Carbon Credits (Carbon Farming Initiative—Industrial Equipment Upgrades) Methodology Determination 2018

I, Josh Frydenberg, Minister for the Environment and Energy, make the following determination.

Dated 4/4/18 [Date]

Josh Frydenberg

Minister for the Environment and Energy

Contents

Part 1—Preliminary

1 Name

This is the *Carbon Credits (Carbon Farming Initiative— Industrial Equipment Upgrades) Methodology Determination 2018*.

2 Commencement

This determination commences on the day after it is registered.

3 Authority

This determination is made under subsection 106(1) of the *Carbon Credits (Carbon Farming Initiative) Act 2011*.

4 Duration

This determination remains in force for the period that:

(a) begins when this instrument commences; and

(b) ends on the day before this instrument would otherwise be repealed under subsection 50(1) of the *Legislative Instruments Act 2003*.

5 Definitions

(1) In this determination:

Act means the *Carbon Credits (Carbon Farming Initiative) Act 2011*.

baseline period, for an IE unit—see section 22.

biomass means organic matter other than:

(a) fossil fuel, for example coal, lignite, petroleum or natural gas; and

(b) biofuel, for example ethanol or biodiesel.

CO_2-e means carbon dioxide equivalence.

commissioned: following an IE upgrade, the upgraded unit is ***commissioned*** on the date that it is first used to produce an output in a period of normal operation after the end of the commissioning period.

commissioning period, following an IE upgrade, means the period ending when:

(a) any equipment performance testing, calibration or similar activity required to demonstrate that the upgraded unit operates as intended has been completed; and

(b) any action, or installation of equipment, required for upgraded unit to perform its functions in the normal operation of the relevant system of equipment has been completed.

declaration day, in relation to an eligible IEU project, means the day that it was declared an eligible offsets project under section 27 of the Act.

eligible IEU project means an IEU project that has been declared an eligible offsets project under section 27 of the Act.

energy-consuming equipment means equipment that consumes either fuel or electricity.

excisable interval for an IE unit—see subsection 22(8).

government supported renewable energy for an IE unit during a period, means electricity used by the IE unit that was generated at the site served by the unit, from renewable sources, using equipment that:

(a) was installed at the site after the start of the baseline period; and

(b) under the legislative rules (if any) made for subparagraph 27(4A)(c)(ii) of the Act, must not be included in an eligible offsets project.

Note: That subparagraph relates to the government program requirement, one of the additionality requirements under the Act. The rules identify energy production that receives a subsidy under another government program. This energy is treated as if it were non-renewable for the purposes of calculating emissions.

HVAC means heating, ventilation or air conditioning of a building.

HVAC heating/cooling ventilation fan means a fan that:

(a) services the space heating, space cooling or ventilation systems of a building; and

(b) is designed or configured to operate only when the space heating or space cooling applications are heating or cooling the spaces enclosed by the building envelope.

IEU project (for industrial equipment upgrade project)—see subsection 8(10).

IE service means an output of a type listed in subsection 8(4).

IE unit (for industrial equipment unit)—see subsection 8(5)

IE upgrade (for industrial equipment upgrade)—see subsection 8(6).

IEFE Methodology means the *Carbon Credits (Carbon Farming Initiative—Industrial Electricity and Fuel Efficiency) Methodology Determination 2015.*

industrial cooling means refrigerant-based cooling services associated with the production, handling and storage of goods and materials, either to maintain the performance of equipment or to provide appropriate temperatures for inputs or products.

Examples: Refrigeration services for food processing, mine shaft cooling, refrigerant or cold water loops used to cool equipment that is used to process or handle products, and associated chillers.

measurement period, for an IE unit—see section 22.

MVP means a measurement and verification professional who satisfies section 26.

net abatement amount, for an eligible IEU project for a reporting period, means the carbon dioxide equivalent net abatement amount for the project in the reporting period for the purposes of paragraph 106(1)(c) of the Act (see also section 17).

NGA Factors document means the document entitled "National Greenhouse Accounts Factors", published by the Department and as in force from time to time.

NGER (Measurement) Determination means the *National Greenhouse and Energy Reporting (Measurement) Determination 2008*.

original unit, in relation to an IE unit subject to an IE upgrade—see subsection 8(8).

output, of an IE sub-unit or other system of equipment—see subsections 8(3) and 14(1) and (2).

output indicator, for an IE sub-unit, means the output indicator specified for subparagraph 14(1)(c)(ii).

output representativeness criterion, in relation to a baseline period, a project measurement period or reference period for an IE unit—see section 23.

pre-upgrade declaration by an MVP, in relation to an IE unit—see section 24.

post-upgrade declaration by an MVP, in relation to an IE unit—see section 25.

primary parameter—see subsection 14(6).

project measurement period, for an IE unit—see section 22.

rated power—see subsection 10(8).

reference output indicator, for an IE sub-unit, means the output indicator specified for subparagraph 14(1)(c)(iii).

reference period, for an IE unit—see section 22.

RET energy source means an eligible renewable energy source for the purposes of the *Renewable Energy (Electricity) Act 2000*.

sub-unit, of an IE unit of a project—see section 13

system of equipment—see subsection 8(2).

transmitted fuel or electricity—see subsection 8(11).

upgraded unit, in relation to an IE unit subject to an IE upgrade—see subsection 8(9).

useful energy—see subsection 11(7)

verifiable standard constant or measure—see subsection 14(6).

Note: Other words and expressions used in this determination have the meaning given by the Act. These terms include:

Australian carbon credit unit

crediting period

eligible offsets project

emission

greenhouse gas

natural disturbance

offsets project

offsets report

project

project area

project proponent

Regulator

reporting period

6 Factors and parameters from external sources

(1) If a calculation in this determination includes a factor or parameter that is defined or calculated by reference to another instrument or writing, the factor or parameter to be used for a reporting period is the factor or parameter referred to in, or calculated by reference to, the instrument or writing as in force at the end of the reporting period.

Note: This means that calculations using historical data for a reporting period may not be correct for later reporting periods because reference instruments might have changed. Baseline calculations, for example, will have to be re-worked from one reporting period to another, as necessary.

(2) Subsection (1) does not apply if:

(a) this determination specifies otherwise; or

(b) it is not possible to define or calculate the factor or parameter by reference to the instrument or writing as in force at the end of the reporting period.

7 Definitions in other instruments relating to optimised equipment

(1) In applying a definition in this determination in relation to an IE upgrade, a reference to a definition in a standard is a reference to the definition in the version of the standard that was in force on the date on which the upgraded unit is commissioned.

(2) Subsection (1) does not apply if this determination specifies otherwise.

Part 2—IEU projects

8 IEU projects

(1) For paragraph 106(1)(a) of the Act, this determination applies to an offsets project if:

(a) it involves one or more IE units; and

(b) the project consists of applying to each IE unit an IE upgrade that can be reasonably expected to:

(i) change the relationship between energy inputs and the output of the IE unit by:

(A) increasing its energy conversion efficiency; or

(B) reducing its energy intensity or energy consumption; or

(C) changing its energy sources or the mix of the energy sources; and

(ii) result in eligible carbon abatement.

Note: Energy intensity is energy consumption per unit of output

Concepts relating to an IE unit

(2) A ***system of equipment*** is system of industrial equipment:

(a) that includes at least one item of energy-consuming equipment; and

(b) whose elements:

(i) are connected to each other, either directly or by means of other elements of the system, including a dedicated transport mechanism that is part of the system; or

Examples: a pipeline, a conveyor belt; a rail system; dedicated roadway and vehicles.

(ii) work together to produce a common service; and

Example: a pump and fan feeding water and combustion air to a boiler are not directly connected, yet both work together to produce steam, in conjunction with the boiler.

(c) such that the system as a whole can be treated as providing a particular service or services to the user in the context in which is used.

(3) The services mentioned in paragraph (2)(c) are the ***outputs*** of the system of equipment.

Note: An output need not be an IE service listed in subsection (4).

(4) An ***IE service*** is one of the following:

(a) a pumping or gas compression service;

(b) delivery of compressed air;

(c) ventilation by means of ducted or partition ventilation fans, other than HVAC heating/cooling ventilation fans;

(d) an industrial fan or industrial low pressure air blowing service;

(e) processing or handling of materials, including, for example:

(i) a crushing or grinding circuit;

(ii) mechanical processing, such as shredding or pulping;

(iii) separation, mixing or sorting of materials;

(f) a vacuum generation service;

(g) refrigeration or industrial cooling (not including HVAC cooling);

(h) process heating, including:

(i) heating or preheating of boilers; and

(ii) heating or preheating of kilns, ovens, roasters, furnaces or similar equipment;

(i) any other heating service, other than HVAC heating, that uses heat, including waste heat, generated through the provision of an IE service listed above.

