EXPLANATORY STATEMENT

Issued by the Authority of the Parliamentary Secretary for Climate Change and Energy Efficiency

Carbon Credits (Carbon Farming Initiative) Act 2011

Carbon Farming (Capture and Combustion of Methane in Landfill Gas from Legacy Waste) Methodology Determination 2012

Background

The *Carbon Credits (Carbon Farming Initiative) Act 2011* (the Act) enables the crediting of greenhouse gas abatement in the land sector and from legacy landfill waste. Greenhouse gas abatement is achieved by either reducing or avoiding emissions or by removing carbon from the atmosphere and storing it in soil or trees.

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

Subsection 106 (1) of the Act empowers the Minister, by legislative instrument, to make a determination known as a methodology determination. The purpose of a methodology determination is to establish procedures for estimating abatement (emissions reductions and sequestration) and project rules for monitoring, record keeping and reporting on abatement.

A methodology determination must meet the offsets integrity standards set out in section 133 of the Act and the other eligibility criteria set out in section 106 of the Act. The Minister cannot make a methodology determination unless the Domestic Offsets Integrity Committee (DOIC) has endorsed a proposal for the methodology determination under section 112 of the Act and advised the Minister of the endorsement under section 113 of the Act. The DOIC is an independent expert panel established to evaluate and endorse proposals for methodology determinations.

Application of the Methodology Determination

The *Carbon Farming (Capture and Combustion of Methane in Landfill Gas from Legacy Waste) Methodology Determination 2012* (the Methodology Determination) sets out the detailed rules for implementing and monitoring projects under the Carbon Farming Initiative (CFI) to reduce methane emissions from landfill gas generated from legacy waste.

The Methodology Determination applies to landfill legacy emissions avoidance projects that are transitioning from the New South Wales Government's Greenhouse Gas Reduction Scheme, the Australian Capital Territory Government's Greenhouse Gas Abatement Scheme or Greenhouse Friendly, or that involve the installation, on or after 1 July 2010, of a landfill gas extraction system to avoid emissions of greenhouse gases from a landfill facility, to the extent that the emissions are attributable to 'legacy waste'. Legacy waste is waste accepted by the facility before 1 July 2012, which is the date specified in the *Carbon Credits (Carbon Farming Initiative) - Landfill Legacy Emissions Avoidance Project Specification 2011*.

Landfill facility is defined in section 5 of the Act to mean a facility for the disposal of solid waste as landfill, and includes a facility that is closed and no longer accepts waste.

The collection and combustion of methane from legacy waste in landfills involves the installation and use of a landfill gas extraction system to capture and combust methane produced by the anaerobic decomposition of organic matter in the waste that in the absence of any abatement activity is emitted to the atmosphere.

Under the Methodology Determination, the abatement amount is derived from the amount of methane captured and destroyed that is in addition to any methane that must be captured and combusted to meet regulatory requirements.

Project proponents wanting to implement the Methodology Determination must make an application to the Clean Energy Regulator (the Regulator) and meet the eligibility requirements for an offsets project set out in subsection 27 (4) of the Act. These requirements include compliance with the rules set out in the Methodology Determination.

Offsets projects that are undertaken in accordance with the Methodology Determination and approved by the Regulator can generate Australian carbon credit units.

Public Consultation

The methodology proposal was developed in collaboration with a technical working group made up of representatives from the industry and local and state governments.

The methodology proposal was published on the Department's website for public consultation from 27 May 2011 to 30 June 2011. Stakeholders and members of the public who asked to be listed on the mailing list maintained by the Department were notified of the public consultation period. Ten submissions were received.

The Interim DOIC considered the issues raised in public submissions during its assessment of the methodology as required under subsection 112 (5) of the Act.

Sections 131 and 132 of the Act contain transitional provisions for the consideration of methodologies by the Interim DOIC prior to the commencement of the Act.

Determination Details

The Methodology Determination is a legislative instrument within the meaning of the *Legislative Instruments Act 200*3.

The Methodology Determination is taken to have commenced on 1 July 2010.

