



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

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I, Angus Taylor, Minister for Energy and Emissions Reduction, make the following determination.

Dated 6 December 2019

Angus Taylor  
Minister for Energy and Emissions Reduction

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# Part 1—Preliminary

## 1 Name

This is the *Carbon Credits (Carbon Farming Initiative—Animal Effluent Management) Methodology Determination 2019*.

## 2 Commencement

This determination commences on the day after it is registered.

## 3 Authority

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

## 4 Duration

This determination remains in force for the period that:

- (a) begins when this determination commences; and
- (b) ends on the day before this determination would otherwise be repealed under subsection 50(1) of the *Legislation Act 2003*.

## 5 Definitions

In this determination:

*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 a combustion device.

Note: The definition includes a covered anaerobic pond without heating and stirring equipment if the methane emissions are captured and destroyed by combustion.

**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 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.

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

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

**animal effluent management project**—see subsection 7(5)

**biogas** means a mixture of gases including methane that is generated as a result of anaerobic digestion.

**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 paragraph 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, includes combustion of:

- (a) 98% or more of the methane; or
- (b) if the Supplement specifies a lower percentage for the purpose of this paragraph—that percentage 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.

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

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

**diversion**, of material from organic effluent—see subsection 7(4).

**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 material**—see section 15.

**emissions avoidance**—see subsection 7(4).

**emissions destruction**—see subsection 7(3).

**ineligible material**—see section 16.

**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**, for a flare or other device, means 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 13(2).

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

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

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

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

**NGER Regulations** means the *National Greenhouse and Energy Reporting Regulations 2008*.

**non-monitored period**—see 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**—see subsection 7(4).

**project facility** means a treatment facility that is used in the project.

Note: Details of at least one project facility must be included the section 22 application (see section 9).

**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 published on the Department’s website from time to time.

**treatment method** (a method of treatment used by a facility that treats organic effluent by emissions avoidance)—see section 14.

**treatment facility**—see subsection 7(2).

**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*

*monitoring requirement*

*offsets project*

*offsets report*

*project*

*project area*

*project proponent*

*Regulator*

*reporting period*

## 6 References to factors and parameters from external sources

- (1) If a calculation in this determination includes a factor or parameter that is defined or calculated by reference to another instrument or writing, the factor or parameter to be used for a reporting period is the factor or parameter referred to in, or calculated by reference to, the instrument or writing as in force at the end of the reporting period.
- (2) Subsection (1) does not apply if:
  - (a) this determination or the Supplement specifies otherwise; or
  - (b) it is not possible to define or calculate the factor or parameter by reference to the instrument or writing as in force at the end of the reporting period.

## Part 2—Animal effluent management projects

### 7 Animal effluent management projects

- (1) For paragraph 106(1)(a) of the Act, this determination applies to an offsets project in which animal effluent, with or without other organic effluent, is processed in a treatment facility at an eligible animal facility in a way that can be reasonably expected to result in eligible carbon abatement.
- (2) A **treatment facility** is a facility that treats animal effluent, with or without other organic effluent, by emissions destruction, emissions avoidance or both.

Note: Treatment facilities that are used in an animal effluent management project become known as project facilities (see section 5).

- (3) A facility treats organic effluent by **emissions destruction** if it:
  - (a) generates biogas from it; and
  - (b) captures and destroys the proportion of the biogas that is methane.
- (4) A facility treats organic effluent by **emissions avoidance** if it:
  - (a) removes material that includes volatile solids (**diversion** of the material); and
  - (b) deals 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**).
- (5) A project covered by subsection (1) is an **animal effluent management project**.



## Part 3—Project requirements

### 8 Operation of this Part

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.

### 9 Project facility must be identified in section 22 application

Unless this determination is to apply to a project as a result of a section 128 application, the section 22 application must specify one or more project facilities that will be used in the project, with the following details:

- (a) a brief description of the facility;
- (b) the location of the facility;
- (c) the capacity of the facility, using any metrics related to the facility set out in the Supplement;
- (d) any known proposals for the expansion of the facility over the course of the project;
- (e) the basis upon which the facility is expected to comply with the requirements of this Part and section 7;
- (f) 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;
- (g) a description of how the project can reasonably be expected to result in eligible carbon abatement.

