Australian Government
Clean Energy Regulator

EMISSIONS REDUCTION FUND

Participating in the Emissions Reduction Fund

A guide to the capture and combustion of methane in landfill gas from legacy waste method

IMPORTANT INFORMATION ABOUT THIS GUIDE

The Clean Energy Regulator is updating the information in this guide to align it with the Emissions Reduction Fund.

While the information in this guide about the landfill gas capture method is current, and may be used to help you read and understand the method and its explanatory statement, general information about how to participate in the Emissions Reduction Fund requires updating.

The Emissions Reduction Fund

The Emissions Reduction Fund is a voluntary scheme that aims to reduce Australia's greenhouse gas emissions by providing incentives for a range of organisations and individuals to adopt new practices and technologies to reduce their emissions.

A number of activities are eligible under the scheme. Individuals and organisations taking part in these activities may be able to earn Australian carbon credit units (ACCUs). One ACCU is earned for each tonne of carbon dioxide equivalent (tCO_2-e) stored or avoided by a project. ACCUs may be sold to generate additional income, either to the government through a Carbon Abatement Contract, or on the secondary market.

Emissions Reduction Fund projects must be conducted according to an approved method. Approved methods include all Emissions Reduction Fund methods and all original Carbon Farming Initiative methods. The methods set out the rules for conducting activities under the Emissions Reduction Fund to earn ACCUs.

Why participate?

As well as contributing to Australia's efforts to reduce the amount of greenhouse gas entering the atmosphere and the opportunity to earn ACCUs, running an Emissions Reduction Fund project may offer a range of other benefits for scheme participants. Examples include increases in biodiversity, better air quality, reduced energy consumption or income from electricity generation exported into the grid. An Aviation project can reduce the carbon footprint of an organisation by reducing fuel consumption, thereby improving air quality as well as reducing costs.

Using this guide

This guide provides an introduction to conducting a landfill gas project using the Carbon Farming (Capture and Combustion of Methane in landfill gas from Legacy Waste) Methodology Determination 2012 and the Carbon Credits (Carbon Farming Initiative) (Capture and Combustion of Methane in Landfill Gas from Legacy Waste: Upgrade projects) Methodology Determination 2012 (the method). Methods set out the rules for conducting activities under the Emissions Reduction Fund to earn ACCUs.

The guide is complementary to the *Carbon Credits (Carbon Farming Initiative) Act 2011*[1] (the Act), the associated legislative rules, approved method and explanatory statement, but does not replace them. It has been prepared by the Clean Energy Regulator, an independent Australian statutory authority responsible for administering legislation to reduce carbon emissions and increase the use of clean energy.

Overview of a landfill gas capture project

Landfill gas from legacy waste is collected and combusted using a flare or an electricity generation system. The methane component of landfill gas is converted to carbon dioxide, which has a significantly lower global warming potential than methane.

To conduct a landfill gas capture project and earn ACCUs make sure you read and understand the method and other legislative requirements. To do this you will need to:

- Download Carbon Credits (Carbon Farming Initiative) (Capture and Combustion of Methane in Landfill Gas from Legacy Waste: Upgrade projects) Methodology Determination 2012[2] and Explanatory Statement[3].
- Download Carbon Credits (Carbon Farming Initiative—Landfill Gas) Methodology Determination 2015[4] and Explanatory Statement[5].
- Download Carbon Farming (Capture and Combustion of Methane in Landfill Gas from Legacy Waste) Methodology Determination 2012[6] and Explanatory Statement[7].
- Download and understand how the *Carbon Credits (Carbon Farming Initiative) Act 2011* (the CFI Act)[8], the Carbon credits (Carbon Farming Initiative) Regulations 2011[9] and the Carbon Credits (Carbon Farming Initiative) Rule 2015[10] apply to a project.
- Download and use the NGER calculation method and Solid Waste Calculator to work out the proportions of methane from legacy and non-legacy waste.
- Download and use the Guidelines for Calculating Regulatory Baselines for Legacy Waste Landfill Methane Projects[11] to establish the project's baseline
- Ensure you have the legal right to conduct your project as well as the as well as the consent of anyone with a legal interest in the land (eligible interest holders).

