EXPLANATORY STATEMENT

Issued by the Minister for Industry, Energy and Emissions Reduction

Carbon Credits (Carbon Farming Initiative) Act 2011

Carbon Credits (Carbon Farming Initiative—Electricity Generation from Landfill Gas) Methodology Determination Variation 2022

Purpose

The *Carbon Credits (Carbon Farming Initiative—Electricity Generation from Landfill Gas) Methodology Determination Variation 2022 (*the Variation*)* amends the *Carbon Credits (Carbon Farming Initiative—Electricity Generation from Landfill Gas) Methodology Determination 2021* (the Determination).

The Determination credits emissions reductions achieved through the destruction of methane from decomposing waste at a landfill site where the landfill operator intends to generate electricity. Organic waste produces methane when decomposing under anaerobic conditions, such as in a landfill. Methane is a greenhouse gas 28 times more potent than carbon dioxide over a 100-year period. Capturing and combusting waste methane converts the methane into carbon dioxide, reducing net emissions from landfills.

The Variation facilitates new activities under the Emissions Reduction Fund (ERF) through projects that generate abatement by capturing and refining waste biogas from landfills to produce biomethane, a high methane concentration gas that can be used as a natural gas substitute.

The Variation amends the Determination by including concepts and equations to enable the creation of Australian carbon credit units (ACCUs) from two types of abatement associated with the production of biomethane from biogas, conversion abatement (associated with the destruction or avoidance of waste methane emissions) and displacement abatement (associated with the avoidance of natural gas combustion emissions due to displacement of natural gas by biomethane). The provisions in the Variation that replace existing provisions in the Determination with substantively the same content are a consequence of the drafting approach. The Variation does not seek to replicate the Determination but rather add new and different provisions. Conversion abatement and displacement abatement are discussed in further detail below.

New projects involving biomethane will be able to access a 12-year crediting period for both conversion abatement and displacement abatement.

Existing projects that have already been creating conversion abatement, for example, through flaring of waste methane, that transfer to the varied Determination and commence biomethane production will be able to access a crediting period of 12 years, less the time the project has already received credits for conversion abatement. The varied Determination allows for a

project to restart as a new project to access the balance of the 12-year crediting period for displacement abatement if the project has earned credits for displacement abatement for less than 12 years when the project's original crediting period ends.

By including these new eligible project activities, the Variation expands opportunities for the waste sector to participate in the ERF.

Legislative provisions

The Determination was made under subsection 106(1) of the *Carbon Credits (Carbon Farming Initiative) Act 2011* (the Act).

The Variation amends the Determination, and is made under subsection 114(1) of the Act, which empowers the Minister to vary, by legislative instrument, a methodology determination.

Background to the Emissions Reduction Fund

The Act enables the crediting of greenhouse gas abatement from emissions reduction activities across the economy. Greenhouse gas abatement is achieved either by reducing or avoiding emissions or by removing carbon from the atmosphere and storing it in soil or vegetation.

In 2014, the Australian Parliament passed the *Carbon Farming Initiative Amendment Act 2014*, which established the ERF. Further Information on the ERF is available at: www.industry.gov.au/funding-and-incentives/emissions-reduction-fund or www.cleanenergyregulator.gov.au/ERF.

Emissions reduction activities are undertaken as offsets projects. The process involved in establishing an offsets project is set out in Part 3 of the Act. An offsets project must be covered by, and undertaken in accordance with, a methodology determination.

Subsection 106(1) of the Act empowers the Minister to make by legislative instrument a methodology determination. The purpose of a methodology determination is to establish procedures for estimating abatement (emissions reductions and sequestration) from eligible projects and rules for monitoring, record keeping, and reporting. These methodologies will ensure that emissions reductions are genuine—that they are both real and additional to business as usual.

In deciding to make a methodology determination, the Minister must have regard to the advice of the Emissions Reduction Assurance Committee (ERAC), an independent expert panel which assesses whether methods meet the integrity requirements of the ERF. The Minister must not make or vary a methodology determination if the ERAC considers it inconsistent with the offsets integrity standards, which are set out in section 133 of the Act. The Minister will also consider any adverse environmental, economic, or social impacts likely to arise as a result of projects to which a methodology determination applies.

Offsets projects that are undertaken in accordance with a methodology determination and approved by the Clean Energy Regulator can generate ACCUs. These units represent emissions reductions from the project.

Background to the Variation

In late 2020, the Minister for Industry, Energy and Emissions Reduction prioritised the development of an ERF method that would enable the crediting of ACCUs from the combustion and use of biomethane produced from waste methane.

Biomethane is a gas with a high methane concentration (95% or above) and is a direct substitute for natural gas. It is produced from biogas that is generated when organic waste decomposes anaerobically – this typically occurs in an anaerobic digester, or in a landfill. The resulting biogas is then captured and refined into biomethane by removal of impurities to leave a high methane concentration gas. Landfills, wastewater treatment facilities and animal effluent treatment plants are examples of waste treatment sites that produce biogas and may be suited to 'upgrading' (refining) that biogas into biomethane.

The intent of the Variation is to credit 2 types of abatement resulting from the production of biomethane: conversion abatement and displacement abatement.

The first type of abatement, called *conversion abatement*, arises when biomethane produced by the project from waste biogas is combusted for energy by an end user. This process converts the methane, a potent greenhouse gas with a global warming potential 28 times greater than carbon dioxide over a 100-year period, to carbon dioxide, reducing net emissions. Conversion abatement has been credited in previous versions of the Determination – projects that earn ACCUs for the destruction of methane in a flare or generator are being credited for conversion abatement. The Variation introduces a new project activity, landfill gas capture for biomethane production, that is also eligible to be credited for generating conversion abatement.

The second type of abatement, called *displacement abatement*, arises from biomethane produced by the project displacing the use of an equivalent quantity of natural gas when it is combusted as a natural gas substitute. Combustion of biomethane releases the carbon absorbed by the biogenic material from the atmosphere during its life, and on this basis is often considered to have net-zero carbon emissions. This is consistent with the approach used by the Intergovernmental Panel on Climate Change (IPCC) in guidelines for national greenhouse gas inventory reporting and accounting for bio-based energy sources. Therefore, combusting biomethane produced by the project creates abatement from the avoided combustion of natural gas and the associated emissions. This abatement is termed displacement abatement in the Variation and is generated by the biomethane production project activity.

Operation of the Variation

The Variation amends the Determination to incorporate projects that involve the production of biomethane from biogas to be credited for both conversion abatement and displacement

abatement, or displacement abatement only. The Variation allows for projects that do not involve biomethane production activities to continue to operate under the Determination in a manner consistent with the Determination prior to the making of the Variation.

The Variation repeals and replaces section 5, introducing new definitions specific to biomethane projects including biogas upgrading, biomethane, conversion abatement, and displacement abatement. In addition to new definitions, the Variation amends several previous definitions to incorporate biomethane projects and improve clarity.

The Variation amends section 7 of the Determination to enable biomethane projects by modifying the project activities that constitute a *landfill gas (electricity generation) project.*

To incorporate biomethane projects under the Determination, the Variation repeals and substitutes Part 3 of the Determination, introducing 5 new Divisions relating to requirements for landfill gas (electricity generation) projects. The new Divisions set out the activities that each type of project must or may involve, different project types and sub-types identified in the new section 8B and the specific requirements for each of the new project types.

The Variation introduces new section 8A, which specifies 3 project activities that can be carried out by a landfill gas (electricity generation) project:

- **Landfill gas capture for biomethane** – this activity involves collecting landfill gas and sending that landfill gas to a biogas upgrading system to be upgraded into biomethane. The methane in biogas produced by this activity is taken to be destroyed when it is sent to be upgraded into biomethane, resulting in conversion abatement.

- **Biomethane production** – this activity involves treating biogas, which includes landfill gas, by biogas upgrading to produce biomethane. This biomethane must be sent to an end use where it can reasonably be expected to be combusted in Australia as a natural gas substitute, resulting in displacement abatement.

- **Emissions destruction** – this activity involves collecting landfill gas and sending it to a combustion device for destruction, resulting in conversion abatement. This activity does not involve producing biomethane.

The Variation also introduces 5 project types in section 8B:

- **Non-biomethane projects** – a new name for projects covered under previous version of the Determination that involve the capture and combustion of landfill gas with the intention to generate electricity, either exclusively or in conjunction with flaring.

- **Biomethane conversion and displacement projects** – a new project type that covers projects involving production of biomethane from landfill gas sourced from landfill gas collection systems. These projects involve installing equipment, called biogas upgrading systems in the Determination, that upgrade biogas into biomethane. Existing landfill gas (electricity generation) projects that commence biomethane

production part-way through their project may change project type to become biomethane conversion and displacement projects.

- **Biomethane displacement-only projects** – a new project type that covers projects that install biogas upgrading systems and upgrade biogas into biomethane. Only displacement abatement is credited for these project types. An example of a project that may wish to register as a biomethane displacement-only project is a 'biomethane hub' facility that upgrades biogas from a range of sources but does not directly involve the capture and upgrading of landfill gas. Such a facility may not meet the eligibility requirements to be credited for conversion abatement, for example, because the landfill gas was already being collected and treated at the landfill prior to the project commencing.

- **Restarting biomethane conversion and displacement projects** – this project type covers landfill gas (electricity generation) projects that have never undertaken biomethane production and whose crediting periods have expired. These former projects can re-enter the scheme if they commence biomethane production. The crediting period for a restarting biomethane conversion and displacement project subtracts the length of the previous ERF project's crediting period to ensure abatement credited remains additional and consistent with the offsets integrity standards in section 133 of the Act.

- **Restarting biomethane displacement-only projects** – this project type covers projects that were previously biomethane conversion and displacement projects or restarting biomethane conversion and displacement projects whose crediting periods expired after receiving less than 12 years of crediting for displacement abatement for producing biomethane. Such projects can re-enter the scheme as restarting biomethane displacement-only projects and earn credits for the balance of the 12-year crediting period for displacement abatement.

The Variation introduces new sections 15B and 15C to provide in lieu of newness requirements for restarting biomethane conversion and displacement projects and restarting biomethane displacement-only projects respectively. The in lieu of newness requirements facilitate projects that are eligible to restart as these project types.

The new Division 5 of Part 3 repeals and replaces section 16 to specify the crediting period for projects other than restarting biomethane conversion and displacement projects or restarting biomethane displacement-only projects. The Variation introduces new sections 16A and 16B, restarting biomethane conversion and displacement projects and restarting biomethane displacement-only projects.

The Variation repeals and substitutes Part 4 of the Determination to introduce new equations for calculating net abatement for conversion abatement and displacement abatement.

Part 5 of the Determination is amended by the Variation to include additional monitoring and reporting requirements, and parameters for landfill gas (electricity generation) projects that

involve biomethane production. New section 33A is included to specify the general information that must be included in offsets reports for the five project types provided for by the Variation. New sections 33B and 33C require additional information to be included in an offsets report for the purposes of a project that involves biomethane. The Variation also amends Division 2 of Part 5 to insert monitoring requirements for projects that involve biomethane production.

Consultation

The Variation was developed by the Clean Energy Regulator.

Public consultation was undertaken from 2 November to 30 November 2021, published on the Department's website at www.industry.gov.au.

Eighteen submissions were received. Many submissions sought an extension to the crediting period. The ERAC considered the feedback and agreed that a 12-year crediting period would support additional abatement. Other minor technical amendments were also made.

Variation details

Details of the Variation are at Attachment A. Numbered sections and items in this explanatory statement align with the relevant sections and items of the Variation. This is intended to assist the interpretation of the Determination as amended by the Variation.