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

### 10 Project facilities must not be pre-existing

- (1) A project facility for a project 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 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 (a); 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.

*Transition from another method*

- (4) If:
  - (a) the project was first declared an eligible offsets project under another 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 facility, or part of a project facility, that operated while the former determination applied to the project.

## 11 Requirement in lieu of newness for certain projects

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.

## 12 Project source must be identified in section 22 or 128 application

The section 22 application or section 128 application must identify one or more facilities that will provide eligible material for the project, with the following details:

- (a) the address and a brief description of:
  - (i) at least one eligible animal facility at which the project will take place; and
  - (ii) other sources of organic effluent likely to be part of the project;
- (b) details that demonstrate that material from the facility or other source is expected to be eligible material, including a description of the evidence required by subsection 15(2);
- (c) the quantities of eligible material that the facility or other source is expected to provide to the project over the course of the project.

Note: Effluent may also be sourced from additional eligible animal facilities, provided that they are documented in accordance with Part 5.

## 13 Treatment facility—emissions destruction

- (1) A project facility that treats organic effluent by means of emissions destruction must use one or more anaerobic digesters to generate and capture the biogas, and one or more combustion devices to destroy the proportion of the biogas that is methane.
- (2) Each combustion device must be operated to result in the complete combustion of methane.
- (3) If a flare is used as a combustion device:

- (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.

#### 14 Treatment facility—emissions avoidance

- (1) A project 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).
- (2) The methods applied under subsection (1) are a *treatment method*.

#### 15 Eligible material

- (1) For this determination, 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; and
      - (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; and
      - (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, in the absence of the declaration of the project as an eligible offsets project, have been treated in an anaerobic pond.
- (2) For paragraph (1)(c), the project proponent must have evidence 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 that meets any requirements in the Supplement.

Note 1: Ineligible material is not excluded from being processed in emissions destruction project facilities; however, the abatement calculations in Part 4 will subtract the potential emissions from the ineligible material from 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 it from the 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 paragraph (2)(b) to satisfy the Regulator that material would have been treated in an anaerobic pond may differ for new facilities compared to existing facilities.

## 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 subsection 21(2).

- (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 it does not affect the treatment effectiveness of the project facility.

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

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

- (a) the project 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 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 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.

Note: Under section 9 the section 22 application in relation to the project needs to explain the basis upon which this section is expected to be met when the project is operational.

## 17 Crediting period for certain projects

- (1) For paragraph 69(3)(b) and subparagraph 70(3)(d)(ii) of the Act, if a project 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 (a) includes projects that only treat organic effluent by emissions avoidance and projects that flare and do not generate electricity.

- (2) However, if:
- (a) a project was covered by subsection (1) at the start of the 8<sup>th</sup> 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 85<sup>th</sup> calendar month that biogas is used to generate electricity.
- (3) For this section and reporting under paragraph 34(1)(i):
- (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.

## 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.

#### 19 Overview of gases accounted for in 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.

<b>Greenhouse gases and emissions sources</b>			
<b>Item</b>	<b>Relevant calculation</b>	<b>Emissions source</b>	<b>Greenhouse gas</b>
1	Gross abatement amounts	The methane emissions either destroyed by the collection and combustion of biogas or avoided by the diversion of volatile solids from the treatment in an anaerobic pond.	Methane (CH <sub>4</sub> )
2	Ineligible emissions amounts	The emissions from the treatment of ineligible material	Methane (CH <sub>4</sub> )
3	Project emissions	Fuel consumption attributable to the project, including transport	Carbon dioxide (CO <sub>2</sub> ) Methane (CH <sub>4</sub> ) Nitrous oxide (N <sub>2</sub> O)
4	Project emissions	Consumption of purchased electricity attributable to the project	Carbon dioxide (CO <sub>2</sub> ) Methane (CH <sub>4</sub> ) Nitrous oxide (N <sub>2</sub> O)
5	Project emissions	Emissions from the post-diversion treatment of material in a project facility using emissions avoidance	Methane (CH <sub>4</sub> ) Nitrous oxide (N <sub>2</sub> O)

## Division 2—Method for calculating net abatement amount

### 20 Summary

The carbon dioxide equivalent net abatement amount for the reporting period is worked out separately for each project 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 combustion of methane and/or avoided by the diversion of volatile solids.