What an IE unit is

(5) A system of equipment may be identified as an ***IE unit*** in relation to an offsets project if:

(a) it is:

(i) at one location; or

(ii) at locations connected by a dedicated transport mechanism that is part of system; and

(b) the principal use of energy that it consumes is to provide IE services (whether the IE services are outputs of the system, or are generated by one part of the system and used by another part in producing the output); and

(c) the use of energy that it consumes for any other function of the system has no more than a minor or trivial effect on the amount of fuel or energy that it uses.

Note: There will often be a choice as to what pieces of equipment to identify as a system that constitutes an IE unit for a project, and also as to the services that will be treated as outputs of the system. The services used as outputs do not have to be IE services. The project proponent will need to choose systems in such a way that each of them:

(i) includes all equipment within an energy boundary (section 11); and

(ii) has an associated IE upgrade that satisfies paragraph (1)(b) and is not excluded by subsection (7), 10(2), 22(3) or 22(4); and

(iii) has an output, or set of outputs, with appropriate output indicators (section 14).

For example, if the main energy-consuming equipment is a pumping service, and the intended upgrade will improve the efficiency of the pumps, the proponent might choose to define the IE unit as consisting of the pumps themselves, and use the fluid output of the pumps as the output indicator. However, if the intended upgrade will improve the efficiency of equipment such as pipes and valves that are supplied by the pumping system and affect the pumping system energy consumption, the proponent might choose to define the IE unit to include that equipment, and may use a broader output indicator such as the output of the site as a whole if pump flow measurements are not available.

IE upgrades

(6) An ***IE upgrade*** consists of doing one or more of the following in relation to an IE unit, other than as maintenance:

(a) modifying, removing or replacing equipment of the unit;

(b) installing additional equipment in the unit;

(c) changing the way existing equipment of the unit is controlled or operated;

(d) changing the energy sources or mix of energy sources used by the unit;

in a way that maintains it as an IE unit that has the same outputs, and uses energy to provide the same IE services for the purposes of paragraph (5)(b), as the original unit.

(7) For subsection (6), an action in relation to an IE unit is done ***as maintenance*** if it constitutes, or is part of, work that:

(a) is no more than is required to maintain the performance and reliability of the equipment in the IE unit; or

(b) is required or recommended by the manufacturer or equipment supplier; or

(c) consists of improvements that are no more than is necessary for the continued operation of the equipment (for example, replacing worn-out components with higher-performing components that have replaced the originals in the market).

(8) The IE unit in its form before the IE upgrade is the ***original unit*** in relation to the unit.

(9) The IE unit in its form after the IE upgrade is the ***upgraded unit*** in relation to the unit.

IEU projects

(10) A project covered by subsection (1) is an ***IEU project***.

Transmission of fuel or electricity

(11) If a system of equipment includes equipment that distributes some of the fuel or electricity that enters it to equipment outside the system, the fuel or electricity so distributed (the ***transmitted*** fuel or electricity) is not treated as energy consumed by the system of equipment.

Examples:

A site includes a large system of electrically powered processing equipment. Lighting for the site, not part of the system, takes its electricity from a power board that is within the system. Subsection (11) applies to the electricity for the lighting.

A site includes a large system of gas-powered equipment that takes the mains gas supply. The system includes gas reticulation that also supplies a number of independent pieces of gas-powered equipment. Subsection (11) applies to the gas supplied to that equipment.

Part 3—Project requirements

9 Operation of this Part

For paragraph 106(1)(b) of the Act, this Part sets out requirements that must be met for an IEU project to be an eligible offsets project.

10 IE units that cannot be included in an eligible offsets project

Limit on energy consumption

(1) An IE unit cannot be included in an eligible offsets project if the annualised total energy consumption of the IE unit ($\boldsymbol{Q_{B,i}}$) given by the following equation is greater than 500,000 gigajoules:

$$Q_{B,i} = \left\{\sum_{m}\left(QFB_{m,i}\right) + QEB_{i} \times \frac{1000}{3.6}\right\} \times \left(\frac{1}{t_{B,i}}\right) \times 365$$

where:

$\boldsymbol{m}$ is a type of fuel consumed by the IE unit in the baseline period.

$\boldsymbol{QFB_{m,i}}$ is the amount, of fuel type m consumed by the IE unit during the baseline period, converted to gigajoules using an energy content factor that is in accordance with the NGER (Measurement) Determination.

$\boldsymbol{QEB_i}$ is the electricity consumption by the IE unit during the baseline period, in kilowatt hours.

$\boldsymbol{t_{B,i}}$ is the number of days in the baseline period for the IE unit.

Upgrade must be more than the normal course of business

(2) An IE unit cannot be included in an eligible offsets project unless its IE upgrade is recommended in:

(a) a report that:

(i) results from a Type 2 or Type 3 energy audit in accordance with whichever of the following standards is applicable:

(A) AS/NZS3598:2014.2 Energy Audits—Industrial and related activities;

(B) AS/NZS3598:2014.1 Energy Audits—Commercial buildings; and

(ii) was made no earlier than 2 years before the application under section 22 of the Act; or

(b) a report on possible energy savings that could be made by the proponent, being a report that:

(i) was produced by an independent professional energy services contractor or consultant that is competent to identify and evaluate the opportunities for energy savings; and

(ii) was made no earlier than 2 years before the application under section 22 of the Act; and

(iii) was not produced by:

(A) a MVP who makes a pre-upgrade declaration or post-upgrade declaration for the project; or

(B) a person with a financial interest in the project or IE unit at the time the report was produced.

Units not operating before the upgrade excluded

(3) An IE unit cannot be included in an eligible offsets project if it was not in operation before the upgrade.

Note: Under this subsection, a new installation cannot be part of an eligible offsets project.

Irregularly or intermittently operating units excluded

(4) An IE unit cannot be included in an eligible offsets project if, before its IE upgrade, the unit is operated only as a reserve, back-up or emergency system.

Note: See subsection 19(2) for restrictions after the IE unit is upgraded.

Substantial change to capacity excluded

(5) An IE unit cannot be included in an eligible offsets project if:

(a) its IE upgrade involves replacing existing items of equipment with new or used items, or installing new or used items of equipment; and

(b) the new or used items add directly to the rated power of the original unit, rather than indirectly; and

(c) the additional rated power is more than 20% of the rated power of the original unit.

Example: An IE system consists of a boiler that serves a number of other pieces of equipment. The capacity of the boiler is currently a constraint on the capacity of the system. Adding a second boiler will add to the capacity of the unit directly, and will be restricted under paragraphs (b) and (c). Adding other pieces of equipment to the boilers, such as additional heat recovery systems, might add to the effective capacity of the unit indirectly (by making fuller use of the boiler), and would be permitted by paragraphs (b) and (c).

Excluded vehicles

(6) An IE unit cannot be included in an eligible offsets project if its IE upgrade involves the upgrade of a vehicle that could a land and sea transport project under the *Carbon Credits (Carbon Farming Initiative—Land and Sea Transport) Methodology Determination 2015*.

Biomass may be used as an energy source only if it is a RET energy source

(7) An IE unit cannot be included in an eligible offsets project if the original unit:

(a) uses, as an energy source, biomass that is not a RET energy source; or

(b) uses off-grid electricity, heat, steam or cooling that is produced using biomass that is not a RET energy source; or

(c) includes energy-consuming equipment:

(i) that uses, as an energy source, biomass that is not a RET energy source; or

(ii) that uses off-grid electricity, heat, steam or cooling that is produced using biomass that is not a RET energy source.

Note: See subsection 19(2) for restrictions on the upgraded IE unit.

Definition of rated power

(8) In this determination:

rated power means either:

(a) if the rated output power of the equipment is specified by the manufacturer—that rated power output; or

(b) otherwise—the input or output power determined by testing the equipment consistently before and after the upgrade.

11 IE unit must include all equipment within an energy boundary

Note 1: *Effect of this section*

The effect of this section is that the IE unit must be specified as a system of equipment whose energy boundary contains all energy-consuming equipment that contributes to producing the measured output. This is so that the unit can validly be used in the abatement calculations that treat the unit as using the direct fuel and energy inputs to the unit, and those inputs only, to produce the outputs.