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[1] http://www.comlaw.gov.au/Series/C2011A00101
[2] http://www.comlaw.gov.au/Details/F2012L02583
[3] https://www.comlaw.gov.au/Details/F2012L02583/Explanatory%20Statement/Text
[4] http://www.comlaw.gov.au/Details/F2015L00059/
[5] http://www.comlaw.gov.au/Details/F2015L00059/Explanatory%Statement/Text
[6] http://www.comlaw.gov.au/Details/F2012L01688
[7] https://www.comlaw.gov.au/Details/F2012L01688/Explanatory%20Statement/Text
[8] http://www.comlaw.gov.au/Series/C2011A00101
[9] http://www.comlaw.gov.au/Series/F2011L02583
[10] http://www.comlaw.gov.au/Details/F2015L00156
[11] http://www.environment.gov.au/climate-change/emissions-reduction-fund/cfi/publications/guidelines-calculating-regulatory-baselines-legacy-waste-landfill-methane-projects

- Apply to register as a scheme participant, to open an account in the Australian National Registry of Emissions Units (ANREU) and to conduct a landfill gas capture project.
- Set up your project according to the instructions in Part 2 of the method. Set up record keeping and monitoring systems for your project as required by Part 4 of the method.
- Estimate the average annual abatement of your project, obtain an audit schedule for your project from the Clean Energy Regulator and engage a Category 2 Greenhouse and Energy Auditor early on in your project. Submit audits of your project according to your audit schedule.
- Determine the amount of carbon your project stores using the calculations in Part 3 of the method. Convert the amount of carbon captured into carbon dioxide equivalents (CO_2-e).

Two methodologies—one guide

This guide can be used to assist you in setting up and running a landfill project using one of two methods.

All methods have similar rules for measuring abatement, monitoring and reporting, but the requirements for equipment, including when it was installed or upgraded, and the calculation of the baseline are different.

You need to consider each method to work out which one your project may be eligible under, and follow the rules laid out in the relevant method.

What does a landfill gas capture project look like?

To run a landfill gas project you need to:

- Install a landfill gas extraction system and collect the landfill gas
- Combust the methane in the landfill gas using a flare or an electricity generation system to convert it to carbon dioxide where at least one of the following circumstances apply:
  - » installation of a new landfill gas extraction and combustion system (including wells, flares and/or electricity generation systems) on or after 1 July 2010
  - » installation of a landfill gas extraction and combustion system under the Greenhouse Friendly, the NSW Government's Greenhouse Gas Reduction Scheme, the ACT Government's Greenhouse Gas Abatement Scheme (GGAS) or Cities for Climate Protection schemes
  - » installation of a landfill gas flaring or generation system between 1 July 2007 and 1 July 2010 that is not connected to a previously installed system, or
  - » upgrade of an existing landfill gas flaring or generation system on or after 1 July 2010

- Calculating how much landfill gas is required to be captured under business-as-usual to control odour or to meet other regulatory requirements to establish the project baseline
- Calculating how much waste was deposited prior to 1 July 2010, as only emissions from this 'legacy waste' is eligible to generate Australian carbon credit units
- Monitoring gas flows and calibrating equipment

Setting up and running a landfill gas capture project

Approved abatement activities under the methods involve collecting and combusting methane from landfills using a landfill gas extraction system. The methods can be applied by operators of landfill waste facilities with legacy waste stores where the following activities apply:

- collection of the landfill gas generated (only the proportion from legacy waste is eligible for crediting)
- combustion of the methane component of the landfill gas, for example using flares and/or an electricity generation system to chemically convert it to carbon dioxide (CO_2), and
- at least one of the following circumstances applies:
  - » installation of a new gas collection system (including wells, flares and/or electricity generation systems) on or after 1 July 2010
  - » installation of a new landfill gas flaring or generation system between 1 July 2007 and 1 July 2010 that is not connected to a previously installed system
  - » upgrade to an existing landfill gas flaring or generation system on or after 1 July 2010.

