EXPLANATORY STATEMENT

Issued by the Authority of the Parliamentary Secretary for Climate Change, Industry and Innovation

Carbon Credits (Carbon Farming Initiative) Act 2011

Carbon Credits (Carbon Farming Initiative) (Destruction of Methane Generated from Manure in Piggeries—1.1) Methodology Determination 2013

Background

The *Carbon Credits (Carbon Farming Initiative) Act 2011* (the Act) enables the crediting of greenhouse gas abatement in the land sector. 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 to make, by legislative instrument, a methodology determination. The purpose of a methodology determination is to establish procedures for estimating abatement (emissions reductions and sequestration) 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 the proposal 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 Determination

The *Carbon Credits (Carbon Farming Initiative) (Destruction of Methane Generated from Manure in Piggeries—1.1) Methodology Determination 2013* (the Determination) sets out the detailed rules for implementing and monitoring a project under the Carbon Farming Initiative (CFI) to reduce the methane generated from manure in piggeries.

Waste management in conventional piggeries involves the collection and storage of manure in uncovered lagoons, where methane is produced by the anaerobic decomposition of organic matter in waste and, in the absence of any abatement activity, is emitted into the atmosphere.

The abatement activity involves collecting the emitted gas by covering open lagoons to prevent the release of biogas containing methane. This abatement activity requires the

installation and operation of covers and gas capture and combustion equipment for existing uncovered treatment lagoons, or alternatively the replacement of conventional lagoons with covered lagoon systems. Piggery operators can use the captured emissions to produce heat and electricity, or destroy it through the use of flares.

Project proponents wanting to implement the 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 Determination.

Offsets projects that are undertaken in accordance with the Determination and approved by the Regulator can generate Australian carbon credit units (ACCUs) that can be sold to:

- Australian companies that pay the carbon price established under the *Clean Energy Act 2011*; and

- businesses in Australia wanting to offset their own carbon pollution.

Public Consultation

The methodology proposal *Methodology for the destruction of methane generated from manure in piggeries* (the proposal) was developed by the Department of Climate Change and Energy Efficiency (the Department) in collaboration with a technical working group made up of representatives from the pork industry and the Australian Government.

The proposal was published on the Department's website for public consultation from 27 June to 26 July 2011. Three public submissions relating to the proposal 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. The Interim DOIC is the committee that was established under the executive power of the Commonwealth before the commencement 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.

The proposal was endorsed by the Interim DOIC on 7 September 2011.

The proposal was made into the *Carbon Credits (Carbon Farming Initiative) (Destruction of Methane from Manure in Piggeries) Methodology Determination 2012* (the original determination) on 27 June 2012.

The Determination provides updates to the original determination following feedback from the Regulator on technical issues during implementation of the original determination.

The Regulator, Australian Pork Limited and key stakeholder Blantyre Farms Pty Ltd were consulted in the development of the Determination.

Determination Details

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

The Determination commences retrospectively from 1 July 2010.

Retrospective commencement is authorised by subsection 122(3) of the Act, which provides that a determination can be expressed to have come into force on 1 July 2010 if the determination is made on or before 30 June 2013, and the application for endorsement was made on or before 30 June 2012. Both of these conditions are satisfied in this case.

Retrospective commencement does 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 on the Federal Register of Legislative Instruments. Rather, retrospective application confers a benefit in that it allows persons to apply for and generate ACCUs in circumstances where they would not normally be eligible to apply.

Details of the Methodology Determination are at Attachment A.

Statement of compatibility prepared in accordance with Part 3 of the *Human Rights (Parliamentary Scrutiny) Act 2011*

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.

Attachment A

Details of the Methodology Determination

Part 1 Preliminary

1.1 Name of the Determination

Section 1.1 provides that the name of the Determination is the *Carbon Credits (Carbon Farming Initiative) (Destruction of Methane Generated from Manure in Piggeries—1.1) Methodology Determination 2013.*

1.2. Commencement

Section 1.2 provides that the Determination commences retrospectively from 1 July 2010. Retrospective commencement is authorised by subsection 122(3) of the Act.

While the Determination may apply to projects that were established prior to 1 July 2010, a project proponent can earn credits only for abatement which occurs from 1 July 2010. Subsections 27(15) and (16) of the Act prevent the crediting of abatement before this date.

1.3 Definitions

Section 1.3 defines a number of terms used in the Determination.

Where the Determination refers to United States Environment Protection Authority (US EPA) methods, a link to those methods is available at www.climatechange.gov.au. The methods are also available on the website of the US EPA.

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

1.4 Kind of project to which this Determination applies

The effect of paragraph 106(1)(a) of the Act is that a determination must specify the kind of offsets project to which it applies.

Section 1.4 of the Determination lists the kind of offsets projects to which the Determination applies.

The effect of section 1.4 is that the Determination applies to a project that involves the capture of biogas generated by the decomposition of piggery manure waste in the circumstances set out in Part 2 of the Determination. This kind of project is a specified offsets project—that is, it is included in the list specified in regulation 3.28 of the *Carbon Credits (Carbon Farming Initiative) Regulations 2011* (the Regulations).

Waste management in conventional piggeries involves the collection and storage of manure in uncovered lagoons. Methane (CH_4) is produced by the anaerobic decomposition of organic matter in the waste, and in the absence of any abatement, is emitted into the atmosphere.

The abatement activity in projects to which the Determination applies requires the use of lagoon covers and gas capture and combustion equipment. Flares, and/or an electricity generation system, and/or a gas boiler are used to combust the methane component of the biogas. The methane is converted to carbon dioxide through combustion.

Part 2 Requirements for declaration as eligible project

2.1 Eligible projects

The effect of paragraph 106(1)(b) of the Act is that a methodology determination must set out the requirements that must be met for a project to be an eligible offsets project.

Part 2 of the Determination specifies a number of requirements that must be met before a project to which the Determination applies can be declared an eligible offsets project.

2.2 Requirement 1—Location

Section 2.2 provides that the project must be located within Australia, including the external territories.

2.3 Requirement 2—Project mechanism

Section 2.3 provides that the project must consist of the following activities:

(a) using covered lagoons to prevent release of biogas (containing methane) into the atmosphere;

(b) collecting the gas from the covered lagoon; and

(c) combusting the methane component in the gas to convert it to carbon dioxide.

The use of lagoons, or anaerobic ponds, is a common method for treating piggery manure.

The project mechanism requires the installation and use of lagoon covers and gas capture and combustion equipment. The section provides that this equipment must have been installed on or after 1 July 2007.

2.4 Requirement 3—Project equipment

Section 2.4 sets out the requirements for equipment installed and used as part of the project.

Subsection 2.4(1) clarifies that lagoons used in the project can already exist as uncovered lagoons on 1 July 2007, or can be new lagoons (i.e. created after 1 July 2007).

Subsection 2.4(2) specifies the equipment and its installation that will be covered by the Determination.

The effect of sections 2.3 and 2.4 is that while the Determination can apply to projects where lagoon covers and gas capture and combustion equipment are installed on or after 1 July 2007, ACCUs can only be earned for abatement which occurs from 1 July 2010, in accordance with subsections 27(15) and (16) of the Act. The inclusion of the 1 July 2007 requirement regarding equipment recognises that some companies began taking action (e.g. managing manure emissions) in anticipation of carbon revenue in early July 2007.

2.5 Requirement 3—Lagoons

Subsection 2.5(1) requires that project lagoons have a minimum depth of 2 metres, and meet the best practice principles in the *National Environmental Guidelines for Piggeries 2010*. These guidelines are available on the Australian Pork Limited website, and a link to these guidelines is provided at www.climatechange.gov.au.

Subsection 2.5(2) provides that the input to the lagoon must consist only of effluent from the operation of piggery sheds in the project.

Effluent from shed operations may include undigested feed and any bedding which would, under normal operations, enter the effluent stream.

2.6 Requirement 4—Flaring systems

Section 2.6 sets out the rules relating to the flaring systems to be used in the project. These are systems used to combust biogas and include open and enclosed flares.

The section provides that the flaring system must use a type of flare that is designed to maintain the continuous destruction of methane, and include a system that detects and records when the flare fails for more than 20 minutes.

The note to the section provides examples of flares that are designed to maintain continuous destruction of methane.

Part 3 Requirements for operation of eligible projects

Division 3.1 Operation of eligible projects

3.1 Operation of eligible projects

Section 3.1 specifies that the rules for operating a project to which the Determination applies are set out in Part 3.

3.2 Flare operation

Section 3.2 provides for the operation of flaring systems.

In particular, the section sets out the requirements for determining whether the flaring system is operational, for the purposes of determining the system's destruction efficiency as required under Subdivision 4.2.5.

Subsection 3.2(2) specifies that if there is no record of the flare being operational, or if the flare is not operational for more than 20 minutes, then the flare destruction efficiency must be taken to be zero.

