EXPLANATORY STATEMENT

Carbon Credits (Carbon Farming Initiative) Act 2011

Carbon Credits (Carbon Farming Initiative) (Destruction of Methane from Piggeries using Engineered Biodigesters) Methodology Determination Variation 2017

Purpose

The *Carbon Credits (Carbon Farming Initiative) (Destruction of Methane from Piggeries using Engineered Biodigesters) Methodology Determination Variation 2017* (the **Variation**) amends the *Carbon Credits (Carbon Farming Initiative) (Destruction of Methane from Piggeries using Engineered Biodigesters) Methodology Determination 2013* (the **Engineered Biodigesters Determination**).

The amendments:

(i) ensure key values remain consistent with Australia's National Greenhouse Gas Inventory;

(ii) remove a term which is erroneously multiplied twice in one equation;

(iii) ensure the correct sources of emissions are accounted for in abatement calculations; and

(iv) correct several other minor errors to ensure clarity and accuracy, including in the calculations that must be performed to determine abatement.

The Variation ensures that the Engineered Biodigesters Determination achieves its original intent of enabling eligible projects to claim greenhouse gas abatement from avoided emissions, less project emissions, with a cap on claimable abatement calculated from baseline emissions estimates. Overall, the amendments are minor in nature.

Legislative provisions

The Engineered Biodigesters Determination was made under subsection 106(1) of the *Carbon Credits (Carbon Farming Initiative) Act 2011* (the Act).

The Variation amends the Engineered Biodigesters Determination. It is made under subsection 114(1) of the Act which empowers the Minister to vary, by legislative instrument, a methodology determination.

Background

Emissions Reduction Fund

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

In 2014, the Act was amended by the *Carbon Farming Initiative Amendment Act 2014* to establish the Emissions Reduction Fund (ERF). The ERF expands on the Carbon Farming Initiative (CFI) by extending the scope of eligible emissions reduction activities and by

streamlining existing processes. The ERF has three elements: crediting emissions reductions, purchasing emissions reductions, and safeguarding emissions reductions.

Emissions reduction 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 rules for monitoring, record-keeping and reporting. These methodologies ensure that emissions reductions are genuine – that they are both real and additional to business as usual.

In deciding to make or vary a methodology determination the Minister must have regard to whether the determination or varied determination complies with the offsets integrity standards and any advice provided by the Emissions Reduction Assurance Committee (ERAC), an independent expert panel established to advise the Minister on proposals for methodology determinations. The Minister need not seek the advice of the Emissions Reduction Assurance Committee when the variation is of a minor nature, for example to ensure the method operates as was intended when it was made, by the correction of clear errors. The Minister will also consider any adverse environmental, economic or social impacts likely to arise as a result of projects to which the determination applies.

Offsets projects that are undertaken in accordance with a methodology determination and approved by the Clean Energy Regulator (the Regulator) can generate Australian Carbon Credit Units, representing abatement from the project.

Project proponents can receive funding from the ERF by submitting their projects into a competitive auction run by the Regulator. The Government will enter into contracts with successful proponents, which will guarantee the price and payment for the future delivery of emissions reductions.

Further information on the Emissions Reduction Fund is available at: www.environment.gov.au/emissions-reduction-fund.

Engineered Biodigesters Determination

The Engineered Biodigesters Determination sets out the rules for implementing and monitoring an agricultural emissions avoidance project under the ERF to reduce methane generated from manure in conventional piggeries.

The abatement activity involves the capture and combustion of biogas that would otherwise be released into the atmosphere, by directing piggery manure into an engineered biodigester. The abatement activity requires the installation and operation of engineered biodigesters, and gas capture and combustion equipment, which are to be used instead of a conventional manure lagoon system.

The Variation

The Variation has been developed by the Department of the Environment and Energy. The Variation amends the Engineered Biodigesters Determination in several ways:

i. Items 3, 5, 13, 15, 49 and 58 ensure key values remain consistent with Australia's National Greenhouse Gas Inventory;

ii. Item 55 removes a term (the global warming potential of methane) which is erroneously multiplied twice in one equation;

iii. Items 4, 6-9, 12, 17-23, 25-39, 41-48, 50-57 and 59-63 ensure the correct sources of emissions are accounted for in abatement calculations; and

iv. Items 1, 2, 10, 11, 14, 16, 24, 40, 64 and 65 correct several other minor errors to ensure clarity, accuracy and cross-method consistency, including in the calculations that must be performed to determine abatement.

Examples of ensuring the correct sources of emissions are accounted for in abatement calculations include removing emissions counted as project emissions where those emissions are already included in the calculation of baseline emissions.

A varied determination must meet the offsets integrity standards set out in section 133 of the Act. Under subsection 114(9) the Minister can vary a methodology determination without seeking formal ERAC advice if the variation is 'of a minor nature'. As the nature of the corrections made by the Variation is considered to be within the original intent of the Engineered Biodigesters Determination and/or corrects clear drafting errors, the Variation is of a minor nature within the meaning of subsection 114(9) of the Act.

