



Carbon Credits (Carbon Farming Initiative— Coal Mine Waste Gas) Methodology Determination 2015

I, Greg Hunt, Minister for the Environment, make the following determination.

Dated 13 February 2015

Greg Hunt
Minister for the Environment

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Part 1—Preliminary

1 Name of determination

This determination is the *Carbon Credits (Carbon Farming Initiative—Coal Mine Waste Gas) Methodology Determination 2015*.

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- (b) ends on the day before this determination would otherwise be repealed under subsection 50(1) of the *Legislative Instruments Act 2003*.

5 Definitions

In this determination:

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

application time, for a project, means the time of application for the declaration of the project as an eligible offsets project.

coal mine waste gas means a substance:

- (a) that consists of:
 - (i) naturally occurring hydrocarbons; or
 - (ii) a naturally occurring mixture of hydrocarbons and non-hydrocarbons; and
- (b) that:
 - (i) is drained from a coal mine that is covered by a lease (however described) that authorises coal mining; or
 - (ii) is drained from a closed mine that is, or was, covered by a lease (however described) that authorises, or authorised coal mining; or
 - (iii) is conveyed in a ventilation air shaft or duct to the surface of a coal mine that is covered by a lease (however described) that authorises coal mining; or
 - (iv) is conveyed in a ventilation air shaft or duct to the surface of a closed mine that is, or was, covered by a lease (however described) that authorises, or authorised coal mining.

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coal mine waste gas project has the meaning given by section 10.

coal seam methane means a substance that:

- (a) consists of:
 - (i) naturally occurring hydrocarbons; or
 - (ii) a naturally occurring mixture of hydrocarbons and non-hydrocarbons;
and
- (b) consists mainly of methane; and
- (c) is drained from a coal seam; and
- (d) is not coal mine waste gas.

combustion device means a flaring device or an electricity production device.

declaration day, for a project, means the day the project is declared to be an eligible offsets project.

decommissioned underground coal mine means an underground coal mine where the following activities have not occurred for at least 12 months and are not expected to occur in the future:

- (a) coal production;
- (b) drainage of methane from the mine (including pre-draining activities);
- (c) active mine ventilation, including the operation of ventilation fans at the mine.

displacement electricity production project means a project that meets the requirements of section 16.

electricity production device means a device that produces electricity from combusting methane but does not include a ventilation air methane oxidation device.

existing electricity production device for a coal mine waste gas project means an electricity production device that existed, during all or part of the period between 24 April 2014 and the application time, at a location where some of the methane component of coal mine waste gas from the mine has been combusted.

existing flaring device for a coal mine waste gas project means a flaring device that existed, during all or part of the period between 24 April 2014 and the application time, at a location where some of the methane component of coal mine waste gas from the mine has been combusted.

existing regulatory obligation has the meaning given by section 6.

expansion electricity production project means a project that meets the requirements of section 15.

expansion flaring project means a project that meets the requirements of section 13.

flaring means the combustion of gas for a purpose other than producing energy.

flaring device means a device that flares methane but does not include:

- (a) a device that is directly associated with the operation of an electricity production device; or
- (b) a ventilation air methane oxidation device.

historic abatement means an amount worked out under section 40.

installed electricity production device for a coal mine waste gas project means an electricity production device installed and operated as part of the project.

installed flaring device for a coal mine waste gas project means a flaring device installed and operated as part of the project.

integrated monitoring system has the meaning given by section 8.

material abatement has the meaning given by section 7.

monitoring requirements means the requirements set out in section 47.

National Electricity Rules means the National Electricity Rules, as in force from time to time, made under the National Electricity Law set out in the Schedule to the *National Electricity (South Australia) Act 1996* (SA).

network support and control ancillary services has the same meaning as in the National Electricity Rules.

new electricity production project means a project that meets the requirements of section 14.

new flaring project means a project that meets the requirements of section 12.

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*.

NGER Regulations means the *National Greenhouse and Energy Reporting Regulations 2008*.

NGER report means a report provided under section 19, 22E, 22G, or 22X of the *National Greenhouse and Energy Reporting Act 2007*.

non-monitored period has the meaning given by subsection 48(1).

operating: a device is **operating** if it is combusting, or monitoring the combustion of, the methane component of coal mine waste gas in accordance with:

- (a) the manufacturer’s specifications for the device; and
- (b) the monitoring requirements.

recognised capacity of a device in a period means:

- (a) for a flaring device—the maximum volume of the methane component of coal mine waste gas capable of being combusted by operating the device in

Section 6

the period worked out at application time in accordance with subsection 42(3); or

- (b) for an electricity production device—the maximum amount of electricity capable of being produced from the combustