partially or fully covers;
    (ii) the calculation is based only on carbon tax waste.

Note: See section 6 for the version of NGER (Measurement) Determination that must be used.

Methane generated in year y

(3) The methane generated by the project landfill in year *y*, in tonnes CO_2-e, is equivalent to parameter CH_{4gen} calculated:
  (a) under Part 5.2 of the NGER (Measurement) Determination; and
  (b) with methane generation determined for the whole project landfill as if it were a single sub-facility zone; and
  (c) in accordance with subsection (4), (5), (6) or (7), as required, and subsection (8), as required.

(4) For working out $M_{Gen, y}$ for equation 7, financial year *y* is a financial year covered (either partly or fully) by the reporting period.

(5) For working out $M_{Gen, y}$ for equation 21, year *y* is the 12-month period immediately after the upgrade undertaken in the project is completed.

(6) For working out $M_{Gen, y}$ for equation 32 and clause 5 of Schedule 1, year *y* is the 12-month period immediately before the project begins.

(7) For working out $M_{Gen, y}$ for clause 2 of Schedule 1 (for the purposes of items 1 and 2 of the table in subclause 6(2) of Schedule 1) and items 5 and 6 of the table in subclause 6(2) of Schedule 1, year *y* is the 12-month period immediately before the advice is given by the environmental regulator.

(8) For subsections (5), (6) and (7), if the 12-month period covers 2 financial years, CH_{4gen} is calculated by:

(a) calculating CH_{4gen} for each financial year covered by the 12-month period; and

(b) multiplying the amount of CH_{4gen} for each financial year by the proportion of days in the financial year covered by the 12-month period; and

(c) summing the results.

26 Methane combusted or taken to be combusted

(1) The methane combusted or taken to be combusted during a reporting period, in cubic metres, is worked out using the formula (***equation 8***):

$$M_{Com} = \sum_{h} M_{Com,\,h}$$

where:

M_{Com} means the methane combusted or taken to be combusted during the reporting period, in cubic metres.

h means, subject to subsection (1A):

(a) a combustion device; or

(b) a biogas upgrading system of a project biomethane facility.

$M_{Com,\,h}$ means, subject to subsection (1A), the methane combusted by combustion device *h*, or taken to be combusted by biogas upgrading system *h*, during the reporting period, in cubic metres, worked out using:

(a) for a biogas upgrading system, combustion device that is a boiler, a flare with monitoring and control system, or an internal combustion engine system—using equation 9; and

(b) for a combustion device that is not a boiler, a flare with monitoring and control system or an internal combustion engine—equation 9A.

(1A) If M_{Com} is being worked out for the purposes of calculating $M_{Com,\,NCT,\,ED}$ (section 24(2)), *h* means a combustion device when determining M_{Com} for the reporting period.

Note: This prevents landfill gas sent from the project landfill to biogas upgrading systems from being included when working out methane combusted through emissions destruction activities under equation 6. This in turn prevents double counting of conversion abatement from biomethane, which under Method 2 is already accounted for in equation 2A.

Methane combusted by combustion device h or taken to be combusted by biogas upgrading system h—boiler or flare with monitoring and control system or internal combustion engine or biogas upgrading system.

(2) Subject to subsection (1), the methane combusted by combustion device *h* or taken to be combusted by biogas upgrading system *h* during a reporting period, in cubic metres, is worked out using the formula (***equation 9***):

$$M_{Com,\,h} = M_{Sent,\,h} \times (1 - PL_h) \times (1 - TL_h) \times DE$$

where:

M**Com, h means the methane combusted by combustion device *h* or taken to be combusted by biogas upgrading system *h* during the reporting period, in cubic metres.

M**Sent, h means the methane sent to combustion device or biogas upgrading system *h* during the reporting period, in cubic metres, worked out using equation 10, 11 or 12.

PL**h means the biomethane production loss factor for landfill gas sent to combustion device or biogas upgrading system *h*, expressed as a fraction, worked out in accordance with section 28B.

Note: PL_h accounts for methane lost during biogas upgrading. It does not affect methane that is sent to combustion devices.

TL**h means the transport loss factor for biogas sent to combustion device or biogas upgrading system *h*, expressed as a fraction, which is:

(a) if *h* is a combustion device—zero;

(b) if *h* is a biogas upgrading system that sends landfill gas to a biogas upgrading system at a project biomethane facility and all biomethane produced by the biogas upgrading system during the reporting period is consumed at the project land fill or a project biomethane facility—zero;

(c) otherwise – 0.02.

Note: TL_h accounts for methane that is not combusted due to gas lost in transport. It is only relevant when a project undertakes biomethane production and sends the gas off-site for use and combustion.

DE means the default methane destruction efficiency for a combustion device or biogas upgrading system, expressed as a fraction, which is:

(a) if *h* is an internal combustion engine—1;

(b) otherwise—0.98.

Methane combusted by combustion device h—other combustion devices

(3) Subject to subsection (1), the methane combusted by combustion device *h* during a reporting period, in cubic metres, is worked out using the formula (***equation 9A***):

$$M_{Com,\,h} = DE \times \sum_a \left(O_{h,\,a} \times M_{Sent,\,h,\,a} \right)$$ where:

M**Com, h means the methane combusted during the reporting period by combustion device *h*, in cubic metres.

DE means the default methane destruction efficiency for a combustion, expressed as a fraction, which is:

(a) if *h* is an internal combustion engine—1;

(b) otherwise—0.98.

O**h, a means the operation of combustion device *h* in hour *a*, which is either 0 or 1, worked out in accordance with the monitoring requirements.

$M_{Sent, h, a}$ means the methane sent to combustion device *h* in hour *a*, in cubic metres, worked out using equation 10 or equation 11.

27 Methane sent to combustion device or biogas upgrading system

(1) Methane sent to a combustion device *h* or biogas upgrading system *h* during a particular period may be worked out using:

(a) for a combustion device or biogas upgrading system—equation 10; or

(b) for a combustion device—equation 11; or

(c) for a combustion device that is an internal combustion engine—equation 12.

Option 1—using landfill gas sent to combustion device or biogas upgrading system

(2) Using the volume of the landfill gas sent to the combustion device or biogas upgrading system ($Q_{LFG,h}$), the methane sent to the combustion device or biogas upgrading system during the period is worked out using the formula (***equation 10***):

$$M_{Sent, h} = Q_{LFG, h} \times W_{LFG, CH4, h}$$

where:

$M_{Sent, h}$ means the methane sent to the combustion device or biogas upgrading system *h* during the period, in cubic metres.

$Q_{LFG, h}$ means the landfill gas sent to the combustion device or biogas upgrading system *h* during the period, in cubic metres, worked out in accordance with the monitoring requirements.

$W_{LFG, CH4, h}$ means the proportion of the landfill gas sent to combustion device or biogas upgrading system *h* that is methane, which is, subject to subsection (2A), at the election of the project proponent:

(a) 0.42; or

(b) worked out in accordance with the monitoring requirements; or

(c) if the project is a landfill gas (electricity generation) project whose application under section 22 of the Act was made before 1 September 2020—set out in section 5.14C of the NGER (Measurement) Determination.

(2A) If *h* is a biogas upgrading system, $W_{LFG, CH4, h}$ must be worked out in accordance with the monitoring requirements.

(3) If, at any time during which this determination is, or the 2015 LFG determination was, the applicable methodology for the project, the monitoring requirements are or, as the case may be, were used to work out $W_{LFG, CH4, h}$, then, the monitoring requirements must be used for that purpose for the remainder of the project.

(4) Subsection (3) has effect subject to section 36.

Option 2—using energy content of landfill gas sent to combustion device

(5) Using the energy content of the landfill gas sent to the combustion device (***$Q_{En,h}$***), the methane sent to the combustion device during the period is worked out using the formula (***equation 11***):

$$M_{Sent,\,h} = \frac{Q_{En,\,h}}{EC_{LFG}}$$

where:

$M_{Sent,\,h}$ means the methane sent to the combustion device *h* during the period in cubic metres.

$Q_{En,\,h}$ means the energy content of the landfill gas sent to the combustion device *h* during the period, in gigajoules, worked out in accordance with the monitoring requirements.

EC_{LFG} means the energy content factor for landfill gas that is collected for combustion (methane only), in gigajoules per cubic metre, set out in Part 2 of Schedule 1 to the NGER (Measurement) Determination.

Option 3—using electricity produced by internal combustion engine

(6) If the combustion device is an internal combustion engine, using the electricity produced by the device (***$Q_{EG,h}$***), the methane sent to the combustion device during the period is worked out using the formula (***equation 12***):

$$M_{Sent,\,h} = \frac{Q_{EG,\,h} \times F_{MWh \to GJ}}{Eff_h \times EC_{LFG}}$$

where:

$M_{Sent,\,h}$ means the methane sent to the combustion device h during the period, in cubic metres.

$Q_{EG,\,h}$ means the electricity (supplied to the grid or used on-site) produced by internal combustion engine *h* during the period, in megawatt hours, worked out in accordance with the monitoring requirements.

$F_{MWh \to GJ}$ means the factor to convert megawatt hours to gigajoules, which is 3.6.

Eff_h means:

(a) the factor for the electrical efficiency of internal combustion engine *h* determined in accordance with:

(i) the manufacturer's specifications for the combustion of landfill gas; and

(ii) if the specifications set out a range of such efficiencies—the highest of those efficiencies; or

(b) if no such factor can be determined in accordance with the manufacturer's specifications—the amount set out in subparagraph 2.38(2)(a)(ii) of the NGER (Measurement) Determination.

EC_{LFG} means the energy content factor for landfill gas that is captured for combustion (methane only), in gigajoules per cubic metre, set out in Part 2 of Schedule 1 to the NGER (Measurement) Determination.