If your project is a transitioning project, a gas extraction system installed before 1 July 2010 may be used.

How do landfill projects relate to the National Greenhouse and Energy Reporting scheme?

Some landfills will have reporting obligations under *the National Greenhouse and Energy Reporting Act 2007 (the NGER Act).*

These landfills are landfills that were open for the acceptance of waste on and after 1 July 2012 and during a year emitted more than 10,000 tonnes of CO_2-e.

A person who has operational control over a landfill that emits 25,000 tonnes of CO_2-e or more in an eligible financial year is a liable entity for landfill emissions under the *Clean Energy Act 2011.*

If a facility is required to report under the NGER Act, the data used for the calculations under the NGER method must also be used to determine the proportions of methane from legacy waste and non-legacy waste when reporting under the Emissions Reduction Fund.

Where calculations require the use of factors and parameters prescribed in the *National Greenhouse and Energy Reporting Regulations 2008* (NGER Regulations) and the *National Greenhouse and Energy Reporting (Measurement) Determination 2008* (NGER Measurement Determination), projects will also need to ensure they use the current factors and parameters in the NGER Regulations and Measurement Determination (Table 1). This means that where a factor or parameter has been revised, the proponent must use that which is prescribed in the relevant NGER Determination at the time the report is submitted or is due, whichever is earlier.

Even if you do not have to report under the NGER Act, the Clean Energy Regulator recommends that you use the NGER calculation methods, particularly the NGER solid waste calculator, to reduce the likelihood of the Clean Energy Regulator requesting further information about your project.

Table 1: The current factors and values applicable at the time of making the Method

Factor or parameter	Reference	Value of factor or parameter at 1 January 2012
γ	The factor converting cubic metres of methane at standard conditions to tonnes of CO_2-e as stated in the NGER Measurement Determination Part 5.2	$6.784 \times 10^{-4} \times 21$
OF	The oxidation factor for near surface methane in a landfill as stated in the NGER Measurement Determination Part 5.2	0.1
$\mathbf{EC}_{\mathbf{biogas}}$	The energy content factor for landfill biogas that is captured for combustion as stated in the NGER Measurement Determination Schedule 1 Part 2	37.7×10^{-3} GJ/m^3
$\mathbf{GWP}_{\mathbf{CH_4}}$	The global warming potential of methane as specified in the NGER Regulations	21
$\mathbf{EF}_{\mathbf{N_20}}$	The emission factor for nitrous oxide (N_2O) from landfill biogas that is captured for combustion as stated in the NGER Measurement Determination Schedule 1 Part 2	0.03 kg CO_2-e/GJ

Measure your greenhouse gas abatement

Identify your project baseline

The project baseline determines a rate of landfill gas capture and flaring beyond which a project can earn ACCUs. Projects transitioning from Greenhouse Friendly, the ACT GGAS or NSW GGAS have prescribed project baselines. The baselines for these projects are:

- 0 per cent for Greenhouse Friendly projects
- 24 per cent for NSW GGAS and ACT GGAS projects

These baselines will apply for the duration of a project's first crediting period. Transitioning projects will need to use the Landfill Baseline Guidelines to establish their project baseline for any subsequent reporting periods.

All Emissions Reduction Fund landfill gas capture and combustion projects that have not transitioned across from Greenhouse Friendly, the ACT GGAS or NSW GGAS should use the Landfill Baseline Guidelines which, in conjunction with the relevant method, set out a step-by-step process for determining project baselines.

The Landfill Baseline Guidelines are maintained so that the regulatory baseline for landfill gas projects can be assessed in a practical and consistent way.

The baseline will differ depending on whether the project is operating under or has operated under a transitioning project.

