Carbon Credits (Carbon Farming Initiative—Animal Effluent Management) Methodology Determination Variation 2022

I, Angus Taylor, Minister for Industry, Energy and Emissions Reduction, make the following legislative instrument.

Dated 2 January 2022

Angus Taylor

Minister for Industry, Energy and Emissions Reduction

Contents

1 Name

This is the *Carbon Credits (Carbon Farming Initiative—Animal Effluent Management) Methodology Determination Variation 2022*.

2 Commencement

This instrument commences on the day after it is registered.

3 Authority

This instrument is made under section 114(1) of the *Carbon Credits (Carbon Farming Initiative) Act 2011.*

4 Amendment of methodology determination

The *Carbon Credits (Carbon Farming Initiative—Animal Effluent Management) Methodology Determination 2019* is amended as set out in Schedule 1.

Schedule 1—Amendments

Carbon Credits (Carbon Farming Initiative—Animal Effluent Management) Methodology Determination 2019

1 Section 5

Repeal the section, substitute:

5 Definitions

In this determination

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

anaerobic digester means a system consisting of a closed unit, or set of closed units, together with associated equipment (which may include equipment for heating and stirring), that:

(a) treats organic matter through anaerobic digestion to generate biogas; and
(b) collects the biogas; and
(c) transfers the biogas to:
  (i) a combustion device; or
  (ii) a biogas upgrading system.

Note: The definition of "anaerobic digester" includes a covered anaerobic pond without heating and stirring equipment if the methane emissions are captured and destroyed by combustion or are treated by biogas upgrading to produce biomethane.

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

anaerobic pond means a man-made, anaerobic storage device in which organic effluent is treated by using anaerobic digestion and from which the resulting biogas vents into the atmosphere. Anaerobic storage devices include outdoor earthen basins (with or without lining) and storage tanks that are above or below ground.

Note: The definition of "anaerobic pond" includes a covered pond if the biogas emissions are not captured and destroyed, but are instead allowed to vent into the atmosphere. An anaerobic pond may include equipment for heating and stirring.

animal effluent means the liquid waste stream generated from the normal operation of an eligible animal facility.

animal effluent management project has the meaning given by subsection 7(2).

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

biogas generation for biomethane has the meaning given by subsection 8A(2).

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 8C.

biomethane displacement-only project has the meaning given by section 8D.

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 treatment facility, the project treatment facility may also be a biomethane facility.

Note 2: Biomethane facilities that are used in an animal effluent management project that involves biogas generation for biomethane or biomethane production 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 paragraph 9A(2)(d)).

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

combustion device means:

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

(b) a flare that has a monitoring and control system and is operated in accordance with the manufacturer's instructions; or

(c) a device:

(i) that combusts biogas with a destruction efficiency of at least 98% (or such other threshold specified for the purposes of this subparagraph in the Supplement); 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 methane or biomethane, is combustion with a destruction efficiency of 98% or more of the methane.

composting (passive windrow) means the treatment of solid material diverted as part of an animal effluent management project aerobically in a pile or windrow (a line of heaped material) that is passively managed with infrequent turning for mixing and aeration.

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) biogas generation for biomethane; or

(b) emissions destruction; or

(c) emissions avoidance.

Note: Biogas generation for biomethane involves sending biogas to a biogas upgrading system to be turned into biomethane. This biogas 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.

default capacity, for a listed type of material, means the default methane-producing capacity that is specified for that type of material in the Supplement.

Note: The Supplement specifies individual default capacities for listed types of material.

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 2 of Part 4), attributable to biomethane production.

diversion, of material from organic effluent has the meaning given by paragraph 8A(5)(a).

eligible animal effluent biogas waste has the meaning given by section 15A.

eligible animal facility means:

(a) a piggery; or
(b) a dairy facility;

that is designed so that, in normal operation, it generates a liquid waste stream that:

(c) consists only of water, the faeces and urine of the animals, and incidental waste (including spoiled feed, straw, etc); and
(d) would normally be treated in an anaerobic pond.

eligible biogas means:

(a) biogas produced from eligible biogas waste; or
(b) landfill gas.

eligible biogas waste means biogas waste that is:

(a) biogas waste that is eligible animal effluent biogas waste; 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.

eligible material—see subsection 15(1).

emissions avoidance has the meaning given by subsection 8A(5).

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

forerunner project:

(a) in relation to a restarting biomethane conversion and displacement project—has the meaning given by paragraph 8E(a); or
(b) in relation to a restarting biomethane displacement-only project—has the meaning given by paragraph 8F(a).

ineligible material—see subsection 16(1).

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.

legacy determination means each of the following, or an earlier version of any of the following determinations applicable in accordance with section 125, 126, 127 or 130 of the Act:

(a) the *Carbon Farming (Destruction of Methane Generated from Manure in Piggeries) Methodology Determination 2012;*
(b) the *Carbon Credits (Carbon Farming Initiative) (Destruction of Methane Generated from Manure in Piggeries—1.1) Methodology Determination 2013;*
(c) the *Carbon Credits (Carbon Farming Initiative) (Destruction of Methane from Piggeries Using Engineered Biodigesters) Methodology Determination 2013;*
(d) the *Carbon Credits (Carbon Farming Initiative—Destruction of Methane Generated from Dairy Manure in Covered Anaerobic Ponds) Methodology Determination 2012.*

listed type of material means a type of material whose default methane-producing capacity is specified in the Supplement for the purposes of this definition.

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

monitoring requirements means the requirements set out in section 41.

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 2022, the National Inventory Report could be accessed from www.industry.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.

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 2022, 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 8B.

non-monitored period has the meaning given by subsection 42(1).

organic effluent means a liquid waste stream of largely organic solids, of a kind that is ordinarily treated using an anaerobic pond.

Note: Animal effluent is one type of organic effluent.

post-diversion treatment has the meaning given by paragraph 8A(5)(b).

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 9A(2)(d)).

project treatment facility, in relation to a project that involves emissions destruction, emissions avoidance, or biogas generation for biomethane, means a treatment 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 non-biomethane project, and the section 22 application for a restarting biomethane conversion and displacement project, must include details of at least one project treatment facility (see paragraphs 9(2)(c) and 9A(2)(c)).

project type means a project of the type listed in subsection 7(3).

quality assurance plans, for a project treatment facility or project biomethane facility, means a plan prepared under section 37 for the facility.

restarting biomethane conversion and displacement project has the meaning given by section 8E.

restarting biomethane displacement-only project has the meaning given by section 8F.

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

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.

stockpiles (solid storage) means the storage of solid material diverted as part of an animal effluent management project in a heaped pile that is not turned.

Supplement means the document entitled "Supplement to the *Carbon Credits (Carbon Farming Initiative—Animal Effluent Management) Methodology Determination 2019*" as in force from time to time and available on the Regulator's website.

treatment facility means a facility that treats animal effluent, with or without other organic effluent, by carrying out emissions avoidance, emissions destruction, or biogas generation for biomethane.

Note 1: Treatment facilities that are used in an animal effluent management project that involves emissions destruction, emissions avoidance, or biogas generation for biomethane, become known as project treatment facilities. Division 4 of Part 3 imposes additional requirements on project treatment facilities.

Note 2: The section 22 application or section 128 application for a biomethane conversion and displacement project or a non-biomethane project, and the section 22 application for a restarting biomethane conversion and displacement project, must include details of at least one project treatment facility (see paragraphs 9(2)(c) and 9A(2)(c)).

treatment method means a method of treatment used by a facility that treats organic effluent by emissions avoidance, being either:

(a) a solids separation treatment method of diversion carried out in accordance with any requirements set out in the Supplement; or

(b) a post-diversion treatment carried out in accordance with any requirements set out in the Supplement, through:

(i) a method of stockpiles (solid storage); or

(ii) a method of composting (passive windrow).

volatile solids **(*VS*)**, in relation to a material that is, or is a component of, organic effluent, means the portion of the material lost on ignition when the material is heated to 550(±50) degrees Celsius for at least one hour.

Note: This is a measure of organic matter content of the material.