The rule set out in subsection 3.2(2) is required because when flares are not operational, any biogas flowing to the device may be released to the atmosphere without combustion and is not eligible for credits under the CFI.

Subsection 3.2(3) sets out how to determine if a flare is operational.

Division 3.2 Greenhouse gas assessment boundary

3.5 Greenhouse gases that must be accounted for

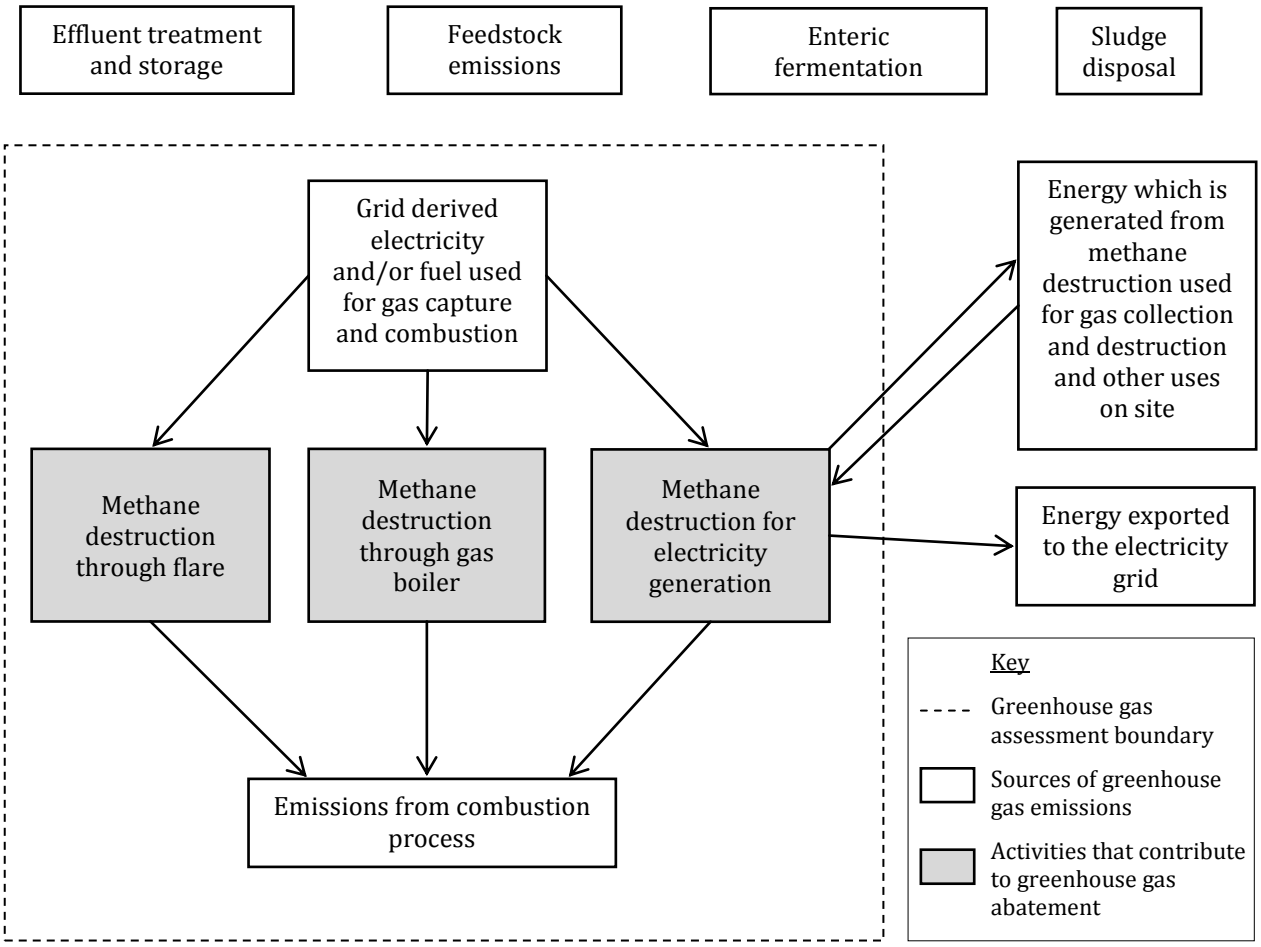
Section 3.5 describes the greenhouse gases that need to be assessed in order to determine the total net change in greenhouse gas emissions resulting from the project.