28 Methane combusted that was not generated from carbon tax waste and that would have been oxidised in near surface conditions

The methane combusted or taken to be combusted during a reporting period that was not generated from carbon tax waste and that, without the project, would have been oxidised in near surface conditions of landfill, in tonnes CO_2-e, is worked out using the formula (***equation 13***):

$$M_{Com,\,Ox} = M_{Com,\,NCT} \times OF \times (1 - W_B)$$

where:

$M_{Com,\,Ox}$ means the methane combusted or taken to be combusted during the reporting period that was not generated from carbon tax waste and that, without the project, would have been oxidised in near surface conditions of landfill, in tonnes CO_2-e.

$M_{Com,\,NCT}$ means the methane combusted or taken to be combusted for the project landfill during the reporting period that was not generated from carbon tax waste, in tonnes CO_2-e, worked out using equation 5.

OF means the oxidation factor for near surface methane in landfill set out in the definition of ***OF*** in subsection 5.4(1) of the NGER (Measurement) Determination.

W_B means the proportion of the methane combusted or taken to be combusted in the reporting period that would have been combusted without the project worked out using whichever of equation 16 to equation 19 applies.

28A Methane destroyed in biomethane produced by project biomethane facilities

The volume of methane sent out from project biomethane facility *f* during a reporting period, ***BC_f***, in cubic metres, is worked out using the formula (***equation 14***):

$$BC_f = \sum_k \left[Q_{BM,\,k} \times W_{BM,\,CH4,\,k}\right] \times \left(1 - TL_{BM,\,f}\right) \times DE_{BM}$$

where:

k is a biogas upgrading system that is part of project biomethane facility *f*.

$\boldsymbol{Q_{BM,\,k}}$ is the total volume of biomethane sent out by biogas upgrading system *k* during the reporting period, in cubic metres, determined in accordance with the monitoring requirements.

$\boldsymbol{W_{BM,\,CH4,\,k}}$ is the proportion of $Q_{BM,\,k}$ that is methane, expressed as a fraction, determined in accordance with the monitoring requirements.

$\boldsymbol{TL_{BM,\,f}}$ is the transport loss factor for biomethane produced by project biomethane facility *f*, expressed as a fraction, which is:

(a) if all biomethane produced by the biogas upgrading system *f* during the reporting period is consumed at the project landfill or project biomethane facility—zero; or

(b) otherwise—0.02.

Note: TL_{BM} accounts for methane that is not combusted due to gas lost in transport of biomethane.

$\boldsymbol{DE_{BM}}$ is the methane destruction efficiency for biomethane produced by a biogas upgrading system, expressed as a fraction, which is 0.98.

28B Biomethane production loss factor

(1) For the purposes of section 26, the biomethane production loss factor for landfill gas sent to combustion device or biogas upgrading system *h* (PL_h), expressed as a fraction, is:

(a) if *h* is a combustion device—zero; or

(b) if *h* is a biogas upgrading system—the fraction determined in accordance with subsection (2).

(2) For paragraph (1)(b), the biomethane production loss factor for biogas upgrading system *h* (PL_h), expressed as a fraction, must be:

(a) determined as a fraction, in accordance with the manufacturer's listed specifications for the biogas upgrading system; or

(b) measured as a fraction, in accordance with the manufacturer's specification in the technical manual for the biogas upgrading system.

(3) For paragraph (2)(a), if the manufacturer's listed specifications for the biomethane production loss factor sets out a range of values, the highest of those values must be selected.

Subdivision 4—Method for calculating baseline conversion abatement

29 Summary

Baseline conversion abatement is calculated as the amount of methane combusted or taken to be combusted by the project that was not generated by carbon tax waste, multiplied by the proportion representing the amount of methane combusted or taken to be combusted during the project that would have been combusted without the project.

The determination of this proportion depends on the project sub-type of a project.

30 Baseline conversion abatement

The baseline abatement for a reporting period, in tonnes CO_2-e, is worked out using the formula (***equation 15***):

$$A_B = M_{Com,\,NCT} \times W_B$$

where:

A_B means the baseline conversion abatement for the reporting period, in tonnes CO_2-e.

$M_{Com,\,NCT}$ means the methane combusted or taken to be combusted for the project landfill during the reporting period that was not generated from carbon tax waste, in tonnes CO_2-e, worked out using equation 5.

W_B means the proportion of the methane combusted or taken to be combusted in the reporting period that would have been combusted without the project worked out using whichever of equations 16 to 19 applies.

31 Proportion of methane that would have been combusted without the project

New, recommencing, transitioning (new) or transitioning (recommencing) project

(1) If the project is a new project, a recommencing project, a transitioning (new) project or a transitioning (recommencing) project, the proportion of the methane combusted or taken to be combusted during a reporting period that would have been combusted without the project is worked out using the formula (***equation 16***):

$$W_B = \text{Maximum}\left(W_{B,\,Reg},\ W_{B,\,Def}\right)$$

where:

W_B means the proportion of the methane combusted or taken to be combusted during the reporting period that would have been combusted without the project.

$W_{B,\,Reg}$ means the regulatory proportion of the methane combusted or taken to be combusted during the reporting period that would have been combusted without the project as determined using Schedule 1 to this determination.

$W_{B,\,Def}$ means the default proportion of the methane combusted or taken to be combusted during the reporting period that would have been combusted without the project, which is as follows:

(a) 0% if the project proponent can demonstrate that, since 24 March 2011, the landfill concerned has not been subject to:

(i) legislation or regulatory guidelines for landfill; or

(ii) a licence condition or development approval that includes any form of general or specific qualitative requirement to collect, control, manage or limit landfill gas, methane odour or greenhouse gases;

(b) otherwise—30%.

Upgrade or transitioning (upgrade) project

(2) If the project is an upgrade project or a transitioning (upgrade) project, the proportion of the methane combusted or taken to be combusted during a reporting period that would have been combusted without the project is worked out using the formula (***equation 17***):

$$W_B = \text{Maximum}(W_{B,\,Reg},\ W_{B,\,Def},\ W_{B,\,Ex})$$

where:

W_B means the proportion of the methane combusted or taken to be combusted during the reporting period that would have been combusted without the project.

$W_{B,\,Reg}$ means the regulatory proportion of the methane combusted or taken to be combusted during the reporting period that would have been combusted without the project determined using Schedule 1 to this determination.

$W_{B,\,Def}$ has the same meaning as in subsection (1).

$W_{B,\,Ex}$ means the proportion of the methane combusted or taken to be combusted during the reporting period that would have been combusted without the project worked out using equation 20.

Transitioning project or transitioning (continued) project

(3) If the project is:

(a) a transitioning project that was operating under the *Carbon Credits (Carbon Farming Initiative) (Capture and Combustion of Methane in Landfill Gas from Legacy Waste) Methodology Determination 2012* (the ***legacy determination***); or

(b) a transitioning (continued) project that was operating under the legacy determination and subsequently under the 2015 LFG determination; or

(c) a restarting biomethane conversion and displacement project whose forerunner project was, at the expiry of its crediting period, operating under the legacy determination;

the proportion of the methane combusted or taken to be combusted during a reporting period that would have been combusted without the project is worked out using the formula (***equation 18***):

$$W_B = R_P$$

where:

W_B means the proportion of the methane combusted or taken to be combusted during the reporting period that would have been combusted without the project.

R_P means R_P as worked out under the legacy determination.

(4) If the project is:

(a) a transitioning project that was operating under the *Carbon Credits (Carbon Farming Initiative) (Capture and Combustion of Methane in Landfill Gas from Legacy Waste: Upgrade Projects) Methodology Determination 2012* (the ***legacy upgrade determination***); or

(b) a transitioning (continued) project that was operating under the legacy upgrade determination and subsequently under the 2015 LFG determination; or

(c) a restarting biomethane conversion and displacement project whose forerunner project was, at the expiry of its crediting period, operating under the legacy upgrade determination;

the proportion of the methane combusted or taken to be combusted during a reporting period that would have been combusted without the project is worked out using the formula (***equation 19***):

$$W_B = B_P$$

where:

W_B means the proportion of the methane combusted or taken to be combusted during the reporting period that would have been combusted without the project.

B_P means B_p as worked out under the legacy upgrade determination.

(5) The value given to W_B in subsection (1), (2), (3) or (4) must be the same throughout the crediting period.

32 Proportion of methane that would have been combusted without upgrade

(1) For an upgrade project or a transitioning (upgrade) project, the proportion of the methane combusted or taken to be combusted during a reporting period that would have been combusted without the project is worked out using the formula (***equation 20***):

$$W_{B,\,Ex} = \frac{W_{Com,\,Bef}}{W_{Com,\,Aft}}$$

where:

$W_{B,\,Ex}$ means the proportion of the methane combusted or taken to be combusted during the reporting period that would have been combusted without the project.

$W_{Com,\,Bef}$ means:

(a) if equation 20 is calculated on the basis of data only for 2 years in accordance with subsection (8)—the average proportion of the methane from the project landfill that is collected and destroyed during the 2 years before the upgrade is started, worked out using equation 21; or

(b) otherwise—the higher of:

(i) the average proportion of the methane from the project landfill that is collected and destroyed during the 2 years before the upgrade is started, worked out using equation 22; and

(ii) the average proportion of the methane from the project landfill that is collected and destroyed during the 4 years before the upgrade is started, worked out using equation 23.

$W_{Com, Aft}$ means the average proportion of the methane from the project landfill that is collected and destroyed during the 12 months immediately after the upgrade is completed, worked out using equation 18.

Methane collected and destroyed during 12 months after upgrade

(2) The average proportion of the methane from the project landfill that is collected and destroyed during the 12 months immediately after the upgrade is completed is worked out using the formula (***equation 21***):

$$W_{Com,\,Aft} = \frac{\gamma \times \sum_h M_{Sent,\,h,\,y}}{M_{Gen,\,y}}$$

where:

$W_{Com, Aft}$ means the average proportion of the methane from the project landfill that is collected and destroyed during the 12 months immediately after the upgrade is completed.

γ means the factor to convert cubic metres of methane at standard conditions to tonnes of CO_2-e set out in subsection 5.4(1) of the NGER (Measurement) Determination.

Note: In 2021, ***γ*** was 6.784 x 10^{-4} x 28.