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

Australian carbon credit unit

crediting period

eligible offsets project

emission

greenhouse gas

offsets project

offsets report

project

project proponent

Regulator

reporting period

2 After section 5

Insert:

5A Meaning of *monitoring and control system*

(1) A ***monitoring and control system*** for a flare or other device, is a system that consists of:

(a) a monitoring system that:

(i) detects combustion; and

(ii) monitors if the combustion device is operating at the manufacturer's specifications for the complete combustion of methane; and

(iii) records any periods of incomplete combustion; and

(b) a means to automatically stop biogas flow to the flare or other device when the flare or device is:

(i) not operating; or

(ii) 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 or a temperature monitoring system that prevents gas flow when the temperature drops below that required for the complete combustion of methane. Combustion devices must be operated to result in the complete combustion of methane under subsection 9C(2).

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

(a) monitors the flow rate of biogas 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.

3 Section 7

Repeal the section, substitute:

7 Animal effluent management projects

(1) For paragraph 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) animal effluent, with or without other organic effluent, is processed in a treatment facility in a way that destroys or avoids methane emissions that would otherwise arise if decomposing organic matter in animal waste was disposed of in an anaerobic pond;

(b) eligible biogas produced from the treatment of organic effluent, 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) A project covered by subsection (1) is an ***animal effluent management project***.

(3) An animal effluent management project that is an eligible offsets project may be 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.

4 Part 3

Repeal the Part, substitute:

Part 3—Project requirements

Division 1—Operation of this Part

8 Operation of this Part

(1) For paragraph 106(1)(b) of the Act, this Part sets out requirements that must be met for an animal effluent management project to be an eligible offsets project.

(2) Division 2 sets out project-specific requirements for each different type of animal effluent management project.

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

(4) Division 4 sets out requirements for project treatment facilities.

(5) Division 5 sets out requirements in lieu of the newness requirement for certain projects, for subparagraph 27(4A)(a)(ii) of the Act.

(6) Division 6 specifies the meaning of "eligible material" and "ineligible material" and imposes restrictions on the treatment of ineligible material in projects.

(7) Division 7 specifies the crediting period for a project, for paragraph 69(3)(b) and subparagraph 70(3)(d)(ii) of the Act.

8A Project activities

(1) An animal effluent management project must involve one or more of the following activities (which are called ***project activities*** in this determination):
- (a) biogas generation for biomethane;
- (b) biomethane production;
- (c) emissions destruction;
- (d) emissions avoidance.

(2) ***Biogas generation for biomethane*** involves:
- (a) treating organic effluent by generating biogas from it; and emissions avoidance.
- (b) capturing that biogas; and
- (c) sending that biogas to a biogas upgrading system that is part of a project biomethane facility.

Note: Conversion abatement from biogas generation for biomethane only occurs when biomethane produced from biogas 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 by biogas upgrading to produce biomethane at a project biomethane facility; 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 a project biomethane facility, or off-site if the biomethane is transported from a project 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) treating organic effluent by generating biogas from it; and

(b) capturing that biogas; and

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

(5) ***Emissions avoidance*** involves treating organic effluent by:

(a) removing material that includes volatile solids (***diversion*** of the material); and

(b) dealing with the diverted material aerobically in a way that produces materially fewer total methane and nitrous oxide emissions than would be produced by treatment in an anaerobic pond (a ***post-diversion treatment***).

Division 2—Project-specific requirements

8B Requirements for non-biomethane projects

A ***non-biomethane project***: must involve:

(a) emissions avoidance; or

(b) emissions destruction; or

(c) both emissions avoidance and emissions destruction.

Note: A non-biomethane project will only earn credits for the conversion abatement attributable to emissions avoidance, emissions reduction or both emissions avoidance and emissions reduction (see paragraph 18A(a)).

8C Requirements for biomethane conversion and displacement projects

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

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

(b) must, if it involves biogas generation for biomethane, also involve biomethane production; and

(c) may also involve emissions avoidance or emissions destruction; and

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

8D Requirements for biomethane displacement-only projects

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

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

(b) must involve biomethane production; and

(c) must 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 18A(c)). Such a project may also involve biogas generation for biomethane, emissions avoidance or emissions destruction, but no credits will be issued in relation to those project activities

8E Requirements for restarting biomethane conversion and displacement projects

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

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

(i) that did not involve biogas generation for biomethane, or biomethane production, or both, during its crediting period or periods; and

(ii) for which the applicable methodology determination was a legacy determination or the *Carbon Credits (Carbon Farming Initiative—Animal Effluent Management) Methodology Determination 2019* or an earlier version of that determination 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 or ended; and

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

(c) must, if it involves biogas generation for biomethane, also involve biomethane production; and

(d) must have a crediting period greater than zero under section 17C.

Note: A restarting biomethane conversion and displacement project will only earn credits for the conversion abatement attributable to biogas generation for biomethane and the displacement abatement attributable to biomethane production (see paragraph 18A(d)). Such a project may also involve emissions avoidance or emissions destruction, but no credits will be issued in relation to those project activities.

8F 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 the *Carbon Credits (Carbon Farming Initiative—Animal Effluent Management) Methodology Determination 2019* or an earlier version of any of that 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 17D.

Note: A restarting biomethane displacement-only project will only earn credits for the displacement abatement attributable to biomethane production (see paragraph 18A(e)). Such a project may also involve biogas generation for biomethane, emissions avoidance or emissions destruction, but no credits will be issued in relation to those project activities.

8G 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 to be included in section 22 and 128 applications

9 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 the project will be;

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

(c) a description of at least one project treatment facility that will be used in the project, and the following details about each project treatment 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 ML or m^3 of organic effluent treated by the facility per year;

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

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

(vi) if the facility is to treat organic effluent by emissions avoidance—a description of the proposed solids separation devices and post-diversion treatments to be applied;

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

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

9A 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 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 at least one project treatment facility that will be used in the project and the following details about each project treatment 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 ML or m^3 of organic effluent treated by the facility per year;

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

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

(vi) if the facility is to treat organic effluent by emissions avoidance—a description of the proposed solids separation devices and post-diversion treatments to be applied;

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

(d) a description of at least one 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 proposals for the expansion of the facility over the course of the project;

(v) the intended recipients of biomethane produced by the project biomethane 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—Project treatment facilities

9B Project treatment facilities—biogas generation for biomethane

A project treatment facility that treats organic effluent by biogas generation for biomethane must:

(a) use one or more anaerobic digesters to generate and capture biogas; and

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

9C Project treatment facilities—emissions destruction

(1) A project treatment facility that treats organic effluent by emissions destruction must use:

(a) one or more anaerobic digesters to generate and capture the biogas; and

(b) one or more combustion devices to destroy the proportion of the biogas that is methane.

(2) Each combustion device used to destroy that methane must be operated to result in the complete combustion of methane.

(3) If a flare is used as a combustion device for that purpose:

(a) the flare must be designed to maintain continuous destruction of methane when operational; and

(b) the facility must include a system that detects and records when the flare is operational, in accordance with the Supplement

9D Project treatment facilities—emissions avoidance

A project treatment facility that treats material by emissions avoidance must:

(a) use a solids separation treatment method of diversion in accordance with any requirements set out in the Supplement; and

(b) apply a post-diversion treatment, in accordance with any requirements set out in the Supplement, through:

(i) a method of stockpiles (solid storage); or

(ii) a method of composting (passive windrow).

Division 5—Newness

10 Project treatment facilities must not be pre-existing

(1A) This section applies to the following projects:

(a) a biomethane conversion and displacement project;

(b) a non-biomethane project.

(1) A project treatment facility for a project to which this section applies must not have operated before the date of the section 22 application.

Note: A project also needs to comply with the newness requirement under subparagraph 27(4A)(a)(i) of the Act as modified by section 11.

(2) Subsection (1) does not apply in relation to a facility, or part of a facility, that:

(a) operated before that date as part of a pilot or trial project; or

(b) consists of a solids separation device present at the site of the project on 1 January 2019 that has not been used:

(i) during the 3 years before the date the section 22 application was made; and

(ii) since 1 January 2019.

(3) If a solids separation device that exists at a site before the date of the section 22 application is included in a project treatment facility, the section 22 application (or next offsets report if the device is included after the section 22 application) must include a signed statement from the owner of the device:

(a) verifying that the device was present at the site of the project on 1 January 2019; and

(b) verifying that the device has not been used:

(i) during the 3 years before the date the section 22 application was made; and

(ii) since 1 January 2019; and

(c) stating that, in the absence of the declaration of the project as an eligible offsets project, the device would continue to be unused; and

(d) setting out the reasons:

(i) why it had not been used in the period covered by paragraph (b); and
(ii) why it is expected that it would continue to be unused over the period to be covered by the project's crediting period in the absence of the declaration of the project as an eligible offsets project.