Application of the Variation

The Variation does not automatically affect projects that are already declared eligible under, and using, the existing Engineered Biodigesters Determination. Even after a determination has been varied, a project that was declared as an eligible offsets project before the variation can continue to use the determination in the form it was at the time the project's crediting period starts, under section 126 of the Act. During a reporting period for a project, a project proponent may apply to the Regulator for approval to move to the varied determination under section 128 of the Act. Once approved, the varied determination applies from the start of the relevant reporting period during which the application was made. All eligible offsets projects approved after the commencement of the Variation, or whose crediting period commences after the start of the Variation, will need to comply with the determination as varied by the Variation, even if the applications were submitted before the Variation commenced. Given the nature of the errors in the Engineered Biodigesters Determination which hinder the calculation of abatement, it is understood that all projects would want to apply the varied determination as soon as practicable.

Consultation

The errors were identified in the Engineered Biodigesters Determination by industry experts and formal advice was provided to the Department on how they could be corrected.

The Department consulted with the sole registered proponent and a potential project proponent under the Engineered Biodigesters Determination in May 2017 on a draft of the Variation and this explanatory statement. This targeted consultation process was undertaken due to the specialised nature of the eligible activities within the Engineered Biodigesters Determination. The Chair of the ERAC and the Regulator were also consulted.

Determination details

The Variation is a legislative instrument within the meaning of the *Legislation Act 200*3.

The Variation commences on the day after it is registered.

Details of the Variation and an explanation of the changes covered under the Variation are given in Attachment A. The definition of terms highlighted in ***bold italics*** can be found in the Variation or the varied Determination.

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

Background on the review process for the Engineered Biodigesters Determination and the outcomes of the targeted assessment of the impact of the Variation can be found in the report provided by the technical assessors found at Attachment C.

Note on this explanatory statement

Numbered sections in this explanatory statement align with the relevant sections of the variation instrument.

Attachment A

Details of the Variation

1. Name

Section 1 provides that the name of the Variation is the *Carbon Credits (Carbon Farming Initiative) (Destruction of Methane from Piggeries using Engineered Biodigesters) Methodology Determination Variation 2017*.

2. Commencement

Section 2 provides that the Variation commences on the day after it is registered.

3. Authority

Section 3 provides that the Variation is made under subsection 114(1) of the Act.

4. Amendment of methodology determination

Section 4 provides that Schedule 1 of the Variation amends the *Carbon Credits (Carbon Farming Initiative) (Destruction of Methane from Piggeries using Engineered Biodigesters) Methodology Determination 2013*.

Schedule 1 Amendments

[1] Paragraph 1.2A(b)

Item [1] amends the reference to the *Legislation Act 2003*.

[2] Section 1.3

Item [2] provides the inclusion of definitions for ***CFI eligible additional waste***, ***CFI ineligible additional waste***, and ***National Inventory Report*** in section 1.3, 'Definitions'. ***National Inventory Report*** is a newly introduced term which refers to the latest version of the Report. As of 2017, the latest version was the *National Inventory Report 2015*. These definitions are included to ensure clarity and accuracy in the calculation of abatement.

The National Inventory Report is incorporated as in force from time to time consistent with subsection 106(8) of the Act. In 2017, it could be downloaded from http://www.environment.gov.au/climate-change/greenhouse-gas-measurement/publications

[3] Subsection 4.7(2) (definition of $\boldsymbol{MCF_l}$)

Item [3] replaces the definition of $\boldsymbol{MCF_l}$, provided in subsection 4.7(2) to one which makes reference to the most recent National Inventory Report. This is to ensure the correct MCF value is used in abatement calculations consistent with Australia's National Inventory Report (NIR). A note provides that in 2017, the relevant values were found on page 336 of Volume 1 of the *National Inventory Report 2015* in "Table 5.E.6 Pigs – Methane conversion factors (MCFs)" in the row labelled "Effluent pond (Uncovered anaerobic lagoon)". Projects need to use the value applicable to their State or Territory. This definition is used in a number of other items of this Variation. The original value was taken from the National Inventory Report available in 2013 and the values have now been made more accurate in recent reports.

[4] Subsection 4.7(6) (definition of $\boldsymbol{Q_{com}}$)

Item [4] amends the definition of $\boldsymbol{Q_{com}}$, provided in subsection 4.7(6), to refer specifically to methane from piggery manure and CFI eligible additional waste. These are the sources of emissions that would have occurred if waste was instead directed to an uncovered anaerobic lagoon. Equation 1.3 is used when calculating the baseline emissions for an additional waste project that includes CFI ineligible waste. This amendment ensures the correct sources of emissions are used in abatement calculations.

[5] Subsection 4.7(6) (definition of $\boldsymbol{MCF_l}$)

Item [5] replaces the definition of $\boldsymbol{MCF_l}$, provided in subsection 4.7(6) to one which makes reference to the National Inventory Report. This is to ensure the correct MCF value is used in abatement calculations consistent with Australia's National Inventory Report. In 2017, the relevant values were found on page 336 of Volume 1 of the *National Inventory Report 2015* in "Table 5.E.6 Pigs – Methane conversion factors (MCFs)" in the row labelled "Effluent pond (Uncovered anaerobic lagoon)". Projects need to use the value applicable to their State or Territory. This definition is used in a number of other items of this Variation. The original value was taken from the National Inventory Report available in 2013 and the values have now been made more accurate in recent reports.