For the purpose of subsections 114(2), (2A), (7A) and (7B) of the Act, in varying the Determination the Minister has had regard to, and agrees with, the advice of the ERAC that the Variation complies with the offsets integrity standards and that the Variation should be made. The Minister is satisfied that the carbon abatement used in ascertaining the carbon dioxide equivalent net abatement amount for a project is eligible carbon abatement from the project. The Minister has also had regard to whether any adverse environmental, economic or social impacts are likely to arise from the carrying out of the kind of project to which the Variation applies and other relevant considerations.

A Statement of Compatibility with Human Rights prepared in accordance with the *Human Rights (Parliamentary Scrutiny) Act 2011* is at Attachment B.

Attachment A

Details of the Legislative Instrument

1 Name

Section 1 sets out the full name of the Variation, which is the *Carbon Credits (Carbon Farming Initiative—Electricity Generation from Landfill Gas) Methodology Determination Variation 2022*.

2 Commencement

Section 2 provides that the Variation commences on the day after it is registered on the Federal Register of Legislation.

3 Authority

Section 3 provides that the Variation is made under subsection 114(1) of the Act.

4 Amendment of methodology determination

Section 4 provides that the *Carbon Credits (Carbon Farming Initiative—Electricity Generation from Landfill Gas) Methodology Determination 2021* is amended as set out in Schedule 1 of the Variation.

Schedule 1 Amendments

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

1 Section 5

Item 1 repeals the former section 5 and introduces a new section 5 to enable the undertaking of projects involving biomethane under the Determination. Amendments include changes to existing terms and introducing new terms, particularly biogas upgrading, biomethane, conversion abatement, displacement abatement, and biomethane facility.

The term ***biogas upgrading*** is a non-inclusive list of the processes by which biogas can be refined into biomethane. ***Biomethane*** is upgraded biogas with a high concentration of methane that can be used as a natural gas substitute.

The Variation introduces the term ***biomethane facility***. A biomethane facility is defined as a facility that undertakes, or intends to undertake, biomethane production, and from which the resulting biomethane is sent to an end use where it can reasonably be expected to be combusted within Australia as a natural gas substitute. The definition of ***project landfill*** is amended to include landfill gas capture for biomethane activity.

A ***biomethane facility*** that is used in carrying out a project that involves ***biomethane production*** is a ***project biomethane facility***.

Conversion abatement is defined as the abatement attributable to the conversion of methane to carbon dioxide by carrying out landfill gas capture for biomethane or emissions destruction. This type of abatement occurs when waste methane is combusted either in the form of biogas or biomethane.

Displacement abatement is defined as the abatement attributable to biomethane production and occurs when biomethane is produced and displaces the consumption of natural gas. Emissions from biomethane combustion are considered to have net-zero emissions because it is of biogenic origin. By comparison, combustion of natural gas emits 51.5 kilograms of CO_2-e per gigajoule (see the *National Greenhouse Energy Reporting (Measurement) Determination 2008* (NGER (Measurement) Determination)). Displacing natural gas with biomethane therefore results in carbon abatement, termed ‘displacement abatement’.

A project biomethane facility may undertake upgrading of biogas from multiple sources, including biogas imported from outside the project. This allows landfill gas (electricity generation) projects that undertake biomethane production to access a greater range of biogas sources, as they are not restricted to landfills that are part of the project. A facility that supplies biogas to a project biomethane facility for biogas upgrading is defined as a ***biogas source facility***. 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.

To ensure biogas that is upgraded by the project into biomethane is waste methane that would have been emitted in the absence of the project, Item 1 introduces the concept of ***eligible biogas***, being biogas produced from ***eligible biogas waste*** or ***landfill gas***. ***Eligible biogas waste*** is defined as wastes that meet the eligibility criteria of terms under 4 other ERF waste methods:

- eligible animal effluent biogas waste, within the meaning of the *Carbon Credits (Carbon Farming Initiative—Animal Effluent Management) Methodology Determination 2019*
- mixed solid waste within the meaning of the *Carbon Credits (Carbon Farming Initiative—Alternative Waste Treatment) Methodology Determination 2015*
- eligible organic material within the meaning of the *Carbon Credits (Carbon Farming Initiative—Source Separated Organic Waste) Methodology Determination 2016*, and
- 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*.

Eligible biogas waste references these definitions because the wastes covered by the ERF methods above are known to be treated in a manner that produces methane under business- as- usual scenarios. Ineligible biogas comes from waste that is not eligible biogas waste. These types of waste may not necessarily produce methane under a business- as- usual scenario. As a result, biomethane produced from biogas sourced from these wastes may be from methane that would not have been produced without the project. For example, crop waste left in the field may decompose aerobically and not emit methane. If these wastes are diverted into an anaerobic digester to produce biogas, additional methane is being produced that would not have occurred in the absence of the project. To ensure a conservative approach is taken when working out a project's net abatement, displacement abatement from ineligible biogas is discounted – see Division 3 of Part 4 of this Determination (Item 20).

Item 1 of the Variation inserts and amends other defined terms to support the inclusion of the new project types, being non-biomethane, biomethane conversion and displacement, biomethane displacement-only, restarting biomethane conversion and displacement, and restarting biomethane displacement-only.

2 After section 5

Item 2 inserts a new section, section 5A, that sets out requirements for monitoring and control systems for flares and biogas upgrading systems. Section 5A incorporates aspects of the monitoring and control system definition previously contained in section 5.

3 Subsection 7(1)

Item 3 repeals and replaces existing subsection 7(1) with a new subsection that expands the scope of a landfill gas (electricity generation) project to be a project that involve one or both of:

- collection and treatment of landfill gas in a way that destroys methane (paragraph 7(1)(a)); or
- treatment of landfill gas, with or without biogas produced from other biogas waste, by biogas upgrading at a biomethane facility to produce biomethane which is then sent to an end use where it can reasonably be expected to be combusted within Australia as a natural gas substitute (paragraph 7(1)(b)).

Paragraph 7(1)(a) covers projects that involve the treatment of landfill gas to avoid methane emissions. This may occur through collection and treatment of landfill gas to produce biogas and subsequent combustion of that biogas (emissions destruction), or collection and treatment of landfill gas to produce biogas that is refined into biomethane that will be combusted as a natural gas substitute (landfill gas capture for biomethane) – see Item 6, section 8A.

Paragraph 7(1)(b) covers projects that upgrade biogas into biomethane and send the biogas to an end use where it is combusted as a natural gas substitute within Australia – see Item 6, section 8A.

4 Paragraph 7(2)(a)

Item 4 inserts an omitted word in paragraph 7(2)(a).

5 Subsection 7(4)

Item 5 omits subsection 7(4) which set out the different project kinds that a landfill gas (electricity generation) project could be. This is now reflected in different project types and sub-types in the new section 8B.

6 Section 8

Item 6 repeals the former section 8 and replaces it with new sections 8, 8A, 8B and 8C, which set out requirements for landfill gas (electricity generation) projects involving landfill gas capture for biomethane, biomethane production and emissions destruction.

Section 8 Operation of this Part

The effect of paragraph 106(1)(b) of the Act is that a methodology determination must set out requirements that must be met for a project to be an eligible offsets project. Under paragraph 27(4)(c) of the Act, the Clean Energy Regulator (the Regulator) must not declare that a project is an eligible offsets project unless the Regulator is satisfied that the project meets these requirements.

Section 8 provides that Part 3 of the Determination sets out requirements for the purpose of paragraph 106(1)(b) of the Act across 5 Divisions and specifies the crediting period for a project under the Determination for paragraph 69(3)(b) and subparagraph 70(3)(d)(ii) of the Act.

Section 8A Project activities

Section 8A specifies 3 types of project activities:

- Landfill gas capture for biomethane involves collecting landfill gas and sending that landfill gas to a biogas upgrading system at a project biomethane facility.
- Biomethane production involves treating biogas, including landfill gas, by biogas upgrading to produce biomethane at a project biomethane facility. The resulting biomethane must be sent to an end use where it can reasonably be expected to be combusted within Australia as a natural gas substitute. Only biomethane produced from biogas that is eligible biogas will contribute towards the project's net abatement.
- Emissions destruction involves collecting landfill gas and destroying that biogas using a combustion device.

A landfill gas (electricity generation) project must involve one or more project activities.

Landfill gas capture for biomethane and emissions destruction create conversion abatement because of waste methane being destroyed or avoided, while biomethane production creates displacement abatement when produced biomethane replaces natural gas.

Item 20, Section 17A in Part 4 specifies how abatement from each activity is to be accounted for, depending on the project's project type.

Section 8B Project types and sub-types

The new section 8B sets out the different project types and sub-types that a landfill gas (electricity generation) project could be.

A landfill gas (electricity generation) project, according to subsection 8B(1), must be one of the following project types: a non-biomethane project; biomethane conversion and displacement project; biomethane displacement-only project; restarting biomethane conversion and displacement project; or a restarting biomethane displacement-only project.

A project's project type is significant because it determines the project activities that can contribute towards its net abatement as set out in section 17A (Item 20).

A project that is a non-biomethane project or a biomethane conversion and displacement project, according to subsection 8B(2), must be one of the following project sub-types, being: a new project; recommencing project; upgrade project; transitioning project; transitioning (continued) project; transitioning (new) project; transitioning (recommencing) project; or a transitioning (upgrade) project.

A project's project sub-type affects how the baseline conversion abatement is determined for the project under Subdivision 4 of Division 2, Part 4 (Item 20) of this Determination. Since baseline conversion abatement is only relevant for project types that include conversion abatement calculations under Part 4, project sub-types are only relevant for non-biomethane projects and biomethane conversion and displacement projects. Restarting biomethane

conversion and displacement projects are treated as if they are of a particular project sub-type depending on the forerunner project for that project – see section 12D (Item 15).

Project requirements for new, recommencing, upgrade, transitioning, transitioning (continued), transitioning (new), transitioning (recommencing) or transitioning (upgrade) projects are defined more extensively in sections 9 to 12E of the Determination.

It is expected that some existing landfill gas projects declared under the *Carbon Credits (Carbon Farming Initiative—Landfill Gas) Methodology Determination 2015* (the 2015 Determination) will seek to transfer their applicable methodology determination to the Determination through a section 128 application to allow them to use the Determination from the start of a reporting period. Once their section 128 application is approved by the Regulator, such projects are identified in the Determination as ***transitioning (continued)***, ***transitioning (new)***, ***transitioning (recommencing)***, or ***transitioning (upgrade)*** projects with effect from the start of the reporting period in which the application was made.

Subsections 8B(3) to 8B(6) provide that projects that transfer to the Determination from the 2015 Determination are transitioning projects of the same kind as they were under the 2015 Determination. That is, a landfill gas project that was a new project under the *Carbon Credits (Carbon Farming Initiative—Landfill Gas) Methodology Determination 2015* that transfers to the Determination through a section 128 application will be a ***transitioning (new) project*** for the purposes of the Determination. The same applies to recommencing and upgrade projects under the 2015 Determination, which become ***transitioning (recommencing)*** and ***transitioning (upgrade)*** projects respectively after transferring to the Determination. A transitioning project (within the meaning of the 2015 Determination) becomes a ***transitioning (continued)*** project under the Determination when it transfers from the 2015 Determination to the 2021 Determination as varied by the Variation.

Section 8C Requirement for projects involving landfill gas capture for biomethane

The new section 8C specifies that projects involving landfill gas capture for biomethane or emissions destruction activities may involve only one project landfill. This requirement applies to prevent circumstances in which multiple project landfills are part of a project that each are of a different project sub-type.

7 Section 9 (heading)

Item 7 modifies the heading of section 9 to make it consistent with other headings in the Division.

