EXPLANATORY STATEMENT

Issued by the Minister for Industry, Energy and Emissions Reduction

Carbon Credits (Carbon Farming Initiative) Act 2011

Carbon Credits (Carbon Farming Initiative—Domestic, Commercial and Industrial Wastewater) Methodology Determination Variation 2022

Purpose

The *Carbon Credits (Carbon Farming Initiative—Domestic, Commercial and Industrial Wastewater) Methodology Determination Variation 2022* (***the Variation***) amends the *Carbon Credits (Carbon Farming Initiative—Domestic, Commercial and Industrial Wastewater) Methodology Determination 2015* (***the Determination***).

The Determination sets out the rules for crediting, calculating, and reporting on projects that reduce emissions by capturing and combusting methane generated from the treatment of domestic, commercial, and industrial wastewater.

The Variation facilitates new activities under the Emissions Reduction Fund (ERF) through projects that generate abatement by capturing and refining waste biogas generated through wastewater treatment 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 and displacement abatement. 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.

New projects involving biomethane will be able to access a 12-year crediting period for both conversion abatement and displacement abatement. This is longer than the standard 7 years for emissions avoidance projects provided under the Act. The longer crediting period recognises that the high capital and operating costs of biomethane projects and the nascent renewable gas market are barriers to the uptake of biomethane projects in Australia, and that abatement from biomethane over the length of the crediting period will be unlikely to occur in the ordinary course of business.

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 Variation allows for projects to restart

as a new project to access the balance of the 12-year crediting period for displacement abatement if there is a balance outstanding 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, biogas generation 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 existing definitions to incorporate biomethane projects and improve clarity.

The Variation substantially amends section 7 of the Determination to include biomethane projects by modifying the project activities that constitute a *wastewater project*, and introduces 5 project types:

- **Non-biomethane projects** – a new name for projects covered under previous versions of the Determination that involve the capture and combustion of biogas generated from the treatment of eligible wastewater.

- **Biomethane conversion and displacement projects** – a new project type that covers projects involving production of biomethane from biogas generated from the treatment of eligible wastewater. These projects involve installing equipment, called biogas upgrading systems, that upgrade biogas into biomethane. Existing wastewater 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 include the treatment of eligible wastewater. Such a facility may not meet the eligibility requirements to be credited for conversion abatement for example, because eligible wastewater was already treated by anaerobic digestion prior to the project commencing.

- **Restarting biomethane conversion and displacement projects** – this project type covers wastewater 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.

To incorporate biomethane projects under the Determination, the Variation repeals and substitutes Part 3 of the Determination, introducing 6 new Divisions relating to requirements for wastewater projects. The new Divisions set out the specific requirements for each of the new project types identified in the new section 7, and the activities that each type of project must or may involve.

The Variation introduces the new section 8A that specifies the 3 project activities that can be carried out as part of a wastewater project:

- **Biogas generation for biomethane** – this activity involves treating eligible wastewater to produce biogas which is sent to a project biogas upgrading system to be upgraded into biomethane. The methane in biogas produced by this treatment 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 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 treating eligible wastewater to produce biogas that is sent to a combustion device for destruction, resulting in conversion abatement. This activity does not involve producing biomethane.

The Variation introduces new sections 11A and 11B that specify requirements in lieu of the newness requirements for restarting biomethane conversion and displacement projects and restarting displacement-only projects respectively. The in lieu of newness requirements facilitate projects that are eligible to restart as these project types.

The new Division 6 of Part 3 specifies the crediting period for each of the wastewater project types. Non-biomethane projects continue to receive a 7-year crediting period. This period is the same length as the crediting period for existing wastewater projects. The Variation introduces new sections 11D to 11G, which set out the crediting periods for the remaining 4 project types involving biomethane.

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 wastewater projects that involve biomethane production. The new section 42A specifies the general information that must be included in offsets reports for the five project types provided for by the Variation. New sections 42B and 42C require additional information to be included in an offsets report for a project that

involves biomethane production. The Variation also inserts a new Division 1A in Part 5 and amends Division 2 in Part 5, which sets out the record-keeping and monitoring requirements for all projects under the Determination.

The Variation also implements several changes that enhance the Determination's usability and make the Determination more applicable to circumstances where multiple deep open anaerobic lagoons are being replaced as part of a project. These changes allow the Determination to accommodate more complex project scenarios, including aggregation.

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—Domestic, Commercial and Industrial Wastewater) 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— Domestic, Commercial and Industrial Wastewater) Methodology Determination 2015* is amended as set out in Schedule 1 of the Variation.

Schedule 1 Amendments

Carbon Credits (Carbon Farming Initiative–Domestic, Commercial and Industrial Wastewater) Methodology Determination 2015

1 Section 5

Item 1 repeals the former section 5 and replaces it with a new section 5 that includes new definitions and changes to existing definitions required to allow the undertaking of projects involving biomethane production under the Determination.

Generally, where terms and expressions are not defined, they have the meaning given by section 5 of the Act.

Under section 23 of the *Acts Interpretation Act 1901*, words in a legislative instrument in the singular number include the plural and words in the plural number include the singular.

The following terms and expressions in the Determination, the operation of which is explained in broad terms below, are particularly important because they are key amendments required to allow the undertaking of projects involving biomethane production under the Determination.

The new term ***biogas upgrading*** is a non-exclusive 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 new term ***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. 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 ***biogas generation 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 carbon dioxide equivalent (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'. Displacement abatement is associated with project activities undertaken at project biomethane facilities.

Item 1 amends the definition of ***historical period of sampling*** by inserting a paragraph (c) to the definition. Paragraph (c) sets out that each ***deep open anaerobic lagoon*** that is part of the

same ***treatment facility*** must have the same historical period of sampling. This reflects changes to **Equation 2** (see Item 5, Section 18), which is modified by the Variation to allow multiple deep open anaerobic lagoons at a ***project treatment facility*** to be replaced by one or more ***anaerobic digesters*** installed as part of the project at the facility. Figures used in **Equation 2** are worked out on a lagoon basis using information collected during the historical period of sampling. Requiring the historical period of sampling for each deep open anaerobic lagoon at a treatment facility to coincide ensures that these figures are calculated consistently.

The new term ***treatment facility*** is defined as a facility that treats eligible wastewater by carrying out emissions destruction, or biogas generation for biomethane and that includes the infrastructure and equipment specified in paragraphs (a) to (c). A treatment facility that is used in carrying out a project that involves emissions destruction or biogas generation for biomethane is a ***project treatment facility***. Project proponents are required to provide a description of at least one project treatment facility in the ***section 22 application*** or ***section 128 application*** for certain types of projects (see Item 4, paragraphs 8H(2)(c) and 8I(2)(c)). In some circumstances anaerobic digesters will not have been installed at the facility at the time of making the application and therefore cannot be described in the description of the facility provided with the application. This does not give rise to a breach of the Determination. Similarly, even once replaced, the replaced deep open anaerobic lagoons are still taken to be a part of the facility.

A project biomethane facility may undertake upgrading of biogas from multiple sources, including biogas imported from outside the project. This allows wastewater projects that undertake biomethane production to access a greater range of biogas sources, as they are not restricted to eligible wastewater that is part of the project. A facility that supplies biogas to a project biomethane facility for biogas upgrading is defined as a ***biogas source facility***. If a single facility treats eligible wastewater to produce biogas and also upgrades that biogas into biomethane, that facility may simultaneously be a project treatment facility, a project biomethane facility, and a biogas source facility.

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 ***domestic or commercial wastewater***, ***industrial wastewater*** or wastes that meet the eligibility criteria of terms under 3 other ERF waste methods:

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

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 the Determination (Item 5).

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, biogas upgrading systems, and other devices. Section 5A incorporates aspects of the monitoring and control system definition previously contained in section 5.

3 Section 7

Item 3 repeals the former section 7 and replaces it with a new section 7 that expands the scope of a wastewater project to be a project that involve one or both of:

- treatment of eligible wastewater, with or without other organic material, in a way that destroys methane emissions that would otherwise arise if the eligible wastewater was treated in a deep open anaerobic lagoon (subsection 7(1)(a)); or
- treatment of eligible biogas produced from eligible wastewater, with or without biogas produced from other biogas waste, by biogas upgrading to produce biomethane that is sent to an end use where it can reasonably be expected to be combusted within Australia as a natural gas substitute (subsection 7(1)(b)).

Subsection 7(1)(a) covers projects that involve the treatment of eligible wastewater to avoid methane emissions. This may occur through anaerobic treatment of material to produce biogas and subsequent combustion of that biogas (emissions destruction), or anaerobic treatment of material to produce biogas that is refined into biomethane that will be combusted as a natural gas substitute (biogas generation for biomethane) – see Item 4, section 8A.

Subsection 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 4 which inserts section 8A.

A project that is covered by one or both of subsections 7(1)(a) or (b) is a ***wastewater project***.

