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EXPLANATORY STATEMENT

Carbon Credits (Carbon Farming Initiative) Act 2011

Carbon Credits (Carbon Farming Initiative) Methodology (Industrial Fuel and Energy Efficiency) Determination 2014

EXPOSURE DRAFT

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Background: Emissions Reduction Fund

The *Carbon Credits (Carbon Farming Initiative) Act 2011* (the ***Act***[1]) 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 Australian Government introduced the *Carbon Farming Initiative Amendment Bill 2014*, which establishes 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 avoidance or sequestration) from eligible projects and rules for monitoring, record keeping and reporting. These methodologies will ensure that emissions reductions are genuine—that they are both real and additional to business as usual.

In deciding to make a methodology determination the Minister must have regard to the advice of the Emissions Reduction Assurance Committee (ERAC), an independent expert panel that will be established to advise the Minister on proposals for methodology determinations. 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.

The *Carbon Farming Initiative Amendment Bill 2014* also provides a process for an Interim ERAC to advise on draft methodology determinations before the Bill is passed by Parliament. In particular, clause 393 of Schedule 1 to the *Carbon Farming Initiative Amendment Bill 2014* enables the advice of the Interim ERAC to be used in the place of advice of the statutory ERAC after the Bill commences. It is intended that consultation on this exposure draft be used to inform the advice of the Interim ERAC under that provision.

The ERAC (or Interim ERAC) must include in its advice to the Minister the Committee's opinion on whether the proposed determination complies with the proposed offsets integrity

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[1] All references to 'the Act' in this document refer to the *Carbon Credits (Carbon Farming Initiative) Act 2011*, as if amended by the *Carbon Farming Initiative Amendment Bill 2014* (as introduced into the Senate on 26 June 2014).

standards to be set out in section 133 of the Act. The offsets integrity standards require that an eligible project should result in carbon abatement that is unlikely to occur in the ordinary course of events and is eligible carbon abatement under the Act. In summary, the offsets integrity standards also include that:

- amounts are measurable and capable of being verified;

- the methods used are supported by clear and convincing evidence;

- material emissions which are a direct consequence of the project are deducted; and

- estimates, assumptions or projections used in the determination should be conservative.

Offsets projects that are undertaken in accordance with the methodology determination and approved by the Clean Energy Regulator (the Regulator) can generate Australian Carbon Credit Units (ACCUs), representing emissions reductions 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 ERF is available on the Department of the Environment website, www.environment.gov.au/emissions-reduction-fund.

Background: Industrial Fuel and Energy Efficiency

Industrial operations generate direct (scope 1) greenhouse gas emissions from fuel combustion in systems such as boilers, furnaces and generators as well as indirect (scope 2) greenhouse gas emissions from electrically powered systems such as motors, pumps and compressed air. A broad range of opportunities exist to reduce these emissions.

The Exposure Draft *Carbon Credits (Carbon Farming Initiative) Methodology (Industrial Fuel and Energy Efficiency) Determination* 2014 (the draft Determination) provides a high-level, activity-neutral framework within which proponents can develop project-appropriate approaches to calculating abatement. This approach provides flexibility for project proponents to determine what fuel or energy efficiency activities are most appropriate for each site. Projects could include replacement or modification of boilers or heating, ventilation and cooling (HVAC) systems, improving control systems and processes, waste heat capture and re-use, improving the efficiency of crushing or grinding equipment on mining sites, replacing low efficiency motors, fans and pumps with high efficiency versions, installing variable speed drives (VSDs), improving compressed air processes, and fuel switching.

Project proponents who could use this draft Determination once it comes into force include owners or operators of (usually large-scale) energy intensive equipment. Well designed projects undertaken under the methodology could potentially lower their energy costs and improve productivity, while lowering emissions.

The draft Determination follows commonly accepted energy efficiency measurement approaches. In simple terms, the level of abatement delivered by a project is determined by comparing emissions levels measured before a system upgrade or replacement (i.e. baseline emissions) with emissions levels measured afterwards (i.e. project emissions). Importantly, the level of emissions before the upgrade or replacement is adjusted to reflect the conditions (e.g. production or temperature) experienced after the upgrade or replacement. This is

achieved using a baseline emissions model, which estimates what emissions would have been in the absence of project activities based on the variables which correlate strongly with emissions. Using a baseline emissions model enables a meaningful comparison of baseline and project emissions levels and enables proponents to be credited appropriately for abatement delivered by project activities, irrespective of whether production increases or decreases.

The draft Determination includes two approaches for estimating project emissions. The first involves monitoring fuel and/or electricity use and applying standard emissions factors to estimate emissions. The second involves using an operating emissions model, which allows proponents to monitor variables that correlate with emissions instead of energy use. Proponents may choose to use an operating emissions model, for example, where direct monitoring of energy use over the entire reporting period would require costly installation of permanent sub-metering.
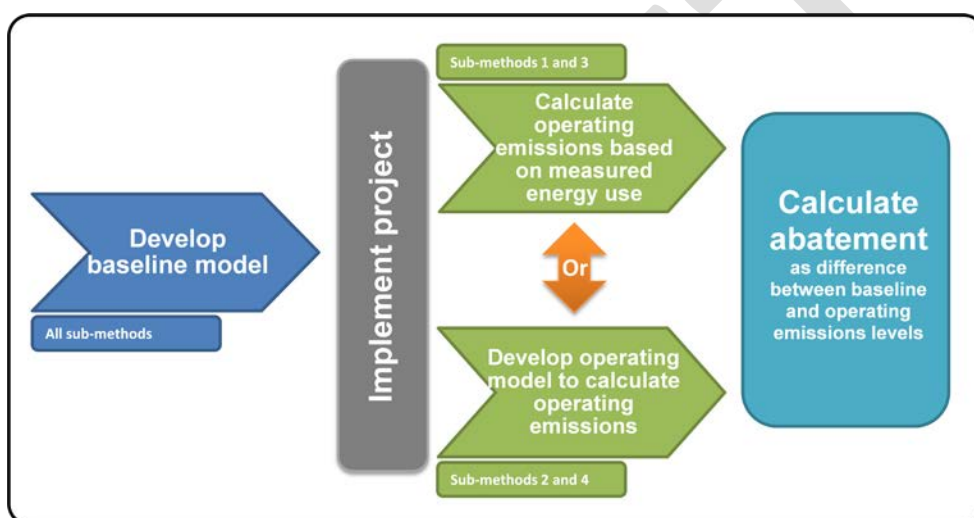
Figure 1: Calculation of abatement

Figure 1: In simplified terms, this methodology calculates abatement by comparing modelled baseline emissions levels with either measured operating emissions (in sub-methods 1 and 3) or modelled operating emissions (in sub-methods 2 and 4).