[6] Section 4.8 (definition of $\boldsymbol{E_P}$)

Item [6] amends the definition of $\boldsymbol{E_p}$, provided in section 4.8, to make explicit that project emissions are "additional" emissions. This amendment ensures the correct sources of emissions are used in abatement calculations.

[7] Subsections 4.9(1) and (2) (definition of $\boldsymbol{Q_{com}}$)

Item [7] amends the definition of Q_{com}, provided in subsections 4.9(1) and (2), consistent with the definition amended by item [4]. This amendment ensures the correct sources of emissions are used in abatement calculations.

[8] Subsection 4.9(2) (definition of $Q_{CH4,h}$)

Item [8] amends the definition of $Q_{CH4,h}$, provided in subsection 4.9(2), to refer specifically to methane from piggery manure and CFI eligible additional waste. This is due to $Q_{CH4,h}$ equating to the volume of methane sent to a combustion device for a standard project, or being that multiplied by the proportion of piggery waste and CFI eligible additional waste relative to total waste for an additional waste project. This amendment ensures the correct sources of emissions are used in abatement calculations.

[9] Subsection 4.9(3)

Item [9] amends the definition of $Q_{CH4,h}$, provided in subsection 4.9(3), to refer specifically to methane from piggery manure and CFI eligible additional waste. This is due to $Q_{CH4,h}$ equating to the volume of methane sent to a combustion device for a standard project, or being that multiplied by the proportion of piggery waste and CFI eligible additional waste relative to total waste for an additional waste project. This amendment ensures the correct sources of emissions are used in abatement calculations.

[10] Section 4.10 (definition of W_{CH4})

Item [10] amends the definition of W_{CH4}, provided in section 4.10, to allow the use of either the default percentage specified in subsection 5.48(2) of the *National Greenhouse Emissions Reporting (Measurement) Determination 2008*, or for the percentage to be measured in accordance with section 5.7 of the Engineered Biodigesters Determination. This amendment ensures cross-method consistency be enabling the use of a default value as permissible under the *Carbon Credits (Carbon Farming Initiative) (Destruction of Methane Generated from Manure in Piggeries—1.1) Methodology Determination 2013*.

[11] Subsection 4.11(3) (Equation 2.7)

Item [11] amends Equation 2.7 by multiplying the piggery manure and CFI eligible additional waste volatile solids and maximum methane-producing capacity by the value for MCF_d. This enables the use of Q_{CFI} (Equation 2.7) to operate as intended in Equation 3.9, where the volume of other methane components are used, and ensures clarity and accuracy in the calculation of abatement.

[12] Subsection 4.11(3) (definition of Q_{CFI})

Item [12] amends the definition of $\boldsymbol{Q_{CFI}}$, provided in subsection 4.11(3), to align it with the definition provided in subsection 4.11(2), which correctly specifies methane generated from piggery manure and CFI eligible additional waste. This amendment ensures the correct sources of emissions are used in abatement calculations.

[13] Subsection 4.11(3)

Item [13] provides the definition for $\boldsymbol{MCF_d}$, which has been inserted into Equation 2.7. This is to ensure the correct MCF value is used in abatement calculations consistent with Australia's National Inventory Report. A note provides that in 2017, the relevant values were found on page 336 of Volume 1 of the *National Inventory Report 2015* in "Table 5.E.6 Pigs – Methane conversion factors (MCFs)" in the row labelled "Anaerobic digester / Covered lagoon". Projects need to use the value applicable to their State or Territory. This definition is used in a number of other items of this Variation.

[14] Subsection 4.11(5) (Equation 2.8)

Item [14] amends Equation 2.8 by multiplying the CFI ineligible additional waste volatile solids and maximum methane-producing capacity by the value for $\boldsymbol{MCF_d}$. This enables the use of $\boldsymbol{Q_{in}}$ (Equation 2.8) to operate as intended in Equation 3.9, where the volume of other methane components are used, and ensures clarity and accuracy in the calculation of abatement.

[15] Subsection 4.11(5)

Item [15] provides the definition for $\boldsymbol{MCF_d}$, which has been inserted into Equation 2.8. This is to ensure the correct MCF value is used in abatement calculations consistent with Australia's National Inventory Report. In 2017, the relevant values are found on page 336 of Volume 1 of the *National Inventory Report 2015* in "Table 5.E.6 Pigs – Methane conversion factors (MCFs)" in the row labelled "Anaerobic digester / Covered lagoon". Projects need to use the value applicable to their State or Territory. This definition is used in a number of other items of this Variation.

[16] Subsection 4.13(4) (definition of $\boldsymbol{QE}$)

Item [16] amends the definition of $\boldsymbol{QE}$, provided in subsection 4.13(4), to align it with the definition provided in subsection 4.13(5). The previous definition was inconsistent and misleading. The amended definition is provided to ensure clarity and accuracy in the calculation of abatement.