8 Paragraph 9(b)

Item 8 repeals the current paragraph 9(b), which requires that a new project must combust landfill gas collected by the project using a combustion device and instead inserts a requirement that a new project must treat the collected gas either by emissions destruction or landfill gas capture for biomethane.

9 Section 10 (heading)

Item 9 modifies the heading of section 10 to make it consistent with other headings in the Division.

10 Paragraph 10(b)

Item 10 repeals paragraph 10(b), which requires that a recommencing project must combust landfill gas collected by the project using a combustion device and instead inserts a requirement that a recommencing project must treat the collected gas either by emissions destruction or landfill gas capture for biomethane.

11 Section 11 (heading)

Item 11 amends the heading of section 11 to make it consistent with other headings in the Division.

12 Paragraph 11(1)(c)

Item 12 repeals paragraph 11(1)(c), which requires that an upgrade project must combust landfill gas collected by the project using a combustion device and instead inserts a requirement that an upgrade project must treat the collected gas either by emissions destruction or landfill gas capture for biomethane.

13 Section 12 (heading)

Item 13 amends the heading for section 12 to make it consistent with other headings.

14 Paragraph 12(1)(b)

Item 14 repeals the current paragraph 12(1)(b), which requires that a transitioning project must combust landfill gas collected by the project using a combustion device and instead inserts a requirement that a transitioning project must treat the collected gas either by emissions destruction or landfill gas capture for biomethane.

15 After section 12

Item 15 inserts new sections 12A to12E, which set out requirements for the different types of landfill gas (electricity generation) projects and a section 12F, which sets out how to change project types.

Section 12A Requirements for non-biomethane projects

The new section 12A specifies requirements for the ***non-biomethane project*** type. Non-biomethane projects must involve the emissions destruction activity.

The non-biomethane project type covers landfill gas (electricity generation) projects that do not involve landfill gas capture for biomethane or biomethane production. Projects that would

have been covered by the Determination prior to the making of the Variation would be non-biomethane projects.

A non-biomethane project can also undertake landfill gas capture for biomethane or biomethane production activities, recognising that some projects may wish to commence making biomethane. However, until the project type is changed in accordance with section 12F, net abatement amounts calculated for the project will not include abatement associated with landfill gas capture for biomethane or biomethane production activities – see paragraph 17A(a).

Section 12B Requirements for biomethane conversion and displacement projects

The new section 12B specifies requirements for the ***biomethane conversion and displacement project*** type. Biomethane conversion and displacement projects may undertake any of the 3 project activities and earn conversion abatement and displacement abatement associated with those activities. They must also involve the installation of one or more biogas upgrading systems. If a biomethane conversion and displacement project undertakes landfill gas capture for biomethane, it must also involve biomethane production – this is to ensure that all biogas generated by the project under a landfill gas capture for biomethane activity is upgraded into biomethane as part of the project and sent for eventual combustion.

If a biomethane conversion and displacement project stops the biogas generation for biomethane and biomethane production project activities, it continues as a biomethane conversion and displacement project because those activities are not mandated under section 12B. This prevents the project's project type changing if a facility stops producing biomethane for a period of time. However, net abatement will only be calculated for project activities that are undertaken by the project – if a project stops biomethane production, no abatement from biomethane production will be credited.

To avoid doubt, a biomethane conversion and displacement project must not be a restarting biomethane conversion and displacement project.

Section 12C Requirements for biomethane displacement-only projects

The new section 12C specifies requirements for the ***biomethane displacement-only project*** type. Biomethane displacement-only projects must involve biomethane production and the installation of one or more biogas upgrading systems. Landfill gas capture for biomethane and emissions destruction may be undertaken, but they will not be counted towards the project's net abatement – see Item 20, paragraph 17A(c).

To avoid doubt, a biomethane displacement-only project must not be a restarting biomethane displacement-only project.

Section 12D Requirements for restarting biomethane conversion and displacement projects

The new section 12D specifies requirements for the ***restarting biomethane conversion and displacement*** project type. Restarting biomethane conversion and displacement projects must occur at a project landfill that was part of a ***forerunner project*** that must:

- have been registered under the Determination or a legacy determination (as specified in subparagraph 12D(1)(a)(ii)),
- not have involved landfill gas capture for biomethane or biomethane production, and
- have had its last or only crediting period end.

The restarting biomethane conversion and displacement project must also involve the installation of one or more biogas upgrading systems and undertake biomethane production if it undertakes landfill gas capture for biomethane.

Restarting biomethane conversion and displacement projects may undertake all 3 project activities. However, only conversion abatement generated by landfill gas capture for biomethane and displacement abatement generated by biomethane production project activities will contribute towards the project's net abatement – see Item 20, paragraph 17A(d).

The restarting biomethane conversion and displacement project type intends to allow projects that were previously registered under the Determination or a legacy determination whose crediting periods have expired to re-enter the scheme if they are beginning to produce biomethane, as such projects are unable to utilise the transfer provisions in section 128 of the Act.

The new section 16A specifies the crediting period for restarting biomethane conversion and displacement projects. A restarting biomethane conversion and displacement project must have a crediting period greater than zero under section 16A, Item 19.

Section 12E Requirements for restarting biomethane displacement-only projects

The new section 12E specifies requirements for the ***restarting biomethane displacement-only*** project type. Restarting biomethane displacement-only projects must occur at a biomethane facility that was part of a forerunner project. The forerunner project must have:

- been registered under the Determination or applicable earlier version of the Determination,
- involved biomethane production, and
- had its last or only crediting period end.

Restarting biomethane displacement-only projects may undertake all 3 project activities, but only displacement abatement generated by biomethane production project activities will contribute towards the project's net abatement – see Item 20, paragraph 18A(e).

The restarting biomethane displacement-only project type intends to allow projects that have previously undertaken biomethane production but have not received a full 12 years of crediting for displacement abatement to re-enter the scheme and earn ACCUs until the project has received a full 12 years of displacement abatement crediting.

The new section 16D, Item 19 specifies the crediting period for restarting biomethane displacement-only projects. A restarting biomethane displacement-only project must have a crediting period greater than zero under section 16D, Item 19.

Section 12F Changing project type

The new section 12F specifies a landfill gas (electricity generation) project that is one of the types listed in subsection 8B(1) may change to a different project type if it satisfies the requirements for that project type. Project proponents must detail that the project has changed type in the project's next offsets report and provide evidence that the project meets all the requirements of the new project type.

16 Section 13

Item 16 repeals the former section 13 and replaces it with sections 13, 13A and 13B, which set out the information that must be included in section 22 and 128 applications under the Determination.

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

Section 13 Applications for landfill gas (electricity generation) projects

Section 13 specifies details that are required for a section 22 or section 128 application for a project that intends to be declared as a landfill gas (electricity generation) project. Section 13 specifies that the section 22 application (for declaration of an eligible offsets project under the Determination) or the section 128 application (to vary the applicable methodology determination of an eligible offsets project to the Determination) must provide written evidence of the intention of the project proponent to either generate electricity from the capture and combustion of landfill gas or treat landfill gas, with or without biogas produced from other biogas waste, by biogas upgrading at a biomethane facility to produce biomethane which is then sent to an end use where it can reasonably be expected to be combusted within Australia as a natural gas substitute.

Section 13A Applications about non-biomethane projects

The new section 13A specifies details that are required for a section 22 or section 128 application for a project that intends to be declared as a non-biomethane project.

Section 13B Applications about other projects

The new section 13B specifies the information that are required for:

- a section 22 or section 128 application for a project that intends to be declared as a biomethane conversion and displacement project, or a biomethane displacement-only project (paragraph 13B(1)(a)), or
- a section 22 application for a project that intends to be declared as a restarting biomethane conversion and displacement project or a restarting biomethane displacement-only project (paragraph 13B(1)(b)).

Paragraph 13B(2)(c) requires applications relating to biomethane conversion and displacement projects or restarting biomethane conversion and displacement projects to provide a description of the project landfill that will be used in the project. This requirement does not apply to biomethane displacement-only projects and restarting biomethane displacement-only projects because those project types do not involve project landfills.

Subparagraph 13B(2)(d)(v) requires that the intended recipients of biomethane produced by project biomethane facilities be specified. This will allow the Regulator to assess whether the project is likely to comply with paragraph 8A(3)(b).

Paragraph 13B(2)(f) requires that the project proponent provide a declaration that biomethane produced by the project can reasonably be expected to be combusted within Australia. This provides further assurance that the project is likely to comply with paragraph 8A(3)(b).

The note to subsection 13B(2) clarifies that it is possible to add project biomethane facilities after the commencement of the project. Any project facilities added after the commencement of the project must meet the eligibility requirements set out in the varied Part 3 of the Determination and must comply with the provisions in Part 5 of the Determination as varied by the Variation.

Abatement generated from a project facility added after the commencement of the project will only be credited from the date on which the facility was declared as having been added to the project.

17 Section 14

Item 17 repeals the former section 14 which contained the information on transitioning projects to be eligible offsets projects of the same kind. This information has been moved to subsections 8B(3) to (6) of the Determination by Item 6 of this Variation.

18 Section 15

Item 18 repeals the former section 15 and replaces it with sections 15, 15A, 15B and 15C, which specify the additionality requirements, and requirements in lieu of newness requirements, for certain projects.

Section 15 Additionality requirements

Section 15 specifies a requirement in lieu of the regulatory additionality requirement under subparagraph 27(4A)(b)(ii) of the Act and materially serves the same function as subsection 15(2) of the Determination as in force prior to the making of the Variation. For further explanation of the operation of the provision, see the Explanatory Statement that accompanied the Determination that first included the provision.

Section 15A Requirements in lieu of newness requirement—recommencing project

Section 15A specifies a requirement in lieu of the newness requirement under subparagraph 27(4A)(a)(ii) of the Act for recommencing projects and materially serves the

same function as subsection 15(1) of the Determination as in force prior to the making of the Variation. For further explanation of the operation of the provision, see the Explanatory Statement that accompanied the Determination that first included the provision.

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

The new section 15B specifies a requirement in lieu of newness for restarting biomethane conversion and displacement projects under subparagraph 27(4A)(a)(ii) of the Act. This recognises that restarting biomethane conversion and displacement projects occur at facilities that previously carried out an eligible offsets project. However, these projects must still meet the relevant requirements set out in new section 12D.

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

The new section 15C that specifies a requirement in lieu of newness for restarting biomethane displacement-only projects under subparagraph 27(4A)(a)(ii) of the Act. This recognises that restarting displacement-only projects occur at facilities that previously carried out an eligible offsets project. However, these projects must still meet the relevant requirements set out in section 12E.

19 Section 16

Item 19 repeals the current section 16 and substitutes sections 16 to 16B, which for paragraph 69(3)(b) and subparagraph 70(3)(d)(ii) of the Act, set out the crediting period for projects under the Determination, based on the relevant project type.

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

Section 16 specifies the crediting period for all projects other than restarting biomethane conversion and displacement projects or restarting biomethane and displacement-only projects. These projects receive a 12-year crediting period. Any projects operating under the previous versions of this Determination – all of which would be categorised as non-biomethane projects – will receive an identical crediting period under the varied Determination.

Projects that transition to the Determination as biomethane conversion and displacement projects, or that change project type to the biomethane conversion and displacement project type will have their crediting period under section 16 commence from the project's original start date.

The crediting period for transitioning projects does not restart as the result of commencing biomethane activities. This approach reflects the Emissions Reduction Assurance Committee considerations and safeguards the additionality of conversion abatement credited under the Determination recognising that conversion abatement from the destruction or avoidance of

methane emissions is equivalent whether it results from combustion in a flare or from production of biomethane that is ultimately combusted. As such, the 12-year crediting period for transitioning projects commences at the start date of that project.