Transitions from another method

(4) If:
(a) a project was first declared an eligible offsets project under a legacy determination (the ***former determination***); and
(b) the Regulator is considering whether to approve, or has approved, the application of this determination to the project under section 130 of the Act;

subsection (1) does not apply in relation to a project treatment facility, or part of a project treatment facility, that operated while the former determination applied to the project.

11 Requirement in lieu of newness requirement for certain projects – emissions avoidance

A requirement in lieu of the newness requirement for a project that treats material by emissions avoidance is that the project complies with subparagraph 27(4A)(a)(i) of the Act, disregarding any acquisition or operation of a solids separation device that:
(a) was present at the site of the project on 1 January 2019; and
(b) has not been used:
(i) during the 3 years before the date the section 22 application was made; and
(ii) since 1 January 2019.

11A 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.

11B 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 6—Eligible and ineligible material

15 Eligible material

(1) In relation to a project, ***eligible material*** is organic effluent that:

(a) was produced by either:

(i) an eligible animal facility; or

(ii) a facility that produces materials of one or more listed types as a waste stream; and

(b) either:

(i) consists of animal effluent; or

(ii) satisfies the following:

(A) the organic effluent consists principally of materials of one or more listed types;

(B) if it includes material that is not of a listed type—that material contributes no more than 2% of the methane avoided or combusted by the project over the reporting period;

(C) the effluent was not diverted from a facility that is part of an eligible offsets project related to the avoidance of methane emissions; and

(c) either:

(i) in the case of a project that is not a restarting biomethane conversion and displacement project, would, in the absence of the declaration of the project as an eligible offset project, have been treated in an anaerobic pond; or

(ii) in the case of a restarting biomethane conversion and displacement project, would, in the absence of the project's forerunner project having been declared as an eligible offsets project, have been treated in an anaerobic pond.

(2) For paragraph (1)(c)(i), the project proponent must have evidence that the organic effluent would have been treated in an anaerobic pond that consists of:
    (a) evidence that the organic effluent had previously been treated in an anaerobic pond, for at least 12 months before the project was implemented; or
    (b) if the organic effluent is of a kind specified in the Supplement for the purposes of this paragraph—evidence that satisfies the Regulator that the material would have been treated in an anaerobic pond in the absence of the declaration of the project as an eligible offsets project, being evidence that meets any requirements in the Supplement.

(3) For paragraph (1)(c)(ii), the project proponent must have evidence that the organic effluent would have been treated in an anaerobic pond that consists of:
    (a) evidence that the organic effluent had previously been treated in an anaerobic pond, for at least 12 months before the project's forerunner project was implemented; or
    (b) if the organic effluent is of a kind specified in the Supplement for the purposes of this paragraph—evidence that satisfies the Regulator that the material would have been treated in an anaerobic pond in the absence of the declaration of the project's forerunner project as an eligible offsets project, being evidence that meets any requirements in the Supplement.

(4) When applying paragraph (3)(b), references in the Supplement to the project are to be read as references to the forerunner project of the restarting biomethane conversion and displacement project.

Note 1: Ineligible material is not excluded from being processed by biogas generation for biomethane or emissions destruction at project treatment facilities; however, the abatement calculations in Division 2 of Part 4 will subtract the potential emissions from the ineligible material from the net abatement amount. As a result, the proponent will receive credit only to the extent that emissions destroyed exceed emissions attributed to the ineligible material.

In practice, it is expected that ineligible material will be included in project facilities only in small quantities, and where the cost or inconvenience of separating the ineligible material from eligible material would outweigh the likely loss of abatement credits.

Note 2: The waste stream from an eligible animal facility is eligible material only if it is produced by the normal operation of the eligible animal facility and therefore includes only incidental waste (such as feed waste) in addition to faeces and urine (see definitions in section 5).

Note 3: Evidence under paragraphs (2)(b) and (3)(b) to satisfy the Regulator that material would have been treated in an anaerobic pond may differ for new facilities compared to existing facilities

15A Eligible animal effluent biogas waste

In relation to a project, ***eligible animal effluent biogas waste*** is organic effluent that:

(a) was produced by either:
    (i) an eligible animal facility; or

(ii) a facility that produces materials of one or more listed types as a waste stream; and

(b) either:

(i) consists of animal effluent; or

(ii) satisfies the following:

(A) the organic effluent consists principally of materials of one or more listed types;

(B) if it includes material that is not of a listed type—that material contributes no more than 2% of the methane avoided or combusted by the project over the reporting period; (C) the effluent was not diverted from a facility that is part of an eligible offsets project related to the avoidance of methane emissions; and

(c) would reasonably have been expected to be treated in an anaerobic pond if it was not treated by anaerobic digestion.

16 Restrictions on treatment of ineligible material

Note: Non-compliance with this section during a reporting period can result in no credits being issued (in accordance with subsections 21(3) and (6)).

(1) For this determination, in relation to a project, ***ineligible material*** is material other than eligible material.

Note: Ineligible material may consist of organic effluent that does not satisfy section 15, or other organic effluent, provided that it does not affect the treatment effectiveness of the project treatment facility.

(2) If the project treatment facility treats material by emissions avoidance, ineligible material must not be combined with eligible material for treatment by the project treatment facility.

(3) Ineligible material may be combined with eligible material for treatment by a project treatment facility only if all the following apply:

(a) the project treatment facility does not treat material by emissions avoidance;

(b) the ineligible material, when combined with the eligible material, has no significant adverse effect on the operation and performance of the project treatment facility;

Note: A significant adverse effect includes exacerbating fugitive emissions or serious adverse secondary environmental effects such as odour.

(c) before any ineligible material is combined with the eligible material:

(i) the quantity of the ineligible material has been measured; and

(ii) the ineligible material either:

(A) is material of a listed type; or

(B) has had its methane-producing capacity measured in accordance with the Supplement;

(d) the volume of methane attributable to any inconsistent ineligible material totals less than 5% of the methane attributable to all the material (both eligible and ineligible) entering the project treatment facility during the reporting period.

(4) For paragraph (3)(d):
   (a) ineligible material is ***inconsistent*** if its methane-producing capacity, measured in accordance with the Supplement, varies by more than 40% between each measurement; and
   (b) the volume of methane attributable to inconsistent ineligible material and all material entering the project must be calculated using equation 8.

Division 7—Crediting period

17 Crediting period for non-biomethane projects

(1) For paragraph 69(3)(b) and subparagraph 70(3)(d)(ii) of the Act, if an animal effluent management project is a non-biomethane project that, during its crediting period or periods:
   (a) does not use biogas to generate electricity; or
   (b) does not use biogas to generate electricity for more than a total period of 84 calendar months;

the period of 12 years is specified.

Note: Paragraph (1)(a) includes projects that only treat organic effluent by emissions avoidance and projects that flare and do not generate electricity.

(2) Despite subsection (1), if:
   (a) a project was a non-biomethane project at the start of the 8th year of its crediting period; and
   (b) before the crediting period ends under subsection (1), the total period for which biogas is used to generate electricity exceeds 84 calendar months;

the crediting period ends at the start of the 85th calendar month that biogas is used to generate electricity.

(3) For this section, and the inclusion of information in the offsets report in accordance with paragraph 34(d):
   (a) biogas is used to generate electricity in a calendar month if at any point during 3 or more days in the calendar month electricity is generated from biogas; and
   (b) the total calendar months of generation do not need to be consecutive; and
   (c) a calendar month after electricity is first generated is presumed to be a month during which electricity is generated if there is no evidence to the contrary.

17A Crediting period for biomethane conversion and displacement projects

(1) For paragraph 69(3)(b) and subparagraph 70(3)(d)(ii) of the Act, if an animal effluent management project is a biomethane conversion and displacement project that, during its crediting period or periods:

(a) does not use biogas to generate electricity; or

(b) does not use biogas to generate electricity for more than a total period of 84 calendar months;

the period of 12 years is specified.

Note: Paragraph (1) (a) includes projects that flare and do not generate electricity.

(2) However, if:

(a) a project was a biomethane conversion and displacement project at the start of the 8th year of its crediting period; and

(b) before the crediting period ends under subsection (1), the total period for which biogas is used to generate electricity exceeds 84 calendar months;

the crediting period ends at the start of the 85th calendar month that biogas is used to generate electricity.