[17] Section 4.14

Item [17] amends the definition of E_p, provided in the initial paragraph of section 4.14, to make explicit that project emissions are "additional" emissions. This amendment ensures the correct sources of emissions are used in abatement calculations.

[18] Section 4.14 (definition of E_P)

Item [18] amends the definition of E_p, provided in section 4.14, to make explicit that project emissions are "additional" emissions. This amendment ensures the correct sources of emissions are used in abatement calculations.

[19] Section 4.14 (definition of E_{TRAN})

Item [19] amends the definition of E_{TRAN}, provided in section 4.14, to refer to all waste. Emissions from the transport of all waste (when transport operations have changed as a result of the project), including piggery manure, would not have occurred in the absence of the project. This amendment ensures the correct sources of emissions are used in abatement calculations. It also corrects a cross-reference.

[20] Section 4.14 (definition of E_{BCS})

Item [20] amends the definition of E_{BCS}, provided in section 4.14, to refer exclusively to emissions from CFI ineligible additional waste. Eligible waste emissions, including venting and fugitive losses, would have occurred in the absence of the project. This amendment ensures the correct sources of emissions are used in abatement calculations. It also corrects a cross-reference.

[21] Section 4.14 (definition of E_{MMS})

Item [21] amends the definition of E_{MMS}, provided in section 4.14, to refer only to CFI ineligible additional waste, as emissions from eligible waste would have occurred in the absence of the project. Item [21] also amends the equation number reference. These amendments ensure the correct sources of emissions are used in abatement calculations. It also corrects a cross-reference.

[22] Section 4.14 (definition of E_{POST})

Item [22] amends the definition of E_{POST}, provided in section 4.14, to refer only to CFI ineligible additional waste, as emissions from eligible waste would have occurred in the absence of the project. This amendment ensures the correct sources of emissions are used in abatement calculations. It also corrects a cross-reference.

[23] Section 4.14 (note)

Item [23] repeals the note provided in section 4.14. The previous note was not accurate as emissions from the transport of CFI ineligible additional waste are additional emissions that would not have occurred in the absence of the project and must be accounted for. This amendment ensures the correct sources of emissions are used in abatement calculations.

[24] Paragraphs 4.15(2)(a) and (b)

Item [24] replaces paragraphs 4.15(2)(a) and (b). The amended paragraphs ensure emissions from electricity use are calculated at all times other than when the carbon price was in effect between 1 July 2012 and 30 June 2014. This is in keeping with the original intent of accounting for emissions from electricity use at all times other than when the carbon price was in effect, and ensures clarity and accuracy in the calculation of abatement.

[25] Subsection 4.15(4) (Equation 3.3)

Item [25] omits ***R*** (proportion of emissions from piggery manure and CFI eligible additional waste) as a factor in Equation 3.3. Emissions from fuel use should apply to all fuel used for the project. This amendment ensures the correct sources of emissions are used in abatement calculations.

[26] Subsection 4.15(4) (definition of ***R***)

Item [26] repeals the definition of ***R*** from subsection 4.15(4), due to ***R*** being omitted from Equation 3.3 by item [25] above. This amendment ensures the correct sources of emissions are used in abatement calculations.

[27] Subsection 4.16 (heading)

Item [27] omits reference to additional waste projects from the heading of section 4.16, 'Calculating emissions from transport (E_{TRAN})' to clarify that the emissions from the increased transport of all waste should be included in the calculation of project emissions, not only emissions from the transport of additional waste. This amendment ensures the correct sources of emissions are used in abatement calculations.

[28] Subsection 4.16(1)

Item [28] replaces subsection 4.16(1) and repeals the note beneath it, to clarify that the emissions from the increased transport of all waste should be included in the calculation of project emissions, not only emissions from the transport of additional waste. This amendment ensures the correct sources of emissions are used in abatement calculations.

[29] Subsection 4.16(2)

Item [29] amends subsection 4.16(2) to make clear that Equation 3.6 applies to all waste, not only additional waste. This amendment ensures the correct sources of emissions are used in abatement calculations.

[30] Subsection 4.16(2) (definition of $\boldsymbol{E_{TRAN}}$)

Item [30] amends the definition of $\boldsymbol{E_{TRAN}}$, provided in subsection 4.16(2), to make clear that $\boldsymbol{E_{TRAN}}$ applies to all waste (when transport operations have changed as a result of the project), not only additional. This amendment ensures the correct sources of emissions are used in abatement calculations.

[31] Subsection 4.17(1)

Item [31] amends subsection 4.17(1) by specifying emissions from only CFI ineligible additional waste are accounted for in project emissions from venting events and incomplete combustion ($\boldsymbol{E_{BCS}}$). This amendment ensures the correct sources of emissions are used in abatement calculations.

[32] Subsection 4.17(1) (Equation 3.8)

Item [32] omits $\boldsymbol{R}$ (proportion of emissions from piggery manure and CFI eligible additional waste) as a factor in Equation 3.8. Emissions from the biogas capture system ($\boldsymbol{E_{BCS}}$) are only applicable for CFI ineligible additional waste. The proportion of emissions from CFI ineligible additional waste is determined in Equation 3.9 due to item [37] of the Variation. This amendment ensures the correct sources of emissions are used in abatement calculations.