The draft Determination provides for estimating emissions reductions for discrete implementations or for populations of implementations. An implementation represents one or more specific energy efficiency activities at a site. A population is a group of implementations that involve the same type of activity. Where emissions reductions are estimated for a population, proponents are able to estimate emissions reductions for a representative sample of implementations and extrapolate the results to the population. This will lower monitoring costs.

Under the draft Determination it is possible to aggregate emissions reductions from multiple implementations (which may involve different activities) and multiple populations. This means that proponents can undertake a single energy efficiency measure or a number of measures at the same time and calculate abatement in a way that best suits their project. The draft Determination includes four sub-methods (providing for the two different approaches to estimating project emissions) to be applied at the level of an implementation or population.

Sub-method 1 provides for calculating the net abatement amount for an implementation by comparing project emissions calculated from measurements of fuel and/or electricity data to baseline emissions from a baseline emissions model.

Sub-method 2 provides for calculating the net abatement amount for an implementation by comparing project emissions from an operating emissions model to baseline emissions from a baseline emissions model.

Sub-method 3 provides for calculating the net abatement amount for a population of implementations based on the abatement delivered by a sample of implementations. It involves estimating abatement for each implementation within the sample by comparing project emissions calculated from measurements of fuel and/or electricity data to baseline emissions from a baseline emissions model.

Sub-method 4 also provides for calculating the net abatement amount for a population of implementations. It differs from sub-method 3 in using an operating emissions model to estimate project emissions for each implementation within the sample instead of monitoring fuel and/or electricity use over the full reporting period.

The draft Determination is based on a similar method under the New South Wales Energy Savings Scheme. In line with advice from stakeholders, the Department has sought to maintain consistency with the New South Wales method. However, there are a number of differences between the New South Wales method and the draft Determination due to differences in overall scheme design and coverage. For example, the draft Determination covers fuels other than electricity because the purpose of the ERF is to reduce emissions from a range of sources, while the aim of the New South Wales scheme is to reduce electricity consumption in the state.

Facility-level methodology

Projects established under this draft Determination may occur within an NGER reporting facility that is also the subject of a project established under the ERF NGER facility methodology determination. In this case, the project proponent of the NGER facility methodology project will be required by that determination to subtract the abatement achieved by the project established under this draft Determination.

This approach provides proponents flexibility in relation to the location and timing of projects while preventing double counting.

Application of the draft Determination

The draft Determination sets out the detailed rules for implementing and monitoring offsets projects that would reduce emissions of greenhouse gases by reducing energy consumption or increasing energy efficiency in industrial settings. These rules have been designed to help ensure that emissions reductions are real and additional to business as usual.

Project proponents wishing to implement projects under the draft Determination, once it is made, must make an application to the Regulator under section 22 of the Act. They must also meet the general eligibility requirements for an offsets project set out in subsection 27(4) of the Act, which include compliance with the requirements set out in the draft Determination, and the additionality requirements in subsection 27(4A) of the Act. The additionality requirements are:

- the newness requirement; and

- the regulatory additionality requirement; and

- the government program requirement.

Subsection 27(4A) of the Act provides that a methodology determination may specify requirements in lieu of any of the above requirements. The draft Determination does not specify any requirements in lieu, and so all three requirements in the Act apply to industrial energy and fuel efficiency projects.

Public consultation

The draft Determination has been developed by the Department of the Environment in collaboration with a technical working group of experts from the energy efficiency sector and the Regulator. The industrial energy efficiency technical working group held meetings on 11 December 2013, 25 February 2014, 5 May 2014 and 15 August 2014. The technical working group has reviewed draft versions of this methodology, in the form of a methodology development template, prior to the release of this draft Determination for public consultation.

The exposure draft of the Determination has been published on the Department's website for public consultation from 14 November 2014 to 12 December 2014. Details for how to make a submission are provided on the Department of the Environment website, www.environment.gov.au.

Draft Determination details

The draft Determination will be a legislative instrument within the meaning of the *Legislative Instruments Act 2003*.

Details of the draft Determination are at Attachment A.

Note on this explanatory statement

Numbered sections in this explanatory statement align with the relevant sections of the draft Determination.

Details of the Methodology Determination

Part 1   Preliminary

1   Name

Section 1 sets out the full name of the draft Determination, which would be the *Carbon Credits (Carbon Farming Initiative) Methodology (Industrial Fuel and Energy Efficiency) Determination 2014.*

2   Commencement

Section 2 provides that the draft Determination would commence on the day after it is registered.

3   Authority

Section 3 provides that the draft Determination would be made under subsection 106(1) of the Act.

4   Duration

Under subparagraph 122(1)(b)(i) of the Act, a methodology determination remains in force for the period specified in the determination.

Paragraph 4(a) provides that the draft Determination would be in force from the commencement until the day before it would otherwise be repealed under subsection 50(1) of the *Legislative Instruments Act 2003*.

Instruments are repealed under that provision on either 1 April or 1 October following the tenth anniversary of registration on the Federal Register of Legislative Instruments. Paragraph 4(b) ensures that the draft Determination would expire in accordance with subparagraph 122(1)(b)(i) of the Act.

If the draft Determination expires or is revoked during a crediting period for a project to which the draft Determination applies, the draft Determination would continue to apply to the project during the remainder of the crediting period under subsections 125(2) and 127(2) of the Act. Project proponents may apply to the Regulator during a reporting period to have a different methodology determination apply to their projects from the start of that reporting period (see subsection 128(1) of the Act).

5   Definitions

Section 5 defines a number of terms used in the draft Determination.

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

Under section 23 of the *Acts Interpretation Act 1901*, words in the determination in the singular number include the plural and words in the plural number include the singular.

Key definitions in section 5 of the draft Determination include those set out below.

Direct emission of greenhouse gas, in relation to a site, means the release of greenhouse gas into the atmosphere as a direct result of fuel combustion at the site.

Emissions model means a baseline emissions model or an operating emissions model.

This refers to a model that estimates emissions for an implementation or a population of implementations. These models are developed using regression analysis; a statistical technique to establish the relationship between one or more independent variables and a dependent variable. Emissions models use emissions as the dependent variable and factors that have a causal link to emissions as independent variables (such as production or temperature). They can be one of two types:

- A baseline emissions model is developed using emissions and independent variable data collected during the ***baseline measurement period***, and then used to estimate baseline scenario emissions in the reporting period. The baseline measurement period occurs prior to when the implementation commences.

- An operating emissions model is developed using emissions and independent variable data collected during the ***operating measurement period***, and used to estimate emissions in the entire reporting period. The operating measurement period occurs after the implementation commences.

Indirect emissions *of greenhouse gases*, in relation to a site, means the release of greenhouse gases into the atmosphere as a direct result of fuel combustion at another site to generate electricity for consumption at the site.