Subsection 12 (2) of the *Legislative Instruments Act 2003* provides that, for a legislative instrument to have effect before the date it is registered, it must not adversely affect the rights of any person or impose a liability on any person in respect of anything done or not done before the date of registration. The Methodology Determination does not offend against these requirements. Retrospective application confers a benefit in that it allows persons to apply for and generate Australian carbon credit units in circumstances where they would not normally be eligible to apply.

Details of the Methodology Determination are at Attachment A.

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

Attachment A

Details of the Methodology Determination

Part 1 Preliminary

1.1 Name of Methodology Determination

This section provides that the name of the Methodology Determination is the *Carbon Farming* (*Capture and Combustion of Methane in Landfill Gas from Legacy Waste) Methodology Determination 2012*.

1.2 Commencement

This section provides that the Methodology Determination is taken to have commenced on 1 July 2010.

Subsection 122 (3) of the Act provides that if a methodology determination is made on or before 30 June 2013 and an application for endorsement of a proposal for the determination was submitted to the DOIC by 30 June 2012, the determination may be expressed to have come into force on 1 July 2010.

1.3. Application

This section sets out the types of landfill legacy emissions avoidance projects to which the Methodology Determination applies.

The effect of paragraph 106 (1) (a) of the Act is that a methodology determination must be expressed to apply to a specific kind of offsets project. This section of the Methodology Determination explains that the instrument applies to certain types of landfill legacy emissions avoidance projects, namely, projects transitioning from the New South Wales Government's Greenhouse Gas Reduction Scheme and the Australian Capital Territory Government's Greenhouse Gas Abatement Scheme (GGAS), projects transitioning from Greenhouse Friendly, and projects that involve the installation and use, on or after 1 July 2010, of a landfill gas extraction and combustion system, in the circumstances set out in Part 2 of the Methodology Determination.

Under baseline conditions, landfill gas is passively emitted due to the anaerobic decomposition of the organic components of waste within a landfill. The abatement activity described in the Methodology Determination reduces the quantity of greenhouse gas emitted from landfill. Because methane is a greenhouse gas with a global warming potential 21 times greater than carbon dioxide, the chemical conversion of methane to carbon dioxide through combustion reduces the greenhouse gas emissions measured in terms of carbon dioxide equivalence that are released into the atmosphere.

The Methodology Determination does not apply to projects that involve the upgrading or reinstallation of landfill gas extraction systems where such systems were already installed before 1 July 2010. The Methodology Determination does not apply to projects that merely involve the use of a gas extraction system that has already been installed, prior to 1 July 2010, unless the project is a transitioning project.

1.4 Definitions

This section defines a number of terms used in the Methodology Determination.

Generally, where terms are not defined in the Methodology Determination, they have the meaning given by section 5 of the Act.

Part 2 Requirements that must be met for an offsets project to be an eligible offsets project

2.1 Requirements that must be met for an offsets project to be an eligible offsets project

The effect of paragraph 106 (1) (b) of the Act is that a methodology determination must set out requirements that must be met for the offsets project to be an eligible offsets project. This section of the Methodology Determination explains that the project must be a project transitioning from GGAS or Greenhouse Friendly, or a project that involves the following activities:

(a) installing a gas collection system (including wells, flares and/or electricity generation systems) on or after 1 July 2010; and

(b) collecting the landfill gas generated (only the proportion from legacy waste is eligible for crediting); and

(c) combusting the methane component of the landfill gas using flares and/or an electricity generation system to chemically convert it to carbon dioxide (CO_2).

The Methodology Determination applies only to the capture and combustion of methane generated from landfill gas from legacy waste. Legacy waste is waste accepted by the landfill facility before 1 July 2012. Where a landfill facility accepts waste on or after 1 July 2012, only the additional abatement generated by reducing methane emissions from legacy waste will be eligible for crediting.

To avoid confusion, 'installing a landfill gas extraction system' does not include the reinstallation, or replacement of, upgrades to or modifications of an existing system, where such systems were installed prior to 1 July 2010. A project under the Methodology Determination that is not a transitioning project must consist of the installation of a new system, in entirety, where no system has previously been installed.

Part 3 Calculating the carbon dioxide equivalent net abatement amount for a project in relation to a reporting period

Division 3.1 Preliminary

3.1 General

This section clarifies that all calculations are in respect of activities done or outcomes achieved during the reporting period for a project, and that the data used in calculations must comply with the data collection requirements set out in Division 3.3 of the Methodology Determination.

3.2 Greenhouse gas assessment boundary

This section describes the greenhouse gas sources and sinks that need to be assessed in order to determine the total net change in greenhouse gas emissions resulting from a project abatement activity.

Sources and sinks of greenhouse gases that must be accounted for in the abatement calculations include those from:

(a) 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;

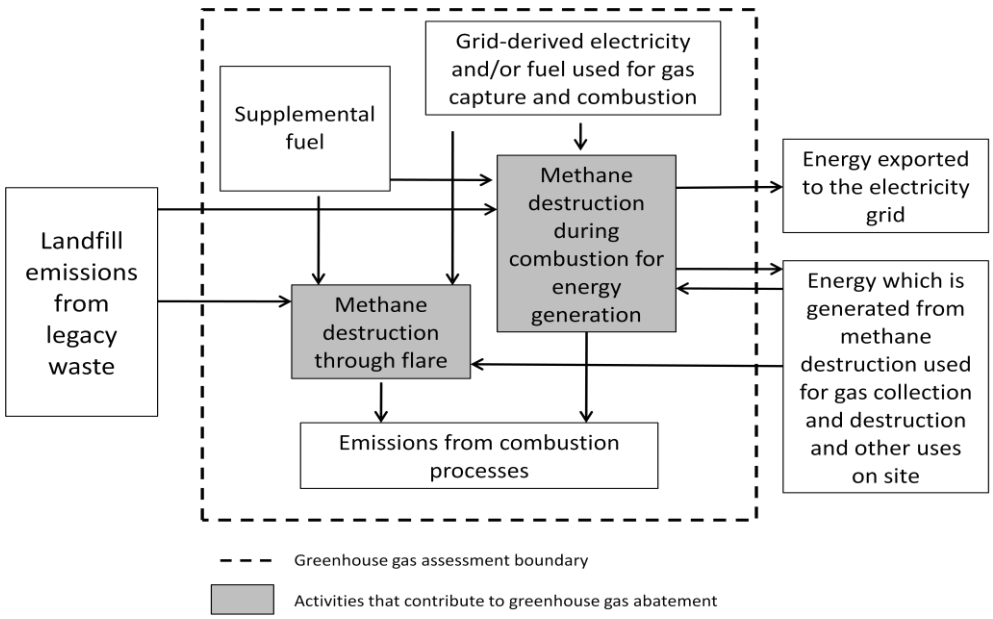
(b) supplemental fuel, for example natural gas, if used to sustain combustion;

(c) landfill gas that is captured and destroyed by an internal combustion engine to generate electricity;

(d) landfill gas that is captured and destroyed via an open or enclosed flare;

(e) 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.

Figure 1 illustrates the greenhouse gas sources included in the greenhouse gas assessment boundary.



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.

The greenhouse gas assessment boundary does not include carbon dioxide emissions reductions associated with displacing fossil fuel derived electricity because this is not an eligible source of abatement for crediting under the CFI. Scope 2 emissions from energy used for gas capture and combustion are not included in the greenhouse gas assessment boundary in circumstances where the energy used is generated from methane combustion on-site, as the scope 1 fugitive emissions from the combustion process are already included in the greenhouse gas assessment boundary.

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

3.3 Calculating the baseline for the offsets project

This section specifies the process for identifying a project baseline as required under paragraph 106 (4) (f) of the Act. The project baseline is the amount of methane that would have been emitted from the landfill in the absence of the project.

The proportion of methane that is required to be captured or destroyed to meet regulatory requirements must be calculated in accordance with the *Guidelines for Calculating Regulatory Baselines for Legacy Waste Landfill Methane Projects* (the Guidelines).

Division 3.2 Calculations

This Division includes a detailed description of the formulas used for calculating net greenhouse gas abatement and explanations of the parameters included in each formula, along with a description of how each parameter is derived.