Subsection 7(3) sets out the 5 project types that a wastewater project could be. Requirements for each project type are set out in Item 4, sections 8B to 8F. A project's project type determines the project's crediting period and what project activities it may undertake to

generate eligible carbon abatement. A project may change its project type if it meets the requirements of a different project type – see Item 4, Section 8G.

4 Part 3

Item 4 repeals Part 3 and replaces it with a new Part 3 that sets out requirements for wastewater projects involving biogas generation for biomethane, biomethane production, and emissions destruction.

Part 3 – Project requirements

Division 1 Operation of this Part

Section 8 Operation of this Part

Section 8 provides that Part 3 of the Determination sets out requirements that must be met for a project to be an eligible offsets project for the purpose of paragraph 106(1)(b) of the Act. These requirements are set out in sections 8A to 11G.

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 sets out that Part 3 of the Determination has 6 Divisions.

Section 8A Project activities

The new section 8A specifies 3 project activities:

- Biogas generation for biomethane involves treating eligible wastewater to create biogas. That biogas must be captured and sent to a biogas upgrading system at a project biomethane facility.
- Biomethane production involves treating biogas 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 treating eligible wastewater in an anaerobic digester installed as part of the project at a project treatment facility to create biogas and combusting that biogas using a combustion device.

A wastewater project must involve one or more project activities.

Biogas generation for biomethane and emissions destruction create conversion abatement because of waste methane being combusted, while biomethane production creates displacement abatement because the produced biomethane replaces natural gas. Section 12A

in Part 4 at Item 5, specifies how abatement from each activity is to be accounted for depending on the project's project type.

Division 2 Project-specific requirements

Section 8B Requirements for non-biomethane projects

The new section 8B specifies requirements for the ***non-biomethane project*** type. Non-biomethane projects must involve emissions destruction.

The non-biomethane project type covers wastewater projects that do not involve biogas generation 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 biogas generation 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 new section 8G, the net abatement amount calculated for the project will not include abatement associated with biogas generation for biomethane or biomethane production activities – see Item 5, paragraph 12A(a).

Section 8C Requirements for biomethane conversion and displacement projects

The new section 8C 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 biogas generation for biomethane, it must also involve biomethane production – this is to ensure all biogas generated by the project under a biogas generation for biomethane activity is upgraded into biomethane as part of the project and sent for eventual combustion within Australia as a natural gas substitute.

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 8C. 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 8D Requirements for biomethane displacement-only projects

The new section 8D specifies requirements for the ***biomethane displacement-only project*** type.

Biomethane displacement-only projects must involve biomethane production, generating displacement abatement, and the installation of one or more biogas upgrading systems. Biogas generation for biomethane and emissions destruction may be undertaken, but these activities will not be accounted for when calculating the project's net abatement amount – see Item 5, paragraph 12A(c).

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

Section 8E Requirements for restarting biomethane conversion and displacement projects

The new section 8E specifies requirements for the ***restarting biomethane conversion and displacement project*** type. Restarting biomethane conversion and displacement projects must occur at a treatment facility that was part of a ***forerunner project***. The forerunner project must:

- have been registered under the Determination, and
- not have involved biogas generation 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 biogas generation for biomethane.

Restarting biomethane conversion and displacement projects may undertake all 3 project activities. However, only conversion abatement generated by biogas generation for biomethane, and displacement abatement generated by biomethane production project activities will contribute towards the project's net abatement – see Item 5, paragraph 12A(d).

The restarting biomethane conversion and displacement project type intends to allow projects that were previously registered under the 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 11F, 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 11F.

Section 8F Requirements for restarting biomethane displacement-only projects

The new section 8F specifies requirements for the ***restarting biomethane displacement-only project*** type. Restarting biomethane displacement-only projects must occur at a treatment facility that was part of a forerunner project. The forerunner project must have:

- been registered under the Determination, and
- 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 the undertaking of the biomethane production project activity will contribute towards the project's net abatement amount – see Item 5, paragraph 12A(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 11G 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 11G.

Section 8G Changing project type

The new section 8G specifies a wastewater project that is one of the types listed in the new subsection 7(3), Item 3, 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 (see Item 6 Section 43A).

Division 3 Information required to be included in section 22 and section 128 applications

The new Division 3 of Part 3 sets out the information that must be included in section 22 and 128 applications under the Determination.

Section 8H Applications about non-biomethane projects

The new section 8H specifies information that must be included in a section 22 or section 128 application for a non-biomethane project.

Subparagraph 8H(2)(c)(iii) requires the project proponent to describe the capacity of each project treatment facility that will be used in the project. This description should include both a description of the capacity of the deep open anaerobic lagoons at the facility that are to be replaced as part of the project and the anticipated capacity of the anaerobic digesters to be installed at the facility as part of the project.

Subparagraph 8H(2)(c)(v) replaces subsection 9(4) and requires evidence of the historical sources of wastewater for the project to be treated at each project treatment facility. The definition of ***historical source*** is provided in Item 1, which inserts section 5. This evidence is

necessary to assess whether wastewater to be treated as part of the project at the project treatment facility is eligible wastewater.

Subparagraph 8H(2)(c)(vi) requires the applicant to describe how they expect the operation of project treatment facilities during the crediting period will comply with the requirements under the Determination. This provision demonstrates to the Regulator that the proponent is able to comply with the requirements of the Determination.

A note to this section clarifies that it is possible to add further project treatment facilities after the project has commenced. Any project treatment facilities added after this declaration must comply with all aspects of the Determination as varied by the Variation. Abatement generated from the undertaking of project activities at project treatment facilities added to the project after the project is declared an eligible offsets project will only be credited from the date on which the facility is added to the project.

Section 8I Applications about other projects

The new section 8I specifies details that are required to be included in a:

- section 22 or section 128 application for a biomethane conversion and displacement project or a biomethane displacement-only project, or
- section 22 application for a restarting biomethane conversion and displacement project or a restarting biomethane displacement-only project.

Paragraph 8I(2)(c) requires applications relating to biomethane conversion and displacement projects or restarting biomethane conversion and displacement projects to provide details about project treatment facilities that will be used in the project. This requirement does not apply to biomethane displacement-only projects or restarting biomethane displacement-only projects because those project types do not involve treatment facilities.

Subparagraphs 8I(2)(c)(iii), (v) and (vi) are equivalent to subparagraphs 8H(2)(c)(iii), (v) and (vi), whose operations are described above.

Paragraph 8I(d)(v) requires that the intended recipients of biomethane produced by project biomethane facilities be specified. This will allow the Regulator to assess the project's compliance with paragraph 8A(3)(b).

Paragraph 8I(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).

Two notes to this section clarify that it is possible to add project treatment facilities and project biomethane facilities after the project is declared an eligible offsets project. Any facilities added after this declaration must comply with all aspects of the Determination (as varied by the Variation). Abatement generated from the undertaking of project activities at facilities added to the project after the project is declared an eligible offsets project will only be credited from the date on which the facility is added to the project.

Division 4 Anaerobic digesters and project treatment facilities

The new Division 4 expands sections 9 to 11 by imposing specific requirements for project treatment facilities at which biogas generation for biomethane and emissions destruction project activities are undertaken.

Section 9 Anaerobic digesters at project treatment facilities to replace lagoons

Subsection 9(1A) sets out that at least one anaerobic digester must be installed at each project treatment facility as part of a project to replace all deep open anaerobic lagoons at the facility. This ensures that the anaerobic digesters used as part of the project to treat eligible wastewater are specifically installed as part of the project, and are not pre-existing.

The note under subsection 9(1A) clarifies that if a deep anaerobic lagoon is not being replaced, it is not considered to be a part of the project treatment facility. For example, before being declared an eligible offsets project, an abattoir operates three deep open anaerobic lagoons. Two of the lagoons are to be replaced by a single engineered biodigester to be installed as part of the project. The third lagoon will not be replaced. Only the two lagoons being replaced are considered to be a part of the project treatment facility, the third unreplaced lagoon is not.

Subsection 9(1) requires that a lagoon to be replaced as part of a project must have been in existence and treating domestic, commercial, or industrial wastewater before 24 April 2014. This ensures that the Determination does not create an incentive for operators to construct and operate new deep open anaerobic lagoons in an emissions-intensive manner solely to qualify as a project under the Determination, as this would have the effect of increasing emissions for a year which otherwise would not have occurred. The date 24 April 2014 is the date the ERF White Paper was released and the reference to that date in the provision is intended to avoid any influence that government policy, as stated in the ERF White Paper, may have had on choices for wastewater management. Greenfield developments where wastewater treatment was not previously occurring are not eligible under the Determination.

Subsection 9(2) sets out the types of wastewater that lagoons to be replaced as part of the project can be used to treat.

Section 10 Project treatment facilities – biogas generation for biomethane

Section 10 sets out requirements for project treatment facilities that undertake the biogas generation for biomethane project activity.

