



Australian Government
Clean Energy Regulator

**EMISSIONS
REDUCTION
FUND**

Biomethane Method Package 2022 – Simple Method Guide

User Guide for Biomethane Projects

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Participating in the Emissions Reduction Fund

The Emissions Reduction Fund (ERF) offers landholders, communities, and businesses the opportunity to run new projects in Australia that reduce or remove greenhouse gas emissions from the atmosphere.

By running a project, you can earn Australian carbon credit units (ACCUs) and sell them to the Australian Government or to companies, State governments and other private buyers. Each carbon credit represents one tonne of carbon dioxide equivalent (CO₂-e) emissions stored or avoided.

How participating in the Emissions Reduction Fund works

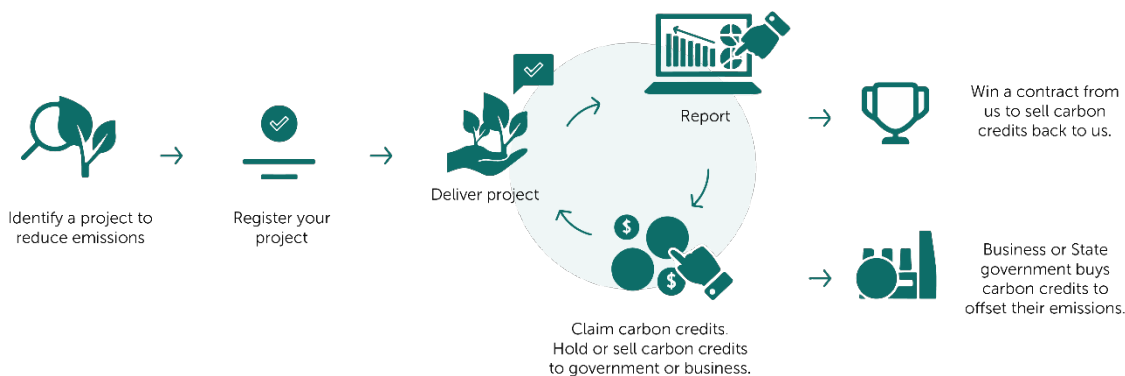


Figure 1: Emissions Reduction Fund project lifecycle

There are four general steps in running a project and participating in the ERF



Plan your project, make sure the project is eligible, and ensure you hold legal right.



Register your project with the ERF.



Run your project and deliver on project activities.



Report on your project and claim ACCUs.

See our website¹ for more information on selling your ACCUs to the Australian Government or other interested buyers.

ERF biomethane projects

Decomposing organic matter in anaerobic (oxygen-free) environments produces a mix of methane, carbon dioxide (CO₂) and other gases that are collectively known as biogas. The methane component of biogas can be refined into a substitute for (fossil fuel) natural gas called biomethane through a process known as 'biogas upgrading'. Biomethane may then be used on-site or injected into the gas network.

What is biomethane?



Biomethane is a gas comprised almost entirely of methane – the same molecule that makes up natural gas. It can be used as a natural gas substitute. Biomethane is produced from biogas, which itself is derived from biogenic sources such as organic solid waste or wastewater. Combusting biomethane releases the carbon absorbed by the biogenic material from the atmosphere during its life, and on this basis biomethane 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.²

'Upgrading' is the process of refining biogas into biomethane. It involves treating biogas to remove impurities such as water, CO₂, and other remnant gases, resulting in a near-pure methane product (≥95% methane concentration). A range of upgrading technologies are commercially available, varying by treatment technology, capital and operation costs, and scalability.

¹ Clean Energy Regulator, 2021, Bidding at auction, <http://www.cleanenergyregulator.gov.au/ERF/Want-to-participate-in-the-Emissions-Reduction-Fund/Step-2-Contracts-and-auctions/bidding-at-an-auction>

² Intergovernmental Panel on Climate Change, 2006 IPCC Guidelines for National Greenhouse Gas Inventories, Volume 2: Energy, [Publications - IPCC-TFI \(iges.or.jp\)](http://www.iges.or.jp/public/2006gl/vol2/); Intergovernmental Panel on Climate Change 2006 IPCC Guidelines for National Greenhouse Gas Inventories, Volume 5: Waste Sector, [Publications - IPCC-TFI \(iges.or.jp\)](http://www.iges.or.jp/public/2006gl/vol5/)

An ERF biomethane project involves two main activities:

1. **Biogas generation**, which involves generating and capturing biogas from waste at facilities such as landfills, wastewater treatment or animal effluent treatment plants, and transporting the biogas to be upgraded into biomethane.
2. **Biomethane production**, which involves receiving and upgrading waste biogas to produce biomethane that is used in a manner where it can reasonably be expected to be combusted within Australia (for example, it is injected into a gas distribution pipeline or burned on-site for heat).

An ERF biomethane project can earn ACCUs by undertaking these activities to produce biomethane and generate abatement. Projects that undertake these activities are collectively referred to as 'biomethane projects' in this document.

The Biomethane method package

The biomethane method package builds on the framework of existing ERF waste methods:

- **Landfill gas (electricity generation)** method, which covers ERF projects that aim to reduce emissions of greenhouse gases by collecting and combusting landfill gas from a landfill.
- **Wastewater treatment** method, which covers ERF projects that install anaerobic digesters to replace open anaerobic lagoons in the treatment of domestic, commercial, or industrial wastewater.
- **Animal effluent** method, which covers ERF projects that treat animal effluent from piggeries, dairies, or other organic wastes that would otherwise have been treated in an anerobic pond.

Under the current ERF waste methods, methane from waste can either be flared or combusted in an engine to generate electricity. The biomethane method package adds biogas generation and biomethane production as new eligible project activities across the ERF waste methods mentioned above, expanding opportunities for the waste sector to participate in the scheme.

The Alternative waste treatment and Source separated organic waste methods will be varied in 2022 to add biogas generation and biomethane production.

Biomethane commercial considerations



The decision to capture and inject or use biomethane is a commercial decision made on a case-by-case basis. There will be a range of factors that will influence the economics of biomethane production compared to electricity generation activities, including the relative prices of gas and electricity as well as revenue from ACCUs and renewable electricity certificates.

Appendix 1 lists the waste feedstocks eligible for biomethane creation under the above methods.

Agricultural waste feedstocks

Each waste method in the biomethane method package specifies the types of wastes eligible to be treated under those methods. Many types of agricultural waste, such as harvested crop waste or sugarcane trash, are generally not eligible under these methods³.



In 2021, the Clean Energy Regulator engaged the Queensland University of Technology (QUT) to review the viability of including of agricultural wastes as a biomethane production feedstock under an ERF method. The report identified that while many agricultural wastes could be diverted to produce biomethane, emissions impacts associated with diversion of these wastes – for example, decreased soil carbon from removal of crop waste from land – were likely to be significant for many waste types.