6   Meaning of implementation

Section 6 defines ***implementation***, which is an activity or group of related activities at a site, that are eligible industrial fuel and energy efficiency project activities under the draft Determination. These activities include, among others, modifying or replacing existing equipment and changing the way equipment is used. The installation of new equipment, where the installation is not to replace, modify or augment existing equipment, is not an eligible activity. The purpose of this exclusion is to make it clear that the methodology does not provide for calculating emissions reductions from installing new equipment in circumstances where there is no baseline data, such as 'greenfields' plants or substantial plant expansions.

The installation of a type of equipment in relation to which a renewable energy certificate can be created under the *Renewable Energy (Electricity) Act 2000* is also not an eligible activity. Please note that additional requirements for activities undertaken as part of industrial fuel and energy efficiency projects are set out under Section 8.

7   Meaning of relevant energy

Section 7 defines ***relevant energy*** for an implementation, which must be monitored for the purposes of establishing baseline emissions models, operating emissions models and to measure project (or post-installation) emissions. The definition establishes what is often called the measurement boundary or project boundary. Relevant energy defines fuel and electricity consumption which is affected by project activities. It includes fuel and electricity consumed by equipment to which emissions reduction activities relate (i.e. equipment that is

being replaced, modified, removed, etc.) as well as fuel and electricity consumed by other equipment indirectly affected by these activities. Fuel or electricity consumption is only relevant energy for an implementation to the extent that the change in consumption is material, the equipment is at the same site as the equipment to which the implementation relates, and the change in consumption is not captured as an interactive effect (see below).

Other equipment at the site which is not equipment to which emissions reduction activities relate might include, for example, a boiler which is operated less frequently as a result of installing a heat recovery system on a furnace.

The concept of relevant energy also enables project activities to involve equipment that does not directly consume electricity or combust fuel. For example, fixing leaks in a compressed air distribution system leads to reductions in electrical energy consumption by the compressor that can be accommodated under relevant energy.

Where the equipment affected by project activities is not separately metered, relevant energy includes fuel or electricity consumed by other equipment for which energy consumption is measured by the same instruments. For example, in a grinding optimisation project existing metering may cover electric power supply to the whole crushing and grinding circuit, all of which would be included in relevant energy.

Changes in the consumption of energy are material for an implementation in a reporting period if the change in emissions related to that consumption is five per cent or greater of the emissions abated by the implementation.

Interactive effects are covered in Section 26 and describe changes in energy use in equipment that is not captured by relevant energy and that is not the focus of the project. A common example of an interactive effect is a reduction in the energy used by an air conditioning system after the installation of highly energy efficient lights that emit less heat. In this example, the lighting upgrade is the focus of the project and the reduction in energy used by the air conditioning system as a direct result of the project could be accounted for as an interactive effect.

The separate concepts of relevant energy and interactive effects provide flexibility to project proponents by allowing flow-on emissions effects in other systems to be accounted for in a project- or site-appropriate way, either as relevant energy or interactive effects.

At the same time, requirements around what *must* be accounted for in relevant energy and what *may* be accounted for as interactive effects ensure that changes to emissions are appropriately accounted for.

Proponents may choose whether energy use is captured by relevant energy or as an interactive effect, within the limits set around the two concepts.

Part 2   Industrial energy and fuel efficiency projects

<u>8   Industrial energy and fuel efficiency projects</u>

Sections 27(4)(b) and 106(1)(a) of the Act require all offsets projects to be covered by a methodology determination, and for methodology determinations to specify the kind of offsets projects to which they apply.

Section 8 provides that the draft Determination would apply to an offsets project that aims to reduce direct (scope 1) and/or indirect (scope 2) emissions of greenhouse gas at one or more sites. The draft Determination defines this kind of project as an industrial fuel and energy efficiency project, and sets out that each implementation in a project must aim to reduce direct and/or indirect emissions of greenhouse gases.

Projects must reduce emissions from equipment that consumes electricity; and/or equipment that generates electricity, useful physical work, or cooling, heat or steam.

The reference to generation of 'useful physical work' covers cases where energy is used to create work, such as running a diesel engine to create shaft power, storing energy chemically, pumping water to a higher location, or compressing gases. This term is intended to cover forms of energy consumption that do not directly relate to production of electricity heat or steam, but that have a productive or business use at a site. Running an empty conveyor is an example of physical work that is not useful and is not intended to be covered by this provision.

Section 8 establishes that the draft Determination would not cover industrial process emissions, flaring of fugitive gases, or reductions in emissions from hydrofluorocarbon refrigerant gases. These changes cannot be efficiently captured by the approaches currently set out in the draft Determination.

Part 3   **Project Requirements**

9   Operation of this Division

The effect of paragraph 106(1)(b) of the Act is that a methodology determination must set out requirements that must be met for a project to be an eligible offsets project. Under paragraph 27(4)(c) of the Act, the Regulator must not declare that a project is an eligible offsets project unless the Regulator is satisfied that the project meets these requirements.

Part 3 of the draft Determination specifies a number of requirements that must be met in order for a project to be an eligible offsets project. These requirements are set out in sections 10 to 13.

10   Declaration requirements

Section 10 applies at the time the project is declared to be an eligible offsets project. It requires an industrial fuel and energy efficiency project to be a project that aims to reduce emissions by undertaking one or more implementations at one or more sites. Reductions in emissions as a result of an implementation must be from changes in relevant energy and capable of being calculated under Part 4. To be declared an eligible offsets project an application for declaration must include information about each implementation that is part of the project, including a description of the proposed sites and the sub-methods to be used for each implementation or type of implementation. Any changes to sub-methods after project declaration must meet all the requirements in this draft Determination (see section 11).

Section 10 seeks to ensure that the type of projects that are eligible under the draft Determination, when it is made, are projects that involve reducing emissions by:

1. modifying existing equipment;
2. changing the way existing equipment is used;
3. replacing existing equipment;
4.   installing new equipment as part of replacing, modifying or augmenting existing equipment;
5. removing existing equipment;
6. changing the energy sources used by existing equipment; and/or
7. changing the mix of energy sources used by existing equipment.

Section 10 also seeks to ensure that proponents adequately describe all implementations or types of implementations within a project and identify which sub-method will be used for each implementation. The reference to types of implementations is intended to cover aggregated projects where the exact location of each implementation may not be known at the time of declaration.

Under the draft Determination, the Regulator may publish a document—the Industrial Fuel and Energy Efficiency implementation descriptions document—that describes specific types of implementations (or energy efficiency activities). This is intended to assist proponents to describe similar implementations in the same way to help streamline approvals processes. If a project fits a description in the IFEE implementation descriptions document, the project proponent must use that description when making an application to the Regulator to have their project approved as an eligible offsets project. Proponents must develop their own descriptions in other cases.