[33] Subsection 4.17(1) (definition of $\boldsymbol{E_{BCS}}$)

Item [33] amends the definition of E_{BCS}, provided in subsection 4.17(1), so that it applies to emissions from CFI ineligible waste. This amendment ensures the correct sources of emissions are used in abatement calculations.

[34] Subsection 4.17(1) (definition of E_{COM})

Item [34] amends the definition of emissions from incomplete combustion (***Ecom***), provided in subsection 4.17(1), through removing reference to methane. Methane emissions are already accounted for in Equation 3.9. This amendment ensures the correct sources of emissions are used in abatement calculations.

[35] Subsection 4.17(1) (definition of ***R***)

Item [35] repeals the definition of ***R*** from subsection 4.17(1), as ***R*** is omitted from Equation 3.8. This amendment ensures the correct sources of emissions are used in abatement calculations.

[36] Subsection 4.17(2) (Equation 3.9)

Item [36] replaces $Q_{CH4,h}$ with ($Q_{CFI} + Q_{in}$) in Equation 3.9. Emissions from all sources need to be accounted for before defining what proportion is from CFI ineligible additional waste. $Q_{CH4,h}$ is a product of ***R*** for additional waste projects and does not allow this to occur. This amendment ensures the correct sources of emissions are used in abatement calculations.

[37] Subsection 4.17(2) (Equation 3.9)

Item [37] amends Equation 3.9 by inserting '× (1 – ***R***)' at the end of the equation. This enables fugitive emissions ($E_{Fug\ CH4}$) to apply only to the proportion of emissions which are attributed to CFI ineligible additional waste. This amendment ensures the correct sources of emissions are used in abatement calculations.

[38] Subsection 4.17(2) (definition of $Q_{CH4,h}$)

Item [38] replaces the definition of $Q_{CH4,h}$, provided in subsection 4.17(2), with definitions for Q_{CFI} and Q_{in} – both terms which have been added to Equation 3.9 by item [36] of the Variation. This amendment ensures the correct sources of emissions are used in abatement calculations.

[39] Subsection 4.17(2)

Item [39] provides the definition of ***R*** in subsection 4.17(2). ***R*** has been added to Equation 3.9 due to item [37] of the Variation. This amendment ensures the correct sources of emissions are used in abatement calculations.

[40] Subsection 4.17(5) (definition of W_{CH4})

Item [40] amends the definition of W_{CH4}, provided in subsection 4.17(5), to allow the use of either the default percentage specified in subsection 5.48(2) of the *National Greenhouse Emissions Reporting (Measurement) Determination 2008*, or for the percentage to be measured in accordance with section 5.7 of the Engineered Biodigesters Determination. This amendment ensures cross-method consistency be enabling the use of a default value as permissible under the *Carbon Credits (Carbon Farming Initiative) (Destruction of Methane Generated from Manure in Piggeries—1.1) Methodology Determination 2013*.

[41] Subsection 4.18(1) (definition of $\boldsymbol{E_{COM}}$)

Item [41] amends the definition of emissions from incomplete combustion (***Ecom***), provided in subsection 4.17(1), through removing reference to methane. Methane emissions are already accounted for in Equation 3.9. This amendment ensures the correct sources of emissions are used in abatement calculations.

[42] Subsection 4.18(1) (definition of ***j***)

Item [42] amends the definition of ***j***, provided in subsection 4.18(1), to clarify that the only greenhouse gas type relevant in the calculation of emissions from combustion devices is nitrous oxide. Methane emissions from sub-optimal flaring are accounted for under section 4.17. This amendment ensures the correct sources of emissions are used in abatement calculations.

[43] Subsection 4.18(2) (Equation 3.12)

Item [43], similar to item [36], replaces $\boldsymbol{Q_{com}}$ with ($\boldsymbol{Q_{CFI}} + \boldsymbol{Q_{in}}$) in Equation 3.12 to clarify that emissions of nitrous oxide from all sources need to be accounted for. $\boldsymbol{Q_{com}}$ is a product of ***R*** for additional waste projects and as previously drafted does not allow this to occur. This amendment ensures the correct sources of emissions are used in abatement calculations.

[44] Subsection 4.18(2) (definition of $\boldsymbol{Q_{com}}$)

Item [44] replaces the definition of Q_{com}, provided in subsection 4.18(2), with definitions for Q_{CFI} and Q_{in} – both terms which have been added to Equation 3.12 by item [40] of the Variation to clarify that emissions of nitrous oxide from all sources need to be accounted for. This amendment ensures the correct sources of emissions are used in abatement calculations.

[45] Subsection 4.19(1)

Item [45] replaces subsection 4.19(1) and the note beneath it with a new provision to clarify that section 4.19 applies when the project is an additional waste project that contains CFI ineligible waste, as opposed to either a standard project or an additional waste project containing CFI eligible waste. This amendment ensures the correct sources of emissions are used in abatement calculations.

[46] Subsection 4.19(3)

Item [46] amends subsection 4.19(3) to clarify that the emissions being accounted for are from the treatment of CFI ineligible additional waste, consistent with subsection 4.19(1) provided by item [45] of the Variation. This amendment ensures the correct sources of emissions are used in abatement calculations.

