Guide to entering data in the Emissions Reduction Fund landfill gas calculator

This guide provides instructions for:

- Navigating through the data input tasks in the correct order.

- Obtaining certain values for inputting into the calculator.

The instructions are not an exhaustive guide to completing data input. They complement the instructions contained in the data input worksheet themselves.

Before you begin

- The Emissions Reduction Fund (ERF) landfill gas calculator can only accommodate a single landfill - separate copies of the calculator must be used in the case of multiple landfills.

- The ERF landfill gas calculator and these instructions apply to all project types - new, recommencing, upgrading and transitioning.

- It is important to follow the steps, which are contained in sections 1 - 6, sequentially. Do not skip steps unless instructed.

- The following documents may be required to complete the calculator successfully:

  » *Carbon Credits (Carbon Farming Initiative Landfill Gas) Methodology Determination 2015[i]*.

  » *National Greenhouse and Energy Reporting (Measurement) Determination 2008[ii]*.

  » For a project transitioning from the Carbon Farming Initiative, previous documentation used to certify and report for the project under the determination.

Section 1. Requirements for calculating methane generation

The landfill gas method includes several equations that require values for methane generation as inputs. Each project will use some, but not all, of these equations. It varies according to the project type and the abatement calculation pathway chosen.

Step 1.1

Does one or more of the following criteria apply to your project?

- Your project is an upgrade project in accordance with section 11 of the landfill gas method.

- The landfill contains waste deposited in 2012/13 and the reporting period includes at least part of 2013/14 or later.

- The landfill contains waste deposited in 2013/14 and the reporting period includes at least part of 2014/15 or later.

- You have chosen to calculate the regulatory requirement using one of the options 1, 2, 3, 6, 7 or 8 as listed in Input table 2 in the worksheet "Baseline". Note: this last criterion does not apply to transitioning projects.

Yes - go to Step 1.2

No - go to Section 5

Step 1.2

You need to calculate one or more values for methane generation in accordance with National Greenhouse and Energy Reporting (NGER), as per the following table:

Criteria	Required values for methane generation	More information at:
Upgrade projects	$CH_4^*{}_{,y}$ for the whole 2 years prior to project commencement	Landfill gas method section 11
The landfill contains waste deposited in 2012/13 and the reporting period includes at least part of 2013/14 or later	$M_{CTW,y}$ and $M_{Gen,y}$ for any years wholly or partly covered by the reporting period	Landfill gas method section 22
The landfill contains waste deposited in 2013/14 and the reporting period includes at least part of 2014/15 or later	$M_{CTW,y}$ and $M_{Gen,y}$ for any years wholly or partly covered by the reporting period	Landfill gas method section 22
Regulatory requirement calculated with one of options 1, 2, 3, 6 or 7	$M_{Gen,y}$ for the whole year immediately prior to project commencement	Worksheet "Baseline" input table 2
Regulatory requirement calculating with option 8	$CH_4^*{}_{,y}$ for the whole year prior to project commencement	Worksheet "Baseline" input table 2

Will you be using the inbuilt NGER worksheets to calculate methane generation values?

Yes - go to Section 2

No - calculate the values manually in accordance with the references in the table above and retain for input in Baseline and go to Section 3

Section 2. Calculating methane generation using the NGER worksheets

The NGER worksheets ("NGER input 1", "NGER input 2") can be used to calculate methane generation, as per requirements in the table above, for ERF abatement calculations. The NGER worksheets in this workbook can be completed either by transferring existing data from the NGER solid waste calculator or by manually completing the worksheets.

1. **Transferring data from the NGER solid waste calculator**

Project proponents who have already used the [NGER solid waste calculator](link)[iii] as part of their NGER reporting obligations may utilise an inbuilt function which copies input data from the NGER solid waste calculator. This is intended to reduce the level of duplication of data entry for reporting required of project proponents who have already provided data for NGER purposes.

2. Manual entry

The alternative approach, in contrast, is to manually complete the worksheets. This alternative approach may be suited to project operators who are not required to report under NGER and have no imperative to use the NGER solid waste calculator. Manual entry in this workbook should be done in accordance with the instructions in the NGER solid waste calculator.

Follow the steps below according to your chosen approach.

Step 2.1

Will you use the NGER solid waste calculator in conjunction with the ERF landfill gas calculator?

Yes, I will be transferring data from the NGER solid waste calculator - go to Step 2.2

No, I will manually complete the worksheets "NGER input 1" and "NGER input 2" directly in the ERF landfill gas calculator - go to Section 3

Step 2.2

Complete the NGER solid waste calculator according to the NGER solid waste calculator guidelines. Go to Step 2.2.1.