From this is deducted:

- (i) 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);
- (ii) any emissions generated by operation of the facility (eg fuel use);
- (iii) for any diverted materials, the emissions resulting from aerobic post-diversion treatment methods.

### 21 Net abatement amount

- (1) The carbon dioxide equivalent net abatement amount for the reporting period,  $A$  (in tonnes CO<sub>2</sub>-e), is worked out using the formula:

$A = \sum_h A_h$	<i>Equation 1</i>
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where:

$h$  is a project facility.

$A_h$  is:

- (a) if the project facility net abatement amount for project 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.
- (2) However, if a project facility does not comply in all material respects with the requirements of section 16 during the reporting period  $A_h$  is taken to be zero.

### 22 Project facility net abatement amount

The project facility net abatement amount for the reporting period for project facility  $h$ ,  $A_h$  (in tonnes CO<sub>2</sub>-e), is worked out using the formula:

$A_h = GA_h - IE_h - PE_h$	<i>Equation 2</i>
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where:

**$GA_h$**  is the gross abatement amount for the reporting period for project facility  $h$ , calculated using equation 3 (section 23).

**$IE_h$**  is the ineligible emissions for the reporting period for project facility  $h$ , calculated using equation 8 (section 26).

**$PE_h$**  is the project emissions for the reporting period for project facility  $h$ , calculated using equation 9 (section 29).

## Division 3—Gross abatement amount

### 23 Gross abatement amount for a project facility

The gross abatement amount for project facility  $h$  for a reporting period,  **$GA_h$**  (in tonnes CO<sub>2</sub>-e), is worked out using the formula:

$GA_h = \gamma (MA + \sum_i MC_i)$	<i>Equation 3</i>
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where:

$\gamma$  is the factor, used in Part 5.3 of the NGER (Measurement) Determination, that converts cubic metres of methane to tonnes CO<sub>2</sub>-e at standard conditions.

Note: In 2019,  $\gamma$  was  $6.784 \times 10^{-4} \times 25$ .

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

$i$  is a combustion device of the facility.

**$MC_i$**  (methane combusted) is the volume of methane destroyed by combustion device  $i$  during the reporting period, calculated using equation 4 or equation 5 (section 24).

### 24 Methane destroyed by combustion devices

- (1) The volume of methane destroyed by combustion device  $i$  of project facility  $h$  during the reporting period,  **$MC_i$**  (in cubic metres), is calculated:
  - (a) for a combustion device that is an internal combustion engine used to generate electricity—using either Method A or Method B; and
  - (b) otherwise—using Method A.



*Method A—direct volume calculation*

- (2) To calculate  $MC_i$  (the volume of methane, in cubic metres, destroyed by combustion device  $i$ ) by **Method A**, use the following formula:

$MC_i = Q_{biogas, i} \times W_{BG, CH_4} \times DE_i$	<b>Equation 4</b>
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where

$Q_{biogas, i}$  is the total volume of biogas sent to combustion device  $i$  during the reporting period, in cubic metres, determined in accordance with the Supplement.

$W_{BG, CH_4}$  is the proportion of  $Q_{biogas, i}$  that is methane, expressed as a fraction, determined in accordance with the Supplement.

$DE_i$  is the methane destruction efficiency for combustion device  $i$ , expressed as a fraction, determined in accordance with the Supplement.

*Method B—calculation from power output*

- (3) To calculate  $MC_i$  (the volume of methane, in cubic metres, destroyed by combustion device  $i$ ) by **Method B**, use the following formula:

$MC_i = QE_i \times CH_4 \text{ conversion factor}$	<b>Equation 5</b>
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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:

$QE_i = \frac{Q_{EG, i} \times EC}{Eff_i}$	<b>Equation 6</b>
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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.