Emissions and sources that must be accounted for in the abatement calculations include emissions:

- from anaerobically treated waste in project lagoons;
- from gas capture and combustion, including via:
    - an internal combustion engine;
    - a gas boiler used to heat water or generate steam; or
    - flaring; and
- from grid derived electricity and fuel used in the capture and combustion of gas.

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

Figure 1 – Greenhouse gas assessment boundary



Part 4 The net abatement amount

Division 4.1 The net abatement amount

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

4.1 The net abatement amount

Section 4.1 provides that the carbon dioxide equivalent net abatement amount for an eligible offsets project to which the Determination applies is the quantity of methane emissions avoided as a consequence of the project, minus emissions from project activities.

The net abatement amount is calculated using Equation 2.1 in Subdivision 4.2.3.

Division 4.2 Calculations

Subdivision 4.2.1 Preliminary

4.2 How calculations are to be made

Section 4.2 clarifies that all calculations are in respect of activities done or outcomes achieved during the reporting period for a project, and requires that the calculations are carried out at least once every 12 months.

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.

Paragraph 4.2(d) of the Determination provides that all calculations performed under Division 4.2 must use the factor or parameter which is prescribed in either the NGER Measurement Determination or NGER Regulations in force at the time that the offsets report is submitted or is due for submission, 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.

4.3 Calculating the baseline for the offsets project

Section 4.3 sets out the general requirements 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 generated and released into the atmosphere from the uncovered lagoons included in the project for each year, in the absence of the abatement activity.

The project baseline is used to cap the amount of captured and combusted methane that can be claimed as emissions abatement.

The amount of methane that would have been generated and released into the atmosphere from uncovered lagoons is calculated based on the amount of Volatile Solids (VS) in the effluent stream deposited into the lagoons in the project. The amount of VS in the effluent stream is estimated using the PigBal model developed for Australian conditions. PigBal estimates of VS are based on the number of animals (in various classes), the feed mix used, climatic conditions and the waste pre-treatment system (before entry of effluent into the lagoon) during the year.

The Determination requires project proponents to use Version 2.14 of PigBal (in accordance with the definition of PigBal model in section 1.3 of the Determination).

The full range of parameters required to calculate VS entering the project lagoons (which is used to calculate baseline methane emissions) is accounted for in the PigBal model. The PigBal model is an appropriate tool for estimating VS from piggeries because it represents industry best practice and is the method used to estimate VS (and hence methane) from piggeries in Australia's National Greenhouse Accounts.

Many piggery operators already collect most of the information required for entry into the PigBal model in the normal course of operations. Methane emissions will be calculated from VS using the maximum methane-producing capacity from VS (Bo) and the methane conversion factors used in compiling Australia's National Greenhouse Accounts.

The process for estimating the project baseline assumes that waste treatment and storage practices do not change as a result of the abatement activity. Thus, emissions from stationary energy or fuel use associated with washdown of effluent and other waste in sheds into lagoons, and the operation and maintenance of lagoons, are not included in the project baseline.

The process for estimating the project baseline further assumes that the sludge disposal practices are not changed due to the abatement activity. De-sludging involves pumping the sediment from the lagoon and removing it for drying, and in some circumstances processing (for example, composting) prior to subsequent use. The quantity of sludge generated within the covered lagoon will not exceed the quantity generated in an uncovered lagoon and therefore the practice itself and the amount of energy used for de-sludging will not change as a result of the lagoon being covered. For this reason, emissions from stationary energy or fuel use associated with waste disposal are not included in the project baseline.

Subdivision 4.2.2 Baseline emissions (E_b)

Subdivision 4.2.2 outlines equations required to calculate the baseline.

4.4 Calculating the baseline emissions

Equation 1.1 sets out the formula for calculating the baseline methane emissions. It requires the prior calculation of the volume of methane that would be released into the atmosphere from the operation of uncovered anaerobic treatment lagoons within the project site in the absence of the project, using Equation 1.2.

4.5 Calculating the volume of methane

Equation 1.2 sets out the formula for calculating the volume of methane released in the absence of the project. It requires the prior calculation of the quantity of VS entering the project lagoons in kilograms, which is calculated using the PigBal model in accordance with the PigBal Manual.

The amount of VS is multiplied by two default factors. These are Bo, which is the maximum methane producing capacity from VS in pig waste effluent, and MCF, which is the methane conversion factor reflecting the portion of Bo that is achieved under temperature and treatment specifications.

Baseline calculations in Equations 1.1 and 1.2 are consistent with those used to compile Australia's National Greenhouse Accounts.