Establish your project boundary

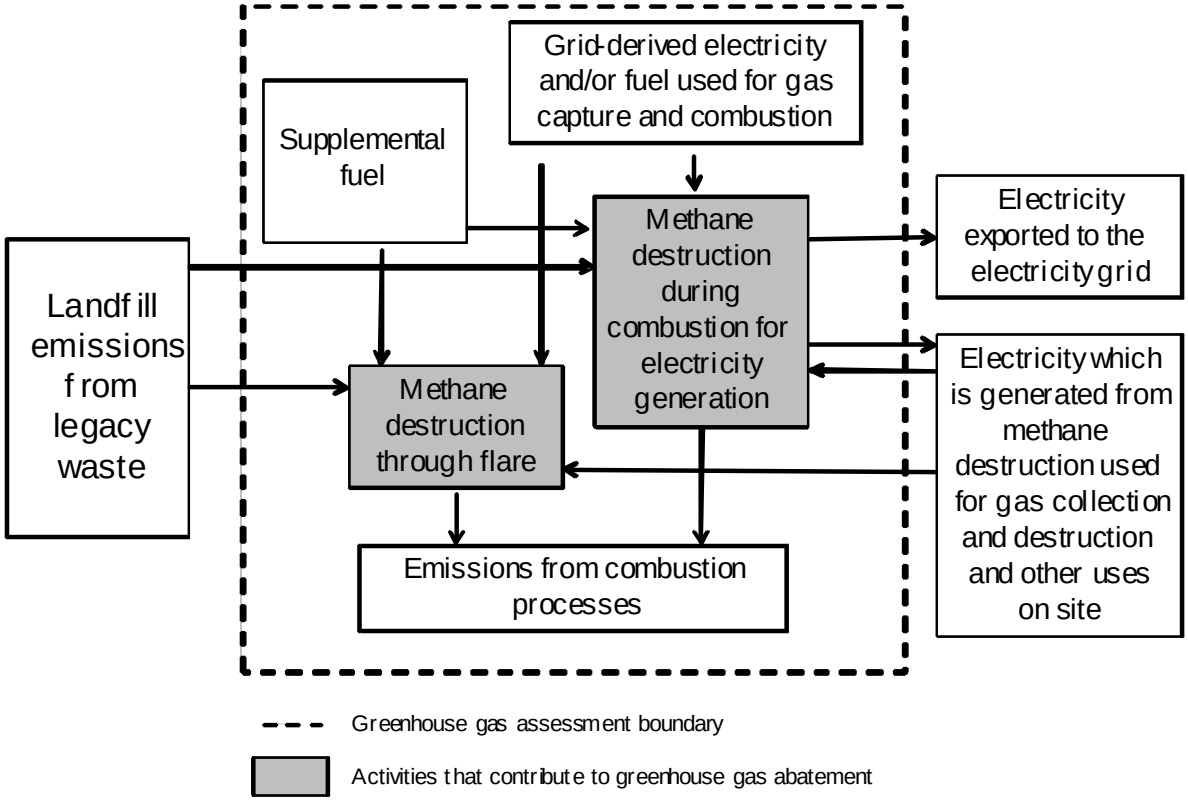
The methods describe the activities you need to assess to identify the change in greenhouse gas emissions resulting from your project. This is referred to as the project boundary.

Activities that must be accounted for in your abatement calculations are shown in Figure 1 and include:

- grid-derived electricity and/or fuel used in the process of gas capture and combustion, for example the electricity and fuel used to power pumps and engines used in the operation of flares, as well as in the operation of control and monitoring systems
- supplemental fuel, for example natural gas, if used to sustain combustion of landfill gas in a flare or combustion engine, where emissions are generated by the combustion process, and fugitive emissions from the incomplete combustion of the methane and the generation of nitrous oxide during the combustion process
- landfill gas that is captured and destroyed by an internal combustion engine to generate electricity
- landfill gas that is captured and destroyed via an open or enclosed flare.