## 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 facility  $h$  by diversion of material that includes volatile solids during the reporting period,  $MA$  (in cubic metres), is worked out using the formula:

$MA = \sum_w \sum_n (MCF_n \times VS_{Div, w, n} \times B_{o, Div, w, n})$	<b>Equation 7</b>
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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 in 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.

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

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

## Division 4—Ineligible emissions

Note: This Division does not apply in relation to a project facility that treats material using 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 facility

The ineligible emissions for project facility  $h$  during the reporting period,  $IE_h$  (in tonnes CO<sub>2</sub>-e), is worked out using the formula:

$IE_h = \gamma \sum_w (VS_{Inel, w} \times B_{o, w})$	<b>Equation 8</b>
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where:

$\gamma$  is the factor, used in Part 5.3 of the NGER (Measurement) Determination, that converts cubic metres of methane to tonnes CO<sub>2</sub>-e at standard conditions.

Note: In 2019,  $\gamma$  was  $6.784 \times 10^{-4} \times 25$ .

$w$  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 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 (i.e. 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.

## Division 5—Project emissions

### 28 Summary

The project emissions for the reporting period are the emissions that must be subtracted from the gross abatement 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 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

The project emissions for project facility  $h$  for the reporting period,  $PE_h$  (in tonnes CO<sub>2</sub>-e), is worked out using the formula:

$$PE_h = E_F + E_{PE} + E_{\text{Post, Methane}} + E_{\text{Post, Nitrogen}}$$

**Equation 9**

where:

$E_F$  is the emissions from fuel that is specifically attributable to the operation of the project facility during the reporting period (including transport), in tonnes CO<sub>2</sub>-e, worked out using equation 10 (section 30).

$E_{PE}$  is the emissions from purchased electricity that is specifically attributable to the operation of the project facility during the reporting period, in tonnes CO<sub>2</sub>-e, worked out using equation 11 (section 31).

$E_{\text{Post, Methane}}$  is the emissions due to methane arising from the post-diversion treatment of material diverted in the project facility under a treatment method during the reporting period, in tonnes CO<sub>2</sub>-e, worked out using equation 12 (section 32).

$E_{\text{Post, Nitrogen}}$  is the emissions due to nitrogen arising from the post-diversion treatment of material diverted in the project facility under a treatment method during the reporting period, in tonnes CO<sub>2</sub>-e, worked out using equation 13 (section 32).

### 30 Emissions from fuel use

- (1) The emissions from fuel used that is specifically attributable to the operation of project facility  $h$  during the reporting period (including transport),  $E_F$ , (in tonnes CO<sub>2</sub>-e.) is worked out using the formula:

$$E_F = \sum_i \sum_j \frac{Q_{F,i} \times EC_i \times EF_{ij}}{1\,000}$$

**Equation 10**

where:

$i$  is a fuel type.

$j$  is a greenhouse gas type.

$Q_{F,i}$  is the amount of fuel type  $i$  that is specifically attributable to the operation of the project facility during the reporting period, in tonnes, kilolitres, cubic metres, or gigajoules, determined in accordance with the Supplement.

$EC_i$  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  $Q_{F,i}$  is measured in gigajoules, then  $EC_i$  is not required ( $EC_i=1$ ).

$EF_{ij}$  is the emission factor for greenhouse gas type  $j$  and fuel type  $i$ , in kilograms CO<sub>2</sub>-e per gigajoule, set out in the NGER (Measurement) Determination.

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

### 31 Emissions from purchased electricity use

- (1) The emissions from purchased electricity that is specifically attributable to the operation of project facility  $h$  during the reporting period,  $E_{PE}$ , (in tonnes CO<sub>2</sub>-e) is worked out using the formula:

$E_{PE} = Q_{PE} \frac{EF_{PE}}{1000}$	<i>Equation 11</i>
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where:

$Q_{PE}$  is the amount of purchased electricity that is specifically attributable to the operation of the project facility during the reporting period, in kilowatt hours, determined in accordance with the Supplement.