However, if a biomethane conversion and displacement project reaches the end of its crediting period and has undertaken biomethane production for less than 12 years, the project may be eligible to re-enter the scheme as a restarting biomethane displacement-only project – see section 16B. This recognises that displacement abatement is not currently credited under the ERF and is unlikely to occur in the ordinary course of business.

Section 16A Crediting period for restarting biomethane conversion and displacement project

Section 16A sets out the crediting period for restarting biomethane conversion and displacement projects. The crediting period for a restarting biomethane conversion and displacement project is 12-*x* years, where *x* is the length of the last or only crediting period for the project's forerunner project.

The crediting period for restarting biomethane conversion and displacement projects deducts the crediting period of the forerunner project for the same reasons projects that transition to become biomethane conversion and displacement projects do not receive a restarting crediting period under section 16. It recognises that conversion abatement may be occurring in the ordinary course of business, such as through combustion of methane in the forerunner project and providing a new 12-year crediting period risks crediting conversion abatement that would have otherwise occurred, notwithstanding that the means of methane destruction may have changed from flaring to biogas generation for biomethane and biomethane production.

Section 16B Crediting period for restarting biomethane displacement-only project

Section 16B sets out the crediting period for restarting biomethane displacement-only projects. The crediting period for restarting biomethane displacement-only projects is 12-*x* years, where *x* is the length of time between:

- the start date of the first reporting period in which the project's forerunner project first undertook biogas upgrading to produce biomethane, and
- the end date of the crediting period of the forerunner project.

This allows a project that had received less than 12 years of displacement abatement to re-enter the scheme to access the remainder of that 12 years of displacement abatement crediting period. For example, if a non-biomethane project commenced in January 2024 and transitioned to a biomethane conversion and displacement project in January 2030, the project's crediting period would end in January 2036, 12 years after it originally began (see section 16). At that point, the project would only have been credited for 6 years of displacement abatement, between 2030 and 2036. The project could then re-enter as a

restarting biomethane displacement abatement project with a crediting period of 12 – 6 = 6 years.

This allows projects to be credited for the full 12-year displacement abatement crediting period, consistent with biomethane displacement-only projects, without being disadvantaged by having started biomethane production part-way through an existing ERF project.

20 Part 4

Item 20 repeals the former Part 4 and replaces it with a new Part 4 that specifies the method for working out the net abatement amount for a reporting period for a landfill gas (electricity generation) project that is an eligible offsets project.

Part 4 Net abatement amounts

Division 1 Operation of this part

Section 17 Operation of this Part

Section 17 sets out that this Part operates in accordance with paragraph 106(1)(c) of the Act.

Section 17A What can be included in calculating net abatement

Section 17A specifies that a project may only include abatement associated with particular project activities when working out net abatement for a reporting period. The types of project activity that can contribute to the project's net abatement depends on the project's project type. For example, non-biomethane projects cannot earn ACCUs for undertaking biomethane production unless they change to a project type that includes abatement from biomethane production – for instance, the biomethane conversion and displacement project type.

Paragraph 17A(a) specifies that the net abatement calculations for non-biomethane projects must only include conversion abatement attributable to emissions destruction worked out in accordance with Division 2 of Part 4.

Paragraph 17A(b) specifies that the net abatement calculations for biomethane conversion and displacement projects must include the following:

- Conversion abatement attributable to biogas generation for biomethane, worked out in accordance with Division 2 of Part 4.
- If the project activity undertaken is emissions destruction, conversion abatement attributable to emissions destruction, worked out in accordance with Division 2.
    - Note that conversion abatement from emissions destruction activities undertaken during a calendar month is only to be included in net abatement calculations if the project proponent has not chosen to exclude abatement from emissions destruction for that calendar month under subsection 16A(4).

- If abatement from emissions destruction is excluded for a calendar month, the project's net abatement is to be worked out as if emissions destruction activities have not been undertaken by the project during that period.
- In practice, it is expected that for these periods the project would work out its net abatement as if it were a restarting biomethane conversion and displacement project (see subparagraph 17A(d)), and only include project abatement and emissions associated with the biogas generation for biomethane and biomethane production project activities.

- Displacement abatement attributable to biomethane production, worked out in accordance with Division 3.

Paragraph 17A(c) specifies that the net abatement calculations for biomethane displacement-only projects must only include displacement abatement attributable to biomethane production, worked out in accordance with Division 3.

Paragraph 17A(d) specifies that the net abatement calculations for restarting biomethane conversion and displacement projects must only include conversion abatement attributable to biogas generation for biomethane, worked out in accordance with Division 2, and displacement abatement attributable to biomethane production, worked out in accordance with Division 3. Unlike biomethane conversion and displacement projects, restarting biomethane conversion and displacement projects cannot include conversion abatement associated with emissions avoidance or emissions destruction project activities.

Similar to paragraph 17A(c), paragraph 17A(e) specifies that the net abatement calculations for restarting biomethane displacement-only projects must only include displacement abatement attributable to biomethane production, worked out in accordance with Division 3.

Section 17B Working out net abatement

Section 17B sets out **equation 1**, used to calculate a landfill gas (electricity generation) project's net abatement amount for a reporting period. Total net abatement is the sum of net abatement attributable to conversion activities, worked out using **equation 2** or **equation 2A**, and net abatement attributable to displacement activities, worked out using **equation 24**.

Division 2—Working out conversion abatement

Subdivision 1—Overview

Section 18 Overview of gases accounted for in conversion abatement calculations

Section 18 sets out the greenhouse gas sources that are assessed to determine the net conversion abatement amount.

A number of emissions sources are excluded from the abatement calculations for the following reasons:

- Emissions from generating, collecting, transporting, processing and disposing of the waste that generates landfill gas collected in the project is excluded because these activities are common to both the baseline scenario and project.

- Carbon dioxide emissions emitted from the decay of organic waste in a landfill or the combustion of landfill gas are excluded because these emissions have a biogenic origin (originate from organic material). This means that without the project, this carbon dioxide from organic material would have been released in any case.

- Emissions from using fuel or electricity to operate the landfill gas system, including any processing of the landfill gas, are excluded based on analysis of data from existing landfill gas projects showing that this emission source is immaterial.

- Emissions of nitrous oxide from the combustion process are excluded because it is an immaterial amount. Methane emissions from the combustion device are included through the application of a destruction efficiency factor in the calculation of abatement.

Subdivision 2 Method for calculating net conversion abatement amount

Section 20 Summary

Section 20 provides an overview of how net conversion abatement is worked out. For landfill gas (electricity generation) projects the net conversion abatement amount is project abatement minus baseline abatement. This means that credits are only given for the abatement achieved in the project that goes beyond what would have been achieved in the baseline scenario.

For biomethane conversion and displacement projects or restarting biomethane conversion and displacement projects that only upgrade biogas sourced from the project landfill, an alternative calculation approach is available that works out gross abatement based on the amount of biomethane produced. From this total, any project operating emissions (for example fuel use emissions) are deducted to derive net abatement.

Section 21 Net conversion abatement amount

Section 21 sets out how the net conversion abatement amount is to be worked out. Two methods are provided to work out net conversion abatement amounts.

- Method 1 in subsection 21(2) works out the conversion abatement for each project landfill, based on the amount of methane destroyed or taken to be destroyed by the landfill project (**equation 2**). Method 1 can be used by all landfill gas (electricity generation) projects.

- Method 2 in subsection 21(4) provides an alternative calculation method that works out conversion abatement based on the output of both project landfill and project biomethane facilities (**equation 2A**). Conversion abatement from emissions destruction is worked out as with Method 1. However, in Method 2, conversion

abatement arising from landfill gas capture for biomethane is worked out by determining the quantity of methane sent out by project biomethane facilities. Method 2 is intended to reduce monitoring requirements for projects that produce biomethane, allowing abatement to be worked out directly through measurement of produced biomethane rather than requiring measurement of sent-out biogas on a project landfill basis as in Method 1. To ensure that conversion abatement is only being accredited for destruction of methane that is part of the project, subparagraph 21(1)(a) specifies that Method 2 can only be used by biomethane conversion and displacement projects or restarting biomethane conversion and displacement projects that only upgrade biogas sourced from the project landfill. No biogas from non-project sources is to be imported to the project for biogas upgrading.

Subsections 21(3), 21(5) and 21(6) specify circumstances in which net abatement for a project landfill is zeroed for a reporting period. This occurs if the project landfill sends biogas to a biogas upgrading system but that gas is not upgraded into biomethane that could be reasonably expected to be combusted in Australia as a natural gas substitute. This would be triggered if, for example, landfill gas sent from a project landfill was vented to atmosphere.

Subsection 21(6) analogously zeroes the net abatement for a project biomethane facility under Method 2 if biomethane produced by that facility could not be reasonably expected to be combusted in Australia as a natural gas substitute.

Section 21A Inputs and parameters

Section 21A sets out instructions relevant to the inputs and parameters used in the net conversion abatement calculation and materially serves the same function as section 19 of the Determination as in force prior to the making of the Variation. For further explanation of the operation of this provision, see the Explanatory Statement that accompanied the Determination that first included the provision.

Subdivision 3 Method for calculating project conversion abatement

Section 22 Summary

Section 22 sets out a summary of the method for calculating project conversion abatement.

Section 23 Project conversion abatement

Subsection 23(1) sets out that for projects working out conversion abatement using Method 1 in section 21, the project proponent determines the project conversion abatement amount for each reporting period using **equation 3**, which has 2 elements:

- the amount of methane that is combusted which was not generated by carbon tax waste, during the reporting period ($\boldsymbol{M_{Com,\,NCT}}$)

less

- the portion of this combusted methane that, without the project, would have been oxidised in the near surface conditions of the landfill ($M_{Com, Ox}$).

Subsection 23(2) analogously sets out that for projects working out conversion abatement using Method 2 in section 21, the project proponent determines the project conversion abatement amount for each reporting period using equation 4, which has 2 elements:

- the amount of methane that is combusted through emissions destruction activities which was not generated by carbon tax waste, during the reporting period ($M_{Com, NCT, ED}$)

less

- the portion of this combusted methane that, without the project, would have been oxidised in the near surface conditions of the landfill ($M_{Com, Ox}$).

The method only credits the destruction of emissions from legacy waste (accepted at the landfill before the start of the carbon tax) and non-legacy waste (accepted at the landfill after the end of the carbon tax). Waste deposited between these periods generates landfill gas that is not eligible for emissions reduction credits. This is referred to as ***carbon tax waste***.

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

Subsection 24(1) sets out, for projects working out conversion abatement using Method 1 in section 21, how to determine the amount of methane that is combusted, or taken to be combusted, which was not generated by ***carbon tax waste***. This means the methane combusted that was generated either by legacy waste (deposited at the landfill before the start of the carbon tax) or non-legacy waste (deposited at the landfill after the end of the carbon tax).

This calculation is worked out using **equation 5**, which has 3 elements:

- the default conversion factor used to express the result of this calculation in carbon dioxide equivalent (Y)

multiplied by

- the total volume of methane combusted or taken to be combusted (irrespective of whether it was generated by legacy waste, non-legacy waste or carbon tax waste)

(M_{Com}) – when worked out under section 26 for the purposes of **equation 5**, M_{Com} accounts for both methane combusted by combustion devices and methane taken to be combusted by biogas upgrading systems.)

multiplied by

- the proportion of the methane combusted or taken to be combusted that was not generated by carbon tax waste (W_{NCT}).