The calculations allow for calculation of the combustion of legacy waste using two types of combustion devices, being flares (open or enclosed) and internal combustion engines.

General

A number of the calculations require the use of a factor or parameter prescribed in the *National Greenhouse and Energy Reporting (Measurement) Determination 2008* (NGER Measurement Determination) and the *National Greenhouse and Energy Reporting Regulations 2008* (NGER Regulations), both of which are amended from time to time.

Subsection 3.1 (2) of the Methodology Determination establishes that calculations under this Division must use the factor or parameter which is prescribed in the relevant NGER Measurement Determination or the NGER Regulations in force at the time the report is submitted or is required, whichever is earlier. This is the case even if a different value was in effect for the factor or parameter earlier in the reporting period.

This approach is varied in the case of an offset project which is related to a facility with reporting obligations under the *National Greenhouse and Energy Reporting Act 2007* (NGER Act). In this case, the factor or parameter used in the report under the NGER Act must also be used in the calculations done under this Division. This is to ensure that a person with reporting obligations under the NGER Act uses consistent values in their reports under the Act.

The current factors and values (applicable at the time of making the Methodology Determination) are listed in the following table:

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
$\mathbf{EC_{biogas}}$	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
$\mathbf{GWP_{CH_4}}$ [1]	The global warming potential of methane as specified in the NGER Regulations	21
$\mathbf{EF_{N_2O}}$	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

[1] Global Warming Potential is an index that measures the heat absorbing ability and the decay rate of a well mixed greenhouse gas in the atmosphere over a time interval, relative to that of carbon dioxide.

Subdivision 3.2.1 Calculating the carbon dioxide equivalent net abatement amount (A)

This subdivision outlines equations required to calculate the quantity of methane emissions avoided as a consequence of the project.

3.4 Carbon dioxide equivalent net abatement amount (A)

This section sets out the requirements for Equation 1. Paragraph 106 (1) (c) of the Act provides that a methodology determination must specify a method for calculating the carbon dioxide equivalent net abatement amount for the project in relation to a reporting period.

Equation 1 requires the calculation of:

- the quantity of methane emissions from legacy waste avoided as a consequence of the project using Equation 2; and
- emissions from electricity and fuel used to operate the gas capture and combustion equipment using Equation 13.

Subdivision 3.2.2 Calculating avoided emissions (A_p)

3.5 Avoided emissions (A_p)

This section sets out the requirements for Equation 2 which requires calculation of:

- the volume of methane generated from legacy waste destroyed by the combustion device using Equation 3;
    - if an internal combustion engine is used and the project proponent chooses to calculate the quantity of methane destroyed by the internal combustion engine based on the generation of electricity in megawatt hours this quantity must be calculated using Equation 9;
- the quantity of methane generated by legacy waste destroyed under baseline conditions due to regulatory requirements using Equation 12; and
- the quantity of methane and nitrous oxide emissions released from combustion devices in the landfill facility using Equation 5.

The oxidation factor used in Equation 2 discounts the emissions avoided by the amount of methane that would have been oxidised in the soil of the landfill under baseline conditions.

If an internal combustion engine is used and the project proponent chooses to calculate the quantity of methane destroyed by the internal combustion engine based on the generation of electricity in megawatt hours, Equation 9 must be used and avoided emissions (A_p) must be calculated using Equation 2(a) at subsection 3.8 (4).

3.6 Volume of methane generated from legacy waste destroyed by a combustion device ($Q_{com,h}$)

This section sets out the requirements for Equations 3, 4a, and 4b.

Equation 3 requires the calculation of:

- the volume of methane sent to a combustion device using Equation 4a or Equation 4b; and
- the proportion of legacy waste using Equation 11.

If the energy content of landfill gas is calculated in gigajoules from the measured flow rate and methane fraction of the landfill gas by a flow computer and measured parameters are corrected to standard conditions, the project proponent may choose to use Equation 4b to calculate the volume of methane sent to a combustion device. Otherwise Equation 4a must be used.

3.7 Emissions from combustion devices (E_{com})

This section sets out the requirements for Equations 5, 6, 6(a), 7, 8, and 8(a).

Equation 5 requires the calculation of the quantity of methane and nitrous oxide emissions released from all combustion devices using Equation 6 or Equation 6(a).

The project may adopt the latter approach only if an internal combustion engine is used and the project proponent chooses to calculate the quantity of methane destroyed by an internal combustion engine based on the amount of electricity produced by an internal combustion engine generator measured in megawatt hours.

Use of Equation 6 requires the calculation of the volume of methane generated by legacy waste not destroyed by the combustion device using Equation 7.

Use of Equation 6(a) requires:

- calculation of the volume of methane generated by legacy waste not destroyed by the combustion device using Equation 7; and
- calculation of the energy content of the methane sent to the internal combustion engine in gigajoules using Equation 10.

Equation 5 also requires the calculation of the quantity of nitrous oxide emissions released as a result of all combustion devices using Equation 8. If an internal combustion engine is used and the project proponent chooses to calculate the quantity of methane destroyed by an internal combustion engine based on the amount of electricity produced by an internal combustion engine generator measured in megawatt hours, the quantity of nitrous oxide emissions released as a result of all combustion devices must be calculated using Equation 8(a).

3.8 Quantity of methane combusted in an internal combustion engine – optional calculations

This section outlines the approaches to be taken if an internal combustion engine is used and the project proponent chooses to calculate the quantity of methane destroyed by an internal combustion engine based on the amount of electricity produced by an internal combustion engine generator measured in megawatt hours using Equations 2(a), 9, and 10.

3.9 Proportion of methane generated from legacy waste (L_p)

This section outlines the procedure for determining the proportion of methane generated from legacy waste using Equation 11.

3.10 Quantity of methane destroyed under baseline conditions, due to regulatory requirements (A_{reg})

This section sets out the requirements for Equations 12 and 12(a). Equation 12 requires the calculation of:

- the volume of methane generated by legacy waste destroyed by the combustion device using Equation 3 at section 3.6; and
- the quantity of methane that is required to be captured and destroyed to meet regulatory requirements according to the criteria given at subsection 3.10 (1).

The quantity of methane that is required to be captured or destroyed to meet regulatory requirements must be calculated in accordance with the Guidelines. The Guidelines provide a baseline of zero for projects transitioning from Greenhouse Friendly, and a baseline of 0.24 for projects transitioning from GGAS. The Guidelines are available on the Department's website at: www.climatechange.gov.au/cfi.

If an internal combustion engine is used and the project proponent chooses to calculate the quantity of methane destroyed by an internal combustion engine based on the energy used in the generation of electricity in megawatt hours, the quantity of methane destroyed under baseline conditions due to regulatory requirements must be calculated using the Equation 12 (a).

Subdivision 3.2.3 Calculating emissions from fuel and grid-delivered electricity used to operate the landfill gas extraction system used in the project ($\mathbf{Y_p}$)

This subdivision outlines equations required to calculate the quantity of emissions from fuel and grid-delivered electricity used to operate the landfill gas extraction system to capture and destroy methane generated from legacy waste as a result of the project.

3.11 Emissions from fuel and grid-delivered electricity used to operate the landfill gas extraction system used in the project (Y_p)

This section sets out the requirements for Equations 13, 14, and 15. Equation 13 requires the calculation of:

- the total emissions from fuel and grid-delivered electricity used to operate the landfill gas extraction system using Equation 14;
- the emissions from fuel and grid-delivered electricity used to operate the landfill gas extraction system to meet regulatory requirements using Equation 15.

Equation 14 requires the calculation of the total emissions from fuel used (including supplemental natural gas) to operate the landfill gas extraction system using Equation 16 and the calculation of the total emission from consumption of purchased electricity used to operate the landfill gas extraction system using Equation 18.

3.12 Total emissions from fuel used to operate the landfill gas extraction system (Ef)

This section sets out the requirements for Equations 16 and 17. Equation 16 requires the calculation of the emissions of each greenhouse gas from each fuel type using Equation 17.