$EF_{PE}$  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<sub>2</sub>-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<sub>2</sub>-e per kilowatt hour; or
    - (ii) otherwise—the emissions factor, in kilograms CO<sub>2</sub>-e per kilowatt hour, for off-grid electricity included in the NGA Factors document.
- (2) For subparagraph (b)(i) of the definition of  $EF_{PE}$  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

#### *Methane emissions*

- (1) The emissions due to methane arising from the post-diversion treatment of material diverted in project facility *h* under a treatment method during the reporting period,  $E_{Post, Methane}$  (in tonnes CO<sub>2</sub>-e) is worked out using the formula:

$E_{Post, Methane} = \gamma \times \sum_n (MCF_{Post, n} \times \sum_w (VS_{Div, w, n} \times B_{o, Div, w}))$	<b>Equation 12</b>
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where:

$\gamma$  is the factor, used in Part 5.3 of the NGER (Measurement) Determination, that converts cubic metres of methane to tonnes CO<sub>2</sub>-e at standard conditions.

Note: In 2019,  $\gamma$  was  $6.784 \times 10^{-4} \times 25$ .

*n* is a treatment method.

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

- (a) specified in the Supplement; and
- (b) if a project facility uses more than 1 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.

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

$B_{o, Div, w}$  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 facility *h* under a treatment method during the reporting period,  $E_{Post, Nitrogen}$  (in tonnes CO<sub>2</sub>-e) is worked out using the formula:

$E_{Post, Nitrogen} = N_2O-N_{CF} \times \sum_n (INOEF_{Post, n} \times \sum_w N_{Div, w, n})$	<b>Equation 13</b>
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where:

$N_2O-N_{CF}$ , 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.

$INOEF_{Post, n}$ , 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.

$N_{Div, w, n}$  is the amount of nitrogen in the material of type  $w$  that is diverted in the project 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  $B_{o,Div, w}$ ; or
  - (b) for a group of listed materials:
    - (i) to treat them as if they were a single material of type  $w$  (so that the quantity is a single measure,  $VS_{Div, w, n}$ ); and
    - (ii) use the highest value of their individual default capacities instead of  $B_{o,Div, w}$ .

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

## Part 5—Reporting, record-keeping and monitoring requirements

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

### Division 1—Offsets report requirements

#### 33 Operation of this Division

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

#### 34 Information that must be included in an offsets report

- (1) An offsets report for a reporting period must include:
  - (a) a description of the sources of project emissions; and
  - (b) if the project involves emissions avoidance—a detailed description of the post-diversion treatment method used in accordance with paragraph 14(1)(b), including the dimensions of the relevant stockpiles or windrows; and
  - (c) the output of each equation in this Determination used to calculate the net abatement amount for the reporting period; and
  - (d) the basis upon which equations 10 and 11 were calculated; and
  - (e) 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; and
  - (f) an explanation of any periods where the project was not monitored in accordance with the monitoring requirements in this Determination or the Supplement; and
  - (g) 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; and
  - (h) 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; and
  - (i) if the project has used biogas to generate electricity during its crediting period or periods—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 subsection 17(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.



- (2) If an offsets report for a reporting period is the first offsets report, or the first offsets report after a new project facility is added to the project, it must:
  - (a) include details of each combustion device that is part of the project, and the project facility the combustion device is installed at, that has not previously been included in an offsets report in accordance with this paragraph including a description of the monitoring and control system for the combustion device; and
  - (b) state whether each project facility that is part of, or is added to the project, is a facility that treats organic effluent by emissions destruction, emissions avoidance or both.
- (3) If the project involves emissions avoidance and the following information has not previously been included in an offsets report or has changed:
  - (a) a description of the post-diversion treatment method used in accordance with paragraph 14(1)(b); and
  - (b) the type and specifications of the devices used for solids separation in the project.
- (4) If the information provided in accordance with sections 9 or 12 for a project has changed or has not previously been provided for a facility, the next offsets report for a reporting period must include that information.
- (5) If ineligible material has been used by the project during a reporting period, the offsets report for the reporting period must explain how the requirements of section 16 are satisfied in relation to the use of that material, including:
  - (a) whether there was any inconsistent ineligible material (within the meaning of section 16) during the reporting period; and
  - (b) the volume of methane attributable to any inconsistent ineligible material; and
  - (c) 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.
- (6) If a quality assurance plan prepared under section 37 has not been provided to the Regulator after it was made or amended, the offsets report must include a copy of that plan.