Subdivision 4.2.3 Calculating the carbon dioxide equivalent net abatement amount

4.6 Calculating the carbon dioxide equivalent net abatement amount

Equation 2.1 sets out the formula for calculating the carbon dioxide equivalent (CO_2-e) net abatement amount for the project in relation to a reporting period. It requires the prior calculation of:

- the quantity of methane emissions avoided as a consequence of the project, less the nitrous oxide emissions resulting from the destruction of methane, using Equation 2.2; and
- emissions from fuel and/or electricity used to operate gas capture and combustion equipment using Equation 4.1.

Subdivision 4.2.4 Calculating A_p

4.7 Calculating avoided greenhouse gas emissions (A_p)

Equation 2.2 sets out the formula for calculating the quantity of methane avoided as a consequence of the project. It requires prior calculation of:

- the capped volume of methane destroyed by combustion device h using Equation 2.3; and
- the quantity of nitrous oxide emissions released as a result of methane destruction from all combustion devices using Equation 2.5

Using Equation 2.2, the Determination allows for methane to be destroyed using flaring, electricity generation or gas boiler system or any combination of these systems.

Subsection 4.7(2) clarifies that if a project proponent chooses to calculate the quantity of methane destroyed by an internal combustion engine based on the amount of electricity produced by the engine, then the equations set out in section 4.13 should be used instead of Equation 2.2.

Subdivision 4.2.5 Calculating $Q_{com,h}$

4.8 Calculating the volume of methane destroyed by the combustion device

Equation 2.3 sets out the formula for calculating the volume of methane destroyed by a combustion device. It requires prior calculation of:

- the capped volume of methane sent to combustion device h using Equation 2.4; and
- the methane destruction efficiency for device h.

4.9 Determining the destruction efficiency of combustion device (DE_h)

When determining the methane destruction efficiency of the combustion device, project proponents can elect either to use a default value of 0.98 or to measure the destruction efficiency in accordance with Division 4.3 of the Determination.

Project proponents can only use the default value (0.98) where the equipment is being, or has been, installed and operated in accordance with the manufacturer's requirements.

Subdivision 3.2.5 Calculating $Q_{CH4,h}$

4.10 Calculating the volume of methane

Equation 2.4 sets out the formula for calculating the capped volume of methane sent to combustion device h. It requires the prior calculation of:

- the volume of biogas sent to combustion device h adjusted to standard conditions. Where volumetric measurements have not been adjusted to standard conditions based on actual temperature and pressure readings of the biogas, the volume of biogas sent to the combustion device must be multiplied by 0.97 before the portion of the volume of the biogas that is methane can be measured; and
- the proportion of the volume of the biogas that is methane.

To calculate the proportion of the volume of the biogas that is methane, project proponents may elect either to use a default value of 0.70 in accordance with the NGER Measurement Determination, or to measure the proportion of methane in accordance with Division 4.3 of the Determination.

In some instances a proponent may have installed one or more devices to combust the methane. These devices may be all of the same type or may be a combination of different devices such as internal combustion engines, flares and boilers. Where these devices have the same destruction efficiency then, for ease of calculation, these devices may be considered to be the same device.

This situation may lead to accounting difficulties if one or more of the devices fail and flow meters have not been installed to allow the gas flow to be measured for each device. In such circumstances the project proponent will be required to demonstrate how all methane has been accounted for, including where that methane was not combusted. This could be demonstrated by, for example, using equation 3.1.

If the proponent cannot demonstrate how all methane being sent to each of the devices was accounted for as either combusted or not combusted, then the destruction efficiency of all these devices must be assumed to be zero during the period in which the methane cannot be accounted for.

4.11 Capping the volume of methane

Section 4.11 clarifies that the volume of methane destroyed by all combustion devices must not be greater than the volume derived from the baseline methane emissions calculations.

The effect of section 4.11 is to cap the measured volume of methane destroyed by the theoretical estimate of methane emissions produced from the anaerobic lagoon based on pig numbers and feed usage.

Subdivision 4.2.7 Calculating E_{N_2O}

4.12 Calculating nitrous oxide (E_{N_2O}) emissions

Equation 2.5 requires input of the amount of capped volume of methane destroyed by combustion device h, as calculated earlier in Equation 2.3.

Where the amount of methane destroyed by an internal combustion engine for electricity generation is calculated based on the amount of electricity produced by the internal combustion engine generator measured in megawatt hours using Equations 3.2 and 3.3, the quantity of nitrous oxide emissions from internal combustion engine must be calculated using Equation 2.5(a) in subsection (2).