11   Implementations to be similar as described in application.

Section 11 applies the following declaration and provides that any changes to how an implementation is undertaken, from that described in the application, must be approved by the Regulator. This section aims to ensure that projects are carried out in a manner that is approved by the Regulator and that is consistent with the draft Determination.

12   No limiting output or services provided by equipment

Section 12 sets out that the project must not involve undertaking an implementation that limits the output of equipment, or reduces the service levels provided by equipment at a site unless there is an associated increase in energy efficiency. In other words, the project activities must not reduce levels of service (e.g. tonnes of output, building temperature set points, or lighting levels) unless the current level of service is inappropriate.[2] For example, lighting levels can be reduced where they exceed Australian Standards.

For discussion: approach to the disposal of removed equipment

The NSW Energy Savings Scheme (ESS) Project Impact Assessment with Measurement and Verification Method—the method on which this methodology is based—does not allow removed equipment to be refurbished, reused or sold to third parties (see Clause 5.3A of the NSW ESS Rule[3]). This approach prevents older, less efficient equipment from re-entering the market, which could lead to leakage (where emissions reductions achieved under the project are offset by reuse of the removed equipment).

The Department recognises that preventing the sale or reuse of some large pieces of removed equipment may limit participation under this draft Determination, including where the equipment is bespoke or has a large residual value. In such cases the residual value of equipment could be a significant determinant of project investment decisions.

Stakeholder views are sought on the scale and materiality of any leakage risk that may arise as a result of allowing reuse or sale of removed equipment, and whether particular types of equipment present a greater risk. The Department is also interested in views on whether precluding reuse or sale of removed equipment would present a significant barrier to the establishment of projects under this draft Determination.

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[2] This is consistent with the approach in *AS/NZS 3598.1 Energy Audits: Commercial Buildings*.
[3] Available here: http://www.ess.nsw.gov.au/Scheme_Changes/ESS_Rules_2014

Part 4   Net abatement amount

Division 1   Preliminary

13   Operation of this Part

Paragraph 106(1)(c) of the Act provides that a methodology determination must specify how to calculate the carbon dioxide equivalent (CO_2-e) net abatement amount for the project in a reporting period. The net abatement amount for a project in a reporting period sets the number of ACCUs that can be issued to the project proponent, with each ACCU representing one tonne of abatement delivered by the project.

14   Overview of gases accounted for in abatement calculations

Section 14 provides a summary of the greenhouse gas sources that are assessed in the draft Determination in order to determine the net abatement amount. The emissions sources which need to be taken into account when calculating abatement for the project are set out in Table 1.

Greenhouse gases and emissions sources			
Item	**Relevant emissions calculation**	**Emissions source**	**Greenhouse gas**
1	Baseline emissions for an implementation or sample of a population	Direct emissions	Carbon dioxide (CO_2) Methane (CH_4) Nitrous oxide (N_2O)
2	Baseline emissions for an implementation or sample of a population	Indirect emissions	Carbon dioxide (CO_2) Methane (CH_4) Nitrous oxide (N_2O)
3	Operating emissions or measured emissions for an implementation or sample of a population	Direct emissions	Carbon dioxide (CO_2) Methane (CH_4) Nitrous oxide (N_2O)
4	Operating emissions or measured emissions for an implementation or sample of a population	Indirect emissions	Carbon dioxide (CO_2) Methane (CH_4) Nitrous oxide (N_2O)

The draft Determination covers scope 1 (direct) emissions from onsite fuel combustion and scope 2 (indirect) emissions from electricity consumed onsite. It does not cover scope 3 emissions associated with the extraction and processing of fossil fuels or the manufacture, transportation, installation and disposal or decommissioning of equipment. It is an ERF scheme-wide policy to exclude scope 3 emissions from baseline and project emissions sources. This draft Determination also does not cover emissions of hydrofluorocarbon refrigerant gases or other industrial process emissions.

15   References to factors and parameters from external sources

The calculation of the net abatement amount in the draft Determination includes factors taken from other sources, such as emissions factors from the *NGER (Measurement) Determination*. The draft Determination specifies that such factors or parameters must be taken from the version of the external source that is current at the time of reporting emissions reductions

from the project or at the time the report is required to be given to the Regulator (whichever is earlier).

The requirement to use versions of referenced documents current at the earlier of the time the offsets report is submitted or the time the report is due does not apply to the emissions factor for electricity. The draft Determination states that the relevant grid-based emissions factor for electricity must be derived from the *National Greenhouse Accounts (NGA) Factors document* in force on the day the project is declared an eligible offsets project[4].

Division 2   Method for calculating net abatement amount

16   Carbon dioxide equivalent net abatement amount

Section 16 defines the net abatement amount for a project in equation 1 as the sum of abatement for all individual implementations included in the project, and all populations of implementations included in the project. Accordingly, proponents may undertake a number of implementations under this draft Determination, under a number of sub-methods, and aggregate the abatement as a single project.

Section 16 includes the first and highest level equation in the draft Determination. The sections that follow in Divisions 2 and 3 relate to issues that are common across a number of sub-methods. Divisions 4 to 8 then focus on the calculations that are required under each individual sub-method.

17   Using a sub-method

Section 17 sets out high level requirements for using sub-methods for an implementation. The primary requirement is that the sub-method used for an implementation should be the same for all reporting periods for a project. There is an exception where a proponent wishes to change from using an operating emissions model under sub-method 2 to measuring emissions over the full reporting period under sub-method 1. This is allowed because moving from sub-method 2 to sub-method 1 will improve the accuracy of the calculation of abatement. Conversely, as a change from sub-method 1 to sub-method 2 would reduce the accuracy of the abatement calculation the method does not allow for this change.

Section 17 also requires a random selection method to be used to select a representative sample of the population of implementations where sub-methods 3 or 4 are used. Random selection means that each member of the population has the same statistical probability of being selected in the sample, which reduces selection bias. Under these sub-methods, a sample is required to be representative of the population to ensure that the estimate of abatement from the sample can be sensibly scaled to the size of the population without under or overestimating emissions reductions.

The section also establishes that while measurements of relevant parameters—such as fuel and electricity use, or production levels—may take place at various time intervals, the only time intervals that can be used to calculate abatement (referred to as 'measurement time intervals') are those in which (a) site constants are their normal value, and (b) measurements of independent variables are within the effective range (plus or minus a five per cent margin) of the relevant independent variable.

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[4] Grid-based emissions factors will be included in the *National Greenhouse Accounts (NGA) Factors document* for the purposes of the Emissions Reduction Fund.

Site constants are parameters that do not vary under typical conditions, yet materially affect emissions levels from relevant energy consumption when they vary (see section 20). An example of a site constant may be floor space or motor size.