The project proponent will often have a choice about how to define the IE units in its project.

There will be a minimum set of energy boundaries for the project that includes each item of equipment that will be affected by the proposed IE upgrades, and the proponent may define the IE units of the project to conform to those boundaries. However, this section does not require the smallest possible energy boundaries to be chosen, and the proponent may use a wider energy boundary to define an IE unit if this is more convenient. This might be done, for example, in order to include other energy-consuming equipment that is not separately metered, or to allow the use of a better output indicator. However, such a wider boundary may be chosen only if it does not significantly affect the accuracy of the abatement calculations.

The choice of whether certain equipment should be included within the IE unit, or specified as a partly independent sub-system under section 12, may depend on how the output is to be defined and the choice of output indicators for section 14.

Note 2: *Effect of upgrade on energy boundary*

This section does not require the original unit and the upgraded unit to have the same energy boundary. However, the requirements that the outputs and output indicators be unchanged will mean that the energy boundary can change only to the extent necessary to accommodate the changes due to the upgrade, such as excluding removed equipment and including any installed equipment or components.

Note 3: *Effect of section 38*

Section 38 requires that energy inputs and certain other energy flows in the IE unit be measured, either directly or by using a reliable proxy method. Measurement and estimation must be done in accordance with specified standards.

In some cases, section 38 will allow the proponent to rely on metering that includes a wider range of equipment than the sub-unit, and use a proxy method to measure the amount of energy that is not used by sub-unit.

(1) This section applies to both the original unit and the upgraded unit of each IE unit of the project.

What the unit must include

(2) The unit must include at least one item of energy-consuming equipment.

(3) For each included item, the unit must also include each other item of equipment (including energy-consuming equipment, components, or connecting equipment) that:

(a) operates with the included item in producing one or more of the outputs of the system; or

(b) uses energy from the included item, other than energy that is, or is a component of, the output of the IE unit as a whole; or

(c) can, in operation, be substituted for or used as an alternative to the included item; or

(d) may experience an increase in emissions as a result of the IE unit upgrade.

Examples:

(i): Piping; ducting; heat exchangers.

(ii): If a system includes a compressor, and a boiler uses waste heat from the compressor for pre-heating, the system must also include the boiler.

(iii): If a refrigeration system uses several fans, and load can be shared between them they must be treated as a single system.

(iv): If a pumping system uses several pumps, and load can be shared between them, then downsizing one pump could lead to greater loads for the other pumps increasing emissions.

What the unit must not include

(4) The unit must not include any equipment that is also included in another IE unit of the project (***shared equipment***) unless:

(a) the shared equipment is not subject to the IE upgrade; and

(b) either:

(i) the shared equipment is not energy-consuming equipment; or

(ii) the amount of energy consumed by the shared equipment is expected to be less than 5% of the energy used by each of the IE units served by it; and

(c) the equipment does not transfer materials or energy between any of the IE units served by it; and

(d) the shared equipment is included in the IE unit for both the baseline period and the project measurement period.

Examples:

(i): Electrical switching equipment that uses a non-material amount of electricity for its functions may serve several IE units, and be treated as part of each of them, provided that it does not transfer electric power between units, for example by providing a load-balancing service.

(ii): A dedicated rail track or pipeline may be shared by IE units provided that each IE unit uses it independently to move material between its different components, and all the energy used for the movement of one unit's material is consumed within that unit.

(5) The unit must not include any equipment that does not contribute to the output of the unit unless:

(a) the equipment is part of a partly independent sub-system specified under section 12; or

(b) the inclusion of that equipment has only a minor or trivial effect on the abatement for the unit.

Note: The effect might be only minor or trivial because, for example:

- its energy consumption is small compared with that of the unit as a whole;
- the change in its energy consumption between the baseline period and the project measurement period is small compared with that of the unit as a whole.

Energy inputs must have NGER emissions factors

(6) The unit must not consume or draw useful energy from outside the unit (including transmitted fuel or electricity) other than:

(a) fuel or electricity with emissions factors listed in the NGER (Measurement) Determination; or

(b) lower grade energy returned to a partly independent subsystem in the circumstances prescribed by paragraph 12(3)(b).

Definition of useful energy

(7) In this determination:

useful energy means fuel, electricity, heat, steam, cooling or useful physical work.

Examples:

(i): Heat can be in the form of hot process fluids or other materials transferred from outside the unit in a way that materially reduces the energy consumption of the unit. Heat transfers to and from the unit fall within the scope of this provision if they are effected by equipment configured for heating purposes, but not if the heat transfer is incidental or not material.

(ii): Physical work is useful in this context if it reduces the energy consumption of the equipment. For example, if water is supplied to a submersible pump station at high speed and this kinetic energy is dissipated in the water tank, this wasted energy would not fall under this provision.

12 Partly independent sub-system of an IE unit

Note: If an IE unit has a partly independent sub-system that draws fuel or electricity and provides steam, heat, cooling or compressed air partly to other parts of the IE unit and partly to external equipment, the project proponent will be able to deduct the fuel or electricity attributable to services provided to the external equipment from the abatement calculations.

Example:

The project site generates steam from a large central plant that is used for a number of processes. Some of these processes are already efficient, but others are not. The project upgrade will replace machinery used in the less efficient processes.

Section 11 (in particular subsection 11(6)) requires the boundary of the IE unit to include the steam generation plant. However, much of the steam output is used in ways that do not interact with the equipment subject to the upgrade. If the project proponent is able to specify the plant as a partly independent sub-system under this section, the proportion of the fuel input that is attributable to the steam that is used in the processes that are not affected by the upgrade can be deducted, so that the abatement calculations focus on those processes that are affected.

When a sub-system may be partly independent

(1) A system of equipment that is a sub-system of an IE unit may be specified as ***partly independent*** if:

(a) the sub-system does not consume useful energy from outside the sub-system other than:

(i) fuel or electricity from outside the unit (which must satisfy paragraph 11(6)(a)); or

(ii) lower grade energy returned to the subsystem in the circumstances prescribed by paragraph (3)(b).

(b) the sub-system does not supply useful energy to the rest of the IE unit apart from its output; and

(c) the output of the sub-system consists of the delivery of:

(i) steam; or

(ii) heated fluid; or

(iii) cooled fluid; or

(iv) compressed air;

(d) the efficiency of the sub-system is not affected by the IE upgrade; and

(e) part of the steam, heat or cooling output is used by other equipment in the IE unit and part is not (the ***internal output*** and the ***external output*** of the sub-system respectively); and

(f) the energy content of the internal and external outputs can be monitored in accordance with section 38, (in particular subsection 38(9)).

Effect of specifying a partly independent sub-system

(2) If a sub-system is specified as partly independent:

(a) the external output of the sub-system is not treated as an output of the IE unit for section 14 (and so is not represented by an output indicator); and

(b) the fuel or electricity consumed by the sub-system and attributable to the external output is taken not to be fuel or electricity consumed by the IE unit for the purposes of the abatement calculations.

Attribution of fuel or electricity consumption

(3) The fuel or electricity consumed by the sub-system is attributed to the internal and external outputs:
   (a) in the same proportions as the energy content of those outputs; and
   (b) net of the energy content of any lower grade energy originally created by the partly independent subsystem and returned to that subsystem.

13 Dividing an IE unit into sub-units

Note: The sub-units are used as the basis of abatement calculations, rather than the IE units themselves. Each sub-unit must draw fuel or electricity from outside the IE unit, and must contribute a part of the output of the unit. Conceptually, they are parallel systems, but they may exchange energy between themselves.

(1) The project proponent may divide an IE unit into 2 or more subsystems that satisfy subsection (4).

(2) If the IE unit is divided in this way, each such system is a ***sub-unit*** of the unit.

(3) If the IE unit is not divided, the whole of the unit is taken to be a ***sub-unit*** of itself

(4) The subsystem satisfies this section if, before and after the upgrade:
   (a) it includes an item of energy-consuming equipment; and
   (b) it has outputs that are outputs of the IE unit, and not inputs to another subsystem; and
   (c) it draws energy from electricity or fuel that is:
      (i) from outside the IE unit; and
      (ii) can be measured or accounted for separately from the electricity or fuel drawn by other subsystems; and
   (d) it uses the energy principally to provide IE services, either as outputs of the subsystem, or in order to serve equipment that is included in the subsystem.