QUT concluded that further research on these effects, known as ‘leakage’ effects, would be required to accurately model their impact on net abatement in an ERF method. As such, agricultural wastes were not included in the scope of the 2021 proposed biomethane method package.

In October 2021, the Minister for Industry, Energy and Emissions Reductions announced further research into using agricultural wastes as potential feedstocks to support an enhanced biomethane method⁴.

Carbon abatement from biomethane projects

When an ERF biomethane project captures biogas from waste and turns it into biomethane that is used as a natural gas substitute, 2 different types of carbon abatement are generated. They are known as **conversion abatement** and **displacement abatement**.

- **Conversion abatement** – in the business-as-usual scenario, the methane in biogas emitted from decomposing waste escapes into the atmosphere. This is a significant source of emissions because methane’s global warming potential is 28 times that of carbon dioxide. Capturing and combusting biogas converts the methane to carbon dioxide and reduces emissions generating carbon abatement. This type of abatement is termed ‘conversion abatement’. An example of a conversion activity is combusting biomethane in a boiler to generate heat.

³Some agricultural wastes can be eligible under the animal effluent method in specific circumstances, for example, the wastes will need to have been treated in an open anaerobic pond in the absence of an ERF project.

⁴ Minister for Industry, Energy and Emissions Reduction, New ERF method and 2022 priorities announced, Media Release, 1 October 2021, <https://www.minister.industry.gov.au/ministers/taylor/media-releases/new-erf-method-and-2022-priorities-announced>

- **Displacement abatement** – combustion of biomethane as a natural gas substitute, for example, when biomethane is injected into the gas network or burned for heat or power, displaces an equal volume of natural gas consumption. Emissions from biomethane combustion are negligible because it is of biogenic origin and considered to have net-zero emissions. By comparison, combustion of natural gas emits 51.5 kilograms of CO₂-e per gigajoule⁵. Displacing natural gas with biomethane therefore results in carbon abatement, termed ‘displacement abatement’.

Biomethane project activities

An ERF biomethane project can create both conversion and displacement abatement by producing biomethane. Each method in the proposed biomethane method package will be varied to incorporate 2 types of project activity, one for each type of abatement.

Table 1: Biomethane project activities

Project activity	Activity description	Abatement credited
Biogas generation for biomethane	This activity involves capturing methane emissions from eligible waste either in an anaerobic digester or from landfill, and transporting that biogas to a ‘biogas upgrading system’ to be upgraded into biomethane under the biomethane production activity.	Conversion abatement
Biomethane production	This activity involves receiving biogas generated from eligible waste sources and upgrading the biogas to produce biomethane using a ‘biogas upgrading system’. The biomethane must then be sent to an end use where it is expected to displaced natural gas that would be combusted within Australia, creating displacement abatement.	Displacement abatement

A project that involves biogas generation for biomethane must also involve biomethane production to ensure the biogas is turned into biomethane. Biogas upgraded into biomethane must be sent to an end use where it is combusted resulting in conversion abatement

Biomethane project types

The biomethane method package introduces 5 *project types* to the landfill gas (electricity generation), wastewater treatment, and animal effluent methods, set out in **Table 2**. A project’s project type is important

⁵ See Schedule 1 of the National Greenhouse and Energy Reporting (Measurement) Determination 2008, available from <https://www.legislation.gov.au/Series/F2008L02309/Compilations>

because it dictates what project activities can contribute towards the project’s net abatement and earn ACCUs.

More information on the crediting period, that is the period of time a project may earn ACCUs, for each project type is provided in **Biomethane project crediting periods** below.

Table 2: Biomethane project types

Project type	Description	Project activities that earn ACCUs
<p>Biomethane conversion and displacement projects</p>	<p>Biomethane conversion and displacement projects earn ACCUs for both conversion abatement and displacement abatement, and:</p> <ul style="list-style-type: none"> • must involve installing a biogas upgrading system • may involve building new waste treatment and biomethane production infrastructure at sites that have never undertaken an ERF project • may occur when an existing ERF waste project decides to start producing biomethane for the first time. <p>» In this scenario, the existing ERF project’s project type would change from ‘non-biomethane’ to ‘biomethane conversion and displacement’, allowing them to earn ACCUs for undertaking the biogas generation for biomethane and biomethane production project activities.</p>	<ul style="list-style-type: none"> • Biogas generation for biomethane • Biomethane production • Non-biomethane activities, such as emissions destruction of biogas using a flare

<p>Biomethane displacement-only projects</p>	<p>Biomethane displacement-only projects:</p> <ul style="list-style-type: none"> • earn ACCUs for displacement abatement only • must involve installation of a biogas upgrading system • are most suited as new ERF projects at facilities that wish to earn ACCUs for producing biomethane from biogas. For example, a project that involves construction of a ‘biomethane hub’ facility that upgrades biogas from a range of sources but does not directly involve treatment of waste may be suited to this project type. • may also be appropriate in situations where the newness requirements (see Additionality – Newness) for conversion abatement activities cannot be met, for example, where a landfill gas collection system had already been collecting and combusting methane at a landfill with an ERF project. <ul style="list-style-type: none"> » In this example, the landfill could commence biomethane production from captured landfill as a new activity and earn displacement ACCUs as a biomethane displacement-only project. 	<p>Biomethane production</p>
<p>Restarting biomethane conversion and displacement projects</p>	<p>The restarting biomethane conversion and displacement project type allows former ERF waste projects whose crediting periods have expired to re-enter the scheme and earn ACCUs for conversion and displacement abatement resulting from producing biomethane.</p> <p>Additional requirements include:</p> <ul style="list-style-type: none"> • the facility must not have previously produced biomethane. • the previous project must have installed a biogas upgrading system. <p>Non-biomethane activities, such as emissions destruction from flaring waste methane, are not allowed under this project type.</p>	<ul style="list-style-type: none"> • Biogas generation for biomethane • Biomethane production

<p>Restarting biomethane displacement-only projects</p>	<p>Restarting biomethane displacement-only projects can only occur at facilities that were formerly either:</p> <ul style="list-style-type: none"> • a biomethane conversion and displacement project, or • a restarting biomethane conversion and displacement project. <p>Projects that have not earned their full 12 years of ACCUs for displacement abatement can register as restarting biomethane displacement-only projects to access the balance of the 12-year crediting period.</p> <p>Restarting biomethane displacement-only projects earn ACCUs only for displacement abatement.</p>	<p>Biomethane production</p>
<p>Non-biomethane projects</p>	<p>The non-biomethane project type is a new project type that covers all non-biomethane activities covered by the 3 methods prior to the biomethane variations.</p> <p>Non-biomethane projects do not earn ACCUs for any biomethane activities they may undertake.</p> <p>A non-biomethane project may change project type, for example, to being a biomethane conversion and displacement project, if the criteria for that project type are met.</p>	<p>Non-biomethane activities, such as emissions destruction of biogas using a flare</p>

Projects can undertake activities for which they cannot earn ACCUs, for example, a biomethane displacement-only project is not prevented from also destroying waste methane in a flare. However, abatement associated with activities that are not covered by the project’s project type will not contribute towards its net abatement for the purpose of earning ACCUs.