Measured values for independent variables are considered to fall within five per cent of the effective range when their value is within five per cent of the range of the measured values of that independent variable used to build the emissions model. For example, if during a baseline measurement period, the lowest production value recorded is 100 units and the highest is 1100 units, the allowable range of the production independent variable would be 95 to 1155 units. Any time periods during the reporting period in which productions levels fall outside this range must be excluded when calculating abatement.

Section 17 also establishes that a single measurement time interval (for example, one hour, one day or one month) must be used for all parameters when calculating abatement under a sub-method. Measurement time intervals may be aggregated together to form larger measurement time intervals for the purposes of ensuring consistency. Larger measurement time intervals may not be broken down into smaller measurement time intervals.

For discussion: determination of the sample size

The sample size is a significant factor in determining whether a sample is truly representative of a population. Even where a sample has been selected randomly, an insufficient sample size will not provide suitable coverage of the statistical variation within the population.

The Department is seeking views on appropriate requirements for the determination of a sample size to ensure that regression models can be truly representative of the variation in emissions for the population.

Division 3   Requirements for emissions models

18   General requirements

This approach quantifies emissions using baseline emissions models and operating emissions models (for sub-methods 2 and 4) developed using regression analysis. Regression analysis describes the process of developing a model or equation that attempts to predict the value of a dependent variable, in this case emissions, based on the values of one or more independent, or explanatory, variables.

Section 18 outlines requirements for emissions models, including the requirement that the model be based on emissions from relevant energy (total measured emissions) and that it reasonably reflect actual emissions.

In order to control for the effects of changes in emissions due to factors that are not due to the project, emissions models must be developed using variables that have an effect on emissions. Similarly, section 18 requires that emissions models account for variations in input quality by including this factor as a relevant variable or site constant, except where it is included as an interactive effect. This is to ensure that the calculations account for the significant impacts of effects of raw material (e.g. ore) quality in sectors such as mining or metals processing.

Section 19 also sets out the requirement that an emissions model for an implementation, or a sample of a population, must include one or more independent variables or site constants that represent output or service levels. This provision is to ensure that emissions models account for the effect of output or service levels on emissions.

19 Minimum statistical requirements

Emissions models must meet rigorous statistical requirements including that the t-statistic for each independent variable coefficient must be greater than the value for the t-distribution at the 97.5 per cent single sided confidence interval; and that the lesser of the coefficient of determination (R^2) or adjusted coefficient of determination (adjusted R^2) be greater than 0.75. These requirements are aimed at ensuring that emissions models are robust, and are consistent with standard energy efficiency measurement and verification practices.

Section 19 also requires the calculation of the relative precision of the emissions level predicted by the emissions model at the 95 per cent level. This figure is required to be within plus or minus 100 per cent. As an example, if the relative precision of the emissions level predicted by an emissions model at the 95 per cent level is calculated as plus or minus 12 per cent, the model would be taken to satisfy the requirement under subsection 20(1)(c). Section 20(2) sets out how the relative precision for an emissions model is worked out.

20 Requirements for baseline emissions models

Section 20 specifies that baseline emissions models must be based on measurements of relevant energy and other parameters taken over the baseline measurement period, and that these measurements must be made in accordance with the monitoring requirements. The baseline measurement period must meet the requirements set out in Section 22. Baseline emissions models must be worked out for each implementation under sub-methods 1 and 2, and each sample of implementations under sub-methods 3 and 4.

21 Requirements for operating emissions models

Section 21 specifies that operating emissions models must be based on measurements of relevant energy and other parameters taken over the operating measurement period. The operating measurement period must meet the requirements set out in Section 22. Project proponents may update their operating model for any subsequent reporting period.

The calculations in Division 5 and Division 7 apply a decay factor when working out abatement estimates using an operating emissions model. This provides an incentive for proponents to update their model, as it conservatively discounts the abatement to reflect (a) reduced efficiency of equipment over time that is not captured by the measured parameters, and (b) decreased certainty in the level of delivered abatement given that actual fuel and/or electricity use is not fully measured over each entire reporting period. Proponents may choose to continue with the original model and be subject to the annually adjusted decay factor, or update their model and reset the decay factor to 1 for the year following the update. Decay factors are set out in section 27.

22 Baseline measurement period and operating measurement period

Section 22 sets out that the data on which a model is based must cover a sufficient range of operating conditions so as to cover the relevant equipment's full operating cycle and provide a reasonable weighting of operating conditions expected during the reporting period. Reporting period measurements of independent variables cannot be used to calculate abatement where they fall outside the range of values measured during the baseline or operating measurement period (plus or minus 5 per cent).

Section 22 also specifies timing for the measurement periods so that the calculations of net abatement are accurate and appropriate. For example, in the case of emissions models for sub-method 4, all implementations in the identified sample must have been completed before the start of the first operating measurement period so that the emissions model that is developed is representative of the population of implementations that is being modelled.

Baseline measurement periods must end before the project activity commences for each implementation, but must not start earlier than 24 months before the date the activity commences.

23   Independent variable

Section 23 establishes requirements for independent variables in the emissions models, including that the parameter must vary over time or between implementations in a sample and must be able to cause or explain changes in emissions. To enable non-linear regression models, an independent variable may be a function of another independent variable, such as the cube of the fluid flow rate for a pump. Independent variables can be calculated or derived from other measurements where there is not a material loss of precision.

24   Site constants

Some parameters do not vary under typical conditions, yet materially affect emissions levels from relevant energy consumption when they vary. Section 24 defines these site constants, including that a site constant is considered at its normal value when it is within the range observed during the relevant measurement period.

The primary difference between independent variables and site constants is that independent variables are expected to vary over time, whereas site constants are expected to remain static. Distinguishing between the two allows site constants to be excluded from emissions models under sub-methods 1 and 2, as a static values cannot cause variation in emissions in the regression modelling. Excluding static factors for sub-methods 1 and 2 reduces the complexity of models while still allowing for any changes in site constants to be taken into account by excluding time periods in which they are not at their normal value.

Site constants should be included in emissions models as independent variables where they differ between implementations in a sample under sub-methods 3 and 4. An example is where pumps are of different sizes for different implementations in a sample. In such cases a site constant

25   Interactive effects

Section 25 sets out that a material change in the consumption of fuel or electricity at a site is an interactive effect for an implementation in a time period if it meets two conditions. Firstly, the consumption of fuel or electricity is not relevant energy. Secondly, the change in consumption of fuel or electricity in the time period is due to the implementation.