Step 2.2.1

Open one copy of the ERF landfill gas calculator and one completed copy of the NGER solid waste calculator, so that they are both open in the same session of Microsoft Excel. Go to Step 2.2.2.

Step 2.2.2

Close all other workbooks (if any). Go to Step 2.2.3.

Step 2.2.3

Click on the NGER transfer button in the worksheet "NGER input 1". Go to Step 2.2.4.

Step 2.2.4

Ensure the NGER solid waste calculator is displaying the worksheet containing data for the project landfill e.g. "Subfacility 1". Click on the NGER transfer button in the worksheet "NGER input 2". Go to Section 3.

Note: steps 2.2.1 - 2.2.4 can be repeated at any time to update the ERF landfill gas calculator to reflect changes made to the NGER solid waste calculator.

Section 3. Data input in "Baseline"

This worksheet performs preliminary calculations needed to calculate the proportion of the methane combusted during the reporting period that would have been combusted without the project (W_B).

The instructions for worksheet "Baseline" are contained within the worksheet itself.

Step 3.1

Complete Input Table 1, then.

- For New/Recommencing Projects complete Input Tables 2 and 3.
- For Transitioning Projects complete Input Table 4.
- For Upgrade Projects complete Input Tables 2, 3 and 5.

Go to Section 4.

Section 4. Guide to completing project abatement activity data in worksheet "Project activity"

The worksheet "Project activity" is used to calculate amount/s of methane combusted during the reporting period by combustion device/s ($M_{com,h}$). It also performs preliminary calculations to enable calculation of the proportion of the methane combusted during the reporting period that was not generated from carbon tax waste (W_{NCT}).

Steps 4.1 - 4.2 only provide instructions for calculating $M_{com,h}$. Instructions are provided in Section 5 for calculating W_{NCT} (if required).

The worksheet "Project activity (sample only)" provides an example of how "Project activity" looks once completed correctly. The sample is not intended to represent a typical project, rather simply demonstrate requirements for data input.

This spreadsheet tool can accommodate data input and calculations for multiple combustion devices. Data for all project combustion devices is entered in the single table in the worksheet "Project activity" in columns A to J. If there is more than one device, input all data for a device into the table and then list data for subsequent device/s directly underneath in the same table.

The recommended approach for inputting abatement activity for a combustion device data differs according to the equipment category. Equipment categories (A, B, C, D, E, F, G and H) are described below, including category descriptions and category-specific instructions for inputting activity data.

Step 4.1

Do you need to input more combustion device activity data?

Yes, I have not input data for any combustion devices yet - go to Step 4.2

Yes, I need to enter data for another combustion device - go to Step 4.2

No - go to Step 4.3

Step 4.2

Select an equipment category for the combustion device from the table below and input data into columns as per the **detailed instructions for all equipment categories** and **detailed instructions for each equipment category** which follow.

Equipment category summaries

Category	Description	Measurement
A	The device is either a boiler or a flare with a monitoring and control system or an internal combustion engine.	Landfill gas/methane sent to the combustion device is measured using $Q_{LFG,h}$ and default $W_{LFG,CH4}$.
B	The device is either a boiler or a flare with a monitoring and control system or an internal combustion engine.	Landfill gas/methane sent to the combustion device is measured using $Q_{LFG,h}$ and non-default $W_{LFG,CH4}$.
C	The device is either a boiler or a flare with a monitoring and control system or an internal combustion engine.	Landfill gas/methane sent to the combustion device is measured using $Q_{En,h}$.
D	The device is an internal combustion engine.	Landfill gas/methane sent to the combustion device is measured using $Q_{EG,h}$ and default Eff_h.
E	The device is an internal combustion engine.	Landfill gas/methane sent to combustion device is measured using $Q_{EG,h}$ and non-default Eff_h.
F	The device is something other than either a boiler or a flare with a monitoring and control system or an internal combustion engine.	Landfill gas/methane sent to the combustion device is measured using $Q_{LFG,h}$ and default $W_{LFG,CH4}$.
G	The device is something other than either a boiler or a flare with a monitoring and control system or an internal combustion engine.	Landfill gas/methane sent to the combustion device is measured using $Q_{LFG,h}$ and non-default $W_{LFG,CH4}$.
H	The device is something other than either a boiler or a flare with a monitoring and control system or an internal combustion engine.	Landfill gas/methane sent to the combustion device is measured using $Q_{En,h}$.

Detailed instructions for all equipment categories

Data input instructions (for yellow highlighted columns)

Step 4.2.1

Financial year ending:

Input each financial year (year ending e.g. enter 2016 for financial year 2015/16) in which project abatement occurs during the reporting period. Input each financial year once only per combustion device.