A project may change from one project type to another if it meets all requirements for that project type. Changes in project type must be reported to the Clean Energy Regulator.

Planning and registering your ERF project

There are general requirements that need to be met to participate in the ERF, as well as specific requirements contained in the individual methods in the biomethane method package. Project proponents will also need to consider project costs and potential carbon credit returns as well as the legislative requirements.

Eligibility requirements

You must first register your biomethane project as an eligible offsets project before it can begin earning ACCUs.

Eligible offsets projects must meet the requirements in Section 23 of the *Carbon Credits (Carbon Farming Initiative) Act 2011* (CFI Act) and Section 13 of the Carbon Credits (Carbon Farming Initiative) Rule 2015 (CFI Rule). Each method that will include biomethane as an eligible activity also has method-specific eligibility requirements. **Appendix 1** summarises each method's eligibility requirements.

General eligibility information that must be provided to the Regulator when applying to register your project include:

- a summary of the project, including details of its location and information about the facility or facilities that will produce biomethane
- a declaration that biomethane produced by the project can reasonably be expected to be combusted within Australia as a natural gas substitute
- details of the applicant
- details of the project's activities that show how they are eligible under the method
- the skills and expertise available to the applicant to carry out the project
- a description of the approvals required to undertake the project and progress in obtaining these approvals
- information that shows that the applicant has the legal right to carry out the project
- an estimate of the forward abatement (emissions reduced) available from the project
- details of how the project meets the additionality requirements.

For more information on eligibility, visit [our website](#)⁶.

Fit and proper person assessment

You need to be recognised as a [fit and proper person](#)⁷ for the purposes of the ERF. The fit and proper test involves declarations about any convictions or insolvency, and whether a person has the capabilities needed to run a project.

⁶ Clean Energy Regulator, 2020, Planning a project, <http://www.cleanenergyregulator.gov.au/ERF/Want-to-participate-in-the-Emissions-Reduction-Fund/Planning-a-project>

⁷ Clean Energy Regulator, 2017, Fit and proper person posture, <http://www.cleanenergyregulator.gov.au/About/Policies-and-publications/fit-and-proper-person-posture>

Regulatory approvals

You need to ensure you have all relevant approvals, licenses, permits or authorities that are required to carry out your project.

For a biomethane project, relevant regulatory approvals may include:

- development and building approval for biomethane upgrading and gas injection infrastructure
- gas quality standards injection approvals and gas safety and management requirements
- environmental laws or permits.

Hold legal right

You need the legal right to undertake your project and claim ACCUs. For a biomethane project, the owner of the facility at which biogas generation for biomethane and biomethane production activities are occurring would typically hold legal right. Projects undertaking biomethane production may also need to demonstrate that they hold the legal right to dispatch the biomethane. For example, if the project injects biomethane into the gas network, the project proponent may need to demonstrate that the gas network owner has consented to this arrangement.

You may need a written agreement to evidence legal right if there are multiple parties involved in the project.

Additionality – Newness

For a project to be declared an eligible offset project, Section 27(4A)(a) of the CFI Act requires the project 'has not begun to be implemented'. This is known as the 'newness' test.

Activities that may not meet newness include:

- making a final investment decision on the project
- purchasing equipment
- commencing construction.

Newness considerations for biomethane projects will depend on the project's circumstance, including whether the relevant facility was previously part of an ERF waste project and whether new carbon abatement activities are being carried out. Two biomethane project types relate to projects that restart after a previous project has terminated and are provided an exemption from newness requirements in the biomethane method package.

For more information, see **Biomethane project types**.

Additionality – Regulatory additionality

For a project to be declared an eligible offset project, Section 27(4A)(b) of the CFI Act requires the project is 'not required to be carried out by or under a law of the Commonwealth, a State or a Territory' (regulatory additionality).

In October 2020, the Clean Energy Regulator published guidance on the approach for addressing regulatory additionality where greenhouse gas offset obligations are imposed by a state or territory government⁸. In brief, where an entity establishes an ERF project and is also subject to a regulatory obligation to reduce or offset their emissions, any ACCUs generated by that project used to meet the regulatory requirements must be put aside permanently in a Commonwealth holding account. These units cannot be sold or transferred to another party including the Commonwealth. However, any ACCUs resulting from the project that are not used to meet regulatory obligations can be made available to the market.

This means that if there is a regulatory requirement on a biomethane project to meet an offset or emissions reduction obligation, then the project will only be able to sell ACCUs to the extent that the project results in more abatement than the offsetting obligation requires.

Crediting periods and start dates

The crediting period and start date establish the commencement and end date for the crediting of ERF projects, that is, the period of time over which the project can receive ACCUs.

Biomethane project crediting periods

The crediting period for biomethane projects is a **maximum of 12 years** for both conversion abatement and displacement abatement. The crediting period may be less than 12 years depending on the project's circumstances, such as the project activities being undertaken and the project type (see **Biomethane project types** above) as described in the project scenarios (**Table 2**) and associated crediting periods (**Table 3**) below.

In general, new biomethane projects – projects that have never been part of an ERF waste project and meet the newness requirements – will receive a crediting period of 12 years. This can apply to both biomethane conversion and displacement projects, as well as biomethane displacement-only projects.

Biomethane projects at facilities that were or are part of an existing ERF waste project that expand to include biomethane will have a crediting period of 12 years, less the period of time for which the project previously earned ACCUs. This applies to existing ERF projects that become biomethane conversion and displacement projects, as well as restarting biomethane conversion and displacement projects and restarting biomethane displacement-only projects.

⁸ Clean Energy Regulator, 2020, Regulatory additionality and government programs, <http://www.cleanenergyregulator.gov.au/ERF/Want-to-participate-in-the-Emissions-Reduction-Fund/Planning-a-project/regulatory-additionality-and-government-programs>

Crediting of non-biomethane activities

Crediting abatement from non-biomethane project activities, for example, flaring of waste biogas, at a project facility can continue as part of biomethane conversion and displacement projects, in parallel with biogas generation for biomethane and biomethane production.

The original crediting period for non-biomethane activities is not changed by addition of biomethane project activities. A project cannot claim abatement for a non-biomethane activity for a period longer than its original crediting period, otherwise the project’s crediting period will immediately end. For example, the wastewater treatment project has a 7-year (84 month) crediting period for non-biomethane combustion of waste methane. If a biomethane conversion and displacement project under the wastewater treatment method tries to claim ACCUs for flaring for an 85th month, that project’s crediting period will end and no more ACCUs can be issued for any project activities.



To avoid exceeding crediting period limits on non-biomethane project activities, a project may opt to not include abatement associated with those activities in the project’s net abatement calculations when it reports to the Clean Energy Regulator. In the wastewater treatment project example above, the proponent could continue flaring past the 85th month as long as abatement associated with that activity is excluded from the project’s abatement calculations.