$M_{Sent, h}$ means the methane sent to the combustion device or biogas upgrading system *h* during the reporting period, in cubic metres, worked out using equation 10, 11 or 12.

$M_{Gen, y}$ means the methane generated by the project landfill in year *y*, in tonnes CO_2-e, worked out using subsection 25(3).

y means the 12 months immediately after the upgrade is completed.

Methane collected and destroyed during 2 years before upgrade

(3) The average proportion of the methane from the project landfill that is collected and destroyed during the 2 years before the upgrade is started is worked out using the formula (***equation 22***):

$$W_{Com,\,Bef} = \sum_y \left(\frac{\gamma\left(Q_{cap,\,y} + Q_{flared,\,y} + Q_{tr,\,y}\right)}{CH^*_{4,\,y}} \right) \div 2$$

where:

$W_{Com, Bef}$ means the average proportion of the methane from the project landfill that is collected and destroyed during the 2 years:

(a) immediately before the upgrade is started; or

(b) if elected by the project proponent—immediately before the application for declaration of the upgrade project as an eligible offsets project.

γ means the factor to convert cubic metres of methane at standard conditions to tonnes of CO_2-e set out in subsection 5.4(1) of the NGER (Measurement) Determination.

Note: In 2021, γ was 6.784 x 10^{-4} x 28.

$Q_{cap, y}$ means the quantity of methane in landfill gas collected for combustion from the project landfill during year *y*, in cubic metres, measured as prescribed in Part 5.2 of the NGER (Measurement) Determination.

Note: The term ***collected for combustion*** in the NGER (Measurement) Determination is intended to mean landfill methane collected for combustion for electricity generation.

$Q_{flared, y}$ means the quantity of methane in landfill gas from the project landfill that is flared or otherwise combusted for purposes other than electricity generation during year *y*, in cubic metres, measured as prescribed in Part 5.2 of the NGER (Measurement) Determination.

$Q_{tr, y}$ means the quantity of methane in landfill gas transferred out of the project landfill during year *y*, in cubic metres, measured as prescribed in Part 5.2 of the NGER (Measurement) Determination.

$CH_4^*{}_{, y}$ means the estimated quantity of methane in landfill gas generated by the project landfill during year *y*, in tonnes CO_2-e, measured and determined in accordance with subsection (5).

y means a year in the 2 years:

(a) immediately before the upgrade is started; or

(b) if elected by the project proponent—immediately before the application for declaration of the upgrade project or the transitioning (upgrade) project as an eligible offsets project.

Methane collected and destroyed during 4 years before upgrade

(4) The average proportion of the methane from the project landfill that is collected and destroyed during the 4 years before the upgrade is started is worked out using the formula (***equation 23***):

$$W_{Com, Bef} = \sum_y \left(\frac{\gamma\left(Q_{cap, y} + Q_{flared, y} + Q_{tr, y}\right)}{CH^{*+}_{4,y}} \right) \div x$$

where:

$W_{Com, Bef}$ means the average proportion of the methane from the project landfill that is collected and destroyed during the 4 years:

(a) immediately before the upgrade is started; or

(b) if elected by the project proponent—immediately before the application for declaration of the upgrade project or the transitioning (upgrade) project as an eligible offsets project.

γ means the factor to convert cubic metres of methane at standard conditions to tonnes of CO_2-e set out in subsection 5.4(1) of the NGER (Measurement) Determination.

$Q_{cap, y}$ means the quantity of methane in landfill gas collected for combustion from the project landfill during year *y*, in cubic metres, measured as prescribed in Part 5.2 of the NGER (Measurement) Determination.

Note: The term ***collected for combustion*** in the NGER (Measurement) Determination is intended to mean landfill methane collected for combustion for electricity generation.

$Q_{flared, y}$ means the quantity of methane in landfill gas from the project landfill that is flared or otherwise combusted for purposes other than electricity generation during year *y*, in cubic metres, measured as prescribed in Part 5.2 of the NGER (Measurement) Determination.

$Q_{tr, y}$ means the quantity of methane in landfill gas transferred out of the project landfill during year *y*, in cubic metres, measured as prescribed in Part 5.2 of the NGER (Measurement) Determination.

$CH_4^{*+}{}_{, y}$ means the estimated quantity of methane in landfill gas generated by the project landfill during year *y*, in tonnes CO_2-e, measured and determined in accordance with subsection (6).

y means a year in the 4 years:

(a) immediately before the upgrade is started; or

(b) if elected by the project proponent—immediately before the application for declaration of the upgrade project or the transitioning (upgrade) project as an eligible offsets project.

x means:

(a) if pursuant to subsection (8) $W_{Com, Bef}$ is calculated for the purposes of this subsection based on data for a 4-year period—4;

(b) if pursuant to subsection (8) $W_{Com, Bef}$ is calculated for the purposes of this subsection based on data for a 3-year period—3;

(c) if pursuant to subsection (8) $W_{Com, Bef}$ is calculated for the purposes of this subsection based on data for a 2-year period—2.

(5) $CH_4^*{}_{, y}$ is equivalent to CH_4^* calculated:

(a) under Part 5.2 of the NGER (Measurement) Determination; and

(b) in accordance with the following:

(i) the reporting year is year *y*, where ***y*** means a year in the 2 years immediately before the upgrade;

(ii) methane generation must be determined for the whole project landfill as if it were a single sub-facility zone.

(6) $CH_4^{*+}{}_{,y}$ is equivalent to CH_4^* calculated:
   (a) under Part 5.2 of the NGER (Measurement) Determination; and
   (b) in accordance with the following:
      (i) the reporting year is year *y*, where ***y*** means a year in the 4 years immediately before the upgrade;
      (ii) methane generation must be determined for the whole project landfill as if it were a single sub-facility zone.

(7) For subsections (5) and (6), if year *y* covers 2 financial years, use the method set out in subsection 25(8) (as if CH_{4gen} were CH_4^*).

(8) In subsections (1), (4) and (6), references to "4 years" are taken to mean "2 years or, if data is available to the project proponent for that period, 3 years" for a relevant transitioning (upgrade) project that does not have 4 years of previous data.

Subdivision 5—Project emissions from landfill gas capture for biomethane

32A Summary

The project emissions for a reporting period are the emissions that must be subtracted from the gross project conversion abatement during the reporting period. They are the emissions that are attributable to the use of equipment for landfill gas capture for biomethane activities. They include emissions from fuel (including transport) and purchased electricity.

32B Project emissions from landfill gas capture for biomethane

(1) The project emissions from landfill gas capture for biomethane activities for the project landfill for a reporting period, $PE_{LFG\text{-}BM}$, in tonnes CO_2-e, is worked out using the formula (***equation 23A***):

$$PE_{LFG-BM} = E_{F,\,LFG-BM} + E_{PE,\,LFG-BM}$$

where:

$PE_{LFG\text{-}BM}$ means the project emissions from landfill gas capture for biomethane activities for the project landfill for the reporting period.

$E_{F,\,LFG\text{-}BM}$ means the emissions from fuel that is specifically attributable to the operation of the project landfill for the treatment of landfill gas by landfill gas capture for biomethane, during the reporting period (including transport), in tonnes CO_2-e, worked out using equation 23B (section 32C).

$E_{PE,\,LFG\text{-}BM}$ means the emissions from purchased electricity that is specifically attributable to the operation of the project landfill for the treatment of landfill gas by landfill gas capture for biomethane, the during the reporting period, in tonnes CO_2-e, worked out using equation 23C (section 32D).

(2) In determining $E_{F, LFG-BM}$ and $E_{PE, LFG-BM}$, emissions associated with biomethane production should be disregarded, including emissions from the operation of project biomethane facilities and any downstream transport emissions, during the reporting period, in tonnes CO_2-e, worked out using equation 29 (section 32P).

Note: This ensures that double counting of project emissions does not occur. Project emissions from fuel and electricity used in biogas upgrading systems is accounted for when working out net displacement abatement in Division 3 of this Part.

32C Emissions from fuel use for landfill gas capture for biomethane

(1) The emissions from fuel used that is specifically attributable to the operation of the project landfill for the treatment of landfill gas by landfill gas capture for biomethane during a reporting period (including transport), $E_{F, LFG-BM}$, in tonnes CO_2-e, is worked out using the formula (***equation 23B***):

$$E_{F,\,LFG-BM} = \sum_{i}\sum_{j} \frac{Q_{F,\,LFG-BM,\,i} \times EC_i \times EF_{ij}}{1000}$$

where:

$E_{F, LFG-BM}$ means the emissions from fuel used that is specifically attributable to the operation of the project landfill for the treatment of landfill gas by landfill gas capture for biomethane during the reporting period.

i is a fuel type.

j is a greenhouse gas type.

$Q_{F, LFG-BM, i}$ means the amount of fuel type *i* used that is specifically attributable to the operation of the project landfill for the treatment of landfill gas by landfill gas capture for biomethane during the reporting period, in tonnes, kilolitres, cubic metres, or gigajoules, determined in accordance with the monitoring requirements.

EC_i means the energy content factor for fuel type *i*, in gigajoules per tonne, gigajoules per kilolitre or gigajoules per cubic metre, set out in the NGER (Measurement) Determination.

Note: If $Q_{F, LFG-BM, i}$ is measured in gigajoules, then EC_i is not required (EC_i=1).

EF_{ij} means the emission factor for greenhouse gas type *j* and fuel type *i*, in kilograms CO_2-e per gigajoule, set out in the NGER (Measurement) Determination.

(2) In determining $Q_{F, LFG-BM, i}$, if fuel is used by the project landfill in performing a function that was also performed before the implementation of the project, it is attributable to the operation of the project landfill only to the extent that the project has caused an increase in fuel use.

32D Emissions from purchased electricity use: conversion abatement

(1) The emissions from purchased electricity that is specifically attributable to the operation of the project landfill for the treatment of landfill gas by landfill gas capture for biomethane during a reporting period, $E_{PE,\ LFG\text{-}BM}$, in tonnes CO_2-e, is worked out using the formula (***equation 23C***):

$$E_{PE,\ LFG-BM} = Q_{PE,\ LFG-BM} \times \frac{EF_{PE,\ LFG-BM}}{1000}$$

where:

$E_{PE,\ LFG\text{-}BM}$ means the emissions from purchased electricity that is specifically attributable to the operation of the project landfill for the treatment of landfill gas by landfill gas capture for biomethane during the reporting period.