Note: A sub-unit may consist of equipment that is not directly affected by any part of the upgrade. It must draw at least some energy from outside the IE unit to satisfy paragraph (c), so that the abatement calculations can be made. However, this energy could be supplementary to the energy provided by other sub-units, eg. recovered heat.

14 IE unit must have output indicators

Note: This section requires the specification of a set of outputs and an appropriate output indicator for each sub-unit.

The outputs are services of value that are directly delivered by the unit, and the choice of outputs will depend on where the boundary of the unit is drawn—eg, if the boundary of a unit consisting of a pumping system is drawn at the outlet of the pumps, the output is the pumping service; if it is drawn around equipment served by the pumps, it is the service delivered by that equipment.

The output indicator is a measurable quantity, or a function of a measurable quantity or quantities, that is a reasonable measure of, or proxy for, the output. Indicators can be very straightforward—eg: litres of water pumped; tonnes of ore moved on a conveyor belt. However, it may be necessary to use indicators that are more complex or less direct—eg: tonnes of product of the site served by the IE unit.

Outputs can be grouped together and treated as a single output if an output indicator can be found that is appropriate for them together. A project proponent may need to divide a unit into several sub-units to be able to provide appropriate output indicators.

In some circumstances the project proponent may find that, for the most suitable output indicator, data is available for each measurement period, but not for the whole of the 12 month period used to test whether the output

representativeness criterion in section 23 is met. In that case, the proponent may use another indicator for which data is available for the section 23 test.

Output indicator required for the IE unit, or for each sub-unit

(1) For each IE unit of the project, the project proponent must specify the following:
  (a) the facility served by the IE unit, with a description of its operations;
  (b) the sub-units of the IE unit, set in accordance with section 13;
  (c) for each sub-unit:
    (i) the ***output*** or set of ***outputs***; and
    (ii) the ***output indicator*** for use in provisions other than subsection 23(2); and
    (iii) the ***reference output indicator*** for use in subsection 23(2) .

  Note: The reference output indicator would be expected to be the same as the output indicator unless data relating to the latter is not available for the whole of the 12 month period mentioned in subsection 23(2).

Requirements for outputs and output indicators

(2) An output specified for a sub-unit of an IE unit must satisfy the following:
  (a) it is a service of value that the IE unit physically and directly contributes to creating;
  (b) omitting the IE unit would prevent the generation of the output, or significantly reduce the available range or rate of output.

(3) An output indicator or reference output indicator specified for a sub-unit of an IE unit must be:
  (a) a primary parameter; or
  (b) a ***derived indicator***, expressed as a mathematical formula, that includes one or more primary parameters and may also include verifiable standard constants or measures that do not diminish the precision of the calculation.

(4) An output indicator or reference output indicator must be appropriate for the sub-unit both before and after the upgrade.

(5) An output indicator or reference output indicator is ***appropriate*** if:
  (a) it is measurable in units that comply with the *National Measurement Act 1960*; and
  (b) it is demonstrably related to the outputs, so that:
    (i) if the outputs increase and decrease together, the indicator increases and decreases with them; and
    (ii) the indicator is a reasonable measure of, or proxy for, the outputs; and
  (c) if the output indicator or reference output indicator combines measurements from two or more distinct outputs—either:
    (i) the measurements for each distinct output would separately satisfy the output representativeness criterion in section 23 for each measurement period and reference period; or
    (ii) the production of all distinct outputs that make up the output indicator or reference output indicator is conducted using the same equipment such that:
      (A) the equipment is used for similar times and loads to produce each output; and
      (B) if thermal processes are involved—each output is produced at similar temperatures.

(6) In this determination:

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primary parameter, in relation to an IE unit, means a measurable quantity that relates to an input, internal transfer or intermediate or final product of the facility served by the IE unit.

verifiable standard constant or measure, means a physical constant, measure of material properties or like figure that is documented by an engineering handbook, an Australian or ISO standard, or a similarly authoritative source.

Examples:

An IE unit provides water pumping services for a facility that produces a single final product. If the water is at ambient temperature the volume of water pumped may be an appropriate indicator of the pumping system output.

If the proponent wishes to upgrade machinery that is fed by the pumping service, that machinery may be included in the IE unit. If the proponent can demonstrate a sufficiently close relationship between the output of the IE unit so defined and the quantity of the final product of the facility, that quantity would also be an appropriate indicator for the IE unit.

Examples of verifiable standard constants or measures include the use of standardised temperatures and pressures for compressed air flow, or the use of steam property tables if steam is an output.

15 Information to be included in application for declaration

The application under section 22 of the Act in relation to the project must include the following information:

(a) for each IE unit of the project that is identified at the time of the application:
  (i) the facility that uses the IE unit;
  (ii) a description of the original unit, the proposed upgrade and the upgraded unit;
  (iii) if the IE unit is not a single sub-unit—a description of each sub-unit and the effect on it of the proposed upgrade;
  (iv) an explanation of how an upgrade to the IE unit could reasonably be expected to result in eligible carbon abatement;
  (v) a copy of the relevant energy audit or other report mentioned in subsection 10(2);
  (vi) an explanation of how the requirements of section 10 are, or will be, satisfied in relation to the unit;

(b) for each class of IE units not individually identified at the time of the application, a description of the class, which must consist of IE units:
  (i) that are systems of the same kind; and
  (ii) whose upgrades will be of the same kind;

(c) if biomass will be, or is likely to be:
  (i) used as an energy source in IE unit equipment; or
  (ii) used to produce off-grid electricity, heat, steam or cooling that will be used in IE unit equipment;

—a declaration that the biomass will comply with the definition of RET energy source.

Note: If an IE unit that was not individually identified at the time of application is to be included in any calculations, the details in paragraph 15(a) must be included in the relevant MVP report, which must be provided to the Regulator with the next offsets report.

16 Disposal of equipment and other components

(1) The project must ensure that each item of energy-consuming equipment that:
  (a) is removed as part of the project, or in association with it; and
  (b) is replaced by equipment that is:
    (i) of the same type; and

(ii) of similar capacity; and

(iii) materially more efficient than the existing equipment;

is disposed of and is not re-used or refurbished.

(2) For paragraph (1)(b)(i), the ***type*** of an item of equipment is given by the function it performs in the IE unit and the way it performs it.

Examples: Each of the following is a type: a centrifugal fan with forward-curved blades; a screw-type air compressor; a refrigerated display cabinet.

(3) For paragraph (1)(b)(ii):

(a) the ***capacity*** of an item of equipment means the appropriate measurable capacity in relation to its function; and

Examples:

the capacity of a fan is the airflow it can achieve in the IE unit;
the capacity of a motor is the power output;
the capacity of a refrigerated display cabinet is its volume.

(b) two items of equipment are of similar capacity if the difference between their measures of capacity is no more than 5% of the smaller.

(4) For paragraph (1)(b)(iii), a replacement item of equipment is ***materially more efficient*** than the existing equipment if its energy efficiency or energy intensity at the best efficiency point is more than 5% greater.

Note: Energy intensity is energy consumption per unit of output

(5) Subsection (1) does not prevent an item of energy-consuming equipment or component that is removed from being broken down into other components and those other components being recycled, other than for use as or in an application with the same primary purpose as the original energy-consuming equipment.

Note: This section does not apply where the item is replaced by one that is substantially different to the original, not merely more efficient—for example:

- replacing a motor with a less powerful one that is still adequate for the job
- replacing an air compressor or pump with a different type that has better part-load performance for the job

Where the section does apply, the project proponent may comply with this section by, for example:

- rendering any components that have been removed not usable or refurbishable before disposal; or
- selling or otherwise transferring any components that have been removed to a reputable scrap dealer or recycling business with an assurance that they will not be refurbished or re-used

Part 4— Net abatement amount

Division 1— Preliminary

17 Operation of this Part

For paragraph 106(1)(c) of the Act, this Part specifies the method for working out the carbon dioxide equivalent net abatement amount for a reporting period for an IEU project that is an eligible offsets project.

Note: This is called the ***net abatement amount*** in this determination (see sections 5 and 28).

18 Overview of gases accounted for in abatement calculations

The following table provides an overview of the greenhouse gas sources that are relevant to working out the net abatement amount for an IEU project.