(3) For this section, and the inclusion of information in the offsets report in accordance with paragraph 34(d):

(a) biogas is used to generate electricity in a calendar month if at any point during 3 or more days in the calendar month electricity is generated from biogas; and

(b) the total calendar months of generation do not need to be consecutive; and

(c) a calendar month after electricity is first generated is presumed to be a month during which electricity is generated if there is no evidence to the contrary.

17B Crediting period for biomethane displacement-only projects

For paragraph 69(3)(b) and subparagraph 70(3)(d)(ii) of the Act, if an animal effluent management project is a biomethane displacement-only project, the period of 12 years is specified.

17C Crediting period for restarting biomethane conversion and displacement projects

For paragraph 69(3)(b) and subparagraph 70(3)(d)(ii) of the Act, if an animal effluent management 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: Section 5 defines ***forerunner project*** for a restarting biomethane conversion and displacement project as having the meaning as given by paragraph 8E(a).

17D Crediting period for restarting biomethane displacement-only projects

For paragraph 69(3)(b) and subparagraph 70(3)(d)(ii) of the Act, if an animal effluent management 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: Section 5 defines ***forerunner project*** for a restarting biomethane displacement-only project as having the meaning as given by paragraph 8F(a)

5 Part 4

Repeal the Part, substitute:

Part 4—Net abatement amounts
Division 1—Operation of this Part

18 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 an animal effluent management project that is an eligible offsets project.

18A 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 an animal effluent management 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 avoidance, emissions destruction, or both, worked out using the method set out in Division 2; and
(b) the calculations for a biomethane conversion and displacement project must include only:
    (i) the conversion abatement attributable to biogas generation 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) if the project also involves emissions avoidance, the conversion abatement attributable to that emissions avoidance, worked out using the method set out in Division 2; and

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

(c) the calculations 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 calculations for a restarting biomethane conversion and displacement project must include only:

(i) the conversion abatement attributable to biogas generation 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 calculations 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.

18B Working out net abatement

Subject to section 18A, the total carbon dioxide equivalent net abatement amount for a reporting period for an animal effluent management project A_{tot} (in tonnes CO_2-e), is worked out using the formula:

$A_{tot} = A_{conversion} + A_{displacement}$	***Equation 1A***

where

$A_{conversion}$, is the carbon dioxide equivalent net abatement amount attributable to the treatment of organic effluent by emissions avoidance, emissions destruction or biogas generation for biomethane, at a project treatment facility for the reporting period, in tonnes CO_2-e, worked out using equation 1 or equation 1B (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 14 (section 32C).

Division 2—Working out conversion abatement

Subdivision 1—Overview

19 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 an animal effluent management project that involves biogas generation for biomethane, emissions destruction, or emissions avoidance.

Greenhouse gases and emissions sources			
Item	**Relevant calculation**	**Emissions source**	**Greenhouse gas**
1	Gross abatement amounts	The methane emissions destroyed by the collection and combustion of biogas, destroyed by sending biogas to a biogas upgrading system, or avoided by the diversion of volatile solids from the treatment in an anaerobic pond.	Methane (CH_4)
2	Ineligible emissions amounts	The emissions from the treatment of ineligible material	Methane (CH_4)
3	Project emissions	Fuel consumption attributable to the treatment of organic effluent by emissions destruction, emissions avoidance, or biogas generation for biomethane, at project treatment facilities	Carbon dioxide (CO_2) Methane (CH_4) Nitrous oxide (N_2O)
4	Project emissions	Consumption of purchased electricity attributable to the treatment of organic effluent by emissions destruction, emissions avoidance, or biogas generation for biomethane, at project treatment facilities	Carbon dioxide (CO_2) Methane (CH_4) Nitrous oxide (N_2O)
5	Project emissions	Emissions from the post-diversion treatment of organic effluent in a project treatment facility by emissions avoidance	Methane (CH_4) Nitrous oxide (N_2O)

Subdivision 2—Method for calculating net conversion abatement amount

20 Summary

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

For each facility, the gross abatement amount is calculated as the emissions destroyed by the combustion of methane or the sending of methane to a biogas upgrading system, or avoided by the diversion of volatile solids, or both. Biogas sent to a biogas upgrading system is considered to have its methane component destroyed, as if it had been sent to a combustion device, because subsequent usage of the biomethane results in its combustion. As a result, abatement from biogas sent to a biogas upgrading system is calculated in a manner analogous to that of a combustion device.

If a project is a biomethane conversion and displacement project or restarting biomethane conversion and displacement project involves upgrading biogas that is solely sourced from project treatment facilities, 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:

(a) the potential emissions from any ineligible material processed by the facility (it is presumed that all methane generated by the ineligible material has been destroyed by combustion);

(b) any emissions generated by operation of the facility (for example, fuel use);

(c) for any diverted materials, the emissions resulting from aerobic post-diversion treatment methods.

21 Net conversion abatement amount

(1) The carbon dioxide equivalent net abatement amount attributable to the treatment of organic effluent by emissions destruction, emissions avoidance, or biogas generation for biomethane, for a reporting period, $A_{conversion}$ (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 biogas from project treatment facilities—using either Method 1 (set out in subsections (2) to (4)) or Method 2 (set out in subsections (5) to (8)); and

(b) otherwise—using Method 1 (set out in subsections (2) to (4)).

Method 1—project treatment facility calculation

(2) The carbon dioxide equivalent net abatement amount attributable to the treatment of organic effluent by emissions destruction, emissions avoidance, or biogas generation for biomethane, at project treatment facilities for a reporting period, $A_{conversion}$ (in tonnes CO_2-e), is worked out using the formula:

$\mathrm{A}_{\mathrm{conversion}} = \sum_{\mathrm{h}} \mathrm{A}_{\mathrm{conversion,\,h}}$	***Equation 1***

where:

h is a project treatment facility.

$A_{conversion,\,h}$ is:

(a) if the project treatment facility net abatement amount for project treatment facility *h*, calculated using equation 2 (section 22), is greater than or equal to zero—that amount; and
(b) if that amount is less than zero—zero.

(3) However, if a project treatment facility does not comply in all material respects with the requirements of section 16 during the reporting period $A_{conversion,\ h}$ for the project treatment facility is taken to be zero.

(4) If, during the reporting period, a project treatment facility:
(a) sends biogas to a biogas upgrading system; and
(b) either:
(i) the biogas 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 reasonably be expected to be combusted within Australia as a natural gas substitute;

$A_{conversion,\ h}$ for the project treatment facility is taken to be zero

Method 2—project treatment facility and project biomethane facility calculation

(5) The carbon dioxide equivalent net abatement amount attributable to the treatment of organic effluent by emissions destruction, emissions avoidance, or biogas generation for biomethane, for a reporting period, $A_{conversion}$ (in tonnes CO_2-e), is worked out using the formula:

$\mathbf{A_{conversion}} = \sum_{\mathbf{h}} \mathbf{A_{conversion,\ h}} + \gamma\left(\sum_{\mathbf{f}} \mathrm{BC_f}\right)$	***Equation 1B***

where:

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 2022, γ was $6.784 \times 10^{-4} \times 28$.

h is a project treatment facility.

$A_{conversion,\ h}$ is:
(a) if the project treatment facility net abatement amount for project treatment facility *h* calculated using equation 2 (section 22) is greater than or equal to zero—that amount; and
(b) if that amount is less than zero—zero.

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 6A (section 24A).

(6) However, if a project treatment facility does not comply in all material respects with the requirements of section 16 during the reporting period:

(a) $A_{conversion,\ h}$ for the project treatment facility is taken to be zero; and

(b) for each project biomethane facility that received biogas from that project treatment facility—BC_f for the project treatment facility is taken to be zero.

(7) If, during the reporting period, a project treatment facility:

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

(b) either:

(i) the biogas 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 reasonably be expected to be combusted within Australia as a natural gas substitute;

$A_{conversion,\ h}$ for the project treatment facility is taken to be zero.

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

22 Project treatment facility net abatement amount

The project treatment facility net abatement amount for a reporting period for project treatment facility *h*, $A_{conversion,\ h}$ (in tonnes CO_2-e), is worked out using the formula:

$\mathrm{A_{conversion,\,h}} = \mathrm{GA_{conversion,\,h}} - \mathrm{IE_h} - \mathrm{PE_{conversion,\,h}}$	***Equation 2***

where:

$GA_{conversion,\ h}$ is the gross abatement amount for the reporting period for project treatment facility *h*, in tonnes CO_2-e, calculated using equation 3 (section 23).

IE_h is the ineligible emissions for the reporting period for project treatment facility *h,* in tonnes CO_2-e, calculated using equation 8 (section 26).

$PE_{conversion,\ h}$ is the project emissions for the reporting period for project treatment facility *h,* in tonnes CO_2-e, calculated using equation 9 (section 29).

Subdivision 3—Gross abatement amount

23 Gross abatement amount for a project treatment facility

(1) The gross abatement amount for project treatment facility *h* for a reporting period, $GA_{conversion,\ h}$ (in tonnes CO_2-e), is worked out using the formula:

$\mathrm{GA}_{\mathrm{conversion,\ h}} = \gamma\left(\mathrm{MA} + \sum_{\mathrm{i}} \mathrm{MC}_{\mathrm{h,\ i}}\right)$	***Equation 3***

where:

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 2022, γ was 6.784 x 10^{-4} x 28.

MA (methane avoided) is the volume of methane avoided in the project treatment facility by diversion of material that includes volatile solids during the reporting period, calculated using equation 7 (section 25).

i is:

(a) a combustion device of project treatment facility *h*; or

(b) subject to subsection (2), a biogas upgrading system of a project biomethane facility.

$MC_{h,\ i}$ (methane combusted) is the volume of methane from project treatment facility *h* destroyed by combustion device *i*, or taken to have been destroyed by biogas upgrading system *i*, during the reporting period, calculated using equation 4 or equation 5 (section 24).

(2) For subsection (1), if the project works out its net conversion abatement for a reporting period under section 21 using Method 2, *i* is a combustion device of the project treatment facility *h*.

Note: This prevents biogas sent from project treatment facilities to biogas upgrading systems from being included when working out gross abatement under equation 3. This, in turn, prevents double-counting of conversion abatement from biomethane, which under Method 2 is already accounted for in equation 1B.

24 Methane destroyed by combustion devices or taken to have been destroyed by biogas upgrading systems

(1) The volume of methane from project treatment facility *h* destroyed by combustion device *i*, or taken to have been destroyed by biogas upgrading system *i,* during a reporting period, $\boldsymbol{MC_{h,\,i}}$ (in cubic metres), is calculated:

(a) for a combustion device that is an internal combustion engine used to generate electricity—using either Method A (set out in subsection (2)) or Method B (set out in subsections (3) and (4)); and

(b) otherwise—using Method A (set out in subsection (2)).

Method A—direct volume calculation

(2) To calculate $\boldsymbol{MC_{h,\,i}}$ (the volume of methane from project treatment facility *h*, in cubic metres, destroyed by combustion device *i*, or taken to have been destroyed by biogas upgrading system *i*) by ***Method A***, use the following formula:

$\mathrm{MC_{h,\,i}} = \mathrm{Q_{biogas\ h,\,i}} \times \mathrm{W_{BG,\,CH4}} \times (1 - \mathrm{PL_i}) \times (1 - \mathrm{TL_i}) \times \mathrm{DE_i}$	***Equation 4***

where:

$\boldsymbol{Q_{biogas\ h,\,i}}$ is the total volume of biogas from project treatment facility *h* sent to combustion device or biogas upgrading system *i* during the reporting period, in cubic metres, determined in accordance with the Supplement.

$\boldsymbol{W_{BG,\,CH4}}$ is the proportion of $\mathrm{Q_{biogas\ h,\,i}}$ that is methane, expressed as a fraction, determined in accordance with the Supplement.

$\boldsymbol{PL_i}$ is the biomethane production loss factor for biogas sent to combustion device or biogas upgrading system *i*, expressed as a fraction, worked out in accordance with section 24B.

Note: $\mathrm{PL_i}$ accounts for methane lost during biogas upgrading. It does not affect methane that is sent to combustion devices.

$\boldsymbol{TL_i}$ is the transport loss factor for biogas sent to combustion device or biogas upgrading system *i*, expressed as a fraction, which is:

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

(b) if *i* is a biogas upgrading system that sends biogas 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 a project treatment facility or a project biomethane facility—zero; or

(c) otherwise—0.02.

Note: $\mathrm{TL_i}$ 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$_i$ is the methane destruction efficiency for combustion device or biogas upgrading system *i*, expressed as a fraction, determined in accordance with the Supplement.

Method B—calculation from power output

(3) To calculate ***MC$_{h,\,i}$*** (the volume of methane from project treatment facility *h*, in cubic metres, destroyed by combustion device *i*) by ***Method B***, use the following formula:

$MC_{h,\ i} = QE_i \times CH_4$ conversion factor	***Equation 5***

where:

QE$_i$ is the total energy content, in gigajoules (GJ), of the methane destroyed by combustion device *i* during the reporting period, calculated using equation 6 in subsection (4).

CH$_4$ conversion factor is the methane conversion factor to convert gigajoules of energy into volume of methane in cubic metres, which is 26.52.

(4) For subsection (3), ***QE$_i$*** (the total energy content, in gigajoules, of the methane destroyed by combustion device *i* during the reporting period) is worked out using the following equation:

$QE_i = \frac{Q_{EG,\,i} \times EC}{Eff_i}$	***Equation 6***

where:

Q$_{EG,\,i}$ is the total amount of electricity produced by combustion device *i* (whether used on-site or exported to the grid or another user), in megawatt hours, determined in accordance with the Supplement.

EC is the energy content per megawatt hour of electricity, in gigajoules per megawatt hour, which is 3.6.

Eff$_i$ is the electrical efficiency of the combustion device *i*, expressed as a fraction, determined in accordance with the Supplement.

24A Methane destroyed in biomethane produced by project biomethane facilities

The volume of methane sent out from project biomethane facility *f* during the reporting period, ***BC$_f$*** (in cubic metres), is worked out using the formula:

$BC_f = \sum_k \left[Q_{BM,\,k} \times W_{BM,\,CH4,\,k}\right] \times (1 - TL_{BM,\,f}) \times DE_{BM}$	***Equation 6A***

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 Supplement.

$\boldsymbol{TL_{BM,\,f}}$ 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 project biomethane facility *f* during the reporting period is consumed at a project treatment facility 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 biomethane production, expressed as a fraction, which is 0.98.

24B Biomethane production loss factor

(1) For the purposes of section 24, the biomethane production loss factor for biogas sent to combustion device or biogas upgrading system *i,* $\boldsymbol{PL_i}$, expressed as a fraction, is:

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

(b) if *i* 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 *i*, $\boldsymbol{PL_i}$, 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.

25 Methane avoided by diversion

Note: This is the gross amount avoided by diversion. It is offset by the post-diversion emissions calculated in section 32.

The volume of methane avoided in project treatment facility *h* by diversion of material that includes volatile solids during the reporting period, ***MA*** (in cubic metres), is worked out using the formula:

$\mathrm{MA} = \sum_{\mathrm{w}} \sum_{\mathrm{n}} \left(\mathrm{MCF_n} \times \mathrm{VS_{Div,\ w,\ n}} \times \mathrm{B_{o,\ Div,\ w,\ n}} \right)$	***Equation 7***

where:

MCF$_n$ is the methane conversion factor for the source material region and type:

(a) if a factor can be selected and applied from the National Inventory Report in accordance with any requirements specified in the Supplement—that factor; or

(b) otherwise—a default value determined in accordance with the Supplement.

Note: This factor, which is a proportion less than 1, set out in tables 5.E.6 Pigs and 5.A.7 Dairy cattle in the 2017 National Inventory Report reflects the facts that:

- in practice, the amount of methane produced in an anaerobic pond is less than the methane-producing potential;
- the amount produced varies with climate.

w is a type of material that includes volatile solids

n is a relevant region, State or Territory for the source material used in the National Inventory Report to determine a methane conversion factor.

VS$_{\mathrm{Div,\ w,\ n}}$ is the amount of volatile solids from material of type *w*, in tonnes of volatile solids, that is diverted in the project treatment facility during the reporting period, and treated using treatment method *n*, determined in accordance with the Supplement.

B$_{o,Div}$ $_{\mathrm{,\ w,\ n}}$ is the methane-producing capacity for the volatile solids of material of type *w* that are diverted in the project treatment facility under treatment method *n* in cubic metres of methane per tonne of volatile solids, worked out in accordance with section 27.

Subdivision 4—Ineligible emissions

Note: This Subdivision does not apply in relation to a project treatment facility that treats organic effluent by emissions avoidance, as under subsection 16(2) ineligible material may not be included in the operation of the facility for the project.

26 Ineligible emissions for a project treatment facility

The ineligible emissions for project treatment facility *h* during a reporting period, IE_h (in tonnes CO_2-e), is worked out using the formula:

$\mathrm{IE_h} = \gamma \sum_{\mathrm{w}} \left(VS_{Inel,\,w} \times B_{o,\,w} \right)$	***Equation 8***

where:

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 2022, γ was 6.784 x 10^{-4} x 28.

w is a type of material that includes volatile solids.

$VS_{Inel,\,w}$ is the amount of volatile solids of material of type *w* in the ineligible material that enters the project treatment facility during the reporting period, in tonnes of volatile solids, determined in accordance with the Supplement.

$B_{o,\,w}$ is the methane-producing capacity of volatile solids of material of type *w*, in cubic metres of methane per tonne of volatile solids, worked out in accordance with section 27.

27 Methane-producing capacities of different types of material ($B_{o,\,w}$ and $B_{o,Div,w,n}$)

(1) Subject to this section, the methane-producing capacity of volatile solids from material of type ***w*** ($B_{o,\,w}$ and $B_{o,Div,\,w,\,n}$) must be determined in accordance with the Supplement.

(2) For material of a listed type, the project proponent may apply the default methane-producing capacity specified for the type in the Supplement.

Note: Different options (that is, using the default value or measuring in accordance with the Supplement) may be used for different material types.

(3) If, at any time during the reporting period the Supplement is amended so that a particular type of material, not previously a listed type, becomes a listed type, the project proponent may, following the amendment, use the default capacity for that type for any reporting period for which an offsets report has not been submitted.

(4) However, if, at any time during the project:

(a) a particular type of material is a listed type; and

(b) the project proponent uses a value for the type that is measured in accordance with the Supplement;

the methane-producing capacity for the type must be measured in accordance with the Supplement for the remainder of the project.

Subdivision 5—Conversion abatement project emissions

28 Summary

The conversion abatement project emissions for a reporting are the emissions that must be subtracted from the gross abatement for project treatment facilities during the reporting period. They are the emissions that either would not have resulted from the treatment of the material in an anaerobic pond, or are attributable to the use of equipment to operate the project treatment facilities. They include emissions from fuel (including transport) and purchased electricity and, for treatment using emissions avoidance, emissions from post-diversion treatment of diverted material.

29 Project emissions: conversion abatement

(1) The project emissions for project treatment facility *h* for a reporting period, $\boldsymbol{PE_{conversion,\ h}}$ (in tonnes CO_2-e), is worked out using the formula:

$PE_{conversion,\ h} = E_{F,\ conversion} + E_{PE,\ conversion} + E_{Post,\ Methane} + E_{Post,}$	***Equation 9***

where:

$\boldsymbol{E_{F,\ conversion}}$ is the emissions from fuel that is specifically attributable to the operation of the project treatment facility for the treatment of organic effluent by emissions destruction, emissions avoidance, or biogas generation for biomethane, during the reporting period (including transport), in tonnes CO_2-e, worked out using equation 10 (section 30).

$\boldsymbol{E_{PE,\ conversion}}$ is the emissions from purchased electricity that is specifically attributable to the operation of the project treatment facility for the treatment of organic effluent by emissions destruction, emissions avoidance or biogas generation for biomethane, during the reporting period, in tonnes CO_2-e, worked out using equation 11 (section 31).

$\boldsymbol{E_{Post,\ Methane}}$ is the emissions due to methane arising from the post-diversion treatment of material diverted in the project treatment facility for the treatment of organic effluent by emissions avoidance under a treatment method during the reporting period, in tonnes CO_2-e, worked out using equation 12 (section 32).

$\boldsymbol{E_{Post,\ Nitrogen}}$ is the emissions due to nitrogen arising from the post-diversion treatment of material diverted in the project treatment facility for the treatment of

organic effluent by emissions avoidance under a treatment method during the reporting period, in tonnes CO_2-e, worked out using equation 13 (section 32).

(2) In determining $\boldsymbol{E_{F,\ conversion}}$ and $\boldsymbol{E_{PE,\ conversion}}$, emissions associated with biomethane production should be disregarded, including emissions from the operation of biogas upgrading systems and any downstream transport emissions, during the reporting period, in tonnes CO_2-e, worked out using equation 19 (section 32L).

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.

30 Emissions from fuel use: conversion abatement

(1) The emissions from fuel used that is specifically attributable to the operation of project treatment facility *h* during a reporting period (including transport), $\boldsymbol{E_{F,\ conversion}}$, (in tonnes CO_2-e.) is worked out using the formula:

$$E_{F,\ conversion} = \sum_{i}\sum_{j} \frac{Q_{F\ conversion,\ i} \times EC_i \times EF_{ij}}{1000}$$	***Equation 10***

where:

i is a fuel type.

j is a greenhouse gas type.

$\boldsymbol{Q_{F\ conversion,\ i}}$ is the amount of fuel type *i* that is specifically attributable to the operation of the project treatment facility for the treatment of organic effluent by emissions destruction, emissions avoidance, or biogas generation for biomethane, during the reporting period, in tonnes, kilolitres, cubic metres, or gigajoules, determined in accordance with the Supplement.

$\boldsymbol{EC_i}$ 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 $Q_{F\ conversion,\ i}$ is measured in gigajoules, then EC_i is not required (EC_i=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 $\boldsymbol{Q_{F\ conversion,\ i}}$, if fuel is used by the project treatment facility in performing a function that was also performed before the implementation of the project, it is attributable to the operation of the project treatment facility only to the extent that the project has caused an increase in fuel use.

31 Emissions from purchased electricity use: conversion abatement

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

$E_{PE,\ conversion} = Q_{PE\ conversion} \times \frac{EF_{PE,\ conversion}}{1000}$	***Equation 11***

where:

$Q_{PE\ conversion}$ is the amount of purchased electricity that is attributable to the operation of the project treatment facility for the treatment of organic effluent by emissions destruction, emissions avoidance, or biogas generation for biomethane, during the reporting period, in kilowatt hours, determined in accordance with the Supplement.

$EF_{PE,\ conversion}$ 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 $EF_{PE,\ conversion}$ 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.

32 Emissions from post-diversion treatment of material diverted in emissions avoidance: conversion abatement

Methane emissions

(1) The emissions due to methane arising from the post-diversion treatment of material diverted in project treatment facility *h* under a treatment method during a reporting period, $E_{Post,\ Methane}$ (in tonnes CO_2-e) is worked out using the formula:

$E_{Post,\,Methane} = \gamma \times \sum_{n}\left(MCF_{Post,\,n} \times \sum_{w}\left(VS_{Div,\,w,\,n} \times B_{o,\,Div,\,w}\right)\right)$	***Equation 12***

where:

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 2022, **γ** was 6.784 x 10^{-4} x 28.

n is a treatment method.

$\boldsymbol{MCF_{Post,\,n}}$ is the post-diversion methane conversion factor for treatment method *n*, that is:

(a) specified in the Supplement; and

(b) if a project treatment facility uses more than one post-diversion treatment at a facility—is the highest applicable post-diversion methane conversion factor.

Note: This factor, which is a proportion less than 1, represents the amount of methane produced by the diverted material under the relevant treatment method as a proportion of its methane-producing capacity.

w is a type of material that includes volatile solids.

$\boldsymbol{VS_{Div,\,w,\,n}}$ is the amount of volatile solids from material of type *w* that is diverted in the project treatment facility during the reporting period, and treated using treatment method *n*, in tonnes of volatile solids, determined in accordance with the Supplement.

$\boldsymbol{B_{o,Div,\,w}}$ is the methane-producing capacity for the volatile solids of material of type *w*, in cubic metres of methane per tonne of volatile solids, determined in accordance with the Supplement, subject to subsection (3).

Nitrogen related emissions

(2) The emissions due to nitrogen arising from the post-diversion treatment of material diverted in project treatment facility h under a treatment method during the reporting period, $\boldsymbol{E_{Post,\,Nitrogen}}$, (in tonnes CO_2-e) is worked out using the formula:

$E_{Post,\,Nitrogren} = N_20 - N_{CF} \times \sum_{n}\left(INOEF_{Post,\ n} \times \sum_{w} N_{Div,\,w,\,n}\right)$	***Equation 13***

where:

$\boldsymbol{N_2O\text{-}N_{CF}}$, the nitrous oxide conversion factor, converts tonnes of N_2O-N into tonnes CO_2-e, specified in the Supplement.

n is a treatment method.