$Q_{PE,\ LFG\text{-}BM}$ is the amount of purchased electricity that is specifically attributable to the operation of the project landfill for the treatment of landfill gas by landfill gas capture for biomethane during the reporting period, in kilowatt hours, determined in accordance with the monitoring requirements.

$EF_{PE,\ LFG\text{-}BM}$ is:

(a) for electricity obtained from an electricity grid that is a grid in relation to which the NGA Factors document includes an emissions factor—that factor, in kilograms CO_2-e per kilowatt hour; or

(b) for electricity obtained from an electricity grid not covered by paragraph (a) or from a source other than an electricity grid:

(i) if the supplier of the electricity is able to provide an emissions factor that reflects the emissions intensity of the electricity—that factor, in kilograms CO_2-e per kilowatt hour; or

(ii) otherwise—the emissions factor, in kilograms CO_2-e per kilowatt hour, for off-grid electricity included in the NGA Factors document.

(2) For subparagraph (b)(i) of the definition of $EF_{PE,\ LFG\text{-}BM}$ in subsection (1), the emissions factor must be worked out:

(a) on a sent-out basis; and

(b) using a measurement or estimation approach that is consistent with the NGER (Measurement) Determination.

Division 3—Working out displacement abatement

Subdivision 1—Overview of gases

32E Overview of gases accounted for in displacement abatement calculations

The following table provides an overview of the greenhouse gas abatement and emissions that are relevant to working out the carbon dioxide equivalent net abatement amount for a landfill gas (electricity generation) project that involves biomethane production.

Greenhouse gases and emissions sources

Item	Relevant calculation	Emissions source	Greenhouse gas
1	Gross abatement amounts	The carbon dioxide emissions avoided by displacement of natural gas combustion by biomethane produced by the project.	Carbon dioxide (CO_2)
2	Project emissions	Fuel consumption attributable to biogas upgrading at project biomethane facilities.	Carbon dioxide (CO_2) Methane (CH_4) Nitrous oxide (N_2O)
3	Project emissions	Consumption of purchased electricity attributable to biogas upgrading at project biomethane facilities.	Carbon dioxide (CO_2) Methane (CH_4) Nitrous oxide (N_2O)

Subdivision 2—Method for calculating net displacement abatement amount

32F Summary

The carbon dioxide equivalent net displacement abatement amount for a reporting period is worked out separately for each biomethane facility in the project. These amounts are then added together to give the total amount for the project.

For each project biomethane facility, the gross abatement amount is calculated as the natural gas combustion emissions displaced by the quantity of biomethane produced from biogas upgrading as part of the project. As biomethane and natural gas are identical from a fuel combustion standpoint, it is assumed that displacement occurs on a one-to-one basis.

The gross abatement amount is multiplied by the proportion of biogas that is eligible biogas, to prevent crediting of biomethane created from ineligible waste sources. The fraction of eligible biogas is worked out for each biogas source facility that supplies biogas during a reporting period. If a biogas source facility supplies a mixture of eligible and non-eligible biogas to a project during a reporting period, the fraction of eligible biogas from the biogas must be worked out in accordance with section 32M.

From this is deducted any emissions generated by operation of the project biomethane facility or associated with production of biomethane (for example, fuel and electricity use at a project biomethane facility, or fuel used in transporting biomethane).

32G Net displacement abatement amount

(1) The carbon dioxide equivalent net abatement amount attributable to the treatment of biogas by biomethane production for a reporting period, $A_{displacement}$, in tonnes CO_2-e, is worked out using the formula (***equation 24***):

$$A_{displacement} = \sum_{f} A_{displacement,\ h}$$

where:

f is a project biomethane facility.

$A_{displacement,\ f}$ is:

(a) if the project biomethane facility net abatement amount for project biomethane facility *f* calculated using equation 25 (section 32H) is greater than or equal to zero—that amount; and

(b) if that amount is less than zero—zero.

(2) If, during the reporting period, the biomethane produced by a project biomethane facility cannot be reasonably expected to be combusted within Australia as a natural gas substitute, $A_{displacement, f}$ is taken to be zero.

32H Project biomethane facility net abatement amount

The project biomethane facility net abatement amount for a reporting period for project biomethane facility f, $A_{displacement, f}$, in tonnes CO_2-e, is worked out using the formula (***equation 25***):

$$A_{displacement, f} = GA_{displacement, f} \times EA_h - PE_{displacement, f}$$

where:

$GA_{displacement, f}$ is the gross abatement amount for a reporting period for project biomethane facility *f*, in tonnes CO_2-e, calculated using equation 26 (section 32K).

EA_f is the eligible abatement fraction for the reporting period for project biomethane facility *f,* as a fraction, calculated using equation 27 (section 32M).

$PE_{displacement, f}$ is the project emissions for the reporting period for project biomethane facility *f,* in tonnes CO_2-e, calculated using equation 29 (section 32P).

32I Certain abatement must not be included in calculating net abatement amount

(1) For the purposes of working out the carbon dioxide equivalent net abatement amount attributable to biogas upgrading at project biomethane facilities for a reporting period $A_{displacement}$, in tonnes CO_2-e, using equation 24 (section 32G), the project proponent must not calculate displacement abatement attributable to biomethane production at a project biomethane facility during the reporting period if that biomethane is subsequently used as an energy source in a fuel switching emissions reduction activity at an emissions avoidance offsets project.

(2) In this section:

fuel switching emissions reduction activity means changing the energy sources or mix of energy sources in a way that gives rise to eligible carbon abatement and includes the following:

(a) changing the energy sources or mix of energy sources used by existing emissions-producing equipment as part of an industrial electricity and fuel efficiency project covered by the *Carbon Credits (Carbon Farming Initiative—Industrial Electricity and Fuel Efficiency) Methodology Determination 2015*;

(b) changing the energy sources or mix of energy sources used by existing emissions-producing equipment as part of an industrial and commercial emissions reduction project covered by the *Carbon Credits (Carbon*

Farming Initiative—Industrial and Commercial Emissions Reduction) Methodology Determination 2021;

(c) changing energy sources (fuels and electricity) or the mix of energy sources for vehicles and land and sea transport project covered by the *Carbon Credits (Carbon Farming Initiative—Land and Sea Transport) Methodology Determination 2015*;

(d) changing the energy sources or mix of energy sources used at a facility as part of a facilities project covered by the *Carbon Credits (Carbon Farming Initiative—Facilities) Methodology Determination 2015*.

Subdivision 3—Gross abatement amount

32J Summary

The gross abatement for a project biomethane facility for a reporting period is the emissions avoided as the result of carrying out biomethane production during the reporting period.

32K Gross abatement amount for a project biomethane facility

The gross abatement amount for project biomethane facility *f* for a reporting period, $GA_{displacement,\,f}$, in tonnes CO_2-e, is worked out using the formula (***equation 26***):

$$GA_{displacement,\,f} = \frac{\sum_k Q_{BM,\,k} \times EC_{NG} \times EF_{NG,\,CO2}}{1000}$$

where:

k is a biogas upgrading system at project biomethane facility *f* used during the reporting period.

$Q_{BM,\,k}$ is the total volume of biomethane sent out by biogas upgrading system *k* during the reporting period, in cubic metres, determined in accordance with the monitoring requirements.

EC_{NG} is the energy content factor for natural gas distributed in a pipeline, in gigajoules per cubic metre, set out in Part 2 of Schedule 1 to the NGER (Measurement) Determination.

$EF_{NG,\,CO2}$ is the carbon dioxide (CO_2) combustion emissions factor for natural gas distributed in a pipeline, in kilograms CO_2-e per gigajoule, set out in Part 2 of Schedule 1 to the NGER (Measurement) Determination.

Note: Methane (CH_4) and nitrous oxide (N_2O) emissions are constant regardless of whether biomethane or natural gas is combusted, and hence do not result in displacement abatement.

Subdivision 4—Eligible abatement fraction

32L Summary

The eligible abatement fraction for a reporting period is the proportion of gross abatement associated with biomethane produced from eligible biogas during a reporting period. This excludes abatement created from biogas upgrading of ineligible biogas. Only the eligible abatement fraction of gross abatement is counted towards the net abatement to ensure biomethane produced from ineligible sources is not credited.

The eligible abatement fraction is expressed as a fraction, representing the proportion of biogas sent to a biogas upgrading system in the project that is eligible biogas. If 100% of biogas that undergoes biogas upgrading is eligible biogas, there is no deduction for ineligible abatement.

The eligible abatement fraction is worked out as the fraction of the quantity of eligible biogas supplied by all biogas source facilities during a reporting period to the total quantity of biogas treated during a reporting period. The quantity of eligible biogas sent from each biogas source facility is worked out by:

(i) direct measurement of the quantity of eligible biogas sent for biogas upgrading; or
(ii) estimation of the proportion of biogas sent for biogas upgrading that is eligible biogas.

32M Eligible abatement fraction for a project biomethane facility

The eligible abatement fraction for project biomethane facility *f* during a reporting period, $\boldsymbol{EA_f}$, as a fraction, is worked out using the formula (***equation 27***):

$$\mathrm{EA_f} = \frac{\sum_g \mathrm{Q_{BG,\,El,\,g}}}{\sum_g \mathrm{Q_{BG,\,g}}}$$

where:

g is a biogas source facility that sends biogas to project biomethane facility *f* during the reporting period.

$\boldsymbol{Q_{BG,\,El,\,g}}$ is the volume of eligible biogas sent to project biomethane facility *f* from biogas source facility *g* during the reporting period, in cubic metres, determined in accordance with section 32N.

$\boldsymbol{Q_{BG,\,g}}$ is the volume of biogas sent to project biomethane facility *f* from biogas source facility *g* during the reporting period, in cubic metres, determined in accordance with the monitoring requirements.