Similarly, subsection 24(2) sets out, for projects working out conversion abatement using Method 2 in section 21, how to determine the amount of methane that is combusted through emissions destruction activities which was not generated by ***carbon tax waste***. This means the methane combusted that was generated either by legacy waste (deposited at the landfill before the start of the carbon tax) or non-legacy waste (deposited at the landfill after the end of the carbon tax).

This calculation is worked out using **equation 6**, which has 3 elements:

- the default conversion factor used to express the result of this calculation in carbon dioxide equivalent (y)

multiplied by

- the total volume of methane combusted through emissions destruction activities (irrespective of whether it was generated by legacy waste, non-legacy waste or carbon tax waste) (M_{Com}) – when worked out under section 26 for the purposes of equation 6, M_{Com} only accounts for methane combusted by combustion devices

multiplied by

- the proportion of the methane combusted through emissions destruction activities that was not generated by carbon tax waste (W_{NCT}).

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

Section 25 sets out the calculation for the proportion of methane combusted or taken to be combusted that was not generated by carbon tax waste (W_{NCT}) and materially serves the same function as section 25 of the Determination as in force prior to the making of the Variation.

For further explanation of the operation of the provision, see the Explanatory Statement that accompanied the Determination that first included the provision

Section 26 Methane combusted or taken to be combusted

Subsection 26(1) sets out **equation 8** that calculates the volume of methane combusted or taken to be combusted in the project $\boldsymbol{M_{Com}}$ as the sum of methane combusted by each combustion device *h*, or taken to be combusted by each biogas upgrading system of a project biomethane facility *h*, in cubic metres, ($\boldsymbol{M_{Com,\,h}}$).

Subsection 26(1A) specifies that if $\boldsymbol{M_{Com}}$ is being worked out for the purposes of calculating the methane combusted through emissions destruction activities for the project landfill during a reporting period that was not generated from carbon tax waste, $\boldsymbol{M_{Com,\,NCT,\,ED}}$, *h* means a combustion device. Subsection 26(1A) applies when the project's conversion net abatement is being worked out using Method 2 under section 21. Restricting $\boldsymbol{M_{Com}}$ to combustion devices avoids double counting of conversion abatement arising from landfill gas sent to biogas upgrading systems, as under Method 2 conversion abatement from landfill gas sent to biogas upgrading systems is accounted for in **equation 2A** (section 21).

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

- **equation 9** where ***h*** is a biogas upgrading system or a combustion device that is a boiler, a flare with monitoring and control system, or an internal combustion engine system; and
- **equation 9A** where ***h*** is a combustion device that is not a boiler, a flare with monitoring and control system or an internal combustion engine.

Subsection 26(2) sets out equation 9 that determines the amount of methane combusted by a combustion device *h* or taken to be combusted by biogas upgrading system *h* using the following parameters:

- The amount of methane sent to the combustion device or biogas upgrading system ($\boldsymbol{M_{Sent,\,h}}$), worked out using equation 10, 11 or 12.
- The biomethane production loss factor, $\boldsymbol{PL_h}$, identifies the percentage of gas lost during the biogas upgrading process, worked out in accordance with section 28B. The factor $\boldsymbol{1\text{-}PL_h}$ gives the percentage of gas that is not lost during the biogas upgrading process. The biomethane production loss factor is only relevant for biogas sent to a biogas upgrading system.
- The transport loss factor, $\boldsymbol{TL_h}$, identifies the percentage of gas lost during transport, prior to combustion. For landfill gas sent to a combustion device, or landfill gas upgraded into biomethane where the biomethane is used on-site, this factor is assumed to be zero – transport losses are taken to be negligible. For landfill gas upgraded into

biomethane that is combusted off-site, it is conservatively estimated that some gas will be lost during the transport process. A conservative factor of 2% is applied in this circumstance, based on an average of the unaccounted for gas fractions for states and territories in the National Greenhouse Account (NGA) Factors 2021. This value takes a weighted average of the state and territory factors weighted by the proportion each jurisdiction represents of Australia's total gas consumption (based on the Australian Energy Statistics 2020), and accounts for the NGA Factors attributing 55% of unaccounted for gas to leakage. The factor $\boldsymbol{1\text{-}TL_h}$ gives the percentage of gas that is not lost during transport.

- A default destruction efficiency factor (***DE***), which is 1 for internal combustion engines and 0.98 for other combustion devices.

Subsection 26(3) sets out **equation 9A** that determines the amount of methane combusted ($\boldsymbol{M_{Com,\,h}}$) for combustion devices that are not boilers or flares with monitoring and control systems, internal combustion engines.

Equation 9A uses the amount of methane sent to the combustion device ***h*** in hour ***a*** ($\boldsymbol{M_{Sent,\,h,\,a}}$) and a default destruction efficiency factor (***DE***) as explained above but includes a third term that is the operation of the combustion device h in each hour ***a*** of the reporting period ($\boldsymbol{O_{h,\,a}}$). Inclusion of $\boldsymbol{O_{h,\,a}}$ ensures that the amount of methane sent to the combustion device when the combustion process is not occurring in a satisfactory manner (and therefore may not be properly combusting the methane) is excluded from the calculation of net abatement. If the combustion process of the device is occurring satisfactorily in an hour (for instance determined by a temperature reading above 500 degrees Celsius), then the value is one and otherwise it is taken to be zero. This approach is consistent with the legacy Determinations.

For both equations 9 and 9A, any landfill gas that is sent to a combustion device when it is not being operated in accordance with the manufacturer's instructions must be excluded, in line with the project requirements in Part 3 of the Determination.

Section 27 Methane sent to combustion device or biogas upgrading system

Subsection 27(1) outlines 3 options in **equations 10, 11** or **12** to calculate the methane sent to a combustion device ***h*** or biogas upgrading system ***h*** ($\boldsymbol{M_{sent,\,h}}$). The reference in this subsection that this amount is determined for a *particular period* indicates that, depending on the output required, the calculation is carried out for different periods. These time bases are the default reporting period (calculating $\boldsymbol{M_{Sent,\,h}}$), the hour a in the reporting period (calculating $\boldsymbol{M_{Sent,\,h,\,a}}$) or the year *y* (calculating $\boldsymbol{M_{Sent,\,h,\,y}}$).

Each of the 3 options requires a different monitored parameter, either the volume of landfill gas sent to the combustion device or biogas upgrading system together with the proportion of landfill gas that is methane (applying either a monitored or default value) in equation 10, the energy content of the landfill gas sent to the combustion device in equation 11 or the electricity produced by the combustion device (this option is only applicable to internal combustion engines) in equation 12.

Subsection 27(2) (option 1) provides equation 10, which is the option of using measurement of the volume of landfill gas sent to the combustion device. The equation has 2 terms:

- the volume of landfill gas sent to combustion devices or biogas upgrading systems ($\boldsymbol{Q_{LFG,\,h}}$), which is a monitored parameter

multiplied by

- the fraction of the volume of landfill gas sent to combustion devices or biogas upgrading systems that is methane ($\boldsymbol{W_{LFG,\,CH4}}$), which is either a monitored parameter or a default value.

If the project proponent elects to use a default value for $\boldsymbol{W_{LFG,\,CH4}}$, the default value is 0.42. However, if the project's original application under section 22 of the Act for declaration as an eligible offsets project was made before 1 September 2020, the project proponent has an additional option to elect for $\boldsymbol{W_{LFG,\,CH4}}$ to be the default methane proportion value set out in section 5.14C of the NGER (Measurement) Determination. Use of this factor is consistent with earlier landfill gas methodology determinations. The date of 1 September 2020 reflects the first public consultation by the Department of Industry, Science, Energy and Resources about changing the default methane proportion value available to landfill gas projects from the value set out in section 5.14C of the NGER (Measurement) Determination to 0.42. The use of the NGER (Measurement) Determination factor is grandfathered for landfill gas (electricity generation) projects that applied for declaration under the 2015 Determination prior to this date to support consistency in project calculations and provide business certainty to older projects.

Subsection 27(2A) specifies that if h is a biogas upgrading system, $\boldsymbol{W_{LFG,\,CH4,\,h}}$ must be worked out in accordance with the monitoring requirements.

Subsection 27(3) directs that if a project proponent chooses to monitor the fraction of the volume of landfill gas sent to combustion devices that is methane ($\boldsymbol{W_{LFG,\,CH4}}$), either under the Determination or if the project proponent elected to monitor $\boldsymbol{W_{LFG,\,CH4}}$ when the project was an eligible offsets project under the 2015 Determination, then they must do so for the entire crediting period. If a project uses the default value for $\boldsymbol{W_{LFG,\,CH4}}$, the project may change to monitoring, however it cannot change back to using a default value. The reference in this subsection to 'at any time during which the Determination is, or the 2015 Determination was, the applicable methodology determination' means a ***transitioning project*** that has transferred directly from the legacy determinations to the Determination can decide at the time the Determination becomes their applicable methodology to either monitor or use the default, disregarding whether they had elected to monitor under the legacy determinations.

Subsection 27(4) notes that subsection 27(3) has effect subject to the monitoring requirements in section 36 (Item 21).

Subsection 27(5) (option 2) provides equation 11, which is the option using measurement of the energy content of landfill gas sent to the combustion device. The equation has 2 terms:

- the energy content of landfill gas sent to combustion devices ($\boldsymbol{Q_{En,\,h}}$), which is a monitored parameter

divided by

- the energy content factor for landfill gas ($\boldsymbol{EC_{LFG}}$), which is sourced from the NGER (Measurement) Determination.

Subsection 27(6) (option 3) provides equation 12, which is the option that uses measurement of the electricity generated from combusting landfill gas in an internal combustion engine. The equation has 4 terms:

- the electricity generated from combusting landfill gas in an internal combustion engine h ($\boldsymbol{Q_{EG,\,h}}$), which is a monitored parameter

multiplied by

- the factor that converts megawatt hours to gigajoules, which is 3.6

divided by

- the factor for electrical efficiency of the internal combustion engine, which is the factor specific to the internal combustion device *h* and landfill gas fuel, which is the amount of electricity produced from an amount of landfill gas, expressed as a percentage. If this factor is not stated in the manufacturer's specifications for the internal combustion engine then an amount of 36% is used

divided by

- the energy content factor for landfill gas ($\boldsymbol{EC_{LFG}}$), which is sourced from the NGER (Measurement) Determination.

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

Section 28 sets out **equation 13**, which is used to calculate the amount of methane combusted or taken to be combusted in the project that was not generated by carbon tax waste that would have been oxidised in the near surface conditions of the landfill ($\boldsymbol{M_{Com,\,Ox}}$) and materially serves the same function as section 28 of the Determination as in force prior to the making of the Variation. For further explanation of the operation of the provision, see the Explanatory Statement that accompanied the Determination that first included the provision.

Section 28A Methane destroyed in biomethane produced by project biomethane facilities

Section 28A sets out in **equation 14** how the volume of methane sent out from a project biomethane facility, $\boldsymbol{BC_f}$, is worked out. Biomethane produced by a project must be reasonably expected to be combusted within Australia as a natural gas substitute. As such,

BC_f represents the volume of methane taken to be destroyed from biogas generation for biomethane activities.

Equation 14 multiplies the total volume of biomethane sent out by a biogas upgrading system that is part of a project biomethane facility ($Q_{BM,k}$), determined in accordance with section 32L, by the proportion of that biomethane that is methane ($W_{BM,CH4,k}$), worked out in accordance with the monitoring requirements. This is summed over all biogas upgrading systems at the project biomethane facility, resulting in the total volume of methane sent out by that facility during the reporting period.

In **equation 14**, the total volume of methane sent out is multiplied by one minus the transport loss factor ($1-TL_{BM,f}$) and destruction efficiency factor (DE_{BM}), which respectively serve the same function as TL and DE in section 26 in accounting for methane that is not ultimately combusted due to loss.