Subdivision 4.2.8 Calculating emissions combusted in an internal combustion engine

Subdivision 4.2.8 outlines the alternative approaches that must 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 energy used for the generation of electricity measured in megawatt hours.

4.13 Quantity of emissions combusted in an internal combustion engine—optional calculations

In circumstances where a proponent chooses to calculate the quantity of methane destroyed by an internal combustion engine based on the amount of electricity produced by the internal combustion engine generator measured in megawatt hours, and where one or more internal combustion engines are used, Equation 3.1 is to be used instead of Equation 2.2.

Equation 3.1 requires the prior calculation of:

- the amount of methane destroyed as a consequence of an internal combustion engine using Equations 3.2 and 3.3; and
- the calculation of the volume of methane destroyed by combustion devices other than an internal combustion engine using Equation 2.3.

Equation 3.2 requires prior calculation of the energy content of the methane sent to one or more internal combustion engines using Equation 3.3.

Subdivision 4.2.9 Calculating emissions from fuel and grid-derived electricity used to operate the gas extraction system in the project (Y_p)

4.14 Calculating emissions from electricity and fuel use

Equation 4.1 sets out the formula for calculating total emissions from the fuel and electricity used to operate the gas capture and combustion equipment. It requires prior calculation of:

- the total emissions from fuel use using Equations 4.2 and 4.3; and
- the total emissions from consumption of purchased electricity used to operate the gas capture and combustion system using Equation 4.4.

4.15 Calculating total emissions from fuel use (E_f)

Calculation of the total emissions from fuel use using Equation 4.2 requires emissions to be calculated for each fuel type and each greenhouse gas type.

Equation 4.3 is calculated as the sum of all emissions that have been calculated using Equation 4.2.

4.16 Emissions from the consumption of purchased electricity (E_{elec})

Emissions from the consumption of purchased electricity are calculated based on the quantity of electricity used and an emissions factor, as outlined in the NGER Determination.

The effect of subsection 4.16(1) is that emissions from grid derived electricity must only be calculated for the period beginning 1 July 2010 and ending 1 July 2012. This is to account for the introduction of the carbon pricing mechanism on 1 July 2012, which covers emissions from electricity generation and therefore covers scope 2 emissions from electricity consumption.

Division 4.3 Data Collection

4.17 Data collection procedures and measurement frequency

Division 4.3 provides the data collection methods for deriving the parameters used to calculate greenhouse gas emissions and removals and project emissions and removals. The Division describes the data collection method, unit of measurement, measurement procedure and measurement frequency for each parameter used to calculate project emissions. It includes data collection requirements for PigBal inputs used to determine VS as well as data collection used in abatement calculations.

4.18 Volumetric measurement—quantity of biogas sent to combustion device h ($Q_{biogas,h}$)

Section 4.18 provides the details required for measuring the volume of biogas sent to a combustion device.

4.19 Measurement of W_{CH_4} methane percentage in biogas

Section 4.19 includes requirements for the recording of data when measuring the portion of the volume of biogas that is methane.

Part 5 Monitoring, record-keeping and reporting requirements

Division 5.1 General

5.1 Application

The effect of subsection 106(3) of the Act is that a methodology determination may require the project proponent of an eligible offsets project to comply with specified monitoring, record-keeping and reporting requirements.

Under Parts 17 and 21 of the Act, a failure to comply with these requirements may constitute a breach of a civil penalty provision, and a financial penalty may be payable.

The monitoring, record-keeping and reporting requirements specified in Part 5 of the Determination are in addition to any requirements specified in the Act and the Regulations.

Division 5.2 Monitoring requirements

5.2 Monitoring requirements

Section 5.2 sets out requirements for recording inputs to PigBal and specifications for measurement equipment used for a project.

The monthly average of the recorded data can be entered into PigBal and the PigBal model run on an annual basis. Significant changes to the herd resulting from destocking, herd expansion or changes to the herd mix—for example, in response to market drivers—require more frequent monitoring and recording. Such changes to the herd are accounted for through weekly monitoring until numbers stabilise when a return to monthly monitoring and recording can be made.

5.3 Quality assurance and quality control

Section 5.3 sets out requirements relating to inspection and maintenance of monitoring and other technical equipment used in a project.

Division 5.3 Record-keeping requirements

Division 5.3 specifies the records that must be kept in relation to the project.

Division 5.4 Offsets report requirements

Division 5.4 provides that project proponents must submit reports, and sets out the information that must be included in those reports.