32N Determining the quantity of eligible biogas from a biogas source ($Q_{BG, El, g}$)

(1) The volume of eligible biogas sent to project biomethane facility *f* from biogas source facility *g* during a reporting period, $\boldsymbol{Q_{BG, El, g}}$, in cubic metres, is worked out:

(a) if it is possible to measure $\boldsymbol{Q_{BG, El, g}}$ in accordance with the monitoring requirements—in accordance with the monitoring requirements; or

(b) if it is not possible to measure $\boldsymbol{Q_{BG, El, g}}$ in accordance with the monitoring requirements—in accordance with subsection (2).

Note: Measurement of $Q_{BG, El, g}$ is possible if all biogas from a biogas source facility is eligible, or if eligible biogas is physically apportioned in such a way that permits direct measurement in accordance with the monitoring requirements.

(2) For paragraph (1)(b), the volume of eligible biogas sent to project biomethane facility *f* from biogas source facility *g* during a reporting period, $\boldsymbol{Q_{BG, El, g}}$, in cubic metres, is worked out using the formula (***equation 28***):

$$Q_{BG, El, g} = EB_g \times Q_{BG, g}$$

where:

$\boldsymbol{EB_g}$ is the proportion of biogas sent to project biomethane facility *f* from biogas source facility *g* during a reporting period that is eligible biogas, expressed as a fraction, determined in accordance with subsection (3).

$\boldsymbol{Q_{BG, g}}$ is the volume of biogas sent to project biomethane facility *f* from biogas source facility *g* during the reporting period, in cubic metres, determined in accordance with the monitoring requirements.

(3) For subsection (2), the proportion of biogas sent to project biomethane facility *f* from biogas source facility *g* during a reporting period that is eligible biogas, $\boldsymbol{EB_g}$, expressed as a fraction, must be:

(a) determined using:

(i) the proportion of eligible biogas waste to biogas waste treated to produce biogas from biogas source facility *g* for a reporting period, by methane-producing capacity; or

(ii) the proportion of eligible biogas waste to biogas waste treated to produce biogas from biogas source facility *g* for a reporting period, by mass; or

(iii) another approach that can reasonably be expected to provide a fraction that accurately reflects the proportion of eligible biogas for biogas source facility *g* in a reporting period; and

(b) determined using an approach that can reasonably be expected to provide an accurate and conservative value for EB_g; and

(c) determined based on data and calculations that are auditable and verifiable.

(4) If it is not possible to work out the volume of eligible biogas sent to project biomethane facility *f* from biogas source facility *g* during a reporting period, $Q_{BG,}$

$_{El, g}$ (in cubic metres), in accordance with subsection (1), $Q_{BG, El, g}$ is taken to be zero for a reporting period.

Subdivision 5—Displacement abatement project emissions

32O Summary

The displacement abatement project emissions for a reporting period are the emissions that result from a project biomethane facility undertaking biomethane production during the reporting period.

32P Project emissions: displacement abatement

(1) The project emissions for project biomethane facility *f* for a reporting period, $\boldsymbol{PE_{displacement, f}}$, in tonnes CO_2-e, is worked out using the formula (***equation 29***):

$$PE_{displacement, f} = E_{F, displacement, f} + E_{PE, displacement, f}$$

where:

$\boldsymbol{E_{F, displacement, f}}$ is the emissions from fuel that is specifically attributable to the operation of project biomethane facility *f* during the reporting period (including transport), in tonnes CO_2-e, worked out using equation 30 (section 32Q).

$\boldsymbol{E_{PE, displacement, f}}$ is the emissions from purchased electricity that is specifically attributable to the operation of project biomethane facility *f* during the reporting period, in tonnes CO_2-e worked out using equation 31 (section 32R).

(2) In determining $E_{F, displacement, f}$ and $E_{PE, displacement, f}$, fuel and purchased electricity used for landfill gas capture for biomethane and emissions destruction project activities are to be disregarded.

Note: Examples of fuel and purchased electricity uses to be disregarded include fuel and electricity used in the collection of landfill gas or transport of landfill gas to a biogas upgrading system. This ensures that double counting of project emissions does not occur. Project emissions from fuel and electricity used in landfill gas capture for biomethane and emissions destruction are accounted for when working out net displacement abatement in Division 2 of this Part.

32Q Emissions from fuel use: displacement abatement

(1) The emissions from fuel use that is specifically attributable to the operation of project biomethane facility *f*, or transport of biomethane produced at project biomethane facility *f* to an end use where it can reasonably be expected to be combusted within Australia as a natural gas substitute. during a reporting period, $\boldsymbol{E_{F, displacement, f}}$, in tonnes CO_2-e, is worked out using the formula (***equation 30***):

$$E_{F,\ displacement,\ f} = \sum_{i}\sum_{j} \frac{Q_{F,\ displacement,\ f,\ i} \times EC_i \times EF_{ij}}{1000}$$

where:

i is a fuel type.

j is a greenhouse gas type.

$\boldsymbol{Q_{F,\ displacement,\ f,\ i}}$ is the amount of fuel type *i* that is specifically attributable to the operation of project biomethane facility *f*, or transport of biomethane produced at project biomethane facility *f* to an end use where it can reasonably be expected to be combusted within Australia as a natural gas substitute, during the reporting period, in tonnes, kilolitres, cubic metres, or gigajoules, determined in accordance with the monitoring requirements.

$\boldsymbol{EC_i}$ is the energy content factor for fuel type *i*, in gigajoules per tonne, gigajoules per kilolitre or gigajoules per cubic metre, set out in the NGER (Measurement) Determination.

Note: If $Q_{F,\ displacement,\ f,\ i}$ is measured in gigajoules, then EC_j is not required (EC_j=1).

$\boldsymbol{EF_{ij}}$ is the emission factor for greenhouse gas type *j* and fuel type *i*, in kilograms CO_2-e per gigajoule, set out in the NGER (Measurement) Determination.

(2) In determining $Q_{F,\ displacement,\ f,\ i}$, if fuel is used by the project biomethane facility or equipment used to transport biomethane in performing a function that was also performed before the implementation of the project, it is attributable to the operation of the project biomethane facility only to the extent that the project has caused an increase in fuel use.

32R Emissions from purchased electricity use: displacement abatement

(1) The emissions from purchased electricity that is specifically attributable to the operation of project biomethane facility *f* during a reporting period, $\boldsymbol{E_{PE,\ displacement,\ f}}$, in tonnes CO_2-e, is worked out using the formula (***equation 31***):

$$E_{PE,displacement,\ f} = Q_{PE,displacement,\ f}\ \frac{EF_{PE,\ \ displacement}}{1000}$$

where:

$\boldsymbol{Q_{PE,\ displacement,\ f}}$ is the amount of purchased electricity that is specifically attributable to the operation of project biomethane facility *f* during the reporting period, in kilowatt hours, determined in accordance with the monitoring requirements.

$\boldsymbol{EF_{PE,\ displacement}}$ is

(a) for electricity obtained from an electricity grid that is a grid in relation to which the NGA Factors document includes an emissions factor—that factor, in kilograms CO_2-e per kilowatt hour; or

(b) for electricity obtained from an electricity grid not covered by paragraph (a) or from a source other than an electricity grid:

(i) if the supplier of the electricity is able to provide an emissions factor that reflects the emissions intensity of the electricity—that factor, in kilograms CO_2-e per kilowatt hour; or

(ii) otherwise—the emissions factor, in kilograms CO_2-e per kilowatt hour, for off-grid electricity included in the NGA Factors document.

(2) For subparagraph (b)(i) of the definition of $\boldsymbol{EF}_{\boldsymbol{PE,\ displacement}}$ in subsection (1), the emissions factor must be worked out:

(a) on a sent-out basis; and

(b) using a measurement or estimation approach that is consistent with the NGER (Measurement) Determination.

Part 5—Reporting, record-keeping and monitoring requirements

Note: Other reporting, record-keeping and monitoring requirements are set out in regulations and legislative rules made under the Act.

Division 1—Offsets report requirements

33 Operation of this Division

For paragraph 106(3)(a) of the Act, this Division sets out information that must be included in an offsets report about a landfill gas (electricity generation) project that is an eligible offsets project.

33A General information that must be included in offsets report

An offsets report for a reporting period for a project must include the following information:

(a) if the project type is different from the type nominated in the section 22 application or section 128 application for the project or in a previous offsets report:
  (i) the date on which the project type changed; and
  (ii) details about how the project meets the requirements of the changed project type, in accordance with sections 12A to 12E;

(b) a list of the project activities that were carried out at the project landfill or each project biomethane facility (as the case may be) involved in the project including:
  (i) details of any additional project activity that began to be carried out after the section 22 application or section 128 application was made or since an offsets report was given to the Regulator, and the date on which it commenced; and
  (ii) details of any project activity that had previously been carried out, that has stopped being carried out since an offsets report was given to the Regulator, and the date on which it stopped;

(c) a description of the sources of project emissions;

(d) if landfill gas capture for biomethane has been carried out as part of the project—evidence that biogas sent to biogas upgrading systems is used to produce biomethane that can reasonably be expected to be combusted within Australia as a natural gas substitute;

Note: Evidence that biomethane produced by the project can reasonably be expected to be combusted within Australia as a natural gas substitute may include invoices or other records of commercial transactions in which biomethane is traded as a substitute for natural gas for a use that results in its combustion.

(e) if biomethane production has been carried out as part of the project:
  (i) details of the source of any biogas treated during the reporting period;
  (ii) details of the biogas upgrading systems used for the project;

(iii) details about the end use, or anticipated end use, of the biomethane produced during the reporting period;

(iv) details about the measurement of the volume of biomethane sent out by biogas upgrading systems ($Q_{BM, k}$) in accordance with the monitoring requirements, and the point at which biomethane flow is measured;

(v) a declaration from the project proponent that biomethane produced by all project biomethane facilities involved in the project during the reporting period can reasonably be expected to be combusted within Australia as a natural gas substitute.