Paragraph 10(a) requires that the anaerobic digesters used to generate and capture biogas from the treatment of eligible wastewater are anaerobic digesters installed as part of the project.

Paragraph 10(b) requires that the captured biogas is sent to a biogas upgrading system that is part of a project biomethane facility.

Section 11 Project treatment facilities – emissions destruction

Section 11 sets out requirements for project treatment facilities that undertake the emission destruction project activity.

Paragraph 11(1)(a) requires that the anaerobic digesters used to generate and capture biogas from the treatment of eligible wastewater are anaerobic digesters installed as part of the project.

Paragraph 11(1)(b) requires that the captured biogas is sent to one or more combustion devices to be combusted.

Subsection 11(2) requires that each combustion device used to combust the biogas referred to in subsection 11(1) must be operated to result in the ***complete*** combustion of methane. Item 1, section 5 defines what constitutes complete combustion of methane.

Division 5 Newness

The new Division 5 of Part 3 specifies newness requirements for projects under the Determination.

Section 11A Requirement in lieu of newness requirement – restarting biomethane conversion and displacement project

The new section 11A sets out a requirement in lieu of the newness requirement under subparagraph 27(4A)(a)(ii) of the Act.

Subsection 11A(2) sets out that the newness requirement is met if a project is a restarting biomethane conversion and displacement project. The requirement in lieu of the newness requirement recognises that restarting biomethane conversion and displacement projects occur at facilities that were previously a part of an eligible offsets project.

Restarting biomethane conversion and displacement projects must still meet the requirements set out in the new section 8E.

Section 11B Requirement in lieu of newness requirement – restarting biomethane displacement-only project

The new section 11B sets out a requirement in lieu of the newness requirement under subparagraph 27(4A)(a)(ii) of the Act.

Subsection 11B(2) sets out that the newness requirement is met if a project is a restarting biomethane displacement-only project. The requirement in lieu of the newness requirement recognises that restarting biomethane displacement-only projects occur at facilities that were previously a part of an eligible offsets project.

Restarting biomethane conversion and displacement projects must still meet the requirements set out in the new section 8F.

Division 6 Crediting period

For paragraph 69(3)(b) and subparagraph 70(3)(d)(ii) of the Act, the new Division 6 of Part 3 specifies the crediting period for different project types under the Determination.

Section 11C Crediting period for non-biomethane projects

The new section 11C sets out that the crediting period for a wastewater project that is a non-biomethane project is a period of 7 years. This is the same as the length of the crediting period for projects covered by the Determination prior to the Variation.

Section 11D Crediting period for biomethane conversion and displacement projects

The new section 11D sets out the crediting period for biomethane conversion and displacement projects.

Subsection 11D(1) provides for biomethane conversion and displacement projects to have a 12-year crediting period.

However, subsection 11D(2) sets out that the crediting period for a biomethane conversion and displacement project ends after a cumulative 7 years of emissions destruction has been undertaken as part of the project. If subsection 11D(2) is triggered, the crediting period for the project ends at the starts of the 85th calendar month in which emissions destruction is undertaken. The prevents a biomethane conversion and displacement project being credited for abatement generated from the treatment of eligible waster by emissions destruction for longer than is possible under a non-biomethane project.

Subsection 11D(3)(a) clarifies that if any eligible wastewater is treated by emissions destruction on 3 or more days in a calendar month, that month is treated as a month in which emissions destruction is carried out. This simplifies the assessment of when the 7 years of emissions destruction has been completed and prevents project proponents from deliberately sequencing or switching activities in order to effectively extend the crediting period for the project.

Paragraph 11D(3)(b) makes clear that the calendar months of generation do not need to be consecutive.

Paragraph 11D(3)(c) introduces a presumption of emission destruction after it has commenced where there is no evidence to the contrary. It is expected that calendar months without emissions destruction would be evidenced by maintenance records or gas flow and combustion data. The consideration of this evidence would be undertaken at the end of each reporting period as part of the offsets reporting requirement under paragraph 42A(d).

Subsection 11D(4) sets out that emissions destruction is not considered to have been carried out by the project during a calendar month if the abatement generated from the carrying out of that activity in that month is excluded from the net abatement calculations under Part 4. This provision is intended to allow biomethane conversion and displacement projects that undertake emissions destruction alongside biogas generation for biomethane and biomethane

production (for example, flaring for backup or maintenance purposes) to continue undertaking those activities without impacting the longer crediting period granted to biogas generation for biomethane and biomethane production, as long as emissions destruction activities are excluded from project net abatement calculations.

Under section 11D, the crediting period for projects that transition to the Determination as varied by the Variation as biomethane conversion and displacement projects or change project type to the biomethane conversion and displacement project type will 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 consideration of the ERAC and safeguards the additionality of conversion abatement credited under the Determination, recognising that conversion abatement from the destruction of methane emissions is the same whether it results from combustion in a flare or from production of biomethane that is ultimately combusted.

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 new section 11G. This recognises that displacement abatement is not currently credited under the ERF and is unlikely to occur in the ordinary course of business.

Section 11E Crediting period for biomethane displacement-only projects

The new section 11E sets out that the crediting period for a wastewater project that is a biomethane displacement-only project is a period of 12 years.

Section 11F Crediting period for restarting biomethane conversion and displacement projects

The new section 11F 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***. Forerunner project has the meaning given by new paragraph 8E(a).

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 new section 11D. It recognises that conversion abatement may be occurring in the ordinary course of business, such as through flaring of methane in the forerunner project. 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 11G Crediting period for restarting biomethane displacement-only projects

The new section 11G 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 claim the remainder of that 12 years of displacement abatement crediting. For example, if a non-biomethane project commenced in January 2024 and transitioned to a biomethane conversion and displacement project – including undertaking biomethane production – in January 2030, that project's crediting period would end in January 2036, 12 years after it originally began (see new sections 11C and 11D). At that point, the project would only be 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.

5 Part 4

Item 5 repeals the former Part 4 and replaces it with a new Part 4 that includes equations to calculate the displacement abatement from biomethane production.

Part 4 – Net abatement amount

Division 1 – Operation of this Part

Section 12 Operation of this Part

Paragraph 106(1)(c) of the Act provides that a methodology determination must specify how to calculate the carbon dioxide equivalent (CO_2-e) net abatement amount for an eligible offsets project in relation to a reporting period.

Subsection 12(1) provides that this is done in Part 4 of the Determination.

Subsection 12(2) sets out that in Part 4, a reference to an anaerobic digester is a reference to an anaerobic digester installed as part of the project.

Section 12A What can be included in calculating net abatement

Section 12A is a new section that specifies that a project may only include abatement associated with particular project activities when working out the net abatement amount 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 12A(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.

Paragraph 12A(b) specifies that the net abatement calculations for biomethane conversion and displacement projects must include only the following:

- Conversion abatement attributable to biogas generation for biomethane, worked out in accordance with Division 2.
- 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 are 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 11D(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 month.
    - In practice, it is expected that for periods during which abatement from emissions destruction is excluded, the project would work out its net abatement as if it were a restarting biomethane conversion and displacement project (see paragraph 12A(d)), and only include 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 12A(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 new Division 3, Part 4.

Paragraph 12A(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 new Division 2, Part 4 and displacement abatement attributable to biomethane production, worked out in accordance with new Division 3, Part 4. Unlike biomethane conversion and displacement projects, restarting biomethane conversion and displacement projects cannot include conversion abatement associated with emissions destruction project activities.

Similar to paragraph 12A(c), paragraph 12A(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 new Division 3, Part 4.

Section 12B Working out net abatement

Section 12B is a new section that provides for **equation 1A**. Equation 1A sets out that, subject to section 12A, the total carbon dioxide net abatement amount for a reporting period for a wastewater project is the sum of the net conversion abatement amount for the reporting period ($A_{conversion}$) and the net displacement abatement amount for the reporting period ($A_{displacement}$).

Division 2 – Working out conversion abatement

Subdivision 1 – Overview

Section 13 Overview of gases accounted for in conversion abatement calculations

Section 13 sets out the greenhouse gas sources that are relevant to working out the net conversion abatement amount for a wastewater project that involves biogas generation for biomethane or emissions destruction.

Several emissions sources are excluded from the net conversion abatement calculations for the following reasons:

- In the baseline scenario, nitrogen emissions from the treatment of eligible wastewater in a deep open anaerobic lagoon are excluded for reasons of both conservativeness and simplicity.
- Emissions from the transport of ***digestate*** are excluded as these emissions are considered immaterial to the overall emissions of the project.
- Emissions from materials, the transport of materials, the demolition of the deep open anaerobic lagoon and emissions associated with construction of the anaerobic digester and combustion devices are excluded as they are scope 3 emissions. This is consistent with the National Inventory Report and the *NGER (Measurement) Determination*, and also prevents the potential for double counting of abatement from another project or facility where these would be scope 1 emissions.
- Carbon dioxide emissions emitted from the treatment of wastewater and the combustion of biogas are excluded because these emissions have a biogenic origin. That is, the emissions originate from organic material, and are not counted towards Australia's national greenhouse gas accounts.