### **35 Determination of certain factors and parameters**

- (1) If, in the circumstances described in paragraph 6(2)(b), a factor or parameter is defined or calculated for a reporting period by reference to an instrument or writing as in force from time to time, the offsets report about the project for the reporting period must include the following information for the factor or parameter:
  - (a) the versions of the instrument or writing used;
  - (b) the start and end dates of each use;
  - (c) the reasons why it was not possible to define or calculate the factor or parameter by reference to the instrument or writing as in force at the end of the reporting period.
- (2) If a parameter is determined under section 42 for the purpose of working out the carbon dioxide equivalent net abatement amount for an animal effluent management project for a reporting period, the offsets report about the project for the reporting period must include the following information for the parameter:
  - (a) the name of the parameter;
  - (b) the start and end of the non-monitored period for which the parameter was determined;
  - (c) the reasons why the project proponent for the project failed to monitor the parameter as required by the monitoring requirements;

- (d) the value of the parameter and how that value was determined;
- (e) the basis upon which the estimate was conservative.

## **Division 2—Record-keeping requirements**

### **36 Operation of this Division**

For paragraph 106(3)(c) of the Act, this Division sets out record-keeping requirements for an animal effluent management project that is an eligible offsets project.

### **37 Quality assurance plan**

- (1) The project proponent must, no later than the first offsets report submitted after this determination first applied to the project, prepare a quality assurance plan for each project facility that:
  - (a) reflects the operation, maintenance and equipment calibration requirements of the manufacturer or installer, or both, for all project equipment; and
  - (b) specifies records to be kept to show that:
    - (i) all material claimed as eligible material satisfies section 15; and
    - (ii) any treatment of material that includes ineligible material satisfies section 16; and
  - (c) specifies the parameters that will be monitored, the methods to be used and the frequency of monitoring, to meet the monitoring requirements; and
  - (d) ensures the transport of materials and operation of the project facility is conducted in accordance with applicable laws and relevant codes of practice; and
  - (e) is prepared in accordance with any requirements in the Supplement.
- (2) If the Regulator notifies the project proponent that it is not satisfied with the content of a quality assurance plan, the project proponent must amend that plan as soon as practicable after being notified to address the issues identified.

### **38 Records that must be kept**

The project proponent must make and keep records of the information specified in this Division or in the Supplement.

### **39 General information**

The following information must be recorded and kept for general purposes:

- (a) all maintenance records for all project equipment, including combustion devices used in methane destruction projects and any monitoring equipment;
- (b) logs of operations of the combustion device used in project facilities using emissions destruction, including a record of significant shut-downs, start-ups, failures and process adjustments;
- (c) evidence of corrective measures taken if monitoring instruments do not meet the accuracy threshold specified in the Supplement; and
- (d) number, type, serial numbers and size of emissions avoidance or emissions destruction devices used in the project; and
- (e) evidence demonstrating compliance with subsection 41(2).

## Division 3—Monitoring requirements

### 40 Operation of this Division

For paragraph 106(3)(d) of the Act, this Division sets out monitoring requirements for an animal effluent management project that is an eligible offsets project.

### 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 any requirements specified in the Supplement.
- (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.

### 42 Consequences of not meeting requirement to monitor certain parameters

- (1) If, during a particular period (the *non-monitored period*) in a reporting period, the project proponent for an animal effluent management project fails to monitor a parameter covered by subsection 41(1) in accordance with the monitoring requirements, 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 by making a conservative estimate of the parameter having regard to:
  - (a) any relevant measurement or estimation approaches or requirements that apply to the parameter under the NGER (Measurement) Determination; and
  - (b) any relevant historical data for the project; and
  - (c) any other data for the project that relates to the parameter; and
  - (d) any other matter the project proponent considers relevant.
- (2) 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, or regulations or rules made under the Act, 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 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.