33B Information about net abatement calculations that must be included in offsets report

An offsets report for a reporting period for a project must include details of the net abatement calculations for the reporting period, including the following:

(a) the output of each equation in this determination used to calculate the net abatement amount for the reporting period;

(b) if landfill gas capture for biomethane is carried out as part of the project, details about the biomethane production loss factor used to calculate net abatement;

(c) if biomethane production is carried out as part of the project, details of the displacement abatement calculations (that is, calculations made under Division 3 of Part 4), including the following:

(i) information on volumes and methane concentrations of biomethane produced during the reporting period;

(ii) details of the volumes and eligible abatement fractions of biogas treated by each project biomethane facility during the reporting period;

(iii) information on the sources and volumes of project emissions from treatment of biogas by biogas upgrading;

(iv) if $Q_{BG, El, g}$ is determined in accordance with subsection 32N(2) for a reporting period:

(A) an explanation of how the proportion of biogas that is eligible biogas, EB_g, was determined; and

(B) evidence or data supporting how EB_g was calculated; and

(C) a signed declaration from the person that estimated EB_g that the factor is accurate and conservative.

33C Details of certain changes to a project must be included in offsets report

An offsets report for a reporting period for a project must include details of any of the following changes made to the project since the section 22 application or section 128 application for the project was made or since the last offsets report was given to the Regulator:

(a) the project landfill being changed;

(b) a project biomethane facility being added to the project, or an existing project biomethane facility being changed, in which case, the report must also include:
  (i) the intended recipients of biomethane produced by the new or changed project biomethane facilities; and
  (ii) a declaration from the project proponent that biomethane produced by the new or changed project biomethane facility can reasonably be expected to be combusted within Australia as a natural gas substitute;
(c) a biogas upgrading system being added to the project or an existing biogas upgrading system being changed;
(d) any other change in the information provided in the section 22 application or section 128 application for the project, in accordance with sections 13A to 13B.

34 Determination of certain factors and parameters

(1) If, in the circumstances described in paragraph 6(2)(b), a factor or parameter is defined or calculated for a reporting period by reference to an instrument or writing as in force from time to time, the offsets report about the project for the reporting period must include the following information for the factor or parameter:
  (a) the versions of the instrument or writing used;
  (b) the start and end dates of each use;
  (c) the reasons why it was not possible to define or calculate the factor or parameter by reference to the instrument or writing as in force at the end of the reporting period.

(2) If a parameter is determined under section 37 for the purpose of working out the carbon dioxide equivalent net abatement amount for a landfill gas (electricity generation) project for a reporting period, the offsets report about the project for the reporting period must include the following information for the parameter:
  (a) the name of the parameter;
  (b) the start and end dates of the non-monitored period for which the parameter was determined;
  (c) the value of the parameter and how that value was calculated;
  (d) the reasons why the project proponent failed to monitor the parameter as required by the monitoring requirements.

Division 2—Monitoring requirements

35 Operation of this Division

For paragraph 106(3)(d) of the Act, this Division sets out:

(a) requirements to monitor a landfill gas (electricity generation) project that is an eligible offsets project (see section 36); and

(b) certain consequences if the project proponent fails to monitor the project as required (see section 37).

36 Requirements to monitor certain parameters

(1) The project proponent for a landfill gas (electricity generation) project must monitor and determine a parameter set out in an item of the following table in accordance with the instructions in the item.

Monitored parameters

	Parameter	Description	Unit	Measurement procedure (including frequency as required)	Determination of parameter from measurements
1	$Q_{En, h}$	Energy content of the landfill gas sent to combustion device h	Gigajoules	Estimated under Division 2.3.6 of the NGER (Measurement) Determination or section 6.5 of that Determination using measurement criteria AAA.	Cumulative value for reporting period.
2	$O_{h, a}$	Operation of combustion device h during hour a	1 or 0	If the combustion device is a flare, operation is determined for each minute using temperature measurement. If temperature is measured at 500 degrees Celsius or higher for 40 minutes or more in an hour, then $O_{h, a}$ = 1. Otherwise $O_{h, a}$ = 0. For all other combustion devices, operation for each minute is to be determined in accordance with manufacturer's specifications. If the device operates according to manufacturer's specifications for the entire hour then $O_{h, a}$ = 1. Otherwise $O_{h, a}$ = 0. All measuring equipment must be used in accordance	For the purpose of calculating $M_{com, h}$ in equation 9A (above), the value of $O_{h, a}$ determined for an hour based on the operation of the combustion device must be paired to the cumulative value of $M_{sent, h}$ for the same hour.

Monitored parameters					
	Parameter	**Description**	**Unit**	**Measurement procedure (including frequency as required)**	**Determination of parameter from measurements**
				with appropriate measuring requirements.	
3	$Q_{LFG, h}$	Landfill gas sent to combustion device or biogas upgrading system h	Cubic metres	Estimated under Division 2.3.6 of the NGER (Measurement) Determination using measurement criteria AAA. Frequency—continuously.	For equation 9A, cumulative values for a time interval not greater than 1 hour must be paired to measurements of W_{LFG, CH_4} for the time interval. Otherwise, the measurements must be paired to measurements of W_{LFG, CH_4} for the same measurement interval.
4	$Q_{EG, h}$	Electricity (supplied to the grid or used on-site) generated by internal combustion engine h	Megawatt hour	Estimated under Part 6.1 of the NGER (Measurement) Determination. Measure only the electricity produced from the combustion of landfill gas (not from the combustion of other fuel types).	Cumulative value for the reporting period.
5	$Q_{F, LFG-BM, i}$	Amount of fuel type i used for landfill gas capture for biomethane activities	Tonnes, kilolitres, cubic metres or gigajoules	Project proponent may choose from the following: (a) estimated in accordance with Division 2.2.5, 2.3.6 or 2.4.6 of the NGER (Measurement) Determination (as appropriate to the fuel type); (b) evidenced by invoices, contractual arrangements or industry metering records. Measure only the fuel used to operate the project in relation to landfill gas capture for biomethane activities.	Cumulative value for the reporting period.

Monitored parameters					
	Parameter	**Description**	**Unit**	**Measurement procedure (including frequency as required)**	**Determination of parameter from measurements**
				Frequency—continuous.	
6	$Q_{EP, LFG-BM}$	Amount of purchased electricity used for landfill gas capture for biomethane activities	Kilowatt hours	Evidence by invoices, contractual arrangements or industry metering records. If $Q_{EP, LFG-BM}$ is measured in gigajoules, the amount of kilowatt hours must be calculated by dividing the amount of gigajoules by the conversion factor of 0.0036. Measure only the electricity used to operate the project in relation to landfill gas capture for biomethane activities. Frequency—continuous.	Cumulative value for the reporting period.
7	W_{LFG, CH_4}	Fraction of the volume of landfill gas that is methane	Fraction	Estimated under Division 2.3.6 of the NGER (Measurement) Determination. Frequency—continuously. Measured at the same conditions as $Q_{LFG, h}$.	For the purpose of equation 9A, average values for a time interval not greater than 1 hour must be paired to measurements of $Q_{LFG, h}$ for the time interval. Otherwise, the measurements must be paired to measurements of $Q_{LFG, h}$ for the same measurement interval.
8	$Q_{BM, k}$	Volume of biomethane sent out by biogas upgrading system k	m^3	Estimated under Division 2.3.6 of the NGER (Measurement) Determination using measurement criteria AAA. Frequency—continuously.	Cumulative value for the reporting period. $Q_{BM, k}$ is to be measured at a point that is after the biomethane leaves the biogas upgrading system and at which the biomethane is suitable for

Monitored parameters					
	Parameter	**Description**	**Unit**	**Measurement procedure (including frequency as required)**	**Determination of parameter from measurements**
					combustion as a natural gas substitute.
9	$W_{BM, CH4, k}$	Proportion of the volume of biomethane from biogas upgrading system k, $Q_{BM, k,}$ that is methane	Fraction	Measured: (a) using an inline gas analyser that analyses gas composition at a point after biogas upgrading is complete; and (b) to an accuracy of +/ 3% absolute; and (c) in accordance with the instrument manufacturer's instructions and the relevant Australian and New Zealand standards.	The measurements must be paired to measurements of $Q_{BM, k}$ for the same measurement interval.
10	$Q_{BG, g}$	Volume of biogas sent to a project biomethane facility from biogas source facility g	m^3	Estimated under Division 2.3.6 of the NGER (Measurement) Determination using measurement criteria AAA. Frequency—continuously.	Cumulative value for the reporting period.
11	$Q_{BG, El, g}$	Volume of eligible biogas sent to a project biomethane facility from biogas source facility g	m^3	Estimated under Division 2.3.6 of the NGER (Measurement) Determination using measurement criteria AAA. Frequency—continuously.	$Q_{BG, El, g}$ must only be measured in accordance with this item if it is possible to directly measure the volume of eligible biogas sent to a project biomethane facility from biogas source facility g. Cumulative value for the reporting period.
12	$Q_{F, displacement, f, i}$	Quantity of each fuel type i used by project biomethane facility f	Either: (a) t (for solid fuel); or (b) m^3(for	(a) monitored in accordance with section 2.25, 2.36 or Division 2.4.6 of the NGER (Measurement) Determination (as	Cumulative value for the reporting period.

Monitored parameters					
	Parameter	**Description**	**Unit**	**Measurement procedure (including frequency as required)**	**Determination of parameter from measurements**
			gas fuel); or (c) kL (for liquid fuel); or (d) GJ	applicable to the fuel type); or (b) evidenced by invoices, contractual arrangements or industry metering records. Frequency—continuous.	
13	$Q_{PE, displacement, f}$	Quantity of electricity purchased by project biomethane facility f	kWh or GJ	Evidenced by invoices, contractual arrangements or industry metering records. If $E_{PE, displacement, f}$ is measured in gigajoules, the quantity of kilowatt hours must be calculated by dividing the amount of gigajoules by the conversion factor of 0.0036. Frequency—continuous.	Cumulative value for the reporting period.

(2) Any equipment or device used to monitor a parameter must be calibrated by an accredited third-party technician at intervals, and using methods, that are in accordance with the manufacturer's specifications.

(3) In this section:

appropriate measuring requirements, in relation to a measurement or estimate, means requirements that are consistent with:

(a) requirements that apply in relation to similar measurements or estimates under the NGER (Measurement) Determination; or

(b) relevant standards and other requirements under the *National Measurement Act 1960*.

i means a fuel type.

37 Consequences of not meeting requirement to monitor certain parameters

(1) If, during a particular period (the ***non-monitored period***) in a reporting period, a project proponent for a landfill gas (electricity generation) project fails to monitor a parameter mentioned in the following table as required by the monitoring requirements, the value of the parameter for the purpose of working out the net abatement amount for the reporting period is to be determined for the non-monitored period in accordance with the table.

1.	Consequence of not meeting requirement to monitor certain parameters	
2. Item	**3. Parameter**	**4. Determination of parameter for non-monitored period**
1	W_{LFG, CH_4}	The parameter is: (a) for any cumulative period of up to 3 months in any 12 months of a crediting period for the project—the amount set out in section 5.14C of the NGER (Measurement) Determination multiplied by 0.9; and (b) for any period in excess of that 3 months—the amount set out section 5.14C of the NGER (Measurement) Determination multiplied by 0.5.
2	Each of the following: (a) $Q_{En, h}$; (b) $Q_{LFG, h}$; (c) $Q_{EG, h}$; (d) $Q_{BM, k}$; (e) $Q_{BG, g}$; (f) $Q_{BG\ El, g}$; (g) $Q_{F, displacement, i}$; (h) $Q_{PE\ displacement}$.	The project proponent must make a conservative estimate of the parameter having regard to: (a) any relevant measurement or estimation approaches or requirements that apply to the parameter under the NGER (Measurement) Determination; and (b) any relevant historical data for the project; and (c) any other data for the project that relates to the parameter; and (d) any other matter the project proponent considers relevant.

(2) To avoid doubt, this section does not prevent the Regulator from taking action under the Act, or regulations or the legislative rules, in relation to the project proponent's failure to monitor a parameter as required by the monitoring requirements.

Note: Examples of action that may be taken include the following:

(a) if the failure constitutes a breach of a civil penalty provision in section 194 of the Act (which deals with project monitoring requirements), the Regulator may apply for a civil penalty order in respect of the breach;

(b) if false or misleading information was given to the Regulator in relation to the failure, the Regulator may revoke the project's section 27 declaration under regulations or legislative rules made for the purposes of section 38 of the Act;

(c) if the giving of false or misleading information in relation to the failure led to the issue of Australian carbon credit units, the Regulator may require all or some of those units to be relinquished under section 88 of the Act.

Schedule 1—Determining regulatory proportion

Note: See subsections 31(1) and (2).

Part 1—Operation of this Schedule

1 Operation of this Schedule

(1) For subsections 31(1) and (2), the regulatory proportion of the methane combusted during a reporting period that would have been combusted without the project ($W_{B,\,Reg}$) is determined using an option set out in Parts 2 to 5.

No obligation on State and Territory environmental regulators

(2) To avoid doubt, this Schedule does not require the environmental regulator in a State or Territory to do anything.

Part 2—Regulatory proportion determined using regulatory guidelines for landfill

2 Regulatory proportion determined using regulatory guidelines for landfill

(1) If there is no permitted methane flux rates for a State or Territory set out in the tables in subclauses 4(2) and 4(3), then, for a project located in the State or Territory, $W_{B,Reg}$ is 0.

(2) Otherwise, $W_{B,Reg}$ may be worked out using the formula (***equation 32***):

$$W_{B,\,Reg} = 1 - \frac{M_{Reg}}{M_{Gen,\,y}}$$

where:

$W_{B,\,Reg}$ means the regulatory proportion of the methane combusted during the reporting period that would have been combusted without the project.

M_{Reg} means the annual amount of methane that is permitted to be emitted from the landfill, in tonnes CO_2-e, worked out using equation 33.

$M_{Gen,\,y}$ means the methane generated by the landfill in year y, in tonnes CO_2-e, worked out using subsection 25(3).

3 Annual amount of methane permitted to be emitted

The annual amount of methane that is permitted to be emitted from the landfill, in tonnes CO_2-e, is worked out using the formula (***equation 33***):

$$M_{Reg} = M_{Reg,\,FI} + M_{Reg,\,D}$$

where:

M_{Reg} means the annual amount of methane that is permitted to be emitted from the landfill, in tonnes CO_2-e.

$M_{Reg,\ FI}$ means the annual amount of methane that is permitted to be emitted from the final and intermediate cover of the landfill, in tonnes CO_2-e, worked using equation 34.

$M_{Reg,\ D}$ means the annual amount of methane that is permitted to be emitted from the daily/operational cover of the landfill, in tonnes CO_2-e, determined in accordance with clause 5.

4 Annual amount of methane permitted to be emitted from final and intermediate cover

(1) The annual amount of methane that is permitted to be emitted from the final and intermediate cover of the landfill, in tonnes CO_2-e, is worked using the formula (***equation 34***):

$$\mathrm{M_{Reg,FI}} = \frac{8760 \times \mathrm{GWP_{CH_4}}}{(1 - \mathrm{OF})} \times \sum_{x} (S_x \times C_x)$$

where:

$M_{Reg,\ FI}$ means the annual amount of methane that is permitted to be emitted from the final and intermediate cover of the landfill, in tonnes CO_2-e.

OF means the oxidation factor for near surface methane in landfill set out in the definition of ***OF*** in subsection 5.4(1) of the NGER (Measurement) Determination.

GWP_{CH_4} means the global warming potential value for methane set out in regulation 2.02 of the *National Greenhouse and Energy Reporting Regulations 2008*.

S_x means the area of the landfill that is cover type ***x***, in square metres.

C_x means the permitted methane flux rate for the landfill for cover type ***x***, in tonnes of methane per square metre per hour, set out the applicable table in subsection (2) or (3).

x means the type of landfill cover, being either final cover or intermediate cover.

(2) The following table sets out permitted methane flux rates for final cover.

Permitted methane flux rates for final cover (C_x)			
Item	**State or Territory**	**Methane concentration limit (CH_4 ppm)**	**Permitted methane flux rate estimated from the methane concentration limit ($tCH_4/m^2/hr$)**
1	New South Wales	500	2.5×10^{-6}
2	Victoria	100	0.3×10^{-6}
3	Queensland	500	2.5×10^{-6}
4	Western Australia	500	2.5×10^{-6}
5	South Australia	n/a	n/a
6	Tasmania	500	2.5×10^{-6}
7	Australian Capital Territory	100	0.3×10^{-6}
8	Northern Territory	n/a	n/a

(3) The following table sets out permitted methane flux rates for intermediate cover.

Permitted methane flux rates for intermediate cover (C_x)			
Item	**State or Territory**	**Methane concentration limit (CH_4 ppm)**	**Permitted methane flux rate estimated from the methane concentration limit ($tCH_4/m^2/hr$)**
1	New South Wales	500	2.5×10^{-6}
2	Victoria	100	0.3×10^{-6}
3	Queensland	500	2.5×10^{-6}
4	Western Australia	500	2.5×10^{-6}
5	South Australia	n/a	n/a
6	Tasmania	500	2.5×10^{-6}
7	Australian Capital Territory	100	0.3×10^{-6}
8	Northern Territory	n/a	n/a

5 Annual amount of methane permitted to be emitted from daily/operational cover

The annual amount of methane that is permitted to be emitted from the daily/operational cover of the landfill ($M_{Reg,D}$) is equivalent to parameter $M_{Gen,y}$, in tonnes CO_2-e, worked out using subsection 25(3) where the calculation is based only on the waste sited vertically below the daily/operational cover.

Part 3—Regulatory proportion determined by asking environmental regulator

6 Regulatory proportion determined by asking environmental regulator

(1) $W_{B,Reg}$ may be determined by asking the environmental regulator, in the State or Territory in which the landfill is located, to provide in writing to the project proponent the gas collection rate that would be required for the landfill to meet the most stringent methane concentration limits for the landfill that have been in force since 24 March 2011.

(2) The term used by the environmental regulator to express this quantitative regulatory requirement must be converted to $W_{B,Reg}$ in accordance with the following table:

Converting quantitative regulatory requirements to collection efficiency

Item	Term used by environmental regulator	Conversion to $W_{B,Reg}$
1	Methane concentration limit, in parts per million methane	$W_{B,Reg}$ is worked out: (a) using Part 2; but (b) for final and intermediate cover—using the permitted methane flux rates, set out in the table in subclause (3), that correspond to the concentration limits advised by the environmental regulator
2	Permitted flux rate, in tonnes methane per square meter per hour	$W_{B,Reg}$ is worked out: (a) using Part 2; but (b) for the permitted flux rate for final and intermediate cover (C_x)—using the flux rates advised by the environmental regulator
3	Proportion of landfill gas generation required to be collected (collection efficiency)	No conversion necessary ($W_{B,Reg}$ is as advised by the environmental regulator)
4	Proportion of landfill gas generation allowed to be released to the atmosphere	$W_{B,Reg}$ is worked out as 1 minus the proportion advised by the environmental regulator
5	Annual amount of landfill gas required to be collected	$W_{B,Reg}$ is worked out as the amount advised by the environmental regulator, in tonnes CO_2-e, divided by the methane generated by the landfill in year *y*, in tonnes CO_2-e, which is equivalent to $M_{Gen,y}$ worked out using subsection 25(3)
6	Other	$W_{B,Reg}$ is worked out as the annual amount of landfill gas required to be collected, in tonnes CO_2-e, determined from the

Converting quantitative regulatory requirements to collection efficiency		
Item	**Term used by environmental regulator**	**Conversion to $W_{B,Reg}$**
		requirement advised by the environmental regulator, divided by the methane generated by the landfill in year *y*, in tonnes CO_2-e, which is equivalent to $M_{Gen,y}$ worked out using subsection 25(3)

(3) The following table sets out allowable flux rates for the purposes of item 1 in the table in subclause (2).