Subdivision 2 – Method for calculating net conversion abatement amount

Section 14 Summary

Section 14 summarises how the net conversion abatement amount for a project for a reporting period is calculated.

Section 15 Net conversion abatement amount

Equation 1B in subsection 15(1A) is a new equation that sets out that the CO_2-e net conversion abatement amount for a project for a reporting period is the sum of net conversion abatement amount for each project treatment facility in the project. This provides for proponents to include multiple project treatment facilities and aggregate the abatement generated by each implementation as a single project.

Equation 1 in subsection 15(1) sets out that CO_2-e net conversion abatement amount for a project treatment facility in a reporting period is worked out by calculating baseline emissions for the project treatment facility ($\boldsymbol{E_{B,t}}$) and then subtracting project emissions for the project treatment facility ($\boldsymbol{E_{P,conversion,t}}$) from the result.

Baseline emissions for a project treatment facility for a reporting period are the emission that would have been produced in the reporting period in the absence of the project. That is, if eligible wastewater for the project treated in anaerobic digesters at the project treatment facility during the reporting period had instead been treated in the deep open anaerobic lagoons at the project treatment facility.

Project emissions for a project treatment facility for a reporting period are the emissions that result from operating the project treatment facility during the reporting period.

Paragraph 15(1)(b) replaces the former subsection 15(2). Paragraph 15(1)(b) sets out that if the difference between the baseline emissions for the project treatment facility and project emissions for the project treatment facility is an amount less than zero then $\boldsymbol{A_{conversion,t}}$ is taken to be zero.

Subsection 15(2) is a new subsection that sets out additional circumstances under which $\boldsymbol{A_{conversion,t}}$ is taken to be zero. Subsection 15(2) has the effect of ensuring that if biogas is sent from a project treatment facility to a biogas upgrading system, conversion abatement is only credited to the project treatment facility if the biogas is used to produce biomethane that can reasonably be expected to be combusted within Australia as a natural gas substitute. An example of a use of biogas that would trigger subparagraph 15(2)(b)(i) is venting of biogas to atmosphere. An example of a use of biomethane produced from biogas upgrading that would trigger subparagraph 15(2)(b)(ii) is the use of the produced biomethane as a feedstock or carbon reductant in chemical manufacturing that does not result in the combustion of the biomethane.

Subdivision 3 – Project treatment facility baseline emissions

Section 16 Summary

Section 16 summarises how the baseline emissions for a project treatment facility for a reporting period is calculated.

Section 17 Project treatment facility baseline emissions

Subsection 17(1) sets out that project proponents must calculate baseline emissions for a project treatment facility in accordance with section 17.

Subsection 17(2) sets out that if sampling was undertaken from the operation of the deep open anaerobic lagoons replaced as part of the project, then the project proponent can calculate baseline emissions for the project treatment facility using the approach set out in either new Subdivision 4 or Subdivision 5.

The approach in Subdivision 4 requires project proponents to monitor the quantity of chemical oxygen demand (COD) in eligible wastewater treated in anaerobic digesters during the reporting period, and to use information collected about the operation of the replaced deep open anaerobic lagoons during their historical period of sampling. The complete sampling required to be undertaken for the purposes of using Subdivision 4 is set out in that Subdivision.

The approach in Subdivision 5 requires project proponents to monitor the amount of methane generated from the treatment of eligible wastewater at the project treatment facility that is sent to a combustion device or biogas upgrading system.

Subsection 17(3) sets out that if the project proponent has not undertaken the sampling required to use the approach in Subdivision 4 then they must calculate baseline emissions for the project treatment facility using the approach in Subdivision 5.

Whichever Subdivision project proponents choose to use, subsection 17(4) sets out that the same Subdivision must be used for each reporting period for the project. An exception to this requirement is set out in new subsection 24(2) for the case where a proponent has selected to calculate baseline emissions using Subdivision 4 but the historical information used does not meet the requirements specified in the Determination. In this situation, project proponents are permitted to use Subdivision 5.

Subdivision 4 – Calculating baseline emissions using sampling from deep open anaerobic lagoons

Section 18 Calculating baseline emissions using sampling from deep open anaerobic lagoons

Section 18 replaces the former section 18 and modifies **equation 2** to accommodate the situation where there are multiple lagoons at the facility are being replaced, each of which will have been the subject of separate historical sampling and have different values of $F_{Eff,l}$ and $F_{Slu,l}$.

Section 18 provides for equation 2, which is used to calculate the figure $E_{B,t}$ for use in equation 1. The figure $E_{B,t}$ is the baseline emissions for a project treatment facility for a reporting period. This represents the emissions that would have been produced from the treatment of eligible wastewater in the reporting period in the absence of the project.

Equation 2 calculates $E_{B,t}$ by first determining the amount of COD in eligible wastewater treated in anaerobic digesters at the project treatment facility that would have been treated in the replaced deep open anaerobic lagoons. This amount is given by the summation term in equation 2.

The summation term in equation 2 has two components. The first component multiples $COD_{In,Tot,t}$ (the amount of COD in the eligible wastewater for the project entering anaerobic digesters at the project treatment facility during the reporting period) by a fraction that represents the proportion of the total COD entering deep open anaerobic lagoons at the project treatment facility in the historical period of sampling that entered lagoon ***l*** during that period. Multiplication of $COD_{In,Tot,t}$ by the fraction gives the amount of COD entering anaerobic digesters at the project treatment facility in the reporting period that would have been treated in lagoon ***l*** in the absence of the project.

The Determination assumes that:

- $COD_{In,Tot,t}$ is the same as the total amount of COD that would have entered the deep open anaerobic lagoons as influent during the reporting had they not been replaced as part of the project, and

- during the reporting period, in the absence of the project, the total amount of COD given by $COD_{In,Tot,t}$ would have entered the lagoons in the same proportion as that observed during the historical period of sampling.

The second component of the summation term in equation 2 is the nested brackets, which reads as 1 less the fraction of organic material that, in the absence of the project, would have entered deep open anaerobic lagoon ***l*** and would subsequently have been removed in effluent ($F_{Eff,l}$) and sludge ($F_{Slu,l}$). Organic material removed in effluent and sludge is not treated in the deep open anaerobic lagoon and therefore does not generate methane.

The fractions $F_{Eff,l}$ and $F_{Slu,l}$ must be worked out in accordance with sections 19 and 22 respectively using data collected during the historical period of sampling.

The value given by the summation term is multiplied by three factors ***UF***, ***MCF*** and ***EF*** to give the final result $E_{B,t}$.

The conservativeness factor (***UF***) is applied to account for the uncertainty that is created by using proportions based on historical data to calculate the net abatement amount. The value of ***UF*** was determined when the Determination was made based on the 'United Nations Clean Development Mechanism AMS III.H.– Methane recovery in wastewater treatment' (UN CDM III.H.) Methodology. It is based on default discount factors for uncertainty published in the United Nation Framework Convention on Climate Change's (UNFCCC) 'Report of the Subsidiary Body for Scientific and Technological Advice on its 18th Session, Bonn, 4-13 June 2003'.

The default methane-correction factor (***MCF***) accounts for the fact that different technologies used to treat wastewater produce different amounts of methane. Treatment of eligible

wastewater in a deep open anaerobic lagoon produce less methane than if the equivalent amount of eligible wastewater were treated in an anaerobic digester because a larger fraction of the organic material in the wastewater decomposes aerobically in the top layers of an open lagoon.

The emissions factor (***EF***) converts tonnes COD to tonnes CO_2-e.

The definition of historical period of sampling in section 5 (see Item 1) sets out that if multiple deep open anaerobic lagoons at a treatment facility, the historical period of sampling for each lagoon must coincide. This is relevant to calculating the figures used in equation 2.

Section 19 Fraction of chemical oxygen demand in influent removed in effluent

Section 19 sets out how the fraction of COD in influent removed in effluent is to be worked out and materially serves the same function as section 19 of the Determination as in force prior to the making of the Variation, with minor modifications so that the fraction of organic material removed in effluent ($\boldsymbol{F_{Eff,l}}$) is calculated for deep open anaerobic lagoon ***l*** that is part of project treatment facility ***t***. For further explanation of the operation of this provision, see the Explanatory Statement that accompanied the Determination that first included the provision.

Section 20 Chemical oxygen demand in effluent leaving a deep open anaerobic lagoon

Section 20 sets out how COD in effluent leaving a deep open anaerobic lagoon is to be worked out and materially serves the same function as section 20 of the Determination as in force prior to the making of the Variation, with minor modifications so the section applies to a deep open anaerobic lagoon ***l*** that is part of project treatment facility ***t*** and was replaced as part of the project. For further explanation of the operation of this provision, see the Explanatory Statement that accompanied the Determination that first included the provision.