$\boldsymbol{INOEF_{Post,\,n}}$, the post-diversion integrated nitrous oxide emission factor for treatment type *n*, specified in the Supplement.

Note: This factor reflects the amount of nitrous oxide produced by diverted material using the relevant treatment method.

w is a type of material from which volatile solids are taken.

$\boldsymbol{N_{Div,\,w,\,n}}$ is the amount of nitrogen in the material of type *w* that is diverted in the project treatment facility during the reporting period, and treated using treatment method *n*, in tonnes of nitrogen, determined in accordance with the Supplement.

Use of default capacities in equation 12

(3) For calculations using equation 12, the project proponent may choose:

(a) for a listed material of type *w*—to use the default capacity for that material instead of $\boldsymbol{B_{o,Div,\,w}}$; or

(b) for a group of listed materials, to both:

(i) treat the materials as if they were a single material of type *w* (so that the quantity is a single measure, $\boldsymbol{VS_{Div,\,w,\,n}}$); and

(ii) use the highest value of their individual default capacities instead of $\boldsymbol{B_{o,Div,\,w}}$.

Note: This will mean that the proponent will not be obliged to monitor those quantities separately, unless this is required elsewhere in the calculations.

Division 3—Working out displacement abatement

Subdivision 1—Overview of gases

32A 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 an animal effluent management 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	Carbon dioxide (CO_2) Methane (CH_4)

	biomethane facilities.	Nitrous oxide (N_2O)

Subdivision 2—Method for calculating net displacement abatement amount

32B 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 32I

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

32C 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:

$A_{displacement} = \sum_h A_{displacement,\,h}$	***Equation 14***

where:

h is a project biomethane facility.

$A_{displacement,\,h}$ is:

(a) if the project biomethane facility net abatement amount for project biomethane facility *h* calculated using equation 15 (section 32D) 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, $A_{displacement,\ h}$ is taken to be zero.

32D Project biomethane facility net abatement amount

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

$A_{displacement,\ h} = GA_{displacement,\ h} \times EA_h - PE_{displacement,\ h}$	***Equation 15***

where:

$GA_{displacement,\ h}$ is the gross abatement amount for the reporting period for project biomethane facility *h*, in tonnes CO_2-e, calculated using equation 16 (section 32G).

EA_h is the eligible abatement fraction for the reporting period for project biomethane facility *h,* as a fraction, calculated using equation 17 (section 32J).

$PE_{displacement,\ h}$ is the project emissions for the reporting period for project biomethane facility *h,* in tonnes CO_2-e, calculated using equation 19 (section 32L).

32E Certain abatement must not be included in calculating net displacement 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 14 (section 32C), 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

32F Summary

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

32G Gross abatement amount for a project biomethane facility

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

$\mathrm{GA}_{\mathrm{displacement,\ h}} = \frac{\sum_{\mathrm{k}} \mathrm{Q}_{\mathrm{BM,\ K}} \times \mathrm{EC}_{\mathrm{NG}} \times \mathrm{EF}_{\mathrm{NG,\ CO2}}}{1000}$	***Equation 16***

where:

k is a biogas upgrading system at project biomethane facility *h* 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

32H 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.

32I Eligible abatement fraction for a project biomethane facility

The eligible abatement fraction for project biomethane facility h during a reporting period, EA_h (as a fraction), is worked out using the formula:

$EA_h = \frac{\sum_g Q_{BG,El,g}}{\sum_g Q_{BG,g}}$	***Equation 17***

where:

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

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

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

32J 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 *h* from biogas source facility *g* during a reporting period, $Q_{BG,El,g}$ (in cubic metres), is worked out:

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

(b) if it is not possible to measure $Q_{BG,El,g}$ 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 *h* from biogas source facility *g* during a reporting period, $Q_{BG,El,g}$ (in cubic metres) is worked out using the formula:

$Q_{BG,El,g} = EB_g \times Q_{BG,g}$	***Equation 18***

where:

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

$Q_{BG,g}$ is the volume of biogas sent to project biomethane facility *h* 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 *h* from biogas source facility *g* during a reporting period that is eligible biogas, 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 the reporting period.

Subdivision 5—Displacement abatement project emissions

32K 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.

32L Project emissions: displacement abatement

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

$PE_{\text{displacement, h}} = E_{F,\,displacement,\,h} + E_{PE,\,displacement,\,h}$	***Equation 19***

where:

$E_{F,\,displacement,\,h}$ is the emissions from fuel that is specifically attributable to the operation of project biomethane facility *h* during the reporting period (including transport), in tonnes CO_2-e, worked out using equation 20 (section 32M).

$\mathbf{E}_{PE,\ displacement,\ h}$ is the emissions from purchased electricity that is specifically attributable to the operation of project biomethane facility *h* during the reporting period, in tonnes CO_2-e, worked out using equation 21 (section 32N).

(2) In determining $\boldsymbol{E}_{F,\ displacement,\ h}$ and $\mathbf{E}_{PE,\ displacement,\ h}$, fuel and purchased electricity used for biogas generation for biomethane, emissions avoidance and emissions destruction project activities are to be disregarded.

32M Emissions from fuel use: displacement abatement

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

$E_{F,\ displacement,\ h} = \sum_i \sum_j \frac{Q_{F,\ displacement,\ h,\ i} \times EC_i \times EF_{ij}}{1000}$	***Equation 20***

where:

i is a fuel type.

j is a greenhouse gas type.

$\boldsymbol{Q}_{F,\ displacement,\ h,\ i}$ is the amount of fuel type *i* that is specifically attributable to the operation of project biomethane facility *h*, or transport of biomethane produced at project biomethane facility *h* 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 $Q_{F,\ displacement,\ h,\ i}$ is measured in gigajoules, then ECj is not required (ECj=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 $\boldsymbol{Q}_{F,\ displacement,\ h,\ i}$, 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.

32N Emissions from purchased electricity use: displacement abatement

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

$E_{PE,\ displacement,\ h} = Q_{PE,\ displacement,\ h} \times \frac{EF_{PE,\ displacement}}{1000}$	***Equation 21***

where:

$\boldsymbol{Q_{PE,\ displacement,\ h}}$ is the amount of purchased electricity that is specifically attributable to the operation of project biomethane facility *h* 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 $\boldsymbol{EF_{PE,\ displacement}}$ 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.

6 Section 34

Repeal the section, substitute:

34 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 8B to 8F;

(b) a list of the project activities that were carried out at each project treatment facility or 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 the project is a non-biomethane project or a biomethane conversion and displacement project in which biogas has been used to generate electricity during the crediting period or crediting periods of the project—the total number of calendar months that biogas has been used to generate electricity between the start of the project's first or only crediting period and the end of the reporting period;

Note: Under subsections 17(3) and 17A(3), any generation of electricity during 3 or more days in calendar month means that month is counted as a month in which electricity is generated from biogas and the months do not need to be consecutive. After generation has commenced, the generation is presumed to continue in the absence of evidence to the contrary.

(e) if biogas generation 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.

(f) if biogas generation 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:

(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;

(g) if the project involves emissions avoidance—a detailed description of the post-diversion treatment method used in accordance with paragraph 9D(b), including the dimensions of the relevant stockpiles or windrows:

(h) an explanation of how the quality assurance plan prepared under section 37 has been complied with during the reporting period, including details of any non-compliance with applicable laws and relevant codes of practice that occurred during the reporting period:

(i) if a quality assurance plan prepared under section 37 has not been provided to the Regulator after it was made or amended, a copy of that plan.

(j) for each piggery that provides eligible material to the project during the reporting period:

(i) the location of the piggery; and

(ii) the number of pigs in the piggery of each class referenced in the National Inventory Report that are present at the end of the reporting period; and

(iii) any other information related to the National Inventory Report specified in the Supplement for the purpose of this subparagraph;

(k) for each dairy that provides eligible material to the project during the reporting period:

(i) the location of the dairy; and

(ii) the numbers of cows in the dairy that are present at the end of the reporting period; and

(iii) any other information related to the National Inventory Report specified in the Supplement for the purpose of this subparagraph;

(l) if ineligible material has been used by the project during the reporting period, an explanation of how the requirements of section 16 are satisfied in relation to the use of that material, including:

(i) whether there was any inconsistent ineligible material (within the meaning of section 16) during the reporting period; and

(ii) the volume of methane attributable to any inconsistent ineligible material; and

(iii) if the volume under paragraph (b) is greater than zero—the volume of methane attributable to all the material (both eligible and ineligible) entering the project facility during the reporting period.