The greenhouse gas assessment boundary does not include the greenhouse gas emissions from landfill waste, as it is not required for the purpose of calculating the abatement from the methane captured and destroyed. However, an estimate of the emissions from the landfill waste is required for the purpose of calculating the proportion of methane generated from legacy waste.

Figure 1: Flow diagram showing greenhouse gas assessment boundary for an abatement activity



The greenhouse gas assessment boundary does not include reductions in carbon dioxide emissions caused by displacing electricity derived from fossil fuel because this is not an eligible source of abatement for crediting under the Emissions Reduction Fund.

Emissions from electricity used for gas capture and combustion are not included in the greenhouse gas assessment boundary where that electricity is created using methane and combusted on-site. This is because the emissions from the combustion process are already included in the greenhouse gas assessment boundary.

Carbon dioxide emissions associated with the generation and combustion of landfill gas are considered biogenic. This means that, biological capture balances over a sufficiently short time period, such that release of carbon dioxide can be considered to have no net impact on atmospheric greenhouse gas levels. As a result, these emissions are not included in the greenhouse gas assessment boundary.

All calculations must be made in respect of activities undertaken, or outcomes achieved, during the reporting period.

Methods for collecting and recording data on the stipulated sources must be in place from the start of the project. Should an offsets report and associated audit show that data collection and recording methods have not been in place for the entire reporting period, ACCUs may not be issued for some or all of that reporting period.

Legacy waste calculations

Projects operating at landfills that continue to receive waste after 1 July 2012 will need to calculate the proportion of methane generated in the landfill that is generated from legacy waste. When projects are reporting for periods ending after 1 July 2012, they will be required to calculate the proportion of methane generated from legacy and non-legacy waste within the landfill. The methods require this calculation to be made using a method specified in the NGER Measurement Determination[12].

Guidelines to assist you to estimate your landfill's emission profile[13] are available on the Clean Energy Regulator website.

The National Greenhouse and Energy Reporting Solid Waste Calculator[14] provides a means of calculating these proportions for each of the methods available in the *NGER Measurement Determination*.

Once you have calculated the proportion of methane emissions generated from legacy waste, this data, and the figure for total amount of methane sent to the combustion device, can be fed into the Carbon Farming Initiative Landfill Gas Calculator[15]. This calculator can be used to ascertain abatement for reporting periods ending post 1 July 2012.

Establish project monitoring and recording

The Clean Energy Regulator recommends you draw up a plan for the monitoring, data collecting and record keeping required for a project report as specified in Part 5 of the method. The means of collecting and recording data will need to be in place from the start of the project. Should a project report and associated audit show that data collecting and record keeping has not been in place for the entire reporting period, ACCUs may not be issued for some or all of that reporting period.

When developing your plan, make sure you have the right controls and processes around your data. Are you collecting your data efficiently? Will you be able to maintain your data in the event of an emergency such as a fire?

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[12] http://www.cleanenergyregulator.gov.au/NGER/Legislation/Measurement-Determination
[13] http://www.cleanenergyregulator.gov.au/NGER/Forms-and-resources/Historic-resources#Guides
[14] http://www.cleanenergyregulator.gov.au/NGER/Forms-and-resources/Historic-resources#Calculators%20and%20their%20user%20guides
[15] http://www.cleanenergyregulator.gov.au/ERF/Forms-and-resources/Regulatory-Guidance/emissions-avoidance-guidance

Project and audit reports

Once your project is up and running, you will need to report on your project to the Clean Energy You need to report on your project to the Clean Energy Regulator and may report as frequently as every six months where allowed for in the legislative rules made under the *Carbon Farming Initiative Act (2011).* Audits are required where indicated in your project's audit schedule, which the Clean Energy will provide following registration of your project.

For landfill gas projects, which are emissions avoidance projects, the first report must be made between six months to two years from the date the project was registered and then up to every two years thereafter.

Part 5 of the method lists the information that must be included in your project reports. Applications for ACCUs can be made at the same time as you submit your project and audit reports using the *Certificate of entitlement including offsets report form*. Full reporting, record keeping and monitoring requirements are set out in regulations and rules made under *the Act*. You should familiarise yourself with these requirements.