Section 21 Chemical oxygen demand in influent entering a deep open anaerobic lagoon

Section 21 sets out how COD in influent entering a deep open anaerobic lagoon is to be worked out and materially serves the same function as section 21 of the Determination as in force prior to the making of the Variation, with minor modifications so the section applies to a deep open anaerobic lagoon ***l*** that is part of project treatment facility ***t*** and was replaced as part of the project. For further explanation of the operation of this provision, see the Explanatory Statement that accompanied the Determination that first included the provision.

Section 22 Fraction of chemical oxygen demand in influent that would be in sludge

Section 22 sets out how the fraction of COD in influent that would be in sludge is to be worked out and materially serves the same function as section 22 of the Determination as in force prior to the making of the Variation, with minor modifications so that the fraction of organic material in influent removed in sludge ($\boldsymbol{F_{Slu,l}}$) is calculated for deep open anaerobic lagoon ***l*** that is part of project treatment facility ***t***. For further explanation of the operation of

this provision, see the Explanatory Statement that accompanied the Determination that first included the provision.

Section 23 Chemical oxygen demand in sludge in a deep open anaerobic lagoon

Section 23 sets out how the COD in sludge in a deep open anaerobic lagoon is to be worked out and materially serves the same function as section 23 of the Determination as in force prior to the making of the Variation, with minor modifications so that the section applies to a deep open anaerobic lagoon ***l*** that is part of project treatment facility ***t*** and was replaced as part of the project. For further explanation of the operation of this provision, see the Explanatory Statement that accompanied the Determination that first included the provision.

Section 24 Consequences if certain parameters are not determined correctly

Section 24 sets out the consequences if certain parameters are not determined correctly and materially serves the same function as section 24 of the Determination as in force prior to the making of the Variation, with minor modifications to incorporate the concept of a project treatment facility and that the factors $F_{Slu,l}$ and $F_{Eff,l}$ are calculated for each deep open anaerobic lagoon at a project treatment facility. For further explanation of the operation of this provision, see the Explanatory Statement that accompanied the Determination that first included the provision.

Subdivision 5 – Calculating baseline emissions using the amount of methane sent to a combustion device or biogas upgrading system

Section 25 Calculating baseline emissions using the amount of methane sent to a combustion device or biogas upgrading system

Section 25 is equivalent to the former section 25 modified to incorporate the concept of a project treatment facility and the biogas generation for biomethane project activity, which involves the sending of biogas generated from the treatment for eligible wastewater to biogas upgrading systems.

Section 25 provides for **equation 5**, which is used to calculate the figure $E_{B,t}$ for use in **equation 1**. The figure $E_{B,t}$ is the baseline emissions for a project treatment facility for a reporting period. This represents the emissions that would have been produced from the treatment of eligible wastewater in the reporting period in the absence of the project.

Equation 5 calculates $E_{B,t}$ by summing the amount of methane sent to each combustion device or biogas upgrading system from the project treatment facility in the reporting period and multiplying this amount by the proportion of the sent methane that is generated by the treatment of eligible wastewater ($W_{EW,t}$).

An adjustment factor W_{DAL} is applied to reflect the fact that an engineered biodigester will generate more methane for a given input of wastewater than a deep open anaerobic lagoon. If the deep open anaerobic lagoons at the project treatment facility are replaced with engineered biodigesters then the sum of methane generated from eligible wastewater treat in the

engineered biodigesters will be an overestimate of the amount of methane that would have been produced in the baseline scenario. A conservative adjustment factor of 0.75 is established for engineered biodigesters, based on a review of the literature available on the differences in methane generation compared to uncovered lagoons undertaken when the Determination was made.

An adjustment factor of 1 is to be used for covered lagoons. While covered lagoons may produce more methane when compared to a deep open anaerobic lagoon, this difference is small and is considered immaterial. The effect of paragraphs 25(a) and 25(b) are that an adjustment factor equal to 1 can only be used if all anaerobic digesters installed as part of the project at the project treatment facility are covered lagoons.

Section 26 Proportion of methane that is generated by eligible wastewater

Section 26 sets out how the proportion of methane that is generated by eligible wastewater is to be worked out and materially serves the same function as section 26 of the Determination as in force prior to the making of the Variation, with minor modifications to incorporate the concept of a ***project treatment facility***. For further explanation of the operation of this provision, see the Explanatory Statement that accompanied the Determination that first included the provision.

Section 27 Methane generated by eligible wastewater

Section 27 sets out how the quantity of methane generated by eligible wastewater is to be worked out and materially serves the same function as section 27 of the Determination as in force prior to the making of the Variation, with minor modifications to incorporate the concept of a ***project treatment facility***. For further explanation of the operation of this provision, see the Explanatory Statement that accompanied the Determination that first included the provision.

Section 28 Methane generated by ineligible material

Section 28 sets out how the quantity of methane generated by ineligible material is to be worked out and materially serves the same function as section 28 of the Determination as in force prior to the making of the Variation, with minor modifications to incorporate the concept of a ***project treatment facility***. For further explanation of the operation of this provision, see the Explanatory Statement that accompanied the Determination that first included the provision.

Section 29 Maximum methane-producing capacities

Section 29 sets out how the maximum methane-producing capacity of a material is to be worked out and materially serves the same function as section 29 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.

Section 30 Methane send to combustion device or biogas upgrading system

Section 30 is equivalent to the former Section 30 modified to incorporate the concept of a project treatment facility and introduce the biogas generation for biomethane project activity, which involves the sending of biogas generated from the treatment for eligible wastewater to a biogas upgrading system.

Section 30 sets out three approaches to calculate the methane sent from a project treatment facility to a combustion device or biogas upgrading system during a reporting period, $M_{Sent\ t,h}$.

Subsection 30(1) sets out the application of these approaches based on whether methane is sent to a combustion device or biogas upgrading system, and the type of combustion device.

Subsection 30(2) provides for **equation 9**, which can be used to calculated $M_{Sent\ t,h}$ for any type of combustion device or biogas upgrading system. Equation 9 calculates $M_{Sent\ t,h}$ as the volume of biogas sent from the project treatment facility to the combustion device or biogas upgrading system ($Q_{BG,t,h}$) multiplied by the proportion of that biogas that is methane ($W_{BG,CH4,h}$).

Subsection 30(2A) is a new section that provides for **equation 9A**, which can be used to calculate $M_{Sent\ t,h}$ if methane is being sent to a biogas upgrading system. Equation 9A calculates $M_{Sent\ t,h}$ as the total volume of biomethane sent out from the biogas upgrading system ($Q_{BM,t,h}$) multiplied by the proportion of that biogas that is methane ($W_{BM,CH4,h}$). Measuring the total volume of biomethane sent out from the biogas upgrading system is required to calculate the net displacement abatement generated from undertaking the biomethane production project activity. As such, equation 9A provides proponents of projects that also involve the biogas generation for biomethane project activity the flexibility to streamline measurement by removing the need for proponents to also measure the volume of biogas sent from the project treatment facility to the biogas upgrading system. For conservativeness, equation 9A does not account for any production or transport losses from the sending of methane to biogas upgrading systems.

Subsection 30(2B) is a new subsection setting out the circumstances when equation 9A cannot be used to calculate $M_{Sent\ t,h}$. The note under subsection 30(2B) clarifies that use of equation 9A is restricted in these circumstances because equation 9A does not include a mechanism to attribute biomethane sent out by a biogas upgrading system as being produced from biogas received from a specific project treatment facility.

Subsection 30(3) provides for **equation 10**, which can be used to calculate $M_{Sent\ t,h}$ for a combustion device that is an internal combustion engine. Equation 10 calculates $M_{Sent\ t,h}$ based on the electricity generated from combusting the biogas sent from the project treatment facility in the internal combustion engine.

Subdivision 6 – Project treatment facility project emissions

Subdivision 6 is a new section equivalent to the former Division 4 modified to incorporate the concept of a project treatment facility and new project emissions that arise from undertaking the biogas generation for biomethane project activity.

Section 31 Summary

Section 31 is a modified version of the former Section 31 summarising the method for calculating the emissions that result from operating a project treatment facility during the reporting period (the 'project emissions' for the project treatment facility for a reporting period).

Section 32 Project treatment facility project emissions

Section 32 is equivalent to the former Section 32 modified to incorporate the concept of a project treatment facility and the biogas generation for biomethane project activity that involves the sending of biogas to biogas upgrading systems.