[47] Subsection 4.19(4) (Equation 3.13)

Item [47] amends Equation 3.13 by replacing "$(VS_{p,un} \times Bo_p \times MCF_l) + (VS_{e,un} \times Bo_e \times MCF_l)$" with "$VS_{in} \times Bo_{in} \times MCF_l$". This amendment enables Equation 3.13 to correctly account only for CFI ineligible additional waste. This ensures the correct sources of emissions are used in abatement calculations.

[48] Subsection 4.19(4) (definition of E_{MMS})

Item [48] amends the definition of E_{MMS}, provided in subsection 4.19(4), to clarify that the emissions being accounted for are from the treatment of CFI ineligible additional waste. This amendment ensures the correct sources of emissions are used in abatement calculations.

[49] Subsection 4.19(4) (definition of MCF_l)

Item [49] replaces the definition of MCF_l, provided in subsection 4.19(4), to one which makes reference to the National Inventory Report. This is to ensure the correct MCF value is used in abatement calculations consistent with Australia's National Inventory Report. In 2017, the relevant values are found on page 336 of Volume 1 of the *National Inventory Report 2015* in "Table 5.E.6 Pigs – Methane conversion factors (MCFs)" in the row labelled

"Effluent pond (Uncovered anaerobic lagoon)". Projects need to use the value applicable to their State or Territory. This definition is used in a number of other items of this Variation. The original value was taken from the National Inventory Report available in 2013 and the values have now been made more accurate in recent reports.

[50] Subsection 4.19(4) (definitions of $VS_{p,un}$ and Bo_p)

Item [50] repeals the definitions of $VS_{p,un}$ and Bo_p, provided in subsection 4.19(4), now removed from Equation 3.13 due to item [47] of the Variation. This amendment ensures the correct sources of emissions are used in abatement calculations.

[51] Subsection 4.19(4) (definitions of $VS_{e,un}$ and Bo_e)

Item [51] replaces the definitions of $VS_{e,un}$ and Bo_e, provided in subsection 4.19(4), with definitions of VS_{in} and Bo_{in}. VS_{in} and Bo_{in} have been added to Equation 3.13 due to item [47] of the Variation to make E_{MMS} account for emissions from CFI ineligible additional waste only. This amendment ensures the correct sources of emissions are used in abatement calculations.

[52] Subsection 4.19(5)

Item [52] replaces subsection 4.19(5) with a new provision that replaces Bo_e with Bo_{in} and specifies in paragraph (a) to refer to Schedule 2, CFI ineligible additional waste. This amendment ensures the correct sources of emissions are used in abatement calculations.

[53] Subsection 4.20(2) (definition of E_{EFF})

Item [53] amends the definition of E_{EFF}, provided in subsection 4.20(2), for it to refer correctly to CFI ineligible additional waste instead of piggery manure. Emissions from piggery manure is already accounted for in the Avoided Emissions and Baseline CAP. This amendment ensures the correct sources of emissions are used in abatement calculations.

[54] Subsection 4.20(3) (Equation 3.15)

Item [54] replaces R with $(1 - R)$ in Equation 3.15 to account correctly for the proportion of emissions at landfill from CFI ineligible additional waste only. Emissions from piggery manure and CFI eligible additional waste is already accounted for in the Avoided Emissions and Baseline CAP. This amendment ensures the correct sources of emissions are used in abatement calculations.

[55] Subsection 4.20(5) (Equation 3.16)

Item [55] amends Equation 3.16 by removing the global warming potential for methane ($\boldsymbol{GWP_{CH4}}$) as a factor, as the equation includes the value γ which is a term already multiplied by the global warming potential for methane. Item [52] also replaces $\boldsymbol{R}$ with $(1 - \boldsymbol{R})$, to correctly account only for the proportion of emissions attributed to CFI ineligible additional waste. This amendment ensures the correct sources of emissions are used in abatement calculations.

[56] Subsection 4.20(5) (definitions of $\boldsymbol{E_{EFF}}$ and $\boldsymbol{Bo_{EFF}}$)

Item [56] replaces all occurrences of "piggery manure" in the definitions of $\boldsymbol{E_{EFF}}$ and $\boldsymbol{Bo_{EFF}}$, provided in subsection 4.20(5), with "CFI ineligible additional waste". This amendment enables the definitions of $\boldsymbol{E_{EFF}}$ and $\boldsymbol{Bo_{EFF}}$ to specify correctly that they account for emissions attributed to CFI ineligible additional waste instead of piggery manure. This amendment ensures the correct sources of emissions are used in abatement calculations.

[57] Subsection 4.20(5) (definition of $\boldsymbol{VS_{EFF}}$)

Item [57] amends the definition of $\boldsymbol{VS_{EFF}}$, provided in subsection 4.20(5), by replacing "piggery manure" with "waste" to clarify that all the volatile solids ($\boldsymbol{VS_{EFF}}$) discharged need to be accounted for with the introduction of the $(1 - \boldsymbol{R})$ term. The $(1 - \boldsymbol{R})$ term enables the component of $\boldsymbol{VS_{EFF}}$ that is attributed to CFI ineligible additional waste to be taken into account. This amendment ensures the correct sources of emissions are used in abatement calculations.