Section 28B Biomethane production loss factor

Subsection 28B(1) sets out that the biomethane production loss factor for a combustion device is zero. This eliminates the biomethane production loss factor when calculating abatement for emissions destruction under section 26. For biogas upgrading systems, the biomethane production loss factor is worked out in accordance with subsection 28B(2).

Subsection 28B(2) specifies that the biomethane production loss factor must be determined or measured, as a fraction, in accordance with the manufacturer of the biogas upgrading system's specifications. Determination of this factor may be used where the manufacturer sets out values representing the proportion of gas lost during the upgrade process when using a particular device. Measurement of this factor must take place in accordance with the technical manual for the system.

Subsection 28B(3) specifies that, for paragraph 28B(2)(a), if the manufacturer's listed specifications for the biomethane production loss factor include a range of values, the highest of those values is to be selected. This ensures estimates and factors are conservative, consistent with the offsets integrity standards.

Subdivision 4 Method for calculating baseline conversion abatement

Section 29 Summary

Section 29 sets out that baseline conversion abatement is calculated as the amount of methane combusted or taken to be combusted by the project that was not generated by carbon tax waste multiplied by the proportion representing the amount of methane combusted or taken to be combusted during the project that would have been combusted without the project.

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

Section 30 Baseline conversion abatement

Section 30 sets out **equation 15**, which is used to calculate baseline conversion abatement and materially serves the same function as section 30 of the Determination as in force prior to the making of the Variation. For further explanation of the operation of the provision, see the Explanatory Statement that accompanied the Determination that first included the provision.

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

Section 31 sets out 3 approaches for determining the proportion of methane that would have been combusted without the project. The approach used depends on whether it is a ***new, recommencing, upgrade, transitioning, transitioning (continued), transitioning (new)*** or ***transitioning (recommencing) project***, or a ***transitioning (upgrade) project***.

Subsection 31(1) sets out how to determine the baseline proportion for ***new, recommencing, transitioning (new)*** or ***transitioning (recommencing) projects***. As set out by **equation 16**, the project proponent uses whichever of the following proportions is highest:

- the regulatory proportion of the methane combusted or taken to be combusted during the reporting period that would have been combusted without the project, which is derived using Schedule 1 based on quantitative regulatory requirements ($W_{B, Reg}$)
- the default proportion of the methane combusted or taken to be combusted during the reporting period that would have been combusted without the project ($W_{B, Def}$).

The default value represents the proportion that meets qualitative regulatory requirements and is either 30% or 0%. There are no conditions for applying the 30% default; however, the 0% default can only be applied if the project proponent is able to demonstrate that no qualitative requirements apply to the landfill.

Project proponents applying the 0% default are required to demonstrate that the landfill is not subject to qualitative requirements, including through:

- state or territory legislation
- regulatory guidelines for landfill, which means the guidelines that establish policy and regulatory requirements for sustainable waste management and landfill performance and are applied by environment agencies and environmental protection agencies in Australian jurisdictions. Topics in these guidelines usually cover siting, design, management or operation of landfills.
- landfill licences, operating requirements or development approvals, which may include a qualitative requirement to capture, collect, control, manage or limit landfill gas, methane, odour or greenhouse gases.

Qualitative requirements may be expressed in a variety of ways and do not need to include specific instructions or directions. Examples of qualitative requirements are:

- install a landfill gas collection system

- develop a plan to install a landfill gas collection system
- install a landfill gas collection system to keep within allowable methane concentrations
- control or reduce methane concentrations
- control, manage or limit odour
- capture landfill gas where practicable
- reduce emissions of greenhouse gases
- limit, minimise or control greenhouse gases.

Subsection 31(2) sets out the formula for how to determine the baseline proportion for ***upgrade or transitioning (upgrade) projects***. **Equation 17** sets out that the baseline proportion is the higher of:

- the regulatory proportion of the methane combusted or taken to be combusted during the reporting period that would have been combusted without the project, which is derived using Schedule 1 based on quantitative regulatory requirements ($W_{B,\,Reg}$)
- the default proportion of the methane combusted or taken to be combusted during the reporting period that would have been combusted without the project ($W_{B,\,Def}$), which is defined in subsection 28(1)
- the proportion representing the improvement to the collection efficiency achieved by the upgrade ($W_{B,\,Ex}$).

The first 2 terms ($W_{B,\,Def}$ and $W_{B,\,Reg}$) are also used to determine the baseline proportion for new, recommencing, transitioning (new) and transitioning (recommencing) projects, and the third is specific for upgrade and transitioning (upgrade) projects. The approach is a conservative and verifiable approach, consistent with the offsets integrity standards.

Subsections 31(3) and 31(4) set out that ***transitioning projects*** or ***transitioning (continued) projects*** retain their existing baseline proportion which was determined under the legacy Determinations. **Equation 18** sets the baseline proportion to be R_P, which is applicable to transitioning projects covered by the legacy Determination, and **equation 19** sets the baseline proportion to be B_P, which is applicable to transitioning projects covered by the legacy upgrade Determination. The new paragraphs 31(3)(c) and 31(4)(c) specify that these provisions to work out the baseline proportion also apply to ***restarting biomethane conversion and displacement projects*** whose forerunner project was registered under the legacy determination or legacy upgrade determination respectively.

Subsection 31(5) sets out that the baseline proportion is determined once only. The value determined and used in the first offsets report is used throughout the crediting period.

Section 32 Proportion of methane that would have been combusted without upgrade

Section 32 applies only to ***upgrade projects*** and ***transitioning (upgrade) projects*** and materially serves the same function as section 32 of the Determination as in force prior to the making of the Variation. For further explanation of the operation of the provision, see the Explanatory Statement that accompanied the Determination that first included the provision.

Subdivision 5—Project emissions from landfill gas capture for biomethane

Section 32A Summary

Section 32A provides an overview of how project emissions for conversion abatement from landfill gas capture for biomethane activities are worked out in this Subdivision. Project emissions are the emissions that are attributable to the use of equipment for landfill gas capture for biomethane activities. These include emissions from fuel and electricity used to conduct the project. The total project emissions are subtracted from a project's gross abatement for a reporting period.

Section 32B Project emissions from landfill gas capture for biomethane

Subsection 32B(1) sets out in **equation 23A** how project emissions from landfill gas capture for biomethane activities are worked out for a project landfill. They are the sum of emissions from fuel that is specifically attributable to the operation of the project landfill for the treatment of landfill gas by landfill gas capture for biomethane, during the reporting period (including transport) ($E_{F, LFG-BM}$) and emissions from purchased electricity that is specifically attributable to the operation of the project landfill for the treatment of landfill gas by landfill gas capture for biomethane, the during the reporting period ($E_{PE, LFG-BM}$).

Subsection 32B(2) specifies that when determining $E_{F, LFG-BM}$ and $E_{PE, LFG-BM}$, emissions associated with the biomethane production project activity, as worked out under **equation 29** in Division 3 of this Part, should be disregarded. This includes emissions from fuel and electricity used to operate biogas upgrading systems, and any emissions associated with the transport of biomethane.

A note specifies that this provision exists to ensure double counting of project emissions does not occur. Project emissions for the biomethane production project activity are accounted for under net displacement abatement calculations and worked out under Division 3 of this Part. Specifying that project emissions associated with biomethane production are not to be accounted for under conversion abatement project emissions ensures that the same emissions are not being accounted for twice.

Note that project emissions associated with biomethane production will always be accounted for in a project's net emissions. This is because a project that undertakes landfill gas capture for biomethane must also undertake biomethane production – see paragraphs 12B(b) and 12D(c) (Item 15) that specify requirements for biomethane conversion and displacement projects and restarting biomethane conversion and displacement projects respectively.

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

Subsection 32C(1) sets out in **equation 23B** the calculation for estimating emissions from fuel used that is specifically attributable to the operation of the project landfill for the treatment of landfill gas by landfill gas capture for biomethane activities during the reporting period. Methane, nitrous oxide and carbon dioxide emissions from fuel use are calculated from the quantity of each fuel type used, $\boldsymbol{Q_{F,\,LFG\text{-}BM,\,i}}$, the energy content factor for each fuel type, $\boldsymbol{EC_i}$, and the emissions factor for each greenhouse gas type, $\boldsymbol{EF_{ij}}$. Emissions from each fuel type and greenhouse gas are summed to estimate the total emissions from fuel used to undertake the project activity.

Estimates of the amount of fuel used must be determined in accordance with the monitoring requirements.

Subsection 32C(2) provides that if fuel is used by the project landfill in performing a function that was also performed before the implementation of the project, the fuel use that is attributable to the operation of the project landfill is only to the extent that the project has caused an increase in fuel use.

Section 32D Emissions from purchased electricity use: conversion abatement

Subsection 32D(1) sets out in **equation 23C** the calculation for estimating the emissions from purchased electricity that is used to undertake the project activity. **Equation 23C** multiplies the amount of purchased electricity that is specifically attributable to the operation of the project landfill during the reporting period, $\boldsymbol{Q_{PE,\,LFG\text{-}BM}}$, with $\boldsymbol{E_{PE,\,LFG\text{-}BM}}$, the emissions factor for electricity obtained from the electricity grid.

The electricity grid from which electricity is sourced may or may not be an electricity grid that is a grid in relation to the NGA Factors document. Paragraph 32D(1)(a) states that whenever possible, the project proponent must apply the relevant emissions factor from the NGA Factors document that is in force at the end of the reporting period in accordance with section 6.

Paragraph 32D(1)(b) provides for a situation when the electricity used to undertake the project activity is not sourced from a grid in relation to which the NGA Factors document applies. In this circumstance the project proponent must apply a factor that reflects the emissions intensity of the electricity (subparagraph 32D(1)(b)(i)). For example, this could be a factor provided by the supplier of the electricity. Subparagraph 32D(1)(b)(ii) provides that if this factor is not known, then the factor for off-grid electricity that is provided in the NGA Factor document must be used.

Subsection 32D(2) specifies how the emissions factor must be calculated if subparagraph 32D(1)(b)(i) applies. In these circumstances, the emissions factor must be worked out using the amount of electricity sent out and be determined using a measurement or estimation approach that is consistent with the NGER (Measurement) Determination.

Division 3—Working out displacement abatement

Subdivision 1—Overview of gases

Section 32E Overview of gases accounted for in displacement abatement calculations

Section 32E describes the emissions sources that need to be accounted for to determine the total net abatement amount resulting from project activities that generate displacement abatement.

Subdivision 2—Method for calculating net displacement abatement amount

Section 32F Summary

Section 32F provides an overview of how net displacement abatement is worked out.

Displacement abatement amounts are worked out for each project biomethane facility, based on the quantity of biomethane produced under the assumption biomethane displaces natural gas on a one-to-one basis, and summed to determine gross displacement abatement. The gross abatement is then multiplied by the proportion of biogas that is ineligible biogas. This ensures that biomethane created from ineligible waste sources do not contribute towards the project's net displacement abatement.

From this adjusted total, project operating emissions are deducted to derive net abatement.

Section 32G Net displacement abatement amount

Subsection 32G(1) sets out in **equation 24** how the net displacement abatement amount attributable to biomethane production ($A_{displacement}$) is to be worked out, based on the sum of the net abatement amounts for project biomethane facilities ($A_{displacement, h}$) that are part of the project.

Subsection 32G(2) specifies that if during the reporting period, biomethane produced by a project biomethane facility cannot be reasonably expected to be combusted within Australia as a natural gas substitute, the net abatement amount for that project biomethane facility is taken to be zero for that reporting period.