3.13 Total emissions from the consumption of purchased electricity (E_{elec})

This section sets out the requirements for Equation 18 which provides for the calculation of the total emissions for the consumption of purchased electricity.

Division 3.3 Data Collection

3.14 Measurement procedures and measurement frequency

The effect of paragraph 106 (3) (c) of the Act is that a methodology determination may require the project proponent of an eligible offsets project to comply with specified record-keeping requirements relating to the project. A project proponent who fails to comply with a record-keeping requirement relating to the project will have contravened a civil penalty provision (section 193 of the Act).

This section provides the data collection methods for deriving the parameters used to calculate baseline greenhouse gas emissions and removals and project emissions and removals. The description, unit of measurement, measurement procedure and measurement frequency for each parameter used to calculate project emissions are set out in the table in this section.

It covers:

(a) quantity of landfill gas sent to a combustion device;

(b) methane destruction efficiency for a combustion device;

(c) the methane fraction in the landfill gas;

(d) the quantity of electricity used for abatement activities;

(e) the quantity of fuel used for abatement activities;

(f) the quantity of electricity produced by methane combustion in internal combustion engine generator; and

(g) the electrical efficiency factor of the internal combustion engine generator.

3.15 Volumetric measurement — Quantity of landfill gas ($Q_{lfg,h}$) and methane fraction (W_{CH_4})

This section of the Methodology Determination provides the details required for measuring the volumetric flow rate.

3.16 Flow computer requirements

This section includes requirements for the recording of data where a flow computer is used.

A flow computer is an electronic computational device which implements the required algorithms to turn the raw data received from flow meters into volumes at base conditions.

3.17 Gas composition

This section provides details about the analysis of landfill gas composition and lists the standards that must be used for analysing gas.

3.18 Operation of flares

This section sets out procedures and rules for measuring the destruction efficiency of a flare. The destruction efficiency of a flare is contingent on it being operational. The section sets out the circumstances in which a flare will be taken not to be operational.

Part 4 Monitoring, record-keeping and reporting requirements

Division 4.1 General

4.1 Application

The effect of paragraph 106 (3) (d) of the Act is that a methodology determination may require the project proponent of an eligible offsets project to comply with specified requirements to monitor a project.

A project proponent for an eligible offsets project who fails to monitor a project in accordance with any monitoring requirements in the applicable methodology determination will have contravened a civil penalty provision (section 194 of the Act).

Division 4.2 Monitoring requirements

4.2 Project monitoring

This section of the Methodology Determination sets out specifications for measurement equipment used for an offsets project.

4.3 Quality assurance and quality control

This section of the Methodology Determination sets out requirements relating to inspection and maintenance of monitoring instruments and other equipment used in a project.

Division 4.3 Record-keeping requirements

4.4 Records that must be kept

This section of the Methodology Determination specifies the records that must be kept in relation to the project.

Division 4.4 Offsets report requirements

4.5 Information that must be included in an offsets report

Project proponents will be required to submit:

(a) a report for the first reporting period; and

(b) ongoing reports for subsequent reporting periods.

This section of the Methodology Determination sets out the information that must be included in the first offsets reports for an offsets project.

4.6 Subsequent reporting periods

This section sets out information that must be included in the subsequent project reports.

Attachment B

Statement of Compatibility with Human Rights

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

Carbon Farming (Capture and Combustion of Methane in Landfill Gas from Legacy Waste) Methodology Determination 2012

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

Overview of the Legislative Instrument

The *Carbon Farming (Capture and Combustion of Methane in Landfill Gas from Legacy Waste) Methodology Determination 2012* (Methodology Determination) sets out the detailed rules for implementing and monitoring projects under the Carbon Farming Initiative (CFI) to reduce methane emissions from landfill gas generated from legacy waste.

Project proponents wanting to implement the Methodology Determination must make an application to the Clean Energy Regulator (Regulator) and meet the eligibility requirements set out under the *Carbon Credits (Carbon Farming Initiative) Act 2011*. Offsets projects that are approved by the Regulator can generate Australian carbon credit units.

Human rights implications

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

Conclusion

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

Mark Dreyfus, Parliamentary Secretary for Climate Change and Energy Efficiency