[58] Subsection 4.20(5) (definition of $\boldsymbol{MCF_{EFF}}$)

Item [58] replaces the definition of $\boldsymbol{MCF_{EFF}}$, provided in subsection 4.20 (5), to one which makes reference to the National Inventory Report. This is to ensure the correct MCF value is used in abatement calculations consistent with Australia's National Inventory Report. In 2017, the relevant values are found on page 336 of Volume 1 of the *National Inventory Report 2015* in "Table 5.E.6 Pigs – Methane conversion factors (MCFs)" in the row labelled "Effluent pond (Uncovered anaerobic lagoon)". Projects need to use the value applicable to their State or Territory. This definition is used in a number of other items of this Variation. The original value was taken from the National Inventory Report available in 2013 and the values have now been made more accurate in recent reports.

[59] Subsection 4.20(8) (Equation 3.17)

Item [59] replaces $\boldsymbol{R}$ with (1 – $\boldsymbol{R}$) in Equation 3.17 to account correctly for the proportion of emissions from aerobic post treatment of CFI ineligible additional waste only. Emissions from piggery manure is already accounted for in the Avoided Emissions and Baseline CAP. This amendment ensures the correct sources of emissions are used in abatement calculations.

[60] Section 5.2 (Table row stating $\boldsymbol{VS_{EFF}}$)

Item [60] amends the definition of $\boldsymbol{VS_{EFF}}$, provided in section 5.2, by replacing "piggery manure" with "waste" to ensure consistency with subsection 4.20(5). This amendment ensures the correct sources of emissions are used in abatement calculations.

[61] Section 5.2 (Table row stating $\boldsymbol{Bo_{EFF}}$)

Item [61] amends the definition of $\boldsymbol{Bo_{EFF}}$, provided in section 5.2, by replacing "effluent" with "CFI ineligible additional waste". This amendment ensures consistency with subsection 4.20(5). This amendment ensures the correct sources of emissions are used in abatement calculations.

[62] Subsection 5.4(1)

Item [62] omits "additional" from subsection 5.4(1) to enable the subsection to be consistent with section 5.2 and subsection 4.20(5). This amendment ensures the correct sources of emissions are used in abatement calculations.

[63] Paragraph 5.5(1)(b)

Item [63] replaces "effluent" with "CFI ineligible additional waste" in paragraph 5.5(1)(b). This amendment enables the definition of $\boldsymbol{Bo_{EFF}}$ to be consistent with section 5.2 and subsection 4.20(5). This amendment ensures the correct sources of emissions are used in abatement calculations.

[64] Paragraph 5.7(1)

Item [64] specifies the options for measuring the percentage of methane in biogas ($\boldsymbol{W_{CH4}}$) apply only in the absence of using the default value specified in subsection 5.48(2) of the *National Greenhouse Emissions Reporting (Measurement) Determination 2008*. This amendment ensures cross-method consistency by enabling the use of a default value as permissible under the *Carbon Credits (Carbon Farming Initiative) (Destruction of Methane Generated from Manure in Piggeries—1.1) Methodology Determination 2013*.

[65] Paragraph 5.7(1)(a)

Item [65] amends a typographical error concerning the type of gas analyser that is required to be used when measuring the percentage of methane in biogas in accordance with paragraph 5.7(1)(a). The amendment clarifies that the gas analyser must be “inline”.

Attachment B

Statement of Compatibility with Human Rights

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

The *Carbon Credits (Carbon Farming Initiative) (Destruction of Methane from Piggeries using Engineered Biodigesters) Methodology Determination Variation 2017.*

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 Credits (Carbon Farming Initiative) (Destruction of Methane from Piggeries using Engineered Biodigesters) Methodology Determination Variation 2017* (the **Variation**) amends the *Carbon Credits (Carbon Farming Initiative) (Destruction of Methane from Piggeries using Engineered Biodigesters) Methodology Determination 2013* (the **Engineered Biodigesters Determination**).

The Variation ensures that the Engineered Biodigesters Determination achieves its original intent of being able to claim greenhouse gas abatement from avoided emissions, less project emissions, with a cap on claimable abatement calculated from baseline emission estimates.

The Engineered Biodigesters Determination sets out the detailed rules for implementing and monitoring projects under the Emissions Reduction Fund (ERF) to reduce the methane generated from manure in conventional piggeries by directing manure to an engineered biodigester.

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.