Section 32H Project biomethane facility net abatement amount

Section 32H sets out in **equation 25** the calculation for determining the net abatement amount, $A_{displacement, f}$ in tonnes CO_2-e for each project biomethane facility, being the gross displacement abatement for that facility, $GA_{displacement, f}$, multiplied by the eligible abatement fraction for that facility (EA_h), from which the project emissions for the facility, $PE_{displacement, f}$, are subtracted.

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

Subsection 32I(1) specifies that for the purposes of working out $A_{displacement}$, under **equation 24**, the project cannot include abatement from a project biomethane facility that undertakes biomethane production and sends some or all of the biomethane produced to be

used as an energy source in a fuel switching emissions reduction activity at an emissions avoidance offsets project within the meaning of the Act.

Subsection 32I(2) specifies that a fuel switching emissions reduction activity means the changing of energy sources in a way that results in eligible carbon abatement. The paragraphs 32I(2)(a) to 32I(2)(d) set out a non-exhaustive list of activities under methods that would constitute a fuel switching emissions reduction activity. Activities that involve changing the energy sources in a way that results in eligible carbon abatement that are not specified in paragraphs 32I(2)(a) to 32I(2)(d) may still constitute a fuel switching emissions reductions activity within the meaning of the Determination.

Displacement abatement credited under the Determination credits the avoidance of emissions associated with natural gas combustion emissions that are displaced by biomethane produced by the project.

There is the potential for this biomethane to be used under another ERF project for the purposes set out in subsection 32I(2), and for that second project to also receive ACCUs for replacing a high-emissions fuel source for the same biomethane credited under the Determination. This situation would result in a single unit of biomethane earning ACCUs for displacing natural gas or other fuels twice – once under the Determination as displacement abatement, and once under the fuel switching project. To prevent this 'double credit' from occurring, section 32I prevents a project biomethane facility's displacement abatement from contributing to a project's net abatement if some or all of the biomethane it produces is used for a fuel switching purpose in another ERF project.

Subdivision 3—Gross abatement amount

Section 32J Summary

Section 32J provides an overview of how net displacement abatement is worked out for a project biomethane facility for a reporting period, being the emissions avoided from the carrying out of biomethane production.

Section 32K Gross abatement amount for a project biomethane facility

Section 32K sets out in **equation 26** the gross abatement amount for a project biomethane facility. It is the total quantity of biomethane sent out by biogas upgrading systems that are part of the project biomethane facility ($\boldsymbol{Q_{BM,\,k}}$) multiplied by both the energy content factor for pipeline natural gas ($\boldsymbol{EC_{NG}}$) and the carbon dioxide combustion emissions factor for pipeline natural gas ($\boldsymbol{EF_{NG,\,CO2}}$). Both factors are based on values in the NGER (Measurement) Determination.

Equation 26 operates by assuming a one-to-one displacement of natural gas based on the volume of biomethane produced. The emissions avoided will be the emissions associated with that quantity of natural gas being combusted – these emissions are worked out by multiplying the gas volume $\boldsymbol{Q_{BM,\,k}}$ by the natural gas energy content and emissions factors, as if that volume of gas were pipeline natural gas.

A note to the section clarifies that methane and nitrous oxide emissions are constant regardless of whether biomethane or natural gas is combusted. Combustion of gas will result in small amounts of methane and nitrous oxide greenhouse gas emissions due to incomplete combustion. These emissions occur for both natural gas and biomethane, and hence biomethane production and use does not displace these emissions – they will occur anyway. As such, only the natural gas emissions factor for carbon dioxide ($\boldsymbol{EF_{NG,\,CO2}}$) is used when working out displacement abatement.

Subdivision 4—Eligible abatement fraction

Section 32L Summary

Section 32L provides an overview of how the eligible abatement fraction is worked out for a project biomethane facility for a reporting period. The eligible abatement fraction is the proportion of gross displacement abatement associated with biomethane produced from eligible biogas, on a project biomethane facility basis, during a reporting period. It prevents the crediting of displacement abatement for biomethane produced from ineligible biogas. If 30 per cent of a project biomethane facility's biogas comes from ineligible sources, the eligible abatement fraction for that project biomethane facility will be 70 per cent.

The eligible abatement fraction is worked out as the total quantity of eligible biogas that a project biomethane facility upgrades during a reporting period divided by the total quantity of biogas upgraded by that facility during that reporting period. The quantity of eligible biogas sent from a biogas source facility is worked out either by, if possible, direct measurement of the quantity of eligible biogas sent by that facility for upgrading, and otherwise through estimation based on the method provided in the Subdivision.

Section 32M Eligible abatement fraction for a project biomethane facility

Section 32M sets out in **equation 27** the eligible abatement fraction for a project biomethane facility. It is given by the total volume of eligible biogas sent to the project biomethane facility by biogas source facilities, divided by the total volume of biogas sent to the project biomethane facility by biogas source facilities.

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

Paragraph 32N(1)(a) specifies that the volume of eligible biogas sent to a project biomethane facility from a biogas source facility during a reporting period ($\boldsymbol{Q_{BG,\,El,\,g}}$) is to be worked out by, if possible, measurement of $\boldsymbol{Q_{BG,\,El,\,g}}$ in accordance with the monitoring requirements. If it is not possible to measure $\boldsymbol{Q_{BG,\,El,\,g}}$ in this way, paragraph 32N(1)(b) specifies that $\boldsymbol{Q_{BG,\,El,\,g}}$ is to be worked out in accordance with subsection 32N(2) instead.

A note to this subsection clarifies that measurement of $\boldsymbol{Q_{BG,\,El,\,g}}$ is possible if either all biogas from a biogas source facility is eligible, or if the eligible biogas from that facility is physically separated in a way that permits direct measurement of the volume of eligible biogas. For example, if a wastewater facility that supplies biogas to a project biomethane facility has two anaerobic digesters – one that treats only eligible biogas waste and the other that treats

ineligible biogas waste – it would be possible to measure the volume of eligible biogas by measuring biogas sent from the anaerobic digester that treats the eligible biogas waste. It would not be possible to measure $Q_{BG,\,El,\,g}$ if the biogas from a biogas source facility was a mix of eligible and ineligible biogas. In the wastewater facility example, this might arise if the facility only had a single anaerobic digester that treated both eligible and ineligible biogas waste. If this mix occurs, $Q_{BG,\,El,\,g}$ must be worked out in accordance with subsection 32N(2) instead.

Subsection 32N(2) sets out in **equation 28** how $Q_{BG,\,El,\,g}$ is to be worked out in accordance with paragraph (1)(b). $Q_{BG,\,El,\,g}$ is given by the proportion of biogas sent by the biogas source facility during a reporting period that is eligible biogas (EB_g) multiplied by the volume of biogas sent by the biogas source facility during the reporting period ($Q_{BG,\,g}$)

Subsection 32N(3) specifies how EB_g is to be worked out for a biogas source facility during a reporting period. Paragraph 32N(3)(a) specifies that EB_g must be determined using one of the following methods:

- the proportion of eligible biogas waste to biogas waste treated to produce biogas at the biogas source facility, by methane-producing capacity of the biogas wastes treated; or
- the proportion of eligible biogas waste to biogas waste treated to produce biogas at the biogas source facility, by mass of the biogas wastes treated, or
- another approach that can reasonably be expected to provide a fraction that accurately reflects the proportion of eligible biogas produced by the biogas source facility.

Paragraph 32N(3)(b) specifies that the approach used must reasonably be expected to provide an accurate and conservative value for EB_g. A conservative value for EB_g must not overestimate the proportion of eligible biogas produced by the biogas source facility.

Paragraph 32N(3)(c) specifies that the approach used to work out EB_g must be based on data and calculations that are auditable and verifiable. This supports the offsets report requirements set out in section 33B see Item 21, which require a clear explanation of how EB_g was determined, supported by data and a signed declaration from the person that estimated EB_g that the value derived is accurate and conservative.

The effect of subsection 32N(3) is that if it is not possible to physically measure the volume of eligible biogas produced by a biogas source facility during a reporting period, it may be estimated using a reasonable approach based on a metric relating to the quantities of eligible and ineligible biogas waste treated. The project proponent must have access to data that would allow formulation of such an estimate and will need to clearly report how this value has been derived. If a project biomethane facility receives biogas from a range of sources, the project proponent will need to be able to determine the eligibility of biogas for each of those biogas source facilities and must provide this information in offsets reports for the project.

Subsection 32N(4) specifies that if it is not possible to work out the volume of eligible biogas sent by a biogas source facility ($Q_{BG,\,El,\,g}$) in accordance with subsection 32N(1), $Q_{BG,\,El,\,g}$ is

taken to be zero for the reporting period. This may occur if direct measurement fails and no data is available to provide an estimate in accordance with subsection (2), or if the approach to work out $Q_{BG, El, g}$ under subsection 32N(2) uses an estimate for EB_g that cannot be reasonably expected to be accurate and conservative.

Subdivision 5—Displacement abatement project emissions

Section 32O Summary

Section 32O provides an overview of how project emissions for displacement abatement are worked out in this Subdivision. Project emissions are worked out for each project biomethane facility that undertakes biomethane production during the reporting period.

Section 32P Project emissions: displacement abatement

Subsection 32P(1) sets out in **equation 29** how project emissions are worked out for a project biomethane facility. They are the sum of emissions from fuel ($E_{F, displacement, f}$) and emissions from purchased electricity ($E_{PE, displacement, f}$) attributable to the operation of the project biomethane facility and transport of biomethane produced by that facility during the reporting period.

Subsection 32P(2) specifies that in working out $E_{F, displacement, f}$ and $E_{PE, displacement, f}$, fuel and purchased electricity used in landfill gas capture for biomethane and emissions destruction activities are to be disregarded, as these emissions are accounted for in a project's net abatement under Division 2 of this Part and including them here would result in a double count. Examples of emissions to be disregarded may include fuel and electricity used in the collection of landfill gas or transport of landfill gas to a biogas upgrading system This provision may be relevant if a facility is both a project landfill undertaking landfill gas capture for biomethane or emissions destruction, and also a project biomethane facility undertaking biomethane production. In such a case, fuel and electricity consumption would need to be apportioned based on the project activity that uses that fuel or electricity. Displacement abatement project emissions are anticipated to primarily stem from fuel and electricity used in biogas upgrading systems and any transport of that biomethane to an end-user.

Section 32Q Emissions from fuel use: displacement abatement

Subsection 32Q(1) sets out in **equation 30** the calculation for estimating emissions from fuel used at a project biomethane facility or from transport of biomethane produced at that facility to an end user. Methane, nitrous oxide and carbon dioxide emissions from fuel use are calculated from the quantity of each fuel type used, $Q_{F, displacement, f, i}$, the energy content factor for each fuel type, EC_i, and the emissions factor for each greenhouse gas type, EF_{ij}. Emissions from each fuel type and greenhouse gas are summed to estimate the total emissions from fuel used to undertake the project activity. This equation converts the emissions from each fuel type to a common measure of energy, the gigajoule.

Estimates of the amount of fuel used must be determined in accordance with the monitoring requirements.

Subsection 32Q(2) provides that if fuel is used by either the project biomethane facility or equipment used to transport biomethane from that facility, and that fuel is used for a function that was also performed before the implementation of the project, the fuel use attributable to $Q_{F, displacement, f, i}$ is only to the extent the project has caused an increase in fuel use. For emissions associated with transport of biomethane, this means that fuel consumption emissions associated with transporting the biomethane in a pipeline that existed prior to the project – for example, gas compression equipment – does not need to be accounted for.