Greenhouse gases and emissions sources

Item	Relevant emissions calculation	Emissions source	Greenhouse gas
1	Baseline emissions for an IE unit or sub-unit	Fuel consumption emissions	Carbon dioxide (CO_2) Methane (CH_4) Nitrous oxide (N_2O)
2	Baseline emissions for an IE unit or sub-unit	Electricity consumption emissions	Carbon dioxide (CO_2) Methane (CH_4) Nitrous oxide (N_2O)
3	Operating emissions or measured emissions for an IE unit or sub-unit	Fuel consumption emissions	Carbon dioxide (CO_2) Methane (CH_4) Nitrous oxide (N_2O)
4	Operating emissions or measured emissions for an IE unit or sub-unit	Electricity consumption emissions	Carbon dioxide (CO_2) Methane (CH_4) Nitrous oxide (N_2O)

Division 2—IE units and data to be used in calculations

19 When an IE unit must be excluded from calculations

Note: IE units which cannot be included in an IEU project under Part 3 also cannot be included in abatement calculation.

(1) An IE unit of a project must not be included in the abatement calculations for a reporting period unless:

(a) a pre-upgrade declaration for the IE unit has been obtained before the offsets report is submitted; and

Note: That is, the baseline period has been completed and the baseline emissions rate verified.

(b) a post-upgrade declaration for the IE unit has been obtained before the offsets report is submitted.

Note: That is, the project measurement period has been completed and the project emissions rate verified.

(2) An IE unit of a project must not be included in the abatement calculations for a reporting period if, during the reporting period or a previous reporting period:

(a) the project proponent undertook any activity (whether or not a project activity) at the facility served by the IE unit that:

(i) under legislative rules made for subparagraph 27(4A)(c)(ii) of the Act, must not be included in an eligible offsets project; and

(ii) could reasonably be expected to have an effect, that is not minor or trivial, on the abatement that would be calculated for the IE unit in the period; or

(b) energy-consuming equipment within the upgraded unit was decommissioned during the period; or

(c) the unit was operated only as a reserve, back-up or emergency system; or

(d) the unit uses, as an energy source, biomass that is not a RET energy source; or

(e) the unit uses off-grid electricity, heat, steam or cooling that is produced using biomass that is not a RET energy source; or

(f) the unit includes energy-consuming equipment:

(i) that uses, as an energy source, biomass that is not a RET energy source; or

(ii) that uses off-grid electricity, heat, steam or cooling that is produced using biomass that is not a RET energy source.

(3) If an IE unit has been included in the abatement calculations for a reporting period:

(a) the project proponent may choose to exclude the IE unit in the abatement calculations for a later reporting period; and

(b) if it is so excluded, it must then be excluded from all subsequent reporting periods.

20 Data sources

When data about energy consumption and outputs of an IE unit or sub-unit is to be used to work out the net abatement amount, the project proponent for the project may use only the following as base data:

(a) for government supported renewable energy consumed or drawn by the unit or sub-unit—

(i) data produced by monitoring accordance with section 39; and

(ii) data from a supplier of electricity that relates to renewable energy generated by the facility and exported to the electricity grid, including data given in bills or invoices;

(b) for any other energy or fuel consumed or drawn by the unit or sub-unit—

(i) data from the supplier, including data given in bills or invoices; and

(ii) metering data, including data from sub-meters installed or controlled by the facility; and

(c) for outputs of the unit or sub-unit—measured primary parameters and verifiable standard constants or measures.

21 Use of grid data for energy returned to the grid

For government supported renewable energy, if the data to be used in relation to a particular period is not entirely data produced by monitoring in accordance with section 39, the amount of government supported renewable energy consumed at the site during the period must be calculated as the difference between:

(a) the total amount of renewable electricity generated by the relevant equipment during the period; and

(b) the amount of that electricity that was exported to the electricity grid during the period.

Division 3—Setting the measurement periods and reference period

22 Setting the measurement periods and reference period

(1) For each IE unit in the project, the project proponent must set the following ***measurement periods***:

(i) a ***baseline period*** before the upgrade;

(ii) a ***project measurement period*** after the upgrade.

(2) For each IE unit in the project, the project proponent must also set a ***reference period*** that:

(a) is before the upgrade; and

(b) includes the entire baseline period; and

(c) if it includes excisable intervals in accordance with subsection (7)—is for 365 days plus the length of any excisable intervals; and

(d) if it does not includes excisable intervals—is for 365 days.

Limit on maintenance and other work concurrent with upgrade

(3) The baseline period and the proposed project measurement period for the purposes of paragraph 24(4)(i) (in the pre-upgrade declaration) must be such that it is reasonable to expect that the combined effect of any actions that:

(a) are taken between the beginning of the baseline period and the end of the proposed project measurement period; and

(b) are of a kind mentioned in paragraph 8(6)(a), (b), (c) or (d); and

(c) are not part of the IE upgrade;

will not have a significant effect on the abatement generated by the IE unit.

(4) The baseline period and the project measurement period must be such that the combined effect of any actions that:

(a) are taken between the beginning of the baseline period and the end of the project measurement period; and

(b) are of a kind mentioned in paragraph 8(6)(a), (b), (c) or (d); and

(c) are not part of the IE upgrade;

do not have a significant effect on the abatement generated by the IE unit.

(5) For subsections (3) and (4), if data is available that allows a numerical estimate to be made of the proportion of the abatement generated by the IE unit that is attributable to particular actions, a proportion of less than 20% will be taken not to be significant.

Measurement periods and reference period must be continuous apart from excisable intervals

(6) Subject to subsection (7), each measurement period and the reference period:

(a) must be set as a continuous period; and

(b) must not include any excisable intervals.

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(7) A measurement period or the reference period may, if there is no suitable continuous period that satisfies subsection (6), consist of an otherwise continuous period from which the excisable intervals have been excised.

(8) A time interval is an ***excisable interval*** for the IE unit if it is part of:

(a) a commissioning period for the unit; or

(b) the period of a start-up or shut-down sequence that is not part of the normal cycle of operation; or

(c) if the IE upgrade is performed during a plant shutdown—the period of preparation for the shutdown; or

(d) a period during which the output indicator cannot be measured reliably; or

(e) a period after the upgrade during which the monitoring equipment for section 38 requires re-calibration or does not operate normally.

Note: A time interval may be expressed in whole days, or as a decimal.

Measurement periods must be close to the time of the upgrade

(9) The baseline period for an IE unit must end within 12 months before the upgraded unit is commissioned.

Note 1: If the baseline period that was approved for a unit in the pre-upgrade declaration fails to satisfy this provision because of a delay in commissioning the upgraded unit, but the project proponent has collected the necessary baseline data for a later period that does satisfy this section, it will be possible to set the later period as the baseline period. This will need to be documented and approved by an MVP in the post-upgrade declaration.

Note 2: Note that the end of the baseline period is also the end of the 12 month period over which the reference output is to be measured for the output representativeness criterion (section 23).

Note 3: All or part of a baseline period may be before the application under section 22 of the Act is submitted.

(10) The project measurement period for an IE unit must begin within 18 months after the upgraded unit is commissioned.

Measurement periods and reference period must be representative

(11) Each measurement period and the reference period must be representative of the expected operation of the IE unit and its energy consumption over the crediting period, and in particular:

(a) it must cover any normal variation in output or energy use; and

(b) if the unit is subject to any seasonal or other periodic variations in output or energy use—it must cover representative parts of the different seasons or other periods; and

(c) it must cover a typical range of operating conditions for the original unit.

Note: If there are normal variations in output or factors that affect output or energy use, each measurement period will need to be long enough for those variations to be reasonably represented. Common factors will include the following:

- external factors, such as climate;
- input or output quality and type that materially affect energy consumption;
- the fuel mix;
- operating schedules, including start-ups and shutdowns;
- equipment or equipment configuration.

(12) Each measurement period and the reference period must satisfy the output representativeness criterion in section 23.

23 The output representativeness criterion

Note: The output representativeness criterion can be expressed as follows:

$$(0.85 \times \Omega_{Ref}) < \Omega_A < (1.15 \times \Omega_{Ref})$$

(1) A period of time satisfies the ***output representativeness criterion*** in relation to an IE unit if, for each sub-unit, the annualised output of the sub-unit during the period is within 15% of the reference output.

Note: In this determination, the criterion is applied to the baseline period and project measurement period for the IE unit, and to each reporting period for the project.

(2) For this section, the ***reference output*** of a sub-unit ($\boldsymbol{\Omega_{Ref}}$) is the total output of the sub-unit in the reference period, as measured by the reference output indicator.