Determining allowable flux rates from allowable methane concentrations		
Item	**Methane concentration limit (CH_4 ppm)**	**Permitted methane flux rate estimated from the methane concentration limit ($tCH_4/m^2/hr$)**
1	0	0
2	50	0.1×10^{-6}
3	60	0.1×10^{-6}
4	70	0.2×10^{-6}
5	80	0.2×10^{-6}
6	90	0.2×10^{-6}
7	100	0.3×10^{-6}
8	110	0.3×10^{-6}
9	120	0.4×10^{-6}
10	130	0.4×10^{-6}
11	140	0.5×10^{-6}
12	150	0.6×10^{-6}
13	160	0.6×10^{-6}
14	170	0.7×10^{-6}
15	180	0.7×10^{-6}
16	190	0.8×10^{-6}
17	200	0.8×10^{-6}
18	210	0.9×10^{-6}
19	220	0.9×10^{-6}
20	230	1.0×10^{-6}
21	240	1.0×10^{-6}
22	250	1.0×10^{-6}
23	260	1.1×10^{-6}
24	270	1.2×10^{-6}

Determining allowable flux rates from allowable methane concentrations		
Item	**Methane concentration limit (CH_4 ppm)**	**Permitted methane flux rate estimated from the methane concentration limit ($tCH_4/m^2/hr$)**
25	280	1.3×10^{-6}
26	290	1.3×10^{-6}
27	300	1.3×10^{-6}
28	310	1.3×10^{-6}
29	320	1.4×10^{-6}
30	330	1.4×10^{-6}
31	340	1.5×10^{-6}
32	350	1.6×10^{-6}
33	360	1.6×10^{-6}
34	370	1.8×10^{-6}
35	380	1.8×10^{-6}
36	390	1.8×10^{-6}
37	400	1.9×10^{-6}
38	410	1.9×10^{-6}
39	420	2.0×10^{-6}
40	430	2.0×10^{-6}
41	440	2.0×10^{-6}
42	450	2.2×10^{-6}
43	460	2.2×10^{-6}
44	470	2.2×10^{-6}
45	480	2.3×10^{-6}
46	490	2.3×10^{-6}
47	500	2.5×10^{-6}

Part 4—Regulatory proportion determined by asking environmental regulator and using collection efficiency of existing landfill gas system

7 Regulatory proportion determined by asking environmental regulator and using collection efficiency of existing landfill gas system

(1) $W_{B,Reg}$ may be determined by asking the environmental regulator in the State or Territory in which the landfill is located whether the current gas collection rate for the landfill complies with the most stringent methane concentration limits for the landfill that have been in force since 24 March 2011.

(2) If the environmental regulator advises the project proponent in writing that the current gas collection for the landfill does so comply, then $W_{B,Reg}$ is equivalent to $W_{Com,\ Bef}$ worked out using equation 19 where:

(a) year *y* is the 12 months immediately before the advice is given; and

(b) as if the division by 2 were not part of the equation.

(3) To avoid doubt, subclause (1) does not apply unless the specified limits for methane concentrations for the landfill have not changed since 24 March 2011.

Part 5—Regulatory proportion determined by independent expert

8 Regulatory proportion determined by independent expert

(1) $W_{B,Reg}$ may be determined by a person engaged by the project proponent to determine the parameter.

(2) The person must:
  (a) have no conflict of interest in determining $W_{B,Reg}$; and
  (b) possess a relevant university degree; and
  (c) have more than 3 years' experience in:
    (i) landfill management; and
    (ii) the design and operation of landfill gas collection systems; and
  (d) have extensive knowledge of the regulatory framework relevant to landfill gas management in the jurisdiction in which the landfill is located.

(3) In determining $W_{B,Reg}$, the person must use the most stringent methane concentration limits for the landfill that have been in force since 24 March 2011.

(4) The person must provide to the project proponent, in writing, evidence that verifies:
  (a) the matters in paragraphs (2)(a) to (d); and
  (b) the calculations, assumptions, information, inputs and references used to determine $W_{B,\ Reg}$

Endnotes

Endnote 1—About the endnotes

The endnotes provide information about this compilation and the compiled law.

The following endnotes are included in every compilation:

Endnote 1—About the endnotes
Endnote 2—Abbreviation key
Endnote 3—Legislation history
Endnote 4—Amendment history

Abbreviation key—Endnote 2
The abbreviation key sets out abbreviations that may be used in the endnotes.

Legislation history and amendment history—Endnotes 3 and 4
Amending laws are annotated in the legislation history and amendment history.

The legislation history in endnote 3 provides information about each law that has amended (or will amend) the compiled law. The information includes commencement details for amending laws and details of any application, saving or transitional provisions that are not included in this compilation.

The amendment history in endnote 4 provides information about amendments at the provision (generally section or equivalent) level. It also includes information about any provision of the compiled law that has been repealed in accordance with a provision of the law.

Misdescribed amendments
A misdescribed amendment is an amendment that does not accurately describe the amendment to be made. If, despite the misdescription, the amendment can be given effect as intended, the amendment is incorporated into the compiled law and the abbreviation "(md)" added to the details of the amendment included in the amendment history.

If a misdescribed amendment cannot be given effect as intended, the abbreviation "(md not incorp)" is added to the details of the amendment included in the amendment history.

Endnote 2—Abbreviation key

ad = added or inserted

am = amended

amdt = amendment

c = clause(s)

C[x] = Compilation No. x

Ch = Chapter(s)

def = definition(s)

Dict = Dictionary

disallowed = disallowed by Parliament

Div = Division(s)

exp = expires/expired or ceases/ceased to have effect

F = Federal Register of Legislation

gaz = gazette

LA = *Legislation Act 2003*

LIA = *Legislative Instruments Act 2003*

(md) = misdescribed amendment can be given effect

(md not incorp) = misdescribed amendment cannot be given effect

mod = modified/modification

No. = Number(s)

o = order(s)

Ord = Ordinance

orig = original

par = paragraph(s)/subparagraph(s) /sub-subparagraph(s)

pres = present

prev = previous

(prev…) = previously

Pt = Part(s)

r = regulation(s)/rule(s)

reloc = relocated

renum = renumbered

rep = repealed

rs = repealed and substituted

s = section(s)/subsection(s)

Sch = Schedule(s)

Sdiv = Subdivision(s)

SLI = Select Legislative Instrument

SR = Statutory Rules

Sub-Ch = Sub-Chapter(s)

SubPt = Subpart(s)

<u>underlining</u> = whole or part not commenced or to be commenced

Endnote 3—Legislation history

Name	Registration	Commencement	Application, saving and transitional provisions
Carbon Credits (Carbon Farming Initiative—Electricity Generation from Landfill Gas) Methodology Determination 2021	10 September 2021 (F2021L01254)	11 September 2021 (s 2)	
Carbon Credits (Carbon Farming Initiative—Electricity Generation from Landfill Gas) Methodology Determination Variation 2022	19 January 2022 (F2022L00049)	20 January 2022 (s 2)	*Carbon Credits (Carbon Farming Initiative) Act 2011*, s 126

Endnote 4—Amendment history

Provision affected	How affected
Part 1	
s 2	rep LA s 48D
s 5	rs F2022L00049
s 5A	ad F2022L00049
Part 2	
s 7	am F2022L00049
Part 3	
Division 1	
s 8	rs F2022L00049
Division 2	
s 8A	ad F2022L00049
s 8B	ad F2022L00049
s 8C	ad F2022L00049
s 9	am F2022L00049
s 10	am F2022L00049
s 11	am F2022L00049
s 12	am F2022L00049
s 12A	ad F2022L00049
s 12B	ad F2022L00049
s 12C	ad F2022L00049
s 12D	ad F2022L00049
s 12E	ad F2022L00049
s 12F	ad F2022L00049
Division 3	
s 13	rs F2022L00049
s 13A	ad F2022L00049
s 13B	ad F2022L00049
s 14	rep F2022L00049
Division 4	
s 15	rs F2022L00049
s 15A	ad F2022L00049
s 15B	ad F2022L00049
s 15C	ad F2022L00049
Division 5	
s 16	rs F2022L00049
s 16A	ad F2022L00049
s 16B	ad F2022L00049

Endnote 4—Amendment history

Provision affected	How affected
Part 4	
Part 4	rs F2022L00049
Division 1	
s 17	rs F2022L00049
s 17A	ad F2022L00049
s 17B	ad F2022L00049
Division 2	
s 18	rs F2022L00049
s 19	rep F2022L00049
s 20	rs F2022L00049
s 21	rs F2022L00049
s 21A	ad F2022L00049
s 22	rs F2022L00049
s 23	rs F2022L00049
s 24	rs F2022L00049
s 25	rs F2022L00049
s 26	rs F2022L00049
s 27	rs F2022L00049
s 28	rs F2022L00049
s 28A	ad F2022L00049
s 28B	ad F2022L00049
s 29	rs F2022L00049
s 30	rs F2022L00049
s 31	rs F2022L00049
s 32	rs F2022L00049
s 32A	ad F2022L00049
s 32B	ad F2022L00049
s 32C	ad F2022L00049
s 32D	ad F2022L00049
Division 3	
s 32E	ad F2022L00049
s 32F	ad F2022L00049
s 32G	ad F2022L00049
s 32H	ad F2022L00049
s 32I	ad F2022L00049
s 32J	ad F2022L00049
s 32K	ad F2022L00049
s 32L	ad F2022L00049
s 32M	ad F2022L00049

Endnote 4—Amendment history

Provision affected	How affected
s 32N	ad F2022L00049
s 32O	ad F2022L00049
s 32P	ad F2022L00049
s 32Q	ad F2022L00049
s 32R	ad F2022L00049
Part 5	
Note	am F2022L00049
Division 1	
s 33A	ad F2022L00049
s 33B	ad F2022L00049
s 33C	ad F2022L00049
Division 2	
s 36	rs F2022L00049
s 37	am F2022L00049
Schedule 1	
Schedule 1	am F2022L00049