However, if equipment is built to process and transport biomethane produced as the result of the project, fuel consumed by that equipment must be included in working out $Q_{F, displacement, f, i}$. If road transport of biomethane is employed, fuel consumed by trucks or other vehicles would need to be accounted for in this section unless the project proponent can demonstrate that these transport functions were already occurring in the absence of the project.

Section 32R Emissions from purchased electricity use: displacement abatement

Subsection 32R(1) sets out in **equation 31** the calculation for estimating the emissions from purchased electricity that is used by a project biomethane facility. **Equation 31** multiplies the amount of purchased electricity that is specifically attributable to the operation of the project biomethane facility during the reporting period, $Q_{PE, displacement, f}$, with $EF_{PE, displacement, f}$, the emissions factor for electricity obtained from the electricity grid.

The electricity grid from which electricity is sourced may or may not be an electricity grid that is a grid in relation to the NGA Factors document. Paragraph 32N(1)(a) states that whenever possible, the project proponent must apply the relevant emissions factor from the NGA Factors document that is in force at the end of the reporting period in accordance with section 6.

Paragraph 32R(1)(b) provides for a situation when the electricity used to undertake the project activity is not sourced from a grid in relation to which the NGA Factors document applies. In this circumstance the project proponent must apply a factor that reflects the emissions intensity of the electricity (subparagraph 32R(1)(b)(i)). For example, this could be a factor provided by the supplier of the electricity. Subparagraph 32R(1)(b)(ii) provides that if this factor is not known, then the factor for off-grid electricity that is provided in the NGA Factor document must be used.

Subsection 32R(2) specifies how the emissions factor must be calculated if subparagraph 32R(1)(b)(i) applies. In these circumstances, the emissions factor must be worked out using the amount of electricity sent out and be determined using a measurement or estimation approach that is consistent with the NGER (Measurement) Determination.

21 Part 5 heading—note

Item 21 modifies the note under heading of Part 5, omitting "regulations and rules", and substituting with "the regulations and legislative rules" for clarity.

22 After section 33

Item 22 inserts new sections 33A, 33B and 33C, which set out the information that must be included in offsets reports for projects that undertake certain project activities. Not all requirements set out in these sections will apply to all projects – for example, biomethane displacement-only projects do not involve project landfills, so provisions relating to project landfill information to be reported on will not apply. Similarly, non-biomethane projects will not report on information relating to landfill gas capture for biomethane or biomethane production.

Section 33A General information that must be included in offsets report

Section 33A lists items that must be provided to the Regulator with each offsets report.

Paragraph 33A(a) requires that if the project's project type has changed since its section 22 application, section 128 application, or since the previous offsets report, the offsets report must include information on when the project type changed and how the project meets the requirements of the new project type.

Paragraph 33A(b) provides that a list of project activities that were carried out at each project landfill and project biomethane facility during the reporting period. Subparagraphs 33A(b)(i) and 34(b)(ii) further specify that details of any new activities that commenced since the section 22 application, section 128 application, or previous offsets report, or any activities that have stopped being carried out, must be provided.

Paragraph 33A(c) provides that a description of the sources of project emissions must be provided. This encompasses both conversion and displacement project emissions, where applicable.

Paragraph 33A(d) provides that if landfill gas capture for biomethane was carried out as part of the project, the offsets report must include evidence that biogas sent to biogas upgrading systems was used to produce biomethane that can reasonably be expected to be combusted within Australia as a natural gas substitute.

A note to this paragraph clarifies that suitable evidence may include invoices or other records of commercial transactions involving biomethane being bought or sold for combustion as a natural gas substitute.

Paragraph 33A(e) provides additional reporting requirements for projects that undertake biomethane production.

Subparagraph 33A(e)(i) specifies that details on the source of any biogas treated by biomethane production must be provided – this includes the biogas source facility, and information on whether that biogas is eligible biogas.

Subparagraph 33A(e)(ii) specifies that details about the biogas upgrading systems used in the project must be supplied.

Subparagraph 33A(e)(iii) requires details about the end use, or anticipated end use, of biomethane produced by the project to ensure that it can reasonably be expected to be combusted as a natural gas substitute within Australia.

Subparagraph 33A(e)(iv) requires details about the measurement of produced biomethane volumes in accordance with section 32L, including how the gas flow is measured and at which point the measurements are taken, to be supplied.

Subparagraph 33A(e)(v) specifies that the project proponent must provide a declaration that all biomethane produced by the project during the reporting period can reasonably be expected to be combusted within Australia as a natural gas substitute.

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

Section 33B provides that a project must include details of the net abatement calculations for a reporting period. A non-exhaustive list of information that must be provided to the Regulator with each offsets report is specified in this section.

Paragraph 33B(a) requires the output of each equation used to calculate net abatement for a reporting period to be provided.

Paragraph 33B(b) requires that if the project involves landfill gas capture for biomethane, details about the biomethane production loss factor must be included. This includes how the biomethane production loss factor was worked out in accordance with section 28B (see Item 20)

Paragraph 33B(c) specifies that projects that undertake biomethane production must provide information about displacement net abatement calculations made under Division 3 of Part 4 of this Determination (Item 20). Specific information that must be included in an offsets report for these projects include:

- the volumes and methane concentrations of produced biomethane (subparagraph 33B(c)(i)),
- the volumes and eligible abatement fractions of biogas treated by project biomethane facilities (subparagraph 33B(c)(ii)), and
- and information about displacement abatement project emissions (subparagraph 33B(c)(iii)).

Subparagraph 33B(c)(iv) specifies that if the volume of eligible biogas, $\boldsymbol{Q_{BG,\,El,\,g}}$, is determined in accordance with subsection 32N(2), Item 20 for a reporting period – that is, $\boldsymbol{Q_{BG,\,El,\,g}}$ is estimated and not measured – the offsets report must include details about how this quantity was determined.

Sub-subparagraph 33B(c)(iv)(A) specifies this must include an explanation for how the proportion of biogas that is eligible biogas, $\boldsymbol{EB_g}$, was determined, including what estimation metrics and calculation approaches were used – for example, whether the estimate was based on the methane-producing capacities or masses of eligible and ineligible biogas wastes.

Sub-subparagraph 33B(c)(iv)(B) requires evidence or data used to calculate $\boldsymbol{EB_g}$ to be provided.

Sub-subparagraph 33B(c)(iv)(C) requires a signed declaration from the person that estimated $\boldsymbol{EB_g}$ that the factor is accurate and conservative.

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

Section 33C provides that a project must include details of the following changes that have been made to the project since the section 22 application, section 128 application, or last offsets report provided to the Regulator.

Paragraph 33C(a) requires the changes to existing project landfill to be detailed.

Paragraph 33C(b) requires that the addition of a new project biomethane facility or changes to an existing project biomethane facility to be detailed. In this case, the intended recipients of biomethane produced by the new or changed project biomethane facility must be supplied. Additionally, the project proponent must provide a signed declaration 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.

Paragraph 33C(c) requires details about new biogas upgrading systems or changes to existing biogas upgrading systems to be included.

Paragraph 33C(e) specifies that any other changes to information that was provided in the project's section 22 or section 128 application, as specified in sections 13 to 13B, Item 16 must be detailed.

23 Section 36

Item 23 repeals the former section 36 and substitutes it with a new section 36 that sets out the requirement to monitor parameters.

Section 36 Requirements to monitor certain parameters

Subsection 36(1) specifies that the project must monitor parameters relating to the calculation of net abatement amounts for a landfill gas (electricity generation) project in accordance with the operation of this section.

The Determination sets out that measurement procedures must be undertaken in accordance with relevant NGER (Measurement) Determination specifications. This is the case for the following 9 monitored parameters, which all relate to the calculation of the project's net displacement abatement:

- the energy content of the landfill gas sent to combustion device ***h*** ($Q_{En,\,h}$)
- the landfill gas sent to combustion device or biogas upgrading system ***h*** ($Q_{LFG,\,h}$)
- the electricity (supplied to the grid or used on-site) generated by internal combustion engine ***h*** ($Q_{EG,\,h}$)
- if applicable - the amount of fuel type ***i*** used for landfill gas capture for biomethane activities ($Q_{F,\,LFG\text{-}BM,\,i}$)
- the fraction of the volume of landfill gas that is methane ($W_{LFG,\,CH4}$)
- the volume of biomethane sent out by biogas upgrading system *k* ($Q_{BM,\,k}$)
- the volume of biogas sent to a project biomethane facility from biogas source facility ***g*** ($Q_{BG,\,g}$)
- the volume of eligible biogas sent to a project biomethane facility from biogas source facility ***g*** ($Q_{BG,\,El,\,g}$)
- if applicable - Quantity of each fuel type ***i*** used by project biomethane facility ***f*** ($Q_{F,\,displacement,\,f,\,i}$)

The monitoring requirements are listed in the table in subsection 36(1). The first 3 columns are the parameter name, description and units (consistent with how the parameter is presented, defined and the units needed for the calculation of net abatement in Part 4 (Item 20). The fourth column is the measurement procedure, which is usually a reference to a division in the NGER (Measurement) Determination and the frequency of monitoring if relevant. If the requirement is continuous then spot measurements do not meet this requirement (for instance, the volume of biomethane sent out by a biogas upgrading system is determined on a continuous basis and so cannot be based on weekly samples and analysis). The fifth column sets how the monitored parameter is to be derived from the measurements.

Subsection 36(2) sets out that any equipment or device used to monitor a parameter is calibrated by an accredited third-party technician at intervals, and using methods, that are in accordance with the manufacturer's specifications.

Subsection 36(3) specifies accuracy requirements for equipment used to measure biogas and biomethane pressures and defines ***i*** to mean a fuel type.

24 Subsection 37(1)—table

Item 24 repeals the former table in subsection 37(1) and substitutes it with a new table that sets out how parameters are to be determined for the non-monitored period in a reporting period if in the instance that a project proponent for a landfill gas (electricity generation) project fails to monitor a parameter mentioned in the table in subsection 37(1).

25, 26, 27, 28, 29, 30, 31, 32, 33, 34

Items 25 to 34 make stylistic changes to ensure that the drafting is consistent throughout the instrument and fix typographical errors.

Attachment B

Statement of Compatibility with Human Rights

Prepared in accordance with Part 3 of the Human Rights (Parliamentary Scrutiny) Act 2011

Carbon Credits (Carbon Farming Initiative— Electricity Generation from Landfill Gas) Methodology Determination Variation 2022

This Legislative Instrument is compatible with the human rights and freedoms recognised or declared in the international instruments listed in section 3 of the *Human Rights (Parliamentary Scrutiny) Act 2011*.

Overview of the Legislative Instrument

The *Carbon Credits (Carbon Farming Initiative—Electricity Generation from Landfill Gas) Methodology Determination Variation 2022*(the Variation) amends the *Carbon Credits (Carbon Farming Initiative—Electricity Generation from Landfill Gas) Methodology Determination 2021* (the Determination)

The Variation facilitates new activities under the Emissions Reduction Fund (ERF) through projects that generate abatement by capturing and refining waste biogas from landfills to produce biomethane, a high methane concentration gas that can be used as a natural gas substitute.

The Variation amends the Determination by including concepts and equations to enable the creation of Australian carbon credit units from two types of abatement associated with the production of biomethane from biogas, conversion abatement and displacement abatement.

Project proponents wishing to implement the Determination as varied by the Variation must apply to the Clean Energy Regulator and meet the eligibility requirements set out under the *Carbon Credits (Carbon Farming Imitative) Act 2011*.

Human Rights Implications

This Legislative Instrument does not engage any of the applicable rights or freedoms.

Conclusion

This Legislative Instrument is compatible with human rights as it does not raise any human rights issues.