Interactive effects for the implementation must be calculated consistently with this draft Determination and with the NGER (Measurement) Determination using site data. Where this draft Determination, another methodology Determination or the NGER (Measurement) Determination does not provide a method for calculating the interactive effect, the effect must be calculated using other generally accepted energy efficiency measurement and verification

practices, generally accepted engineering methods, or by using another method that is credible and robust. The calculation approach for the interactive effect must be capable of being measured and verified, and should be conservative.

Approaches to determine a change in consumption may involve the calculation of baseline and operating energy consumption, the direct calculation of a change in consumption, or a combination of both. For example, a heat transfer calculation for new equipment will typically calculate the energy flow directly.

Requiring project proponents to include emissions from any material interactive effects in their abatement calculations will ensure changes in emissions levels that occur as a direct consequence of the project are accounted for.

For discussion: calculation of interactive effects

The current requirements around the calculation of interactive effects are defined quite broadly. Interactive effects are included in the methodology to account for both positive and negative interactions that cannot practically be included in the emissions model(s) for an implementation or for a population of implementations.

The Department is seeking views on appropriate calculation requirements for interactive effects, and whether any of the current provisions in this draft Determination could be better expressed to meet the intent while improving the rigour of the calculations.

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26   Accuracy Factor

Accuracy factors are used to reduce the number of credits issued for a given abatement estimate for which there is a lower level of confidence, i.e., where fuel or electricity use are not fully measured under sub-methods 2 and 4. This is a conservative approach in line with the offsets integrity standards. The accuracy factor (*AF*) for an implementation is worked out using the following table.

Accuracy factors

Item	Relative precision of the emissions abated by implementation (h) in the reporting period at 95% confidence level	Accuracy factor
1	less than 25%	1
2	25% to 50%	0.9
3	50% to 75%	0.8
4	75% to 100%	0.6
5	100% to 150%	0.4
6	150% to 200%	0.2
7	greater than 200%	0

The accuracy factor is based on the relative precision of the abatement estimate (worked out using equation 3). Equations 4 and 5 set out calculations to determine the standard error of the emissions abated by an implementation, which is used to determine the relative precision.

Equations 6 and 7 set out calculations to determine the emissions abated by an implementation which are used to determine standard error.

<u>27   Decay factor</u>

Decay factors are used to account for the increasing uncertainty that the modelled net abatement determined using an operating model will be realised in each successive reporting period, and to account for gradual reductions in the effectiveness of the equipment or process used under the Project. The decay factor provides an incentive to measure operating emissions for the entire reporting period (i.e., to use sub-method 1 or 3).

Section 27 sets out that the decay factor for a reporting period in which an operating emissions model is used is worked out by weighting decay factors specified in the below table by the percentage of measurement time intervals that fall within each decay factor year (also specified in the below table). For example, if under an implementation there are 100 measurement time intervals in a reporting period, with 50 measurement time intervals falling within decay coefficient year 1 (see below table) and the other 50 falling within decay coefficient year 2 (see below table), the decay coefficient to be used in the calculation of abatement under sub-method 2 or 4 (i.e., the 'decay coefficient for a reporting period') would be 0.9.

Year	Decay coefficient
1	1.00
2	0.80
3	0.64
4	0.51
5	0.41
6	0.33
7	0.26

Division 4   Implementation using measured emissions—sub-method 1

Sub-method 1 provides for calculating the net abatement amount for an implementation by comparing project emissions calculated from measurements of fuel and/or electricity data to baseline emissions from a baseline emissions model.

<u>28   Emissions abated</u>

Section 28 sets out how to calculate the emissions abated by an implementation for a reporting period using sub-method 1.

The emissions abated by an implementation during a reporting period are worked out using subsection 28(2) or subsection 28(3). In working out this abatement, these two subsections implement a rule that limits the proportion of total interactive effects in emissions abated, given these effects may be calculated by a less prescriptive method than abatement calculated from relevant energy consumption. This is in line with the proposed offsets integrity standards by applying conservative assumptions.

In simple terms, subsection 28(2) sets out how to calculate abatement for a reporting period when the sum of the absolute value of interactive effects is less than or equal to 10 per cent of abated emissions, which is the allowable limit for interactive effects. In this case, the abatement for the implementation is worked out by adding net interactive effects to the difference between modelled baseline emissions and total measured emissions. The value obtained is multiplied by an accuracy factor.

Subsection 28(3) sets out that if the 10 per cent limit is reached, then the abatement for the implementation in the reporting period is zero.

29   Interactive Effects

Section 29 is used to work out the sum of the sum of the absolute values of interactive effects for an implementation in a reporting period. This is used in section 28 to implement the rule that prevents proponents from capturing too large a proportion of changes in emissions as interactive effects. The absolute value of an interactive effect is the positive value of the effect, whether the value is positive or negative.

30   Modelled baseline emissions

Section 30 establishes that total baseline emissions for an implementation for a reporting period is the sum of modelled baseline emissions for the implementation for each measurement time interval in the reporting period. The output of this calculation is used in the calculation of emission abated in section 28.

31   Baseline emissions model

Section 31 sets out the form of the baseline emissions model that is established by statistical regression analysis, and outlines how it is to be used to work out baseline emissions for a measurement time interval. The baseline emissions model predicts what emissions would have been had the old technology or practices remained in place during the reporting period. Baseline emissions are worked out by substituting the measured values of the independent variables into the baseline emissions model. The resulting estimates are referred to as modelled baseline emissions and are used in section 30.

32   Measured emissions

Section 32 sets out how to calculate the total measured emissions from the consumption of relevant energy for an implementation for a reporting period. This involves adding together the measured emissions for each measurement time interval in the reporting period. Measured emissions for each measurement time interval are worked out using equation 34 in section 54.

Total measured emissions are subtracted from modelled baseline emissions in section 28 to determine the level of abatement, taking into account an accuracy factor that reflects the precision of the measurement and calculation approaches used.

Division 6—Implementation using operating emissions model—sub-method 2

Sub-method 2 provides for calculating the net abatement amount for an implementation by comparing project emissions from an operating emissions model to baseline emissions from a baseline emissions model.

33   Emissions abated

Section 33 sets out how to calculate the emissions abated by an implementation for a reporting period using sub-method 2.

The emissions abated by an implementation for a reporting period is worked out using subsection 33(2) or subsection 33(3). In working out this abatement, these two subsections implement a rule that limits the proportion of total interactive effects in emissions abated, given these effects may be calculated by a less prescriptive method than abatement calculated from relevant energy consumption . This is in line with the proposed offsets integrity standards by applying conservative assumptions.

In simple terms, subsection 33(2) sets out how to calculate abatement for a reporting period when the sum of the absolute value of interactive effects is less than or equal to 10 per cent of abated emissions, which is the allowable limit for interactive effects. In this case, the abatement for the implementation is worked out by adding net interactive effects to the difference between modelled baseline emissions and modelled operating emissions. The value obtained is multiplied by an accuracy factor.