New conversion and displacement projects and displacement-only projects will be eligible for a crediting period of up to 12 years.

Crediting abatement from non-biomethane project activities, for example, flaring of waste biogas, at a project facility can continue as part of biomethane conversion and displacement projects in parallel with biogas generation for biomethane and biomethane production. The original crediting period for non-biomethane activities is not changed by addition of biomethane project activities. A project cannot claim abatement for a non-biomethane activity for a period longer than its original crediting period.

Displacement-only projects relate solely to the treatment of biogas to produce biomethane and not the treatment of waste to avoid methane emissions. A displacement-only project cannot have project activities other than biomethane production. Therefore, its crediting period is always 12 years from the start date.

The crediting periods for the different biomethane project types are set out in **Table 3**.

Table 3: Biomethane project crediting periods

Project type	New or existing project	Crediting period
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Biomethane conversion and displacement projects	New project	12-year crediting period from the start of the project.
	Existing project	<p>12-year crediting period commencing from the start date of the original project.</p> <p>Example: a wastewater treatment facility with an ERF project starts biomethane activities 6 years into the crediting period of the pre-existing wastewater project. Conversion and displacement abatement for biomethane can be earned for the remaining $12 - 6 = 6$ years in the project's crediting period.</p> <p>If a project of this kind has had less than 12 years of crediting for displacement activities at the end of its crediting period, it can re-enter the ERF as a restarting biomethane displacement-only project to earn ACCUs until 12 years of displacement abatement have been credited.</p>
Biomethane displacement-only projects	New project	12-year crediting period from the start of the project.
	Existing project	<p>Not applicable – biomethane displacement-only projects do not involve project activities other than biomethane production. An existing ERF waste project that wants to commence producing biomethane should use the biomethane conversion and displacement project type.</p> <p>If a proponent wishes to add a biomethane displacement-only project to an existing facility, it should be registered as a new biomethane displacement-only project, rather than added on to an existing project.</p>
Restarting biomethane conversion and displacement projects	New project	Not applicable – a restarting biomethane conversion and displacement project must occur at a former ERF waste project whose crediting period has expired.
	Existing project	<p>$(12 - x)$ year crediting period, where x is the length of the crediting period of the former ERF project.</p> <p>Example: a wastewater treatment facility previously had an ERF project with a 7-year crediting period. The facility starts biomethane activities and re-enters the ERF as a restarting biomethane conversion and displacement project. The crediting period for the restarting project is 5 years.</p>

Restarting biomethane displacement-only projects	New project	Not applicable – a restarting biomethane displacement-only project must occur at a former biomethane conversion and displacement project, or former restarting biomethane conversion and displacement project where the crediting period for that former project has expired.
	Existing project	(12 – x) year crediting period, where x is the length of the period in which the project earned ACCUs for biomethane production period under the former project.

Biomethane crediting period example

An ERF wastewater treatment project begins in 2024 and flares waste biogas for 2 years. In 2026, it also begins biomethane conversion and displacement project activities. Under the wastewater method, flaring has a crediting period of seven years while biomethane can have up to 12 years of crediting.



Being an existing project, the wastewater project’s crediting period for conversion and displacement activities is 12 years, ending in 2036 (12 years from 2024). During this period, the project can also earn credits for flaring waste biogas. However, the project cannot claim credits for flaring biogas for a cumulative period of more than 7 years (84 months), as this is the original crediting period afforded to that activity under the wastewater method. It is not extended by starting biomethane production.

In 2036, the project has earned 12 years of conversion abatement credits (from both flaring and biogas generation for biomethane activities), and 10 years of displacement abatement credits. To access the remaining 2 years of displacement abatement, the proponent registers the facility as a restarting displacement-only project with a crediting period of 2 years. The crediting period of this project ends in 2038, after which no further abatement can be credited.

Start date

The start date is the date when the crediting period commences, that is, the day from which a project can begin to earn ACCUs. Scheme participants can nominate any start date from the date the project is declared by the Clean Energy Regulator, and up to 18 months afterwards.

Running and reporting on your project

Following the declaration that your project is an eligible offset project you may then start your project. You will then need to report on the net emissions from your project to the Clean Energy Regulator.

Conducting your project

The following steps provide a high-level overview of the process to run a new biomethane project:

- **Plan your project** ensuring your proposed project meets eligibility requirements under the relevant method. You will need to ensure your project is treating eligible waste under the relevant method, as not all waste feedstocks are allowed under all methods.
- **Register your project** with the Clean Energy Regulator – see **Starting a biomethane project** below.
- **Install equipment** and infrastructure for your project. Depending on your project activities, this could include installing:
 - » biogas capture and waste treatment equipment, e.g. gas collection pipelines and anaerobic digesters
 - » biogas upgrading equipment to refine the biogas into pipeline-ready biomethane
 - » gas pipeline injection and metering infrastructure or mobile transport to send biomethane to customers.
- **Run the project** ensuring the equipment is operating correctly and that project biomethane meets the applicable territory, state, and industry gas standards.
 - » Commence operation of biomethane activities and report your abatement to the Clean Energy Regulator at least once every 2 years.

You can defer the start date of your crediting period by 18 months. Delaying it until after infrastructure construction is complete can help maximise your project’s ability to generate ACCUs during the crediting period.

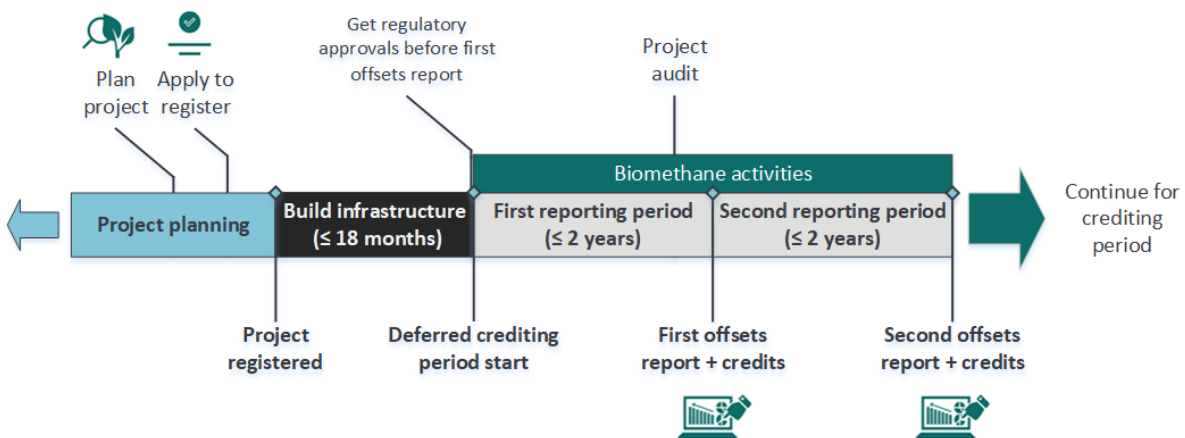




Figure 2: Indicative timelines for a biomethane project

Note: the scheme rules allow flexibility as to the timing of reporting periods and the above 2 year timeframe is illustrative only.