34A 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 biogas generation for biomethane is carried out as part of the project, details about the biomethane production loss factor used to calculate net abatement;

(c) the basis upon which equations 10 and 11 were calculated;

(d) if biomethane production is carried out as part of the project, details of the displacement abatement calculations (that is, the 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 32J(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.

34B 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) a project treatment facility being added to the project or an existing project treatment facility 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) an additional facility providing eligible material for the project, or any additional source of organic effluent being established;

(e) any other change in the information provided in the section 22 application or section 128 application for the project, in accordance with sections 9 to 9A.

7 Subsection 37(1)

After "project proponent" insert "for an animal effluent management project".

8 Subsection 37(1)

Omit "project facility" wherever occurring, substitute "project treatment facility or project biomethane facility".

9 Sections 38 and 39

Repeal the sections, substitute:

38 Records about biogas sent to a project

The project proponent for an animal effluent management project must make and keep records about any biogas sent to the project for biogas upgrading, including the following:

(a) the volume of biogas;

(b) the composition of biogas;

(c) the biogas source facility from which it is sourced;

(d) the eligible abatement fraction of biogas and how it is determined;

(e) the intended end use of biomethane produced by the project.

39 Records about biomethane produced

The project proponent for an animal effluent management project must make and keep records about the intended end use of biomethane produced by the project.

39A Records about measurement

The project proponent for an animal effluent management project must make and keep records of the following information in relation to direct and indirect measurement:

(a) records of any raw data and site observations relating to the animal effluent management project;

(b) all values and intermediate calculations in the calculation of the net abatement amount;

(c) monitoring data, including data to evidence animal effluent management project performance to show that any ineligible material had no significant adverse effect on the operation and performance of the treatment system;

(d) electronic recording of values of logged primary parameters for each measurement interval, for each measurement, including the following:

(i) biogas flow data for each flow meter;

(ii) methane content of gas (% by volume) for each measurement including date, time and location of measurement, notes of non-compliance to performance specifications, remedial actions taken to correct instrument;

(iii) biogas upgrading data for each biogas upgrading system including biogas volume accepted, biomethane volume produced, waste emissions quantities, notes of non-compliance to performance specifications and remedial actions taken to correct system;

(e) auditable evidence of fuel use;

(f) auditable evidence of purchased electricity use;

(g) auditable evidence of electricity use;

(h) auditable evidence of the amount of electricity produced by each internal combustion engine generator used in the project;

(i) auditable evidence of quantities of any ineligible material used (see paragraph 16(3)(c));

(j) auditable calibration data relevant to the project and the calculation of the net abatement amount;

(k) auditable evidence of any measurements taken in accordance with this determination or the Supplement, including:

(i) the location and contract details of any laboratory used to undertake the measurements; and

(ii) the credentials of those conducting any tests or verifying the accuracy of any equipment used in those tests;

(l) auditable evidence that the post-diversion treatment complies with the requirements of clause 8 of the Supplement;

(m) auditable evidence of the amount of biogas received and biomethane produced by each upgrading system used in the project.

39B Records about devices

(1) The project proponent for an animal effluent management project must make and keep records of the information required by this section in relation to each of the following meters, devices and analysers used in the project:

(a) biogas and biomethane flow meters;

(b) electricity meters;

(c) devices for measuring diverted material;

(d) devices for measuring volatile solids and nitrogen in material;

(e) biogas upgrading systems;

(f) any biogas analyser or biomethane analyser used to determine biogas and biomethane composition;

(g) any other devices used in carrying out the project.

(2) The following information must be recorded and kept:

(a) the model number;

(b) the serial number;

(c) calibration procedures;

(d) in the case of a biogas upgrading system—the size of the system;

(e) in the case of a biogas analyser or biomethane analyser—calibration data for each analyser.

39C Records about maintenance and operation of devices

(1) The project proponent for an animal effluent management project must make and keep records in relation to each of the following:

(a) all maintenance records for all project equipment used in the project;

(b) logs of operations of any combustion device or biogas upgrading systems used in the project including a record of any of the following:

(i) a significant shut-down;

(ii) a start-up;

(iii) a significant failure;

(iv) a process adjustment;

(c) evidence of corrective measures taken if monitoring instruments do not meet the accuracy threshold specified in Division 3;

(d) evidence demonstrating compliance with Division 3.

(2) In this section:

project equipment includes any of the following equipment used in a project:

(a) a combustion device used in methane destruction;

(b) a solids separation device;

(c) a biogas upgrading system;

(d) gas transport infrastructure;

(e) monitoring equipment.

10 Section 40

Repeal the section, substitute:

40 Operation of this Division

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

(a) requirements to monitor an animal effluent management project that is an eligible offsets project (see section 41); and

(b) certain consequences if the project proponent fails to monitor the project as required (see section 42).

11 Section 41

Repeal the section, substitute:

41 Requirement to monitor certain parameters

(1) The project proponent must monitor all of the variable parameters used to calculate the carbon dioxide equivalent net abatement amount for a reporting period for an animal effluent management project, and the equipment or devices used to determine or measure those parameters, in accordance with this section and any requirements specified in the Supplement.

(1A) The project proponent for an animal effluent management project that involves biomethane production 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

Item	Parameters	Description	Units	Measurement procedure (including frequency as required)	Determination of parameter from measurments
1	$Q_{BM, k}$	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	Cumulative value for the reporting period. QBM, k is to be measured at a

Monitored parameters					
Item	**Parameters**	**Description**	**Units**	**Measurement procedure (including frequency as required)**	**Determination of parameter from measurments**
				AAA. Frequency—continuously.	point that is after the biomethane leaves the biogas upgrading system and at which the biomethane is suitable for combustion as a natural gas substitute.
2	$Q_{BG, g}$	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.
3	$Q_{BG, El, g}$	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.	QBG, El,g is to be measured in accordance with this item only 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.
4	$Q_{F, displacement, h, i}$	Quantity of each fuel type used by project biomethane facility *h*	Either: (a) t (for solid fuel); or (b) m^3(for gas fuel); or (c) kL (for liquid fuel); or (d) GJ	Either: (a) monitored in accordance with section 2.25, 2.36 or Division 2.4.6 of the NGER (Measurement) Determination (as applicable to the fuel type); or (b) evidenced by invoices, contractual arrangements or	Cumulative value for reporting period.

Monitored parameters					
Item	**Parameters**	**Description**	**Units**	**Measurement procedure (including frequency as required)**	**Determination of parameter from measurments**
				industry metering records. Frequency—continuous	
5	$Q_{PE,\ displacement,\ h}$	Quantity of electricity purchased by project biomethane facility *h*	kWh or GJ	Evidenced by invoices, contractual arrangements or industry metering records. If EPE, displacement, h 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) The measurement of biogas and biomethane pressures must be carried out using equipment that complies with the following accuracy and transmitter requirements:

(a) pressure <±0.5%; and

(b) differential pressure <±0.5%.

(4) In this section:

i means a fuel type.

12 Section 42

Repeal the section, substitute:

42 Value of certain parameters may be estimated if project proponent fails to monitor them

(1) This section applies if, in any period in a reporting period, the project proponent is unable or fails to monitor a parameter specified in the table to this section as required by the monitoring requirements. In this determination this period is called the ***non-monitored period***.

(2) In that case, the value of the parameter for the purpose of working out the carbon dioxide equivalent net abatement amount for the reporting period is to be determined for the non-monitored period in accordance with the table.

Consequence of not meeting requirement to monitor certain parameters		
Item	**Parameters**	**Determination of parameter for non-monitored period**
1	Each of the following: (a) $Q_{BM, k}$ (b) $Q_{BG, g;}$ (c) $Q_{BG, El, g;}$ (d) $Q_{F, displacement, i;}$ (e) $Q_{PE, displacement}$.	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.

(1B) The project proponent must make all practicable efforts to minimise the non-monitored period during a reporting period.

(2) The project proponent must make the estimate clearly distinct from other measured records for consideration during auditing, and must clearly document any approaches taken to derive any estimates.

(3) To avoid doubt, this section does not prevent the Regulator from taking action under the Act, the regulations or the legislative rules in relation to the project proponent's failure to monitor a parameter in accordance with the Supplement.

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.