The Clean Energy Regulator will not issue Australian carbon credit units automatically on receipt of a project report.

Emissions Reduction Fund projects are able to generate credits throughout their crediting period. Crediting periods for each type of project are set out in Part 5 of the *CFI Act*. The crediting period for a landfill gas capture project is 7 years.

The role of audit

Audits assess whether a project complies with the project registration, the relevant method and legislative requirements. Audit reports must be prepared by a registered Category 2 Greenhouse and Energy Auditor; a list of auditors is available on the Clean Energy Regulator website under National Greenhouse and Energy Reporting[16].

The Clean Energy Regulator recommends you engage your auditor early when developing your project to ensure the project is auditable and to assist the auditor to plan activities throughout the reporting and post-reporting periods. The costs of any audit are your responsibility or the responsibility of your organisation. You must make available to the auditor all necessary documents and information, including data records, receipts and other supporting documentation, and calculation spread sheets. For more information about auditing your project see Want to participate in the Emissions Reduction Fund – Reporting and Auditing[17].

[16] http://www.cleanenergyregulator.gov.au/NGER/Pages/default.aspx
[17] http://www.cleanenergyregulator.gov.au/ERF/Want-to-participate-in-the-Emissions-Reduction-Fund/Step-3-Reporting-and-auditing

Making changes to my project

You must notify the Clean Energy Regulator of any changes to your or your project's circumstances or operations that may affect project ownership, the project's eligibility or the amount of abatement reported and the number of ACCUs claimed. A project owner must seek approval from the Clean Energy Regulator if they intend to make a significant change from the project as outlined in the application.

Resources

- For more information on participating in the ERF - www.cleanenergyregulator.gov.au[18]
- For more information regarding method development – www.environment.gov.au[19]
- www.comlaw.gov.au[20] is the site where you can find all legislative instruments including the:
  - *Carbon credits (Carbon Farming Initiative) Act 2011* (current version)[21]
  - Carbon credits (Carbon Farming Initiative) Regulations 2011[22]
  - Carbon Credits (Carbon Farming Initiative) Rule 2015[23]
  - Carbon Credits (Carbon Farming Initiative) (Capture and Combustion of Methane in Landfill Gas from Legacy Waste: Upgrade projects) Methodology Determination 2012[24] and Explanatory Statement[25].
  - Carbon Farming (Capture and Combustion of Methane in Landfill Gas from Legacy Waste) Methodology Determination 2012[26] and Explanatory Statement[27]
- Guidelines for calculating regulatory baselines for legacy waste landfill methane[28]
- Carbon Farming Initiative regulatory baseline calculator[29]
- Carbon Farming Initiative landfill gas calculator
- National Greenhouse and Energy Reporting Solid Waste Calculator Guidelines

[18] http://www.cleanenergyregulator.gov.au/
[19] http://www.environment.gov.au/
[20] http://www.comlaw.gov.au/
[21] http://www.comlaw.gov.au/Series/C2011A00101
[22] http://www.comlaw.gov.au/Series/F2011L02583
[23] http://www.comlaw.gov.au/Details/F2015L00156
[24] http://www.comlaw.gov.au/Details/F2012L02583
[25] http://www.comlaw.gov.au/Details/F2012L02583/Explanatory%Statement/Text
[26] http://www.comlaw.gov.au/Details/F2012L01688
[27] http://www.comlaw.gov.au/Details/F2012L01688/Explanatory%Statement/Text
[28] http://www.cleanenergyregulator.gov.au/ERF/Forms-and-resources/Regulatory-Guidance/emissions-avoidance-guidance
[29] http://www.cleanenergyregulator.gov.au/Infohub/CFI/Carbon-Farming-Initiative-closed-methods

- Enquiries on participating in the ERF - 1300 553 542; enquiries@cleanenergyregulator.gov.au

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