(3) For this section, the ***annualised output*** of the sub-unit (Ω_A) in the period is calculated by:

(a) taking the total output of the unit for the period, as measured by the relevant output indicator; and

(b) calculating the annual rate of the output, as follows:

$$\Omega_A = \Omega_P \times \frac{365}{t_P}$$

where:

Ω_P is the total output of the sub-unit during the period.

t_P is the number of days in the period.

Application of this section to a reporting period for the purposes of section 28

(4) If a reporting period includes any excisable intervals in relation to an IE unit:

(a) the project proponent must modify the reporting period in relation to that IE unit by excising the excisable intervals; and

(b) this section applies in relation to that IE unit as if the reporting period were the period so modified.

Note: The length of an excisable interval is deducted from the number of days in the reporting period, and any output during the interval is not included in the total output of the sub-unit during the reporting period.

The project proponent may need to excise different periods for different IE units.

Division 4—Pre-upgrade and post-upgrade declarations

24 Pre-upgrade declaration by MVP

(1) A ***pre-upgrade declaration*** about an original unit is a declaration by an MVP in accordance with this section.

(2) A pre-upgrade declaration must be made after the end of the baseline period.

(3) To avoid doubt, a pre-upgrade declaration may be made using more than one document.

(4) A pre-upgrade declaration must be signed and dated, or electronically authenticated, by the MVP and must include the following:

(a) the address and a description of the facility that uses the IE unit;

(b) the industry sector of the IE unit;

(c) descriptions of:

(i) the original unit, showing that it satisfies:
(A) subsection 8(5) (it is an IE unit); and
(B) subsection 10(1) (limit on energy consumption); and
(C) subsection 10(3) (not operating before upgrade); and
(D) subsection 10(4) (not operating irregularly or intermittently); and
(E) section 11 (it includes all equipment within an energy boundary); and
(ii) the proposed upgrade, showing that it satisfies:
(A) subsections 8(6) and (7) (it does not include maintenance); and
(B) subsection 10(2) (it is part of an energy efficiency plan); and
(C) subsection 10(5) (no substantial change to capacity); and
(iii) the proposed upgraded unit, showing that it will continue to satisfy section 11;

(d) if they have not already been provided in the section 22 application:
(i) an explanation of how an upgrade to the IE unit could reasonably be expected to result in eligible carbon abatement;
(ii) a copy of the relevant energy audit or other report mentioned in subsection 10(2);

(e) if the IE unit has more than one sub-unit, a description of:
(i) each sub-unit, showing how it satisfies section 13 (including, if energy transfers to and from other sub-units are likely to have a material effect on the amount of abatement that can be expected, a description of the transfers); and
(ii) the effect of the proposed upgrade on each sub-unit;

(f) the outputs of each sub-unit and, if these are not IE services, a description of how they are produced by the sub-unit;

(g) the output indicator and reference output indicator for each sub-unit, with
(i) for a derived indicator— how it is derived from the primary parameters and verifiable standard constants or measures; and
(ii) reasons why the indicator can be considered appropriate (section 14);

(h) details of the baseline period with:
(i) a description of the evidence that it satisfies subsections 22(6) to (11); and
(ii) a summary of the calculations that show that it satisfies the output representativeness criterion for each sub-unit (subsection 22(12));

(i) details of the proposed project measurement period (or possible project measurement periods) with reasons for thinking that it will satisfy subsections 22(6) to (11);

(j) reasons why the baseline period and proposed project measurement period will satisfy subsection 22(3) (limitation on concurrent maintenance or other work);

(k) the baseline emissions rate for each sub-unit ($ER_{B,i}$ and $ER_{P,i}$), with a summary of the calculations;

(l) a statement of the MVP's qualifications, showing that he or she satisfies section 26;

(m) a statement that the MVP is satisfied that the IE unit and the proposed upgrade fulfil the requirements of this determination.

(5) An MVP may provide a pre-upgrade declaration only if he or she is satisfied that:
(a) he or she has received from the project proponent any information about the IE unit that he or she has requested in order to make the declaration; and
(b) the information received is accurate and does not contain anything misleading.

Note: The information that the MVP will require in order to make the declaration, and will need to request if he or she does not already have it from involvement in implementing or testing the upgrade, is likely to include:

- a description of the project activities, including any changes to operating conditions compared to the baseline period
- a description of the energy boundary of the IE unit and any sub-units, including:
    - the energy types consumed by each sub-unit
    - any energy transfers between sub-units, such as heat transfers
    - how energy inputs are measured
    - an explanation of how proposed output measures were chosen, and why the output measure is appropriate
    - total output data for the 12 months prior to the commissioning of the equipment
    - details of any non-routine shutdown or startup events during the baseline period
    - data for major variables or factors affecting energy performance of the IE unit, to enable an assessment of whether the average values of the following factors during the baseline and project measurement periods were comparable, including:
        - external factors, such as climate;
        - changes in input or output quality and type that materially affect energy consumption;
        - changes to the fuel mix
        - regular operating schedules, including start-ups and shutdowns
        - operating procedures or practices, beyond project activities
- an outline of any planned or scheduled changes to IE unit equipment during the crediting period
- if any time intervals were excised from the measurement period under subsection22(7)—reasons why this did not affect the representativeness of the measurement period for subsection 22(11)
- details of the proposed project measurement period.

Note: The actions the MVP will need to take in order to be satisfied as to the content of the declaration will depend on the circumstances, but may include site visits or inspections or monitoring equipment.

(6) An MVP who provides the project proponent with a pre-upgrade declaration must provide, at the same time, written evidence supporting the statements and calculations, including the calculations, assumptions, information and inputs used.

25 Post-upgrade declaration by MVP

(1) A ***post-upgrade declaration*** about an upgraded IE unit is a declaration by an MVP in accordance with this section.

(2) A post-upgrade declaration must be made after the end of the project measurement period, following the upgrade of the IE unit.

(3) To avoid doubt, a post-upgrade declaration may be made using more than one document.

(4) A post-upgrade declaration must be signed or electronically authenticated by the MVP and must include the following:

(a) a reference that identifies the pre-upgrade declaration for the IE unit;

(b) any changes to details set out in the pre-upgrade declaration that are required to accurately describe the IE unit, the upgrade as implemented and the effects of the upgrade;

(c) if any such changes are not material—a declaration to that effect;

(d) if there are material differences:

(i) a description of each difference and the reasons why the relevant element continues to satisfy this determination; and

(ii) a declaration to the effect that the relevant elements continue to satisfy this determination;

(e) the date the upgraded unit was commissioned;

(f) a description of the upgraded unit showing that it satisfies subsection 10(4) (not operating irregularly or intermittently); and

(g) details of the project measurement period with:

(i) a description of the evidence that it satisfies subsections 22(6) to (11); and

(ii) a summary of the calculations that show that it satisfies the output representativeness criterion for each sub-unit (subsection 22(12));

(iii) reasons why the baseline period and project measurement period satisfy subsection 22(4) (limitation on concurrent maintenance or other work);

(h) a statement that the MVP has examined the calculations of the rate of abatement produced by the IE upgrade ($ER_{Bi} - ER_{P,i}$ where these are given by equations 2 and 3) and is satisfied that the amount is consistent with its being predominantly the result of the IE upgrade;

(i) if the MVP did not make the pre-upgrade statement—a statement of the MVP's qualifications, showing that he or she satisfies section 26;

(j) a statement that the MVP is satisfied that the IE unit continues to fulfil the requirements of this determination.

(5) An MVP may provide a post-upgrade declaration only if he or she is satisfied that:

(a) he or she has received from the project proponent any information about the IE unit that he or she needs to make the declaration; and

(b) the information received is accurate and does not contain anything misleading.

(6) An MVP who provides the project proponent with a post-upgrade declaration must provide, at the same time, written evidence supporting the statements and calculations, including the calculations, assumptions, information and inputs used.

26 Qualifications of an MVP

(1) A person must not provide a pre-upgrade or post-upgrade declaration unless the person is a measurement and verification professional who satisfies this section (an ***MVP***).

(2) The measurement and verification professional satisfies this section if he or she:

(a) is either:

(i) an independent professional energy services contractor or consultant; or

(ii) a professional engineer or measurement and verification professional; and

(b) is one of the following

(i) a Certified Measurement and Verification Professional (CMVP);

(ii) a Certified Professional Engineer (CPEng, or equivalent); or

(iii) a professional engineer with:

(A) a university degree that is accredited for the grade of Professional Engineer by Engineers Australia; and

(B) at least 3 years' professional engineering experience that includes energy auditing, energy measurement and verification or energy system project design, analysis and installation.