Starting a biomethane project

The process for starting a biomethane project at a waste facility will depend on the project type and whether you are expanding an existing ERF project to commence biomethane activities.

New or restarting biomethane projects

If you are registering a new biomethane project under the biomethane conversion and displacement or biomethane displacement-only project types, or registering a restarting biomethane conversion and displacement or restarting biomethane displacement-only project, you must follow the standard registration process for a new ERF project:

1. Register your project with the Clean Energy Regulator under the applicable waste method. You can apply to register a project using the [Clean Energy Regulator Client Portal](#)⁹. Do not commence project activities before your project is registered or you may fail to meet the newness test.
2. Implement biomethane project activities in accordance with your project's method. This may include getting appropriate regulatory approvals, installing equipment, and commencing biomethane project activities such as injection into the gas network.
3. Report on your project's abatement to the Clean Energy Regulator at least once every 2 years and earn ACCUs for project carbon abatement.

Expanding an existing ERF project to include biomethane

To start biomethane activities at an existing ERF project, you will need to ensure that your project is registered under a version of the method that permits biomethane activities. Your project should be of the biomethane conversion and displacement project type, to allow ACCUs to be earned for biogas generation for biomethane and biomethane production project activities.

If your project is under a method version that does not include biomethane activities, you will need to vary your project's method. This can be done through the [Clean Energy Regulator Client Portal](#)^{Error! Bookmark not defined.}. You will need to ensure all eligibility requirements are met, which may include identifying existing ERF projects at the project facility and providing information on proposed biomethane activities.

Once your project is successfully registered under a method that includes biomethane activities, you can commence project biomethane activities, report on abatement and earn ACCUs. You will generally need to provide details about your new biomethane activities the next time you report to the Clean Energy

⁹ Clean Energy Regulator, 2021, Client Portal, <http://www.cleanenergyregulator.gov.au/OSR/CP>

Regulator. Note that the crediting period start date will remain the start date of the original project and is not reset when you vary the method.

Implementing biomethane activities

The biomethane method package aims to be technology neutral. This is to allow projects to undertake any form of biomethane upgrade and distribution system that is technologically and economically suitable provided relevant regulations and gas standards for injected biomethane are met and eligible wastes under the selected method are used.

The 2 types of biomethane activity, biogas generation for biomethane and biomethane production, encompass different stages of the biomethane production process. The implementation steps for each are listed in **Table 3** and are discussed further below.

Table 3: Biomethane project activity implementations

Project activity	Implementation
Biogas generation for biomethane activity	<ul style="list-style-type: none"> • Biogas generation • Biogas transport to a biogas upgrading system
Biomethane production activity	<ul style="list-style-type: none"> • Biogas upgrading and compression • Biomethane transport to end-users

Figure 4 illustrates the flow of waste, biogas and biomethane between the 4 implementation steps for biomethane activities, separated between biogas generation for biomethane activities and biomethane production activities. Emissions attributed to either biogas generation for biomethane activities or biomethane production activities are also illustrated, as these will need to be accounted for when determining net abatement from each activity – see **Net abatement** below.

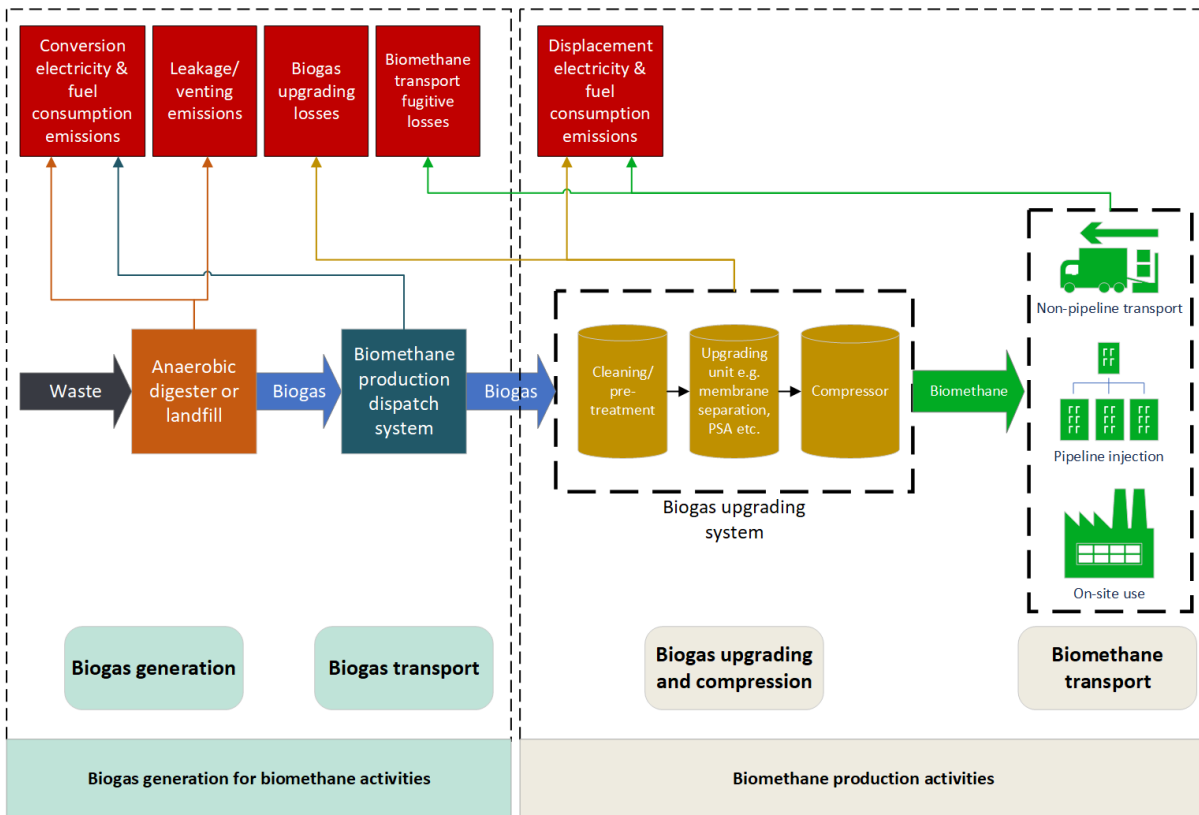


Figure 4: Biomethane activities and emissions

Biogas generation

The biogas generation for biomethane activity starts with the production and capture of biogas from waste. The 3 waste methods in the biomethane package cover different sources of waste biogas:

- **Landfill gas (electricity generation) projects** collect landfill gas (a biogas) by sinking wells into the landfill combined with a blower system to extract the gas.
- **Wastewater projects** treat domestic, commercial, or industrial wastewater in covered lagoons or anaerobic digesters to generate biogas.
- **Animal effluent projects** involve processing animal waste in covered lagoons or anaerobic digesters, which produce and collect biogas.

Each method has requirements for eligible waste and eligible waste processing technologies or systems that projects must follow.

Once the biogas has been produced and captured as part of a biogas generation for biomethane activity, it must be sent to a biogas upgrading system.

Biogas transport to a biogas upgrading system

After biogas has been generated in an anaerobic digester or landfill as part of a biogas generation for biomethane activity, it must be sent to a biogas upgrading system. This could occur through stationary infrastructure like pipes, or mobile systems like trucks. You will need to be able to monitor the amount of biogas sent to biogas upgrading systems.

The biogas upgrading system that receives and upgrades this biogas can be at the same site as the biogas-generating waste facility, or at an entirely different facility. For example, a specialised biomethane production facility that receives biogas from a range of waste sources may be part of the project but be located at a different site to the waste treatment facility.

The biomethane produced from by these biogas upgrading systems must be reasonably expected to be combusted within Australia as a natural gas substitute, to ensure that conversion abatement from destroying the waste methane occurs. It is assumed that the methane in biogas sent to a biogas upgrading system is destroyed, and conversion abatement is credited on this basis. Biogas upgrading systems are therefore treated similarly to flares or other combustion devices that credit the destruction of methane sent to them.

Biogas upgrading and compression

A biomethane production activity begins by receiving eligible biogas and upgrading that gas into pipeline quality biomethane, which typically has a methane proportion of at least 95%.

Eligible biogas

Biogas upgraded into biomethane as part of a biomethane production activity must be 'eligible biogas'. Biogas is eligible biogas if it is generated from waste that would be eligible to be treated under one of the 3 methods in the biomethane method package or would be eligible under the Source separated organic waste method or the Alternative waste treatment method.



The waste facility supplying biogas does not need to have an ERF project for the biogas to be eligible biogas – you will just need to demonstrate that the waste used to produce biogas would fit under one of the methods in the biomethane method package.

A biomethane production activity can upgrade biogas from multiple sources and can upgrade ineligible biogas. However, no ACCUs can be issued for displacement abatement associated with upgrading ineligible biogas. If your project includes a mix of eligible and ineligible biogas, you will need to estimate the proportion of eligible to ineligible biogas and apportion net abatement accordingly.

There are a range of commercial biogas upgrading systems available. System designs vary in their impurity scrubbing mechanism, energy consumption, gas pre-scrubbing requirements, capital cost and size.

Examples of existing commercial upgrading technologies include:

- **Membrane separation** – physically separates molecules by size and charge through a membrane.
- **Pressure swing adsorption** – gas impurities are adsorbed on to a surface under high pressure, with contaminants ejected into a tail gas when chamber pressure is lowered.
- **Amine scrubbing** – biogas is passed through a chemical solvent that dissolves and removes the carbon dioxide.
- **Water wash** – biogas is passed through water under high pressure to dissolve impurities.

Depending on the upgrading technology used, there may be several sub-processes during the upgrading stage. This could include pre-treatment steps to scrub the biogas of hydrogen sulphide and other impurities, or drying stages to remove moisture. The final biomethane will generally need to be compressed for transport to the end user.

While biogas upgrading is not currently common practice in Australia's waste sector, these technologies are in use at scale in the North American and European waste industries. Proponents of biomethane projects will need to make a commercial investment assessment regarding the system or systems would be most appropriate for their project circumstance.

Biogas upgrading system requirements

The biomethane method package does not specify what type of technology can or must be used. However, a project's biogas upgrading system must meet the following requirements:



- The biomethane produced meets the natural gas quality standards required under the relevant regulatory regime.
- Biomethane quality and composition is monitored.
- Waste gases lost during the biogas upgrading process are monitored. These losses are used in abatement calculations for the biogas generation for biomethane activity.
- Fuel and electricity consumed by the upgrade process must also be monitored for use in the abatement calculations.

Biomethane transport to end users

After the biogas has been upgraded into biomethane, the biomethane must be transported to the end user. End uses of biomethane may vary depending on commercial agreements with gas buyers. The biomethane method package does not specify how biomethane must be used as long as it can be expected to be

combusted within Australia as a natural gas substitute. Emissions associated with transporting biomethane must also be monitored as part of the biomethane production activity.

Transporting biomethane to end users may involve one or more of the following:

- Injection of biomethane into a gas network¹⁰. A compressor system is needed to deliver the gas at the correct pressure, and piping and injection infrastructure will be needed to connect the biomethane to the gas mains. The volume of biomethane injected will need to be metered.
- Transport of biomethane using non-pipeline infrastructure such as trucks or other vehicles.
- Using biomethane on-site for heat or to produce electricity.

When reporting on a biomethane production activity, information on the end uses of produced biomethane must be provided.

Biomethane end use information



Project proponents will need to provide information on how their project's biomethane is to be used to ensure that the methane is destroyed and conversion abatement occurs. Contracts, agreements, or declarations from relevant personnel about the end uses of project biomethane are forms of supporting evidence.

Net abatement

Projects are credited for the net abatement they generate, which will be given by the total abatement created minus emissions associated with the project.

Biomethane abatement will be achieved both through conversion of methane emissions into carbon dioxide via combustion, and by displacing natural gas from fossil fuel sources.

Note that a project's project type determines what types of activities are accounted for in net abatement calculations.

Conversion abatement

Conversion abatement is generated from the combustion of waste methane. In non-biomethane projects, this combustion occurs on-site using a flare or generator.

In a biomethane project, the biomethane can be combusted on-site, injected into the gas network, or transported through non-pipeline means, such as by truck, to an end use where it is combusted.

¹⁰ Subject to the relevant state or territory regulations and any regulatory approvals.

The general form of the equation is set out below.

$A_{Conversion,BM} = Q_{CH_4,BM} \times (1 - PL) \times (1 - TL) \times DE - PE_{Conversion}$	
<i>A_{Conversion,BM}</i>	Net conversion abatement from biomethane, in tonnes CO ₂ -e.
<i>Q_{CH₄,BM}</i>	<p>Quantity of methane sent for combustion either on-site or off-site, in cubic meters.</p> <p><i>Q_{CH₄,BM}</i> is the quantity of methane that would have been vented into the atmosphere in the absence of the biomethane project.</p> <p>Emissions are avoided by instead capturing, upgrading, and combusting this quantity of methane to form carbon dioxide. The biomethane method approach defines this emissions avoidance activity as conversion abatement.</p> <p>The loss terms in this equation (PL, TL, and DE) account for the fact that not all the waste methane turned into biomethane will be burned. Some methane will be lost during the production and transport process. This lost methane does not contribute towards the project's net abatement as it still escapes to atmosphere, which is reflected in the abatement calculations.</p>
<i>PL</i>	<p>Production loss factor is a fraction that represents the proportion of methane lost during the biogas upgrading process. Losses will depend on site operating conditions and the biogas upgrading technology employed.</p> <p>Proponents must work out the production loss factor using values or measurement approaches provided by the equipment manufacturer.</p>
<i>TL</i>	<p>Transport loss factor is a fraction that represents the proportion of methane lost during transport of biomethane. Losses could include leakages during gas transfers or through transmission in a pipeline.</p> <p>The transport loss factor is 0 if all biomethane produced is consumed at the biomethane facility. In this scenario, limited gas transfer occurs and assuming losses are negligible is reasonable.</p> <p>If not all biomethane produced is consumed at the biomethane facility, the factor is 0.02, representing a 2% loss factor. This factor is calculated based on average unaccounted for gas values for distribution networks in the National Inventory, weighted by state and territory gas consumption rates¹¹.</p>

¹¹ The default transport loss factor was estimated using the unaccounted for gas fractions and Method 1 in section 3.81 of the National Greenhouse and Energy Reporting (Measurement) Determination 2008 (available from

<i>DE</i>	Destruction efficiency of the methane sent into the gas network or used on-site. A destruction efficiency of 98% (factor of 0.98) is assumed, consistent with the approach taken in the National Inventory.
<i>PE_{Conversion}</i>	Project emissions from biogas generation for biomethane project activities. These emissions are associated with conversion abatement and need to be deducted to ensure the amount of ACCUs issued accurately reflects the net abatement associated with a project’s biomethane activities. Specific project emissions sources accounted for here will depend on the relevant method, but broadly will include: <ul style="list-style-type: none"> • Emissions from electricity and fuel consumption by anaerobic digesters and biomethane production dispatch systems. • Loss or venting emissions from anaerobic digester operation.

Conversion abatement calculations for the wastewater treatment method are set out in a slightly different manner, as that method calculates abatement based on the difference between pre-project ‘baseline emissions’ and post-project ‘project emissions’. However, the concepts relating to calculation of methane destroyed through biogas generation for biomethane are the same.

Displacement abatement

Displacement abatement is calculated through equations added as part of the biomethane method package amendments. Factors influencing displacement abatement include:

- the volume of biomethane injected into the gas network, which determines the quantity of natural gas displaced
- the proportion of the biogas used to produce biomethane that is eligible biogas
- emissions from energy and fuel consumption consumed during biogas upgrading.

The general calculation approach for displacement abatement is set out below.

$$A_{Displacement, BM} = E_{NatGas} \times EA - PE_{Displacement}$$

<https://www.legislation.gov.au/Series/F2008L02309>) weighted by the gas consumption percentage for each state per the Australian Energy Update 2020 Table C (available from <https://www.energy.gov.au/publications/australian-energy-update-2020>). This default loss factor was estimated using the unaccounted for gas fractions and Method 1 in section 3.81 of the National Greenhouse and Energy Reporting (Measurement) Determination 2008

<p><i>A_{Displacement, BM}</i></p>	<p>Net displacement abatement, in tonnes CO₂-e.</p>
<p><i>E_{NatGas}</i></p>	<p>The combustion emissions, in tonnes CO₂-e, from a volume of natural gas equivalent to the volume of biomethane produced by the project.</p> <p>This value represents the emissions avoided through the displacement of natural gas by biomethane. It is determined by multiplying the volume of natural gas displaced (that is, the volume of biomethane produced and sent for combustion) by the National Greenhouse and Energy Reporting (NGER) emissions factor for natural gas in a pipeline⁵.</p> <p>If a project uses some biomethane on-site for heat or power, the quantity of biomethane used to displace the quantity of commercial natural gas consumed from the grid can also be credited.</p>
<p><i>EA</i></p>	<p>The eligible abatement fraction, representing the proportion of biogas upgraded into biomethane that is <i>eligible biogas</i>.</p> <p>The biomethane method package allows for an ERF project biogas upgrading system to accept biogas from sources besides biogas directly produced by the project. This measure is to help biomethane production facilities gain greater economies of scale by allowing the processing of biogas from a broader range of sources.</p> <p>Suppliers of biogas to a project biomethane facility do not have to have ERF projects. However, for biogas to be eligible biogas it must have been produced from treatment of waste that is deemed eligible waste under one of the 3 waste methods in the biomethane method package,¹² or the source separated organic waste or alternative waste treatment methods.</p> <p>For each biogas source, the project proponent must estimate the fraction of biogas supplied for biogas upgrading that is eligible biogas.</p> <p>Evidence must be provided to the Clean Energy Regulator about how this fraction is determined. If all biogas is sourced from an ERF project that only treats eligible waste, the eligible abatement fraction will be 1 one.</p>

¹² Biomethane displacement ACCUs are only issued when the biomethane is produced from biogas that came from an eligible waste source under one of the 3 waste methods, or the source separated organic waste and alternative waste treatment methods because the business-as-usual treatments for these wastes is understood. Diverting non-ERF method waste sources to produce biomethane may cause leakage emissions (e.g. diverting crop wastes previously left in fields may decrease soil carbon) that are not captured in the net abatement calculations. Not crediting biomethane produced from these waste streams controls for this leakage risk.

<i>PE_{Displacement}</i>	<p>Emissions associated with electricity and fuel use by the project for biomethane activities, such as for upgrading or compression equipment, in tonnes CO₂-e.</p> <p>Energy use emissions are calculated by measurement and metering of fuel and electricity use, multiplied by the relevant NGER emissions factors.</p>
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Displacement calculation example

A wastewater facility produces and injects 100 terajoules (TJ) of biomethane in a year into the natural gas network.

- The NGER (Measurement) Determination emissions factor for natural gas is 51.53 kg CO₂-e/GJ
- Therefore gross displaced gas emissions = (100,000)*(51.53)/1000 = 5,153 tCO₂-e
- All biogas upgraded into biomethane is produced at the wastewater facility, so the eligible abatement fraction is 1.
- Emissions from energy used in the upgrading process comes to 100 tCO₂-e

$$\begin{aligned} \text{Net displacement abatement} &= 5,153 * 1 - 100 \\ &= 5,053 \text{ tCO}_2\text{-e} \end{aligned}$$

Biomethane use in ERF fuel switching projects



Using biomethane produced at an ERF biomethane production project at another ERF project involving a fuel switching activity – for example, under the *Carbon Credits (Carbon Farming Initiative—Industrial Electricity and Fuel Efficiency) Methodology Determination 2015* – introduces a risk that displacement abatement is being double counted. Displacement ACCUs under a biomethane project credit the avoided use of natural gas. A fuel switching ERF project could use low emissions biomethane to also avoid the use of natural gas, earning more ACCUs for the same activity.

To ensure double counting cannot occur, biomethane produced at an ERF biomethane project cannot be used in another ERF project undertaking fuel

switching. If this occurs, displacement abatement for the ERF biomethane project is set to zero.

Reporting and crediting

ACCUs from a biomethane project will be issued following lodging of a report and an assessment by the Clean Energy Regulator.

Offsets reports and claiming carbon credits

Once the crediting period for your project has commenced you must provide offset reports in accordance with Section 76 of the CFI Act and Section 70 of the CFI Rule. The first offsets report covers the period commencing from the start of the crediting period and you can choose a duration of between six months and two years¹³. Subsequent reporting periods commence immediately after the end of the previous reporting period and you can choose between one month and two years.

An offsets report is the document (plus supporting information) that you provide to us that details your project's progress, including the net abatement amount. An offsets report may include an 'application for certificate of entitlement' under Section 12 of the CFI Act and Section 7 of the CFI Rule.



Claiming carbon credits

You can claim ACCUs each time you submit your offsets report if a net abatement amount has been determined during the reporting period

You should provide an offsets report no later than 6 months after the end date of each reporting period.

You can submit your offsets report through the [Clean Energy Regulator Client Portal](#)^{Error! Bookmark not defined.}. To be issued carbon credits you'll need to [set up an Australian National Registry of Emissions Units \(ANREU\) account](#)¹⁴.

We will assess your offsets report within 90 days unless further information is required. If we assess everything to be in order, we will issue ACCUs into your ANREU account.

¹³ Projects can report as frequently as monthly if more than 2,000 ACCUs are being sought in the reporting period.

¹⁴ <http://www.cleanenergyregulator.gov.au/OSR/ANREU/Opening-an-ANREU-account>

Auditing requirements

Your project needs to be audited to align with our legislative requirements. The number of audits required over the crediting period will depend on the project size and the forward abatement estimate. Most biomethane projects will require three audits, including one with the first report.

Each audit report is submitted at the same time you apply for carbon credits. We will provide you with an audit schedule when your project is registered. It will tell you which reports need to include audits. For example: “*Audit 2: First project report submitted after 25/07/2024*”.

Engaging auditors

We recommend you engage an auditor early when developing your project, as this will help you work out audit costs. You can find a list of [registered auditors](#)¹⁵ on our website.

Other matters

Notification requirements

You will need to notify us if your project changes, for example, if the person running the project changes.

Appendix 2: Notification requirements lists events that you need to notify the Clean Energy Regulator about and how long you have to provide that notification.

Making changes to your project

You can make changes to your project to adjust for changing circumstances, such as varying the proponent for your project.

To make changes (variations) to your project, you will need to complete a Project Variation form, located in the [Clean Energy Regulator Client Portal](#)^{Error! Bookmark not defined.}. See **Appendix 3: Project variations** for a summary of allowed changes and information requirements.

National Greenhouse and Energy Reporting and safeguard mechanism interactions

The National Greenhouse and Energy Reporting (NGER) scheme is Australia’s national framework for reporting and publishing company information about greenhouse gas emissions, energy consumption and energy production. The NGER scheme requires companies and facilities with emissions over set thresholds to report their energy consumption emissions.

¹⁵ <http://www.cleanenergyregulator.gov.au/Infohub/Audits/register-of-auditors>

The safeguard mechanism creates incentives for very large emitting facilities, known as ‘safeguard facilities’, to keep their emissions below a baseline emissions level. Safeguard facilities must periodically report on their emissions based on their net emissions number and surrender ACCUs if their emissions exceed the facility’s baseline.

At the time of publication there is no emissions factor for the combustion of biomethane sent by pipeline that is used by a facility. This means that facilities that wish to buy biomethane may not be able to report emissions reduction from its use, compared to regular natural gas.

The Department of Industry, Science, Energy and Resources is considering how pipeline biomethane might be accounted for under the NGER and safeguard schemes.

Disclaimer

This document provides general guidance on running an ERF biomethane project. It does not replace or supersede any legal requirements, address all applicable legal requirements, or recommend any investment. Examples are indicative and are not necessarily applicable to individual circumstances.

ERF biomethane projects involve ongoing legal obligations and returns can vary. You are encouraged to carefully consider if a project is right for you and seek independent professional advice relating to your unique circumstances.

Appendix 1 – Eligibility requirements

Table 5 summarises the eligible wastes under the 3 methods in the biomethane method package. Wastes from these sources are considered ‘eligible biogas waste’ and can be credited displacement abatement ACCUs when used for biomethane production.

Table 4: Eligible waste for each biomethane package method

Method	Eligible waste	Treatment
Landfill gas (electricity generation)	Wastes eligible to be disposed of in a landfill	Collection and capture
Wastewater treatment	Domestic or commercial wastewater Industrial wastewater	Anaerobic digesters
Animal effluent	<p>Either organic effluent that:</p> <ul style="list-style-type: none"> Was produced by a piggery, dairy, or a facility that generates a liquid waste stream as part of its normal operation, A liquid waste stream that consists only of water, animal faeces and urine, and incidental waste e.g. spoiled feed that would normally be treated in an anaerobic pond, or <p>Organic effluent that:</p> <ul style="list-style-type: none"> Consists principally of materials that are a listed type in Schedule 1 of the animal effluent supplement¹⁶, and Would have, in the absence of the ERF project, been treated in an open anaerobic pond. 	<ul style="list-style-type: none"> Biogas produced by one or more anaerobic digesters that is destroyed via flare (combustion device) Must use a post-diversion treatment such as composting

¹⁶ Available from: <https://www.legislation.gov.au/Details/F2020L00005/Supporting%20Material/Text>

Appendix 2: Notification requirements

Table 5: Notification requirements

Event	Notification triggers	Notification deadline
Offsets report events	You identify an error in your offsets report relating to project eligibility or the net abatement amount.	Within 60 days of you becoming aware of the event.
Project participant events	<p>The person running the project (the project participant) changes due to death or other circumstances.</p> <p>The project participant is no longer a fit and proper person, due to insolvency or other events.</p>	Within 90 days of you becoming aware of the event.

Appendix 3: Project variations

Table 6: Project variation actions and requirements

Variation type	Requirements
Vary project participant	The project participant is the person who has the legal right and responsibility for carrying out the project and the right to earn credits. You can add, vary, or remove a project participant. You will need to provide evidence of legal right.
Vary to remove condition	<p>Your project is considered 'conditional' until all consents or approvals are received.</p> <p>You can apply to remove this condition by providing all signed eligible interest-holder consent forms or regulatory approvals through the Project Variation form on the Clean Energy Regulator Client Portal.^{Error! Bookmark not defined.}</p> <p>You will need to provide all eligible interest-holder consents and regulatory approvals before your first offsets report.</p>
Vary project start date	<p>You can vary your project's nominated start date (which is also the start of your crediting period and first reporting period). The varied start date cannot be later than 18 months after the date your project is registered.</p> <p>You can only vary the start date before you submit your first offsets report, and it can only be varied once.</p>

Further information on varying your project can be found on our [making changes to your project webpage](#).