Step 4.2.2

Type of device (A-H):

Input equipment category "A" in each row.

Step 4.2.3

Is device an internal combustion engine? ("y" or "n"):

Input "y" in each row if the device is an internal combustion engine, or "n" in each row if the device is not an internal combustion engine.

Step 4.2.4

h (device number):

Input a device number in each row for labelling purposes e.g. if the project uses one combustion device only, then enter "1" in each row for this combustion device.

Detailed instructions for each equipment category (for grey highlighted columns)

Equipment category: A

Description: The device is either a boiler or a flare with a monitoring and control system or an internal combustion engine. Landfill gas/methane sent to the combustion device is measured using $Q_{LFG,h}$ and default $W_{LFG,CH4}$.

There will be a single row of data for each financial year partly or wholly spanned by the project period.

Data input instructions

Step 4.2.A.1
$Q_{LFG,h}$ (landfill gas m^3):
Input the total $Q_{LFG,h}$ (landfill gas sent to the combustion device) for each financial year. Do not include non-project abatement. This will be used to determine the methane sent to the combustion device using Equation 8 of the Methodology Determination 2015.

Step 4.2.A.2
$W_{LFG,CH4}$ (proportion):
Input 0.5 in each row of data.

Step 4.2.A.3
Go to Step 4.1.

Equipment category: B

Description: The device is either a boiler or a flare with a monitoring and control system or an internal combustion engine. Landfill gas/methane sent to the combustion device is measured using $Q_{LFG,h}$ and non-default $W_{LFG,CH4}$.
There will be a row of data for each hour during which project abatement occurred.

Data Input instructions

Step 4.2.B.1
$Q_{LFG,h}$ (landfill gas m^3):
Input the total $Q_{LFG,h}$ (landfill gas sent to the combustion device) for each financial year. Do not include non-project abatement. This will be used to determine the methane sent to the combustion device using Equation 8 of the Methodology Determination 2015.

Step 4.2.B.2
$W_{LFG,CH4}$ (proportion):
Input measured methane proportion next to each project abatement amount listed.

Step 4.2.B.3
Go to Step 4.1.

Equipment category: C

Description: The device is either a boiler or a flare with a monitoring and control system or an internal combustion engine. Landfill gas/methane sent to the combustion device is measured using $Q_{En,h}$.

There will be a row of data for financial year partly or wholly spanned by the project period.

Data Input instructions

Step 4.2.C.1
$Q_{En,h}$ (CH₄ GJ):
Input $Q_{En,h}$ (the energy content of the landfill gas sent to the combustion device) for each financial year. Do not include non-project abatement. This will be used to determine the methane sent to the combustion device using Equation 9 of the Methodology Determination 2015.

Equipment category: D

Description: The device is an internal combustion engine.

Landfill gas/methane sent to the combustion device is measured using $Q_{EG,h}$ and default Eff_h.

There will be a row of data for each financial year partly or wholly spanned by the project period.

Data Input instructions

Step 4.2.D.1
$Q_{EG,h}$ (MWh):
Input $Q_{EG,h}$ (the electricity (supplied to the grid or used on-site) produced by internal combustion engine) for each financial year. Do not include non-project abatement. This will be used to determine the methane sent to the combustion device using Equation 10 of the Methodology Determination 2015.

Step 4.2.D.2
Eff_h (proportion):
Input 0.36 in each row of data.

Step 4.2.D.3
Go to Step 4.1.

Equipment category: E

Description: The device is either a boiler or a flare with a monitoring and control system or an internal combustion engine. Landfill gas/methane sent to combustion device is measured using $Q_{EG,h}$ and non-default Eff_h.

There will be a row of data for each financial year partly or wholly spanned by the project period.

Data Input instructions

Step 4.2.E.1
$Q_{EG,h}$ *(MWh):*
Input the $Q_{EG,h}$ (the electricity supplied to the grid or used on-site) for each financial year. Do not include non-project abatement.

Step 4.2.E.2
Eff_h (proportion):
Input Eff_h (factor for the electrical efficiency of internal combustion engine) in each row.

Step 4.2.E.3
Go to Step 4.1.

Equipment category: F

Description: The device is something other than either a boiler or a flare with a monitoring and control system or an internal combustion engine.

Landfill gas/methane sent to the combustion device is measured using $Q_{LFG,h}$ and default $W_{LFG,CH4}$.

There will be a row of data for each hour during which project abatement occurred.

Data Input instructions

Step 4.2.F.1
$O_{h,a}$ (1 or 0):
Input a value of "0" or "1" in column E. The value of "1" applies if the device was operational for the hour in accordance with monitored parameters. The value "0" applies if the device was not operational for the hour in accordance with monitored parameters.