Division 5—Method for calculating the net abatement amount

Subdivision 1—General provisions

27 Summary

The ***net abatement amount for a project*** for a reporting period is calculated (equation 1) as:

(1) the sum of the abatements for all sub-units of the project in the reporting period, adjusted for any negative abatements carried forward from previous years (equation 1).

The ***abatement for a sub-unit*** is calculated (in the square brackets in equation 1) by:

(2) taking the difference between its daily baseline emissions rate and its daily project emissions rate,

(3) multiplying by the number of days of operation in the reporting period,

(4) adjusting by a decay coefficient in cases where there is a reasonable probability of a decline in reliability over time of using the baseline and operating figures obtained at the beginning of the project because:

(a) the output is measured in the project measurement period and not in each reporting period, or

(b) the output in any reporting period does not satisfy the output representativeness criterion in section 23.

Emissions factors for different types of fuel or energy are calculated by:

(5) applying methods from the NGER (Measurement) Determination for calculating emissions from the mix of energy sources used during the baseline period and project measurement period.

The ***daily baseline emission rate for a sub-unit*** is calculated (in equation 2) by:

(6) measuring its output over its baseline period, using its output indicator,

(7) measuring the energy that it uses in the baseline period,

(8) converting the energy to emissions using the emissions factors,

(9) converting this to a daily rate,

(10) adjusting this rate if the rate of output during the project measurement period is lower than in the baseline period.

The ***daily project emission rate for a sub-unit*** is calculated (in equation 4) by:

(11) measuring its output over its project measurement period, using its output indicator,

(12) measuring the energy that it uses in the project measurement period,

(13) converting the energy to emissions using the emissions factors,

(14) converting this to a daily rate.

28 Net abatement amount for the project (*A*)

The net abatement amount (***A***) for an eligible IEU project for the reporting period (in tonnes CO_2-e) is worked out using the following equation (***equation 1***):

$$\boldsymbol{A} = \left[\sum_{\mathrm{i}} \left(\boldsymbol{ER_{B,i}} - \boldsymbol{ER_{P,i}}\right) \times t_i \times \mathrm{DC_i}\right] + \boldsymbol{A_{Neg}}$$

where:

$\boldsymbol{i}$ is the index of the i^{th} sub-unit of the project (that is, the calculations consider separately the contribution to the abatement of each sub-unit of an IE unit of the project).

$\boldsymbol{ER_{B,i}}$ is the daily baseline emissions rate for the i^{th} sub-unit given by equation 2 (section 29).

$\boldsymbol{ER_{P,i}}$ is the daily project emissions rate i^{th} sub-unit given by equation 4 (section 30).

$\boldsymbol{t_i}$ is the number of days of operation during the reporting period for the upgraded unit that includes the i^{th} sub-unit.

Note: Days within the project measurement period may be included.

$\boldsymbol{A_{Neg}}$ is:

(a) if $\boldsymbol{A}$ was negative in the previous reporting period—the value of $\boldsymbol{A}$ for the previous reporting period;

(b) otherwise—zero.

$\boldsymbol{DC_i}$ is the decay coefficient for the i^{th} sub-unit, and is 1 unless

(a) the output of one of the sub-units of the IE unit was not measured for the reporting period; or

(b) the reporting period did not satisfy the output representativeness criterion in section 23 for one of the sub-units of the IE unit;

in which case $\boldsymbol{DC_i}$ is given by the following table, where decay coefficient year 1 begins on the start date of the project measurement period for relevant IE unit:

If the reporting period ends during this decay coefficient year for the i^{th} sub-unit:	**…the decay coefficient ($\boldsymbol{DC_i}$) is:**
1	1.000
2	0.875
3	0.750
4	0.625
5	0.500
6	0.375
7	0.250

Division 6—Calculation of baseline and project emissions rates

29 Baseline emissions rate for a sub-unit ($\boldsymbol{ER_{B,i}}$)

Calculation of daily baseline emissions rate

(1) The daily baseline emissions rate for the i^{th} sub-unit of the project, $ER_{B,i}$ is given by the following equation (***equation 2***):

$$ER_{B,i} = \left\{\sum_{m}\left(QFB_{m,i} \times \frac{\sum_n EF_{m,n}}{1000}\right) + QEB_i \times \frac{EF_{El}}{1000}\right\} \times \left(\frac{1}{t_{B,i}}\right) \times ADJ_i$$

where, for the i^{th} sub-unit of the project:

m is a type of fuel consumed by the sub-unit in the baseline period.

n is a type of greenhouse gas emitted by the sub-unit in the baseline period due to fuel combustion.

$\boldsymbol{QFB_{m,i}}$ is the amount, of fuel type m consumed by the sub-unit during the baseline period, converted to gigajoules using an energy content factor that is in accordance with the NGER (Measurement) Determination.

$\boldsymbol{EF_{m,n}}$ is the emissions factor for greenhouse gas type n released due to the combustion of fuel type m, in kilograms CO_2-e per gigajoule, specified for that combination of fuel type and greenhouse gas type in Schedule 1 to the NGER (Measurement) Determination.

$\boldsymbol{QEB_i}$ is the electricity consumption by the sub-unit during the baseline period, in kilowatt hours.

$\boldsymbol{EF_{El}}$ is:

(a) for electricity obtained from an electricity grid that is a grid for which the NGA Factors document in force on the declaration day includes an emissions factor—that factor, in kilograms CO_2-e per kilowatt hour; or

(b) for electricity obtained from an electricity grid not covered by paragraph (a) or from a source other than an electricity grid:

(i) if the supplier of the electricity is able to provide an emissions factor that reflects the emissions intensity of the electricity and is applicable on the declaration day—that factor, in kilograms CO_2-e per kilowatt hour; or

(ii) otherwise—the emissions factor, in kilograms CO_2-e per kilowatt hour, for off-grid electricity included in the NGA Factors document in force on the declaration day.

$\boldsymbol{t_{B,i}}$ is the number of days in the baseline period for the sub-unit.

$\boldsymbol{ADJ_I}$ is the adjustment factor for the sub-unit. This depends on the ratio R_i given by equation 3 (subsection (2)), and is:

(a) R_i, for $R_i < 1$; and

(b) 1 for $R_i \geq 1$.

Note: If the rate of output during the project measurement period is lower than during the baseline period, the baseline emissions rate used in abatement calculations is reduced in proportion.

Calculation of adjustment factor

(2) The ratio $\boldsymbol{R_i}$ between the rates of output of the i^{th} sub-unit during baseline period and the project measurement period is given by the following equation (***equation 3***):

$$R_i = \frac{\Omega_{P,i}}{\Omega_{B,i}} \times \frac{t_{B,i}}{t_{P,i}}$$

where, for the i^{th} sub-unit of the project:

$\boldsymbol{\Omega_{B,i}}$ is the measured output over the baseline period.

$\boldsymbol{\Omega_{P,i}}$ is the measured output over the project measurement period.

$t_{B,i}$ is the number of days in the baseline period.

$t_{P,i}$ is the number of days in the project measurement period.

30 Project emissions rate for a sub-unit ($ER_{P,i}$)

The daily project emissions rate for the i^{th} sub-unit of the project, $ER_{P,i}$ is given by the following equation (***equation 4***):

$$ER_{P,i} = \left\{\sum_{m}\left(QFP_{m,i} \times \frac{\sum_{n} EF_{m,n}}{1000}\right) + QEP_{i} \times \frac{EF_{El}}{1000}\right\} \times \left(\frac{1}{t_{P,i}}\right)$$

where, for the i^{th} sub-unit of the project:

m is a type of fuel consumed by the sub-unit in the project measurement period.

n is a type of greenhouse gas emitted by the sub-unit in the project measurement period due to fuel combustion.

$QFP_{m,i}$ is the amount, of fuel type m consumed by the sub-unit during the project measurement period, converted to gigajoules using an energy content factor that is in accordance with the NGER (Measurement) Determination.

$EF_{m,n}$ is the emissions factor for fuel type m and greenhouse gas type n, in kilograms CO_2-e per gigajoule, specified for that combination of fuel type and greenhouse gas type in Schedule 1 to the NGER (Measurement) Determination.

QEP_i is the electricity consumption by the sub-unit during the project measurement period, in kilowatt hours.