Josh Frydenberg, Minister for the Environment and Energy

INTEGRITY AG

Attachment C

Review of Biodigester Variation Final Report

Prepared for:
The Department of the Environment and Energy

Eugene McGahan and
Stephen Wiedemann,
Principal Consultant
Integrity Ag Services
stephen.wiedemann@integrityag.net.au

Version Control

Document Title: 1046 – Review of Biodigester Variation – Final Report V1.0

Client: Department of the Environment and Energy

Project Title: Review of Biodigester Variation

Version	Date	Author
1 – Draft for internal checking	19 Apr 2017	Eugene McGahan
2 – Final Draft for client review	20 Apr 2017	Eugene McGahan and Stephen Wiedemann

Disclaimer

Table of Contents

Background

The *Carbon Credits (Carbon Farming Initiative) (Destruction of Methane from Piggeries Using Engineered Biodigesters) Methodology Determination 2013* (Biodigester Method), was released in 2013 to enable pig farms to claim abatement from the destruction of emissions generated in the treatment of pig manure. In 2016, the Department of Environment and Energy (the Department) commissioned a review of the Biodigester Method that identified a number of critical errors, resulting in incorrect abatement calculations. In addition to the calculation errors, structural issues and redundant sections make the Biodigester Method difficult to understand and costly to implement and audit.

The Department proposes to correct a number of the identified errors in the Biodigester Method through a variation 'of a minor nature'. These corrections aim to amend the key calculation errors that result in little or no net abatement for undertaking a piggery biodigester project activity. The changes required will update key values to align with Australia's National Greenhouse Gas Inventory, remove a term which is multiplied twice in one equation and correct a number of incorrect sources of emissions accounted for in project emissions. The main source of logical error with the current Biodigester Method occurs with the emissions from piggery waste and CFI eligible additional waste being accounted for in not only the baseline cap, but both the emissions avoided and project emissions.

The corrections in the Biodigester Method are not intended to address the structural issues including redundant sections, as these do not impact abatement potential. These will be addressed in a proposed new 'Animal Waste Slurry Management' Method that will replace the Biodigester Method and other current and future animal waste methods.

The Department engaged Integrity Ag Services to conduct an independent, targeted technical review of the material informing the draft variation to the Biodigester Method determination and the draft Biodigester Method variation itself. This required a review of the current Biodigester Method, and the proposed corrections to the abatement calculations to ensure they fix the key problems identified, along with an analysis to confirm that the revised equations correctly account for abatement and produce realistic and conservative abatement figures.

Review and Assessment Method

A detailed review of the proposed amended method, with assessment of the suggested amendments and additional questions that the Department has raised was undertaken. In conducting this detailed review and assessment of proposed amendments, a number of additional amendments were identified that needed to be addressed in order for the varied Biodigester Method to accurately calculate abatement. A response to the Departments suggested amendments and questions, as well as other suggested amendments that will correct numerical and logic errors in the Biodigester Method have been documented in a Technical Report that was supplied to the Department.

To analyse all the suggested amendments, an Excel spreadsheet was constructed that included all equations used in the varied Biodigester Method. These corrected equations were based on a previous review of the Biodigester Method by Dr Stephan Tait, the suggested corrections provided by the Department and additional amendments that were identified during this review

process. This spreadsheet was based on theoretical piggeries of 20,000 and 40,000 Standard Pig Units, with realistic assumptions made for a biodigester project, in order to test all the equations and logic in the varied Biodigester Method.

The scenarios included piggery manure from a theoretical piggery project site (standard project), inclusion of additional piggery manure (eligible waste), additional eligible off-site waste, and additional ineligible off-site waste. It was not possible to calculate abatement for all the possible scenarios, as this would require thousands of combinations of input and output results. However, the tested scenarios covered a range of likely scenarios that would be anticipated at a piggery site operating a biodigester.

Results of Assessment

The Department has been supplied with the spreadsheet used to analyse the varied Biodigester Method and a Technical Report that included additional changes that were identified to allow the method to accurately calculate abatement. This Technical Report also identified additional changes that could be made to make the method clearer to understand and follow, but are not deemed critical to enable the varied Biodigester Method to accurately calculate abatement. Also supplied to the Department was a tracked changes version of the variations required.

Further assessment of the varied Biodigester Method was undertaken once the Department had made all the changes that were deemed necessary, to ensure correct abatement and project emissions were being calculated. The varied Biodigester Method was also assessed to ensure it meets the offsets integrity standards as defined in the *Carbon Credits (Carbon Farming Initiative) Act 2011* by ensuring that only additional abatement is credited. The varied Biodigester Method achieves this by:

1. Providing a detailed description of the type of activity that can be assessed
2. Listing the emissions sources that can be covered by a project
3. Providing detailed instructions for determining a baseline that represents what would occur in the absence of the project
4. Detailing the monitoring, verification and reporting required to calculate abatement
5. Providing procedures for measuring or estimating abatement relative to the baseline
6. Including all possible additional Project Emissions and the correct equations to ensure these emissions alone are deducted from net abatement
7. Ensuring emissions are measureable and verifiable by:
    a. being supported by peer-reviewed science
    b. being consistent with Australia's international greenhouse gas emissions accounts
    c. accounting for leakage and variability
    d. using conservative assumptions to ensure abatement is not over-estimated.

Conclusions and recommendations

The assessment and analysis has determined that, with the proposed amendments, the varied Biodigester Method produces realistic and conservative abatement figures. This corrected approach will allow the Biodigester Method to keep with the original intent of being able to claim GHG abatement from avoided emissions, less project emissions, with a cap on claimable abatement calculated from baseline emission estimations. The reviewers consider the revised method suitable for endorsement.