Step 4.2.F.2
$Q_{LFG,h}$ (landfill gas m³):
Input the total $Q_{LFG,h}$ (landfill gas sent to the combustion device) for each hour in the reporting period. It is not necessary to include information for hours in the reporting period during which no project abatement occurred.

Step 4.2.F.3
$W_{LFG,CH4}$ (proportion):
Input 0.5 in each row of data.

Step 4.2.F.8
Go to Step 4.1.

Equipment category: G

Description: The device is something other than either a boiler or a flare with a monitoring and control system or an internal combustion engine.

Landfill gas/methane sent to the combustion device is measured using $Q_{LFG,h}$ and non-default $W_{LFG,CH4}$.

There will be a row of data for each hour during which project abatement occurred.

Data Input instructions

Step 4.2.G.1
$O_{h,a}$ (1 or 0):
Input a value of "0" or "1" in each row. The value of "1" applies if the device was operational for the hour in accordance with monitored parameters. The value "0" applies if the device was not operational for the hour in accordance with monitored parameters.

Step 4.2.G.2
$Q_{LFG,h}$ (landfill gas m³):
Input the $Q_{LFG,h}$ (landfill gas sent to the combustion device) for each hour in the reporting period. It is not necessary to include information for hours in the reporting period during which no project abatement occurred.

Step 4.2.G.3
$W_{LFG,CH4}$ (proportion):
Input measured methane proportion next to each project abatement amount listed.

Step 4.2.G.4
Go to Step 4.1.

Equipment category: H

Description: The device is something other than either a boiler or a flare with a monitoring and control system or an internal combustion engine.

Landfill gas/methane sent to the combustion device is measured using $Q_{En,h}$.

There will be a row of data for each hour during which project abatement occurred.

Data Input instructions

Step 4.2.H.1
$O_{h,a}$ *(1 or 0):*
Input a value of "0" or "1" in each row. The value of "1" applies if the device was operational for the hour in accordance with monitored parameters. The value "0" applies if the device was not operational for the hour in accordance with monitored parameters.

Step 4.2.H.2
$Q_{En,h}$ *(CH_4 GJ):*
Input the $Q_{En,h}$ (landfill gas sent to the combustion device) for each hour in the reporting period. It is not necessary to include information for hours in the reporting period during which no project abatement occurred.

Step 4.2.H.3
Go to Step 4.1.

Step 4.3

Click process data button. Go to Section 5.

Section 5. Data input in worksheet "Project activity" to calculate non-carbon tax waste proportion (W_{NCT})

Projects may or may not be required to calculate W_{NCT}. The inputs for the calculation are the methane generated by the landfill from carbon tax waste in financial year *y* ($M_{CTW,y}$), and the methane generated by the landfill in Financial year y ($M_{Gen,y}$).

Step 5.1

Do either of the following criteria reply?

* The landfill contains waste deposited in 2012/13 and the reporting period includes at least part of 2013/14 or later.

* The landfill contains waste deposited in 2013/14 and the reporting period includes at least part of 2014/15 or later.

Yes - go to Step 5.2

No - ignore or delete contents of cells in the columns $M_{CTW,y}$ and $M_{Gen,y}$ in worksheet "Project activity" and go to Section 6

Step 5.2

In Step 3, did you choose to calculate the methane generation values $M_{CTW,y}$ and $M_{Gen,y}$ with NGER worksheets?

Yes - go to Step 6

No, I will calculate them manually - go to Section 5.3

Step 5.3

Enter the values for $M_{CTW,y}$ and $M_{Gen,y}$ to correspond with the years listed in the column "Each financial year ending" worksheet "Project activity". Go to Section 6.

Section 6. Data input in "Upgrade data" - upgrade projects

This worksheet performs preliminary calculations for calculation of the proportion of the methane combusted during the reporting period that would have been combusted without the project (W_B). It is for upgrade projects only. In some cases there will be necessary replication of data amongst "Project activity" and "Upgrade data". Completing the worksheet "Upgrade data" is similar to inputting project abatement activity data in the worksheet "Project activity".

Step 6.1

Is your project an upgrade project?

Yes - go to Step 6.2

No - no further input required - end of instructions

Step 6.2

Follow Step 4.1 - Step 4.3 to complete data input in worksheet "Upgrade data", **but only use data for the entire 12 months following the upgrade**.

End of instructions

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[i] https://www.legislation.gov.au/Series/F2015L00059
[ii] https://www.legislation.gov.au/Series/F2008L02309/Compilations
[iii] http://www.cleanenergyregulator.gov.au/NGER/Forms-and-resources/Calculators