Subsection 33(3) sets out that if the 10 per cent limit is reached, then the abatement for the implementation in the reporting period is zero.

34   Interactive Effects

In line with the approach for sub-method 1, section 34 is used to work out the sum of the absolute values of the interactive effects for an implementation in a reporting period. This is then used in section 33 to implement the rule that prevents proponents from capturing too large a proportion of emissions as interactive effects.   The absolute value of an interactive effect is the positive value of the effect, whether the value is positive or negative.

35   Modelled baseline emissions

In line with the approach for sub-method 1, section 35 establishes that total baseline emissions for an implementation for a reporting period is the sum of modelled baseline emissions for the implementation for each measurement time interval in the reporting period. This figure is used in the calculation of emission abated in section 33.

36   Baseline emissions model

Section 36 sets out the form of the baseline emissions model that is established by statistical regression analysis, and outlines how it is to be used to work out baseline emissions for a measurement time interval. The baseline emissions model predicts what emissions would have been had the old technology remained in place during the reporting period. Baseline emissions are worked out by substituting the measured values of the independent variables

into the baseline emissions model (equation) for the implementation. The resulting estimates are referred to as modelled baseline emissions.

37   Modelled operating emissions

Total modelled operating emissions for an implementation for a reporting period are worked out by summing the modelled operating emissions for the implementation across each measurement time interval in the reporting period. This figure is used in the calculation of emission abated in section 33.

38   Operating emissions model

Section 38 sets out the form of the operating emissions model and outlines how it is to be used to work out operating emissions for a measurement time interval. This is achieved by entering the values of the independent variables measured in the measurement time interval into the baseline emissions model for the implementation.

Division 8—Sample using measured emissions—sub-method 3

Sub-method 3 provides for calculating the net abatement amount for a population of implementations based on the abatement delivered by a sample of implementations. It involves estimating abatement for each implementation within the sample by comparing project emissions calculated from measurements of fuel and/or electricity data to baseline emissions from a baseline emissions model.

39   Emissions abated by population

Section 41 sets out how to calculate the emissions abated by a population of implementations in a reporting period based on a representative sample of implementations (equation 3). This calculation involves working out the abatement for a sample of implementations during the reporting period and then scaling those estimates to the size of the population.

40   Emissions abated by sample

Section 41A sets out that the emissions abated by a sample of implementations during a reporting period are to be calculated by summing the abatement delivered by each completed implementation in the sample over the reporting period.

41   Emissions abated by implementation

Section 41 sets out how to calculate the emissions abated by an implementation for a reporting period using sub-method 3.

The emissions abated by an implementation within a sample during a reporting period are worked out using subsection 41(2) or subsection 41(3).

In working out this abatement, these two subsections implement a rule that limits the proportion of total interactive effects in emissions abated, given these effects may be calculated by a less prescriptive method than abatement calculated from relevant energy

consumption. This is in line with the proposed offsets integrity standards by applying conservative assumptions.

In simple terms, subsection 41(2) sets out how to calculate abatement for a reporting period when the sum of the absolute value of interactive effects is less than or equal to 10 per cent of abated emissions, which is the allowable limit for interactive effects. In this case, the abatement for the implementation is worked out by adding net interactive effects to the difference between modelled baseline emissions and total measured emissions. The value obtained is multiplied by an accuracy factor.

Subsection 41(3) sets out that if the 10 per cent limit is reached, then the abatement for the implementation from the sample in the reporting period is zero.

42   Interactive effects

In line with the approaches for subs-methods 1 and 2, section 42 is used to work out the sum of the absolute values of the interactive effects for an implementation in a sample in a reporting period.

This is used in section 41 to implement the rule that limits the proportion of total interactive effects in emissions abated. The absolute value of an interactive effect is is the positive value of the effect, whether the value is positive or negative.

43   Modelled baseline emissions

In line with the approach for sub-methods 1 and 2, section 43 establishes that total modelled baseline emissions for an implementation for a reporting period is the sum of modelled baseline emissions for the implementation for each measurement time interval in the reporting period. This figure is used in the calculation of emission abated in section 41.

44   Baseline emissions model

Section 44 sets out the form of the baseline emissions model that is established by statistical regression analysis, and outlines how it is to be used to work out baseline emissions for a measurement time interval. The baseline emissions model predicts what emissions would have been had the old technology or practice remained in place during the reporting period. Baseline emissions are worked out by substituting the measured values of the independent variables into the baseline emissions model for the implementation. The resulting estimates are referred to as modelled baseline emissions.

45   Measured emissions

Section 45 sets out how to calculate the total measured emissions from the consumption of relevant energy for an implementation for a reporting period. This involves adding together the measured emissions for each measurement time interval in the reporting period. Measured emissions for each measurement time interval are worked out using equation 35 in section 54.

Total measured emissions are subtracted from modelled baseline emissions in section 41 to determine the level of abatement, taking into account an accuracy factor that reflects the precision of the measurement and calculation approaches used.

Division 9—Sample using operating emissions model—sub-method 4

Sub-method 4 provides for calculating the net abatement amount for a population of implementations. It differs from sub-method 3 in using an operating emissions model to estimate project emissions for each implementation within the sample instead of monitoring fuel and/or electricity use over the full reporting period.

46   Emissions abated by population

As with sub-method 3, section 46 sets out how to calculate the emissions abated by a population of implementations in a reporting period based on a representative sample of implementations (equation 3). This involves working out the abatement for a sample of implementations the reporting period and then scaling those estimates to the size of the population.

47   Emissions abated by sample

Section 47 sets out that the emissions abated by a sample of implementations during a reporting period are to be calculated by summing the abatement delivered by each completed implementation in the sample over the reporting period.

48   Emissions abated by implementation

Section 48 sets out how to calculate the emissions abated by an implementation for a reporting period using sub-method 3.

The emissions abated by an implementation within a sample during a reporting period are worked out using subsection 48(2) or subsection 48(3).

In setting out how to work out this abatement, these two subsections implement a rule that limits the proportion of total interactive effects in emissions abated, given these effects may be calculated by a less prescriptive method than abatement calculated from relevant energy consumption. This is in line with the proposed offsets integrity standards by applying conservative assumptions.

In simple terms, subsection 48(2) sets out how to calculate abatement for a reporting period when the sum of the absolute value of interactive effects is less than or equal to 10 per cent of abated emissions, which is the allowable limit for interactive effects. In this case, the abatement for the implementation is worked out by adding net interactive effects to the difference between modelled baseline emissions and modelled operating emissions. The value obtained is multiplied by an accuracy factor.

Subsection 48(3) sets out that if the 10 per cent limit is reached, then the abatement for the implementation in the sample in the reporting period is zero.

49   Interactive effects

In line with the approaches for subs-method 1, 2 and 3, section 49 is used to work out the sum of the absolute values of the interactive effects for an implementation in a sample in a reporting period. This is then used in section 48 to implement the rule that prevents proponents from capturing too large a proportion of emissions as interactive effects.   The

absolute value of an interactive effect is the positive value of the effect, whether the value is positive or negative.

50   Modelled baseline emissions

In line with the approach for sub-methods 1, 2 and 3, section 50 establishes that total modelled baseline emissions for an implementation for a reporting period is the sum of modelled baseline emissions for the implementation for each measurement time interval in the reporting period. This figure is used in the calculation of emissions abated in section 48.

51   Baseline emissions model

Section 51 sets out the form of the baseline emissions model that is established by statistical regression analysis, and outlines how it is to be used to work out baseline emissions for a measurement time interval. The baseline emissions model predicts what emissions would have been had the old technology or practice remained in place during the reporting period. Baseline emissions are worked out by substituting the measured values of the independent variables into the baseline emissions model for the implementation. The resulting estimates are referred to as modelled baseline emissions.

52   Modelled operating emissions

Section 52 establishes that total modelled operating emissions for an implementation for a reporting period is the sum of modelled operating emissions for the implementation for each measurement time interval in the reporting period.

53   Operating emissions model

Section 53 sets out the form of the operating emissions model and outlines how it is to be used to work out operating emissions for a measurement time interval. This is achieved by entering the values of the independent variables measured in the measurement time interval into the baseline emissions model for the implementation.

Division 10—Measured emissions

54   Measured emissions

Section 54 sets out that total measured emissions are the sum of direct and indirect emissions from the consumption of relevant energy for the implementation, and provide calculations for working out the direct and indirect emissions based on established energy content and emissions factors. These calculations are required to establish baseline and operating emissions models (i.e., are used to determine the dependent variable when building emissions models) and are used directly to determine operating emissions for sub-methods 1 and 3.

Part 5   Reporting, monitoring and record keeping requirements

55   Operation of this Part

The effect of paragraph 106(3)(a) of the Act is that a methodology determination may set out requirements to be included in each offsets report.

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 draft Determination are in addition to any requirements specified in the Act, Regulations[5] and legislative rules.

56   Offsets report requirements

Further to requirements under the Act or subordinate legislation, section 56 sets out specific additional information that must be included in an offsets report for an industrial fuel or energy efficiency project. This information includes the baseline and operating emissions models, interactive effects and relative precision for all implementations and populations of implementations in the project. Reports must also cover details of activities undertaken, site locations for implementations and records of equipment disposal.

Information is required to be provided in an offsets report where the information has not been previously provided to the Regulator, or where the information provided to the Regulator has changed.

Division 2   Record keeping requirements

57   Operation of this Part

In accordance with section 106(3)(c) of the Act, this Part sets out the record-keeping requirements for an industrial fuel and energy efficiency project that is an eligible offsets project.

58   Record-keeping requirements—general

Project proponents must keep records of the consumption of fuel and electricity that is relevant energy, and their choice of implementations that make up any samples under sub-methods 3 and 4. Wherever a sample is chosen, evidence must be kept of the day on which it was chosen.

Division 3   Monitoring requirements

59   Operation of this Part

In accordance with section 106(3)(d) of the Act, this Part sets out requirements to monitor an industrial fuel and energy efficiency project that is an eligible offsets project.

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[5] The *Carbon Credits (Carbon Farming Initiative) Regulations 2011* can be accessed at http://www.comlaw.gov.au/Details/F2012C00466. It is intended that these requirements in Regulations will be revised and transferred to legislative rules for the Emissions Reduction Fund over time.

60   Monitoring requirements—general

Subsection 60(1) establishes that project proponents must monitor parameters included in the table in Schedule 1. Subsection 60(2) requires that relevant energy be monitored separately to other energy use at the site to avoid capturing energy use that is unrelated to the equipment that is the subject of, or related to, the project in the emissions abatement calculations.

Subsection 60(3) allows for project proponents to remove data outliers wherever failure to do so would reduce the accuracy of the calculation of the net abatement amount.

61   Monitoring requirements— sub-method 1

Section 61 lists the parameters that must be measured during the baseline measurement period and the reporting period under sub-method 1. These include fuel and electricity use captured by relevant energy that relates to the implementation, independent variables and site constants, and parameters related to the calculation of interactive effects. Parameters must be monitored for each implementation.

62   Monitoring requirements— sub-method 2

Sections 62(2) to 62(3) list the parameters that must be measured during the baseline measurement period and operating measurement periods under sub-method 2. These include fuel and electricity use captured by relevant energy that relates to the implementation, independent variables and site constants, and parameters related to the calculation of interactive effects. Parameters must be monitored for each implementation.

Subsection 62(4) lists the parameters that must be measured during the reporting period under sub-method 2. These include independent variables and site constants that relate to the baseline and operating emissions models. Parameters must be monitored for each implementation in the sample.

63   Monitoring requirements—sub-method 3

Subsection 63(2) lists the parameters that must be measured during the baseline measurement period and the reporting period under sub-method 3 for each implementation in the sample of implementations. These include fuel and electricity use captured by relevant energy that relates to the implementation, independent variables and site constants, and parameters related to the calculation of interactive effects.

64   Monitoring requirements—sub-method 4

Subsections 64(2) and 64(3) list the parameters that must be measured during the baseline measurement period and the operating measurement period under sub-method 4, for each implementation in the sample of implementations. These include fuel and electricity use captured by relevant energy that relates to the implementation, independent variables and site constants, and parameters related to the calculation of interactive effects.

Subsection 64(4) lists the parameters that must be measured during the reporting period under sub-method 4. These include independent variables and site constants that relate to the

baseline and operating emissions models, as well as parameters related to the calculation of interactive effects. Parameters must be monitored for each implementation in the sample.

65 Monitoring requirements—independent variables and site constants

Section 65 sets out that proponents may measure the independent variables and site constants for an emissions model either directly or using a proxy measure that enables the value of the parameter to be reliably calculated. An example is measuring the temperature and pressure of steam to calculate the energy content of a steam flow using steam tables.

Schedule 1—Monitored parameters

Schedule 1 sets out requirements for the parameters to be monitored for a project, as specified in the table. The dependent variables are worked out as the average of all measurements in a measurement time interval multiplied by the time period covered by the interval. For example, a measurement of power in Watts (kilojoules per second) is multiplied by the number of seconds in the time interval to determine the energy consumption.

Schedule 1 establishes that the frequency of measurements must be such that the variance within measurement time intervals is less than the variance between measurement time intervals. This ensures that the measurement time interval that best reflects variability in the parameters is used in the model.