Section 32(1) provides for **Equation 11**, which is used to calculate the figure $\boldsymbol{E_{P,conversion,t}}$, which is used in equation 1. The figure $\boldsymbol{E_{P,conversion,t}}$ is the project emissions for a project treatment facility for a reporting period. Equation 11 calculates $\boldsymbol{E_{P,conversion,t}}$ as the sum of emissions from:

- fuel use ($\boldsymbol{E_{F,conversion,t}}$) and electricity use ($\boldsymbol{E_{EP,conversion,t}}$)
- anaerobic digester leakage and venting events ($\boldsymbol{E_{AD,t}}$)
- methane destroyed by combustion devices or taken to have been destroyed by biogas upgrading systems ($\boldsymbol{E_{Com,t}}$)
- production and transport losses from methane sent to biogas upgrading systems ($\boldsymbol{E_{Upgrade,t}}$)
- digestate treatment ($\boldsymbol{E_{Dig,t}}$).

Subsection 32(2) is a new subsection clarifying that for the purposes of working out emissions from fuel use and electricity use for a project treatment facility, all emissions associated with biogas upgrading should be disregarded. This includes the case where biogas upgrading occurs at a project treatment facility. Project emissions from fuel and electricity used in biogas upgrading systems is accounted for when working out net displacement abatement in Division 3 of Part 4.

Section 33 Emissions from fuel use: conversion abatement

Section 33 sets out how the emissions from fuel use for conversion abatement activities are to be worked out and materially serves the same function as section 33 of the Determination as in force prior to the making of the Variation, with minor modifications to incorporate the concept of a ***project treatment facility***. For further explanation of the operation of this

provision, see the Explanatory Statement that accompanied the Determination that first included the provision.

Section 34 Emissions from purchased electricity: conversion abatement

Section 34 is equivalent to the former Section 34 modified to incorporate the concept of a project treatment facility and require that emissions from purchased electricity used during a reporting period be calculated using the value of electricity emissions factors current at the end of the reporting period.

Subsection 34(1) provides for **equation 13**, which is used to calculate the figure $\boldsymbol{E_{EP,conversion,t}}$ for use in equation 11. Equation 11 calculates $\boldsymbol{E_{EP,conversion,t}}$ by multiplying the amount of purchased electricity used at the project treatment facility during the reporting period by the relevant electricity emissions factor for the purchased electricity.

Paragraph 34(1)(a) provides that if the electricity covered by $\boldsymbol{Q_{EP,t}}$ is obtained from a grid that is covered by the National Greenhouse Accounts (NGA) Factors document for the purposes of the ERF, then the value of $\boldsymbol{EF_{EP}}$ to be used in equation 13 is the grid factor specified in the version of that document that is current at the end of the reporting period for the project.

Paragraph 34(1)(b) provides that if the electricity covered by $\boldsymbol{Q_{EP,t}}$ is obtained from a grid that is not covered by the NGA Factors document, or is obtained from a source other than an electricity grid, and if the supplier of the electricity is able to provide an emissions factor that reflects the emissions intensity of the electricity, then that emissions factor must be used as the value of $\boldsymbol{EF_{EP}}$ in equation 13. However, if the supplier of the electricity is not able to provide an emissions factor that reflects the emissions intensity of the electricity, then the value of $\boldsymbol{EF_{EP}}$ to be used in equation 13 is the factor for off-grid electricity included in the version of the NGA Factors document that is current at the end of the reporting period.

Subsection 34(2) further clarifies that under the circumstance provided for by subparagraph 34(1)(b)(i), the emissions factor must be worked out on a sent-out basis and using a measurement or estimation approach that is consistent with the *NGER (Measurement) Determination*.

In subsection 34(2), ‘on a sent-out basis’ refers to the electricity supplied to a grid, market or the end user of the electricity, as opposed to the electricity as measured at the point of generation. Sent-out electricity excludes the electricity used by the generator itself, often referred to as auxiliary loads. This requirement will ensure that the calculation of the emissions factor accounts for transmission losses but not the electricity used by the generator itself.

Regardless of whether the emissions factor is a grid, off-grid or supplier-provided factor, the value of the factor current at the end of the reporting period is to be used.

Section 35 Emissions from anaerobic digester leakage or venting events

Section 35 sets out how the emissions from anaerobic digester leakage or venting events are to be worked out and materially serves the same function as section 35 of the Determination as in force prior to the making of the Variation, with minor modifications to incorporate the concepts of a project treatment facility and biogas upgrading system, and changes to Subdivision titles implemented by the Variation. For further explanation of the operation of this provision, see the Explanatory Statement that accompanied the Determination that first included the provision.

Section 36 Volume of methane vented due to a major venting event

Section 36 is equivalent to the former Section 36 modified to incorporate the concepts of a project treatment facility and biogas upgrading system.

Section 36 provides for **equation 15**, which is used to calculate the figure $\boldsymbol{M_{Vent,q}}$ for use in **equation 14**. The figure $\boldsymbol{M_{Vent,q}}$ is the volume of methane vented due to a major venting event that occurs during the reporting period and is calculated by adding the maximum biogas storage capacity of the associated anaerobic digester to the volume of biogas through the flow of biogas from the anaerobic digester during the venting event, given by average daily flow of biogas multiplied by the number of days over which the venting occurs. This amount of biogas is then multiplied by the average proportion of the volume of the biogas that is methane.

Section 37 Emissions from combustion of biogas

Section 37 is equivalent to the former Section 37 modified to incorporate the concepts of a project treatment facility and the biogas generation for biomethane project activity that involves the sending of biogas upgrading systems.

Section 37 provides for **equation 16**, which is used to calculated the figure $\boldsymbol{E_{Com,t}}$ for use in **equation 11**. The figure $\boldsymbol{E_{Com,t}}$ is the methane combustion emissions from methane destroyed by combustion devices or taken to have been destroyed by biogas upgrading systems for a project treatment facility during a reporting period. Equation 16 calculates $\boldsymbol{E_{Com,t}}$ as the volume of methane sent to a combustion device or biogas upgrading system scaled for any transport or production losses, multiplied by the energy content factor and emissions factors for sludge biogas. The summation sums over all combustion devices or biogas upgrading systems to which biogas is sent.

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 37A. 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. If methane is sent to a combustion device the value of $\boldsymbol{PL_h}$ will be zero (see section 37A).

The transport loss factor, $\boldsymbol{TL_h}$, identifies the percentage of gas lost during transport, prior to combustion.

For biogas sent to a combustion device, or biogas upgraded into biomethane where the biomethane is used on-site, this factor is assumed to be zero as transport losses are taken to be negligible.

For biogas 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 NGA Factors 2021 document. 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.

Proponents are not required to account for the carbon dioxide emissions that arise from the destruction of the methane because those carbon dioxide emissions are biogenic in origin. Proponents are only required to account for the methane and nitrous oxide emissions.

Section 37A Biomethane production loss factor

Section 37A is a new section that sets out how to work out the biomethane production loss factor ($\boldsymbol{PL_h}$).

Subsection 37A(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 37. For biogas upgrading systems, the biomethane production loss factor is worked out in accordance with subsection 37A(2).

Subsection 37A(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. The factor may be 'determined' if the manufacturer sets out values representing the proportion of gas lost during the upgrade process when using a particular device. Otherwise, the factor must be 'measured' in accordance with the technical manual for the system.

Subsection 37A(3) specifies that, for paragraph 37A(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.

Section 37B Production and transport emissions from methane sent to biogas upgrading system

Section 37B is a new section that provides for **equation 16A,** which is used to calculate the figure $\boldsymbol{E_{Upgrade,t}}$ for use in equation 11. The figure $\boldsymbol{E_{Upgrade,t}}$ is the production and transport emissions from methane sent to biogas upgrading systems at a project treatment facility during a reporting period. If a project treatment facility does not send methane to biogas upgrading systems during a reporting period, $\boldsymbol{E_{Upgrade,\,t}}$ will be zero.

Equation 16A calculates $E_{Upgrade,t}$ as the volume of methane sent to the a biogas upgrading system a project treatment facility ($M_{Sent,h}$) multiplied by the percentage of biogas that is lost during the biogas upgrading process and during transport, prior to combustion. Equation 16A sums this amount over all biogas upgrading systems at the project treatment facility and multiplies by conversion factor.

The biomethane production loss factor, PL_h, identifies the percentage of gas lost during the biogas upgrading process, worked out in accordance with section 37A. The factor $1\text{-}PL_h$ gives the percentage of gas that is not lost during the biogas upgrading process. The transport loss factor, TL_h, identifies the percentage of gas lost during transport, prior to combustion. The factor $1\text{-}TL_h$ gives the percentage of gas that is not lost during transport. Therefore, the factor $1 - ((1 - PL_h) \times (1 - TL_h))$ gives the percentage of biogas that *is* lost through biogas upgrading and during transport.

Section 38 Emissions from the end management of digestate

Section 38 sets out how the emissions from the end management of digestate are to be worked out and materially serves the same function as section 38 of the Determination as in force prior to the making of the Variation, with minor modifications to incorporate the concept of a ***project treatment facility***. For further explanation of the operation of this provision, see the Explanatory Statement that accompanied the Determination that first included the provision.

Section 39 Digestate emissions – aerobic treatment

Section 39 sets out how the emissions from aerobic treatment of digestate are to be worked out and materially serves the same function as section 39 of the Determination as in force prior to the making of the Variation, with minor modifications to incorporate the concept of a ***project treatment facility***. For further explanation of the operation of this provision, see the Explanatory Statement that accompanied the Determination that first included the provision.

Section 40 Digestate emissions – disposed to landfill

Section 40 sets out how the emissions from digestate disposed to landfill are to be worked out and materially serves the same function as section 40 of the Determination as in force prior to the making of the Variation, with minor modifications to incorporate the concept of a ***project treatment facility***. For further explanation of the operation of this provision, see the Explanatory Statement that accompanied the Determination that first included the provision.

Section 41 Digestate emissions – treated in open lagoon

Section 41 is equivalent to the former Section 41 modified to incorporate the concept of a project treatment facility and the scenario where digestate from a project treatment facility is treated in multiple open lagoons.

Section 41 provides for **equation 20** which is used to calculate the emissions from a project treatment facility that is treated in open lagoons ($E_{Dig,t,Lag}$). Equation 20 calculates $E_{Dig,t,Lag}$ as

the product of the volatile solid content of the digestate sent to an open lagoon, the maximum methane-producing capacity of the sent digestate and the methane correction factor for the open lagoon. This amount is summed for all open lagoons to which volatile solids are discharged from the project treatment facility and multiplied by the global warming potential for methane.

Division 3—Working out displacement abatement

Division 3 is a new division that provides for calculating the displacement abatement attributable to biomethane production.

Subdivision 1—Overview of gases

Section 41A Overview of gases accounted for in displacement abatement calculations

Section 41A 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 41B Summary

Section 41B provides an overview of how net displacement abatement is worked out.

Section 41C Net displacement abatement amount

Subsection 42C(1) provides for **equation 21**, which calculates the net displacement abatement amount attributable to biomethane production ($A_{displacement}$) as the sum of the net abatement amount.

Subsection 41C(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 the project biomethane facility is taken to be zero for the reporting period.

Section 41D Project biomethane facility net abatement amount

Section 41D provides for **equation 22**, which calculates the net abatement amount for each project biomethane facility ($A_{displacement, m}$) in tonnes CO_2-e as the gross displacement abatement for the facility ($GA_{displacement, m}$) multiplied by the eligible abatement fraction for the facility (EA_m), from which the project emissions for the facility ($PE_{displacement, m}$) are subtracted.

Section 41E Certain abatement must not be included in calculating net displacement abatement amount

Subsection 41E(1) specifies that for the purposes of working out $A_{displacement}$ using equation 22, 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*** in an emissions avoidance offsets project within the meaning of the Act.

Subsection 41E(2) specifies that a fuel switching emissions reduction activity means the changing of energy sources in a way that results in eligible carbon abatement. Paragraphs 41E(2)(a) to 41E(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 41E(2)(a) to 41E(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 41E(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 41E prevents a project biomethane facility's displacement abatement from contributing to a project's net abatement amount 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 41F Summary

Section 41F 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 41G Gross abatement amount for a project biomethane facility

Section 41G provides for **equation 23**, which is used to calculate the gross abatement amount for a project biomethane facility ($GA_{displacement,m}$) for use in equation 22. Equation 23 calculates $GA_{displacement,m}$ as the total quantity of biomethane sent out by biogas upgrading systems that are part of the project biomethane facility ($Q_{BM,h}$) multiplied by both the energy content factor for pipeline natural gas (EC_{NG}) and the carbon dioxide combustion emissions factor for pipeline natural gas ($EF_{NG,CO2}$). Both factors are based on values in the *NGER (Measurement) Determination 2008*.

Equation 23 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 $Q_{BM, h}$ by the natural gas energy content and emissions factors, as if that volume of gas were pipeline natural gas.

The note to section 41G 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 ($EF_{NG, CO2}$) is used when working out displacement abatement.

Subdivision 4–Eligible abatement fraction

Section 41H Summary

Section 41H provides an overview of how the eligible abatement fraction for a project biomethane facility for a reporting period (EA_m) is worked out for use in equation 22. 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% of a project biomethane facility's biogas comes from ineligible sources, the eligible abatement fraction for that project biomethane facility will be 70%.

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 this Subdivision.

Section 41I Eligible abatement fraction for a project biomethane facility

Section 41I provides for **equation 24**, which sets out that the eligible abatement fraction for a project biomethane facility (EA_m) 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 41J Determining the quantity of eligible biogas from a biogas source ($Q_{BG, El, g}$)

Paragraph 41J(1)(a) specifies that the volume of eligible biogas sent to a project biomethane facility from a biogas source facility during a reporting period ($Q_{BG, El, g}$) is to be worked out by, if possible, measurement of $Q_{BG, El, g}$ in accordance with the monitoring requirements.

If it is not possible to measure $Q_{BG, El, g}$ in this way, paragraph 41J(1)(b) specifies that $Q_{BG, El, g}$ is to be worked out in accordance with subsection 41J(2) instead.

The note after subsection 41J(1) clarifies that measurement of $Q_{BG, El, g}$ 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 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 41J(2) instead.

Subsection 41J(2) provides for **equation 25** which sets out how $Q_{BG, El, g}$ is to be worked out in the circumstances provided for by 41J(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 41J(3) specifies how EB_g is to be worked out for a biogas source facility during a reporting period. Paragraph 41J(3)(a) species 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,
- 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 41J(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 41J(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 42B, Item 6 that 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 41J(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.

Subsection 41J(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 (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 (2) uses an estimate for EB_g that cannot be reasonably expected to be accurate and conservative.

Subdivision 5 – Displacement abatement project emissions

Section 41K Summary

Section 41K provides an overview of how project emissions for displacement abatement are worked out in Subdivision 5. Project emissions are worked out for each project biomethane facility that undertakes biomethane production during the reporting period.

Section 41L Project emissions: displacement abatement

Subsection 41L(1) provides for **equation 26**, which sets out how to calculate project emissions for a project biomethane facility for a reporting period ($PE_{displacement, m}$). They are the sum of emissions from fuel consumption ($E_{F, displacement, m}$) and emissions from the consumption of purchased electricity ($E_{PE, displacement, m}$) attributable to the operation of the project biomethane facility and transport of biomethane produced by that facility during the reporting period.

Subsection 41L(2) specifies that in working out $E_{F, displacement, m}$ and $E_{PE, displacement, m}$, fuel and purchased electricity used in biogas generation for biomethane and emissions destruction activities are to be disregarded, as these emissions are accounted for in a project's net conversion abatement under Division 2 of Part 4 and including them here would result in a double count.

A note to subsection 41L(2) provides examples of emissions to be disregarded may include fuel and electricity consumed by anaerobic digesters or waste processing equipment. Subsection 41L(2) may be relevant if a facility is both a project treatment facility undertaking biogas generation for biomethane or emissions destruction, and 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 41M Emissions from fuel use: displacement abatement

Subsection 41M(1) provides for **equation 27**, which is used to calculate the 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, $Q_{F, displacement, m, i}$, 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 gigajoules as a common measure of energy.

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

Subsection 41M(2) provides that if fuel is used by the project biomethane facility or equipment used to transport biomethane in performing a function that was also performed before the implementation of the project, the fuel use attributable to $Q_{F, displacement, m, i}$ 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 $Q_{F, displacement, m, i}$. If road transport of biomethane is employed, fuel consumed by trucks or other vehicles would need to be accounted for in the section unless the project proponent can demonstrate that these transport functions were already occurring in the absence of the project.

Section 41N Emissions from purchased electricity use: displacement abatement

Subsection 41N(1) provides for **equation 28**, which is used to calculate the emissions from purchased electricity that is used by a project biomethane facility during a reporting period ($E_{PE,displacement,m}$). Equation 21 multiplies the amount of purchased electricity that is specifically attributable to the operation of the project biomethane facility during the reporting period, $Q_{PE, displacement, m}$, by $EF_{PE, displacement, m}$, the emissions factor for electricity obtained from the electricity grid.

Paragraph 41N(1)(a) provides that if the electricity covered by $Q_{PE, displacement, m}$ is obtained from a grid that is covered by the NGA Factors document for the purposes of the ERF, then the value of $EF_{PE, displacement, m}$ to be used in equation 28 is the grid factor specified in the version of that document that is current at the end of the reporting period for the project.

Paragraph 41N(1)(b) provides that if the electricity covered by $Q_{PE, displacement, m}$ is obtained from a grid that is not covered by the NGA Factors document or is obtained from a source other than an electricity grid, and if the supplier of the electricity is able to provide an emissions factor that reflects the emissions intensity of the electricity, then that emissions factor must be used as the value of $EF_{PE, displacement, m}$ in equation 28. However, if the supplier of the electricity is not able to provide an emissions factor that reflects the emissions intensity of the electricity, then the value of $EF_{PE, displacement, m}$ to be used in equation 28 is the factor for off-grid electricity included in the version of the NGA Factors document that is current at the end of the reporting period.