EF_{El} is:

(a) for electricity obtained from an electricity grid that is a grid for which the NGA Factors document in force on the declaration day includes an emissions factor—that factor, in kilograms CO_2-e per kilowatt hour; or

(b) for electricity obtained from an electricity grid not covered by paragraph (a) or from a source other than an electricity grid:

  (i) if the supplier of the electricity is able to provide an emissions factor that reflects the emissions intensity of the electricity and is applicable on the declaration day—that factor, in kilograms CO_2-e per kilowatt hour; or

  (ii) otherwise—the emissions factor, in kilograms CO_2-e per kilowatt hour, for off-grid electricity included in the NGA Factors document in force on the declaration day.

$t_{P,i}$ is the number of days in the project measurement period for the sub-unit.

Part 5—Reporting, notification, record-keeping and monitoring requirements

Note: General reporting, notification, record-keeping and monitoring requirements are set out in the Act and the Rule. This Part includes supplementary requirements specific to this determination.

Division 1—Offsets report requirements

31 Operation of this Division

For paragraph 106(3)(a) of the Act, this Division sets out information that must be included in an offsets report about an eligible IEU project.

32 Information that must be included in an offsets report

(1) An offsets report for a reporting period must, for each IE unit included in a calculation undertaken in accordance with Part 4 for the reporting period, state the following:

(a) the location of the IE unit, and any other details required in a form approved by the Regulator;

(b) either:

(i) the following information:

(A) descriptions of the original unit, the upgrade and the upgraded unit;

(B) the date the upgraded unit was commissioned;

(C) if the IE unit is not a single sub-unit—a description of each sub-unit and how it was affected by the upgrade; and

(D) the outputs of each sub-unit;

(E) the output indicator for each sub-unit;

(F) the dates of the baseline period;

(G) the dates of the project measurement period;

(H) if there are any excisable intervals in the baseline period or project measurement period—the time of those intervals and why they were excisable intervals;

(I) the baseline emissions rate and project emissions rate for each sub-unit ($ER_{B,i}$ and $ER_{P,i}$);

(J) the date of the pre-upgrade declaration and post-upgrade declaration for the unit and the name of the MVP who made those declarations; or

(ii) if the information was provided in an earlier offsets report—a reference to that report;

(c) whether the IE unit:

(i) was included in the most recent previous offsets report; or

(ii) is an old IE unit that was excluded from the most recent previous report; or

(iii) is a new IE unit that has not been included in a previous report; and

(d) if biomass was used during the reporting period:

(i) as an energy source in implementation equipment; or

(ii) to produce heat, steam or cooling that was used in the IE unit;

—a declaration that the biomass used in the reporting period complied with the definition of RET energy source; and

(e) if information specified by subparagraph 15(a)(vi) was not included in the application under 22 of the Act in relation to the project for the IE unit or a previous offsets report—that information.

(2) For an IE unit that was included in calculations for an earlier reporting period, but is not included in calculations for the reporting period to which the offsets report relates, the report must state the reason for the exclusion.

(3) If, in the circumstances described in paragraph 6(2)(b), a factor or parameter is defined or calculated for a reporting period by reference to an instrument or writing as in force from time to time, the offsets report about the project for the reporting period must describe the reasons why it was not possible to define or calculate the factor or parameter by reference to the instrument or writing as in force at the end of the reporting period.

Division 2—Notification requirements

33 Operation of this Division

For paragraph 106(3)(b) of the Act, this Division sets out requirements to notify certain matters relating to an eligible IEU project to the Regulator.

34 Notification requirements

The project proponent must notify the Regulator of any safety or product performance issues that have been identified with equipment installed or proposed to be installed in relation to the project as soon as possible after the proponent becomes aware of that issue.

Division 3—Record-keeping requirements

35 Operation of this Division

For paragraph 106(3)(c) of the Act, this Division sets out record-keeping requirements for an IEU project that is an eligible offsets project.

36 Record-keeping requirement

(1) As well as keeping any other relevant records, the project proponent must keep records of the site of each IE unit that identify the location of:

(a) all the energy-consuming equipment included in the unit; and

(b) equipment that measures the consumption of the energy-consuming equipment of the unit; and

(c) the supply of energy for that consumption.

(2) The project proponent must keep records that evidence that any equipment removed as part of the project was disposed of in accordance with section 16 and any other applicable legislative requirements.

(3) The project proponent must keep records of the pre-upgrade declaration and post-upgrade declaration for each IE unit.

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Division 4—Monitoring

37 Operation of this Division

For paragraph 106(3)(d) of the Act, this Division sets out monitoring requirements for an eligible IEU project.

38 Monitoring requirements—general

(1) For each IE unit, the fuel and electricity consumption within its energy boundary (in equation 2, $\boldsymbol{QFB_{m,i}}$ for each fuel type and sub-unit**,** and $\boldsymbol{QEB_i}$ for each sub-unit**)** must be monitored separately to other energy use at the site during the baseline period and the project measurement period for the IE unit.

(2) If the IE unit includes a partly independent sub-system mentioned in section 12, the following parameters must also be monitored separately:
   (a) those parts of the fuel and electricity consumption of the partly independent sub-system that are attributable to the internal and external outputs of the sub-system;
   (b) if any lower grade energy that was originally created by the partly independent subsystem is returned to that subsystem—the energy returned.

(3) If any fuel or electricity drawn by the unit is transmitted fuel or electricity as mentioned in subsection 8(11), the amounts transmitted must also be monitored separately.

(4) The equipment used to monitor the fuel and energy consumption must also be monitored during the relevant period, including monitoring for:
   (a) verification of data; and
   (b) evidence of bias or drift; and
   (c) the integrity of any anti-tampering measures applied to the equipment.

(5) Measurements of electricity consumption for any period must reflect the active energy consumption.

   Note: Active energy consumption measures only the active or 'real' power by integrating active power with respect to time.

   This measure is used so that changes in the power factor between the baseline period and the project measurement period will not materially affect the abatement estimate.

(6) All data used in the calculations to determine the abatement amount must be measured using an approach that is consistent with:
   (a) relevant measuring and estimation requirements that apply to the parameter under the NGER (Measurement) Determination; or
   (b) the *National Measurement Act 1960*; or
   (c) if it is not practicable to use an approach consistent with paragraph (a) or (b)—relevant Australian, international or industry standards.

(7) If, under subsection (6), a parameter is measured in a period using measuring equipment in accordance with industry practice, the same practice (as applicable at the time of measurement) must be used in any future period that the parameter is measured in accordance with industry practice.

(8) The project proponent may measure the data either:
   (a) directly; or
   (b) by using a proxy method that enables the value of the parameter to be reliably calculated.

(9) Proxy methods may include the use of derived measurements of the energy content of fluid flow rates, based on:

(a) measured material flow rates, temperatures and pressures, adjusted for the effects of latent heat, venting of vapour or gases, and fluid losses (eg from valves); and

(b) scientifically established material properties corresponding to the measured temperatures, pressures and material phases (eg gas or liquid), as documented in engineering or scientific handbooks or textbooks.

(10) The same method must be used for all measurements of a particular quantity in both the baseline period and the project measurement period.

(11) If a proxy method is used for the measurement of the same quantity in both the baseline period and the project measurement period, it must be same proxy method in both periods.

Note: An example of a proxy method is measuring the temperature and pressure of steam flow to calculate energy flow from a boiler or calculating free air delivery for a compressor.

39 Monitoring requirements—government supported renewable energy

If a project proponent will, for the purposes of Part 4, use data for government supported renewable energy at a site that is monitored in accordance with this section, the government supported renewable energy must be monitored in kilowatt hours, annually or more frequently:

(a) using a meter in accordance with the relevant requirements of the National Measurement Institute for electricity metering, set out in the document titled *NMI M 6 Electricity Meters* as in force from time to time; or

(b) using an inverter that:

(i) satisfies the requirements of Australian Standard AS 4777 as in force from time to time; or

(ii) is on the list of approved inverters maintained by the Clean Energy Council, as it exists from time to time.

40 Monitoring equipment

Equipment used for monitoring under section 38 must be:

(a) calibrated by an accredited technician in accordance with the manufacturer's specifications for the equipment; and

(b) installed and operated in accordance with the manufacturer's specifications for the equipment.

Part 6—Dividing an IEU project

41 Division of project for reporting purposes

For subsection 77A(2) of the Act, the project may be divided into parts, each of which is one or more IE units.