Subsection 41N(2) further clarifies that under the circumstance provided for by subparagraph 41N(1)(b)(i), the emissions factor must be worked out on a sent-out basis and using a measurement or estimation approach that is consistent with the *NGER (Measurement) Determination*.

In subsection 41N(2), 'on a sent-out basis' refers to the electricity supplied to a grid, market or the end user of the electricity, as opposed to the electricity as measured at the point of generation. Sent-out electricity excludes the electricity used by the generator itself, often referred to as auxiliary loads. This requirement will ensure that the calculation of the emissions factor accounts for transmission losses but not the electricity used by the generator itself.

Regardless of whether the emissions factor is a grid, off-grid or supplier-provided factor, the value of the factor current at the end of the reporting period is to be used.

6 After section 42

Item 6 inserts 3 new sections, sections 42A, 42B and 42C, that set 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 treatment facilities, so provisions relating to project treatment facility information to be reported on will not apply. Similarly, non-biomethane projects will not report on information relating to biogas generation for biomethane or biomethane production.

Section 42A Information that must be included in offsets report

Paragraph 42A(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 42A(b) provides that offsets reports must include a list of project activities that were carried out at each project treatment facility and project biomethane facility during the reporting period.

Subparagraphs 42A(b)(i) and 42A(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 42A(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 42A(d) provides additional reporting requirements for biomethane conversion and displacement projects.

Subparagraph 42A(d)(i) specifies that if such a project carried out emissions destruction during the project's crediting period or periods, the total number of calendar months that emissions destruction has been carried out since the start of the project's crediting period.

The note to that subparagraph clarifies that emissions destruction is taken to have occurred during a calendar month if it occurred during 3 or more days in that month, the months do not need to be consecutive, and that after emissions destruction commences, they are presumed to continue unless evidence is provided to the contrary.

Subparagraph 42A(e)(ii) specifies that if during the reporting period of such a project emissions destruction is not considered to have been carried out during one or more months in accordance with subsection 11D(4) (see Item 4), the calendar months that are considered to be excluded must be specified in the offsets report. This information is relevant for ensuring biomethane conversion and displacement projects have not exceeded the 84-month limit on emissions destruction set out in Division 6 of Part 3 (see Item 4).

Paragraph 42A(e) provides that if biogas generation for biomethane has been 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. The note to that 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 42A(f) provides additional reporting requirements for projects that undertake biomethane production.

Subparagraph 42A(f)(i) specifies that details on the source of any biogas treated by biomethane production must be provided, including the biogas source facility, and information on whether that biogas is eligible biogas.

Subparagraph 42A(f)(ii) specifies that details about the biogas upgrading systems used in the project must be supplied.

Subparagraph 42A(f)(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 42A(f)(iv) requires details about the measurement of produced biomethane volumes, including how the gas flow is measured and at which point the measurements are taken, to be supplied.

Subparagraph 42A(f)(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 42B Information about net abatement calculations that must be included in offsets report

Section 42B 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 the section.

Paragraph 42B(a) requires the output of each equation used to calculate net abatement for a reporting period to be provided.

Paragraph 42B(b) requires that if the project involves biogas generation 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 37A (see Item 5).

Paragraph 42B(c) specifies that projects that undertake biomethane production must provide information about displacement net abatement calculations made under Division 3 of Part 4 of the Determination (see Item 5). Specific information that must be included in an offsets report for these projects include:

- the volumes and methane concentrations of produced biomethane (subparagraph 42B(c)(i)),
- the volumes and eligible abatement fractions of biogas treated by project biomethane facilities (subparagraph 42B(c)(ii)), and
- information about displacement abatement project emissions (subparagraph 42B(c)(iii)).

Subparagraph 42B(c)(iv) specifies that if the volume of eligible biogas, $\boldsymbol{Q_{BG,\,El,\,g}}$, is determined in accordance with subsection 41J(2) (see Item 5) 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 42B(c)(iv)(A) specifies that 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 42B(c)(iv)(B) requires evidence or data used to calculate $\boldsymbol{EB_g}$ to be provided.

Sub-subparagraph 42B(c)(iv)(C) requires a signed declaration from the person that estimated $\boldsymbol{EB_g}$ that the factor is accurate and conservative.

Section 42C Details of certain changes to a project must be included in offsets report

Section 42C 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 42C(a) requires the addition of a new project treatment facility or changes to existing project treatment facilities to be detailed.

Paragraph 42C(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 42C(c) requires details about new biogas upgrading systems or changes to existing biogas upgrading systems to be included.

Paragraph 42C(d) requires that if a new source of eligible wastewater is being treated as part of the project, information on that eligible wastewater must be provided.

Paragraph 42C(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 8H or 9I (see Item 4) must be detailed.

7 After Division 1 of Part 5

Item 7 inserts a new division, Division 1A that sets out record-keeping requirements for wastewater projects.

Division 1A–Record-keeping requirements

Section 43A Operation of this Division

The new section 43A provides that, in accordance with paragraph 106(3)(c) of the Act, Division 1A sets out the record-keeping requirements for an industrial and commercial emissions reduction project that is an eligible offsets project.

Section 43B Records about biogas sent to a project

Section 43B sets out information about biogas sent to a project for biogas upgrading that must be kept as a record, including information relating to volumes (paragraph 43B(a)), the biogas source facilities (paragraph 43B(c)), and how the eligible abatement fraction for the biogas was determined (paragraph 43B(d)).

Section 43C Records about biomethane produced

Section 43C specifies that the intended end use of biomethane produced by the project must be kept as a record.

8 Section 45

Item 8 repeals the former section 45 and inserts a new section 45 the sets out how certain parameters are required to be monitored.

Section 45 Requirement to monitor certain parameters

Subsection 45(1) specifies that the project proponent must monitor parameters relating to the calculation of net abatement amounts for a wastewater project in accordance with the operation of this section.

The monitoring requirements are listed in the table in subsection 45(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 (see Item 5).

The fourth column is the measurement procedure, which is usually a reference to a division in the *NGER (Measurement) Determination 2008* 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 45(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 45(2A) specifies accuracy requirements for equipment used to measure biogas and biomethane pressures.

Subsection 45(3) specifies the meaning of various indexes used in the section.

9 Section 46

Item 9 repeals the former section 46 and inserts a new section that sets out the how the value of certain parameters may be estimated if the project proponent fails to monitor them.

Section 46 Value of certain parameters may be estimated if project proponent fails to monitor them

Subsection 46(1) specifies that the section applies to a period in which the project proponent does not monitor a parameter specified in column 2 of the table to subsection 46(1A) in accordance with the monitoring requirements in section 45 (see Item 8). This period is known as the ***non-monitored period***.

Subsection 46(1A) sets out that in the event of a non-monitored period for a parameter, the value of the parameter for the purpose of working out the carbon dioxide equivalent net abatement amount for the reporting period is to be determined for the non-monitored period in accordance with the approach specified in column 3 of the table to subsection 46(1A).

Subsection 46(1B) specifies that the project proponent must take efforts to minimise the non-monitored period for a project.

Subsection 46(2) further clarifies that despite these actions being taken to provide a conservative estimate for a parameter that failed to meet its monitoring requirements, the Regulator may still take action under the Act, or regulations or rules made under the Act, in relation to the project proponent's failure to monitor a parameter in accordance with the Determination.

The first example as to when the Regulator may take action, is when the failure constitutes a breach of a civil penalty provision in section 194 of the Act, which deals with project monitoring requirements. In this situation, the Regulator may apply for a civil penalty order in respect of the breach.

The second example as to when the Regulator may take action, is when the project proponent provides false or misleading information to the Regulator in relation to the failure to meet the monitoring requirements. In this situation, the Regulator may revoke the project's section 27 declaration under regulations or rules made for the purposes of section 38 of the Act.

The third example as to when the Regulator may take action, is when the project proponent provides false or misleading information to the Regulator that resulted in the issue of ACCUs. In this situation, the Regulator may require all or some of those units to be relinquished under section 88 of the Act.

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—Domestic, Commercial and Industrial Wastewater) 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—Domestic, Commercial and Industrial Wastewater) Methodology Determination Variation 2022* (the Variation) amends the *Carbon Credits (Carbon Farming Initiative—Domestic, Commercial and Industrial Wastewater) Methodology Determination 2015* (the Determination).

The Variation facilitates new activities under the Emissions Reduction Fund through projects that generate abatement by capturing and refining waste biogas generated through wastewater treatment 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 and displacement abatement.

Project proponents wishing to implement the Determination as varied by the Variation must apply to the Clean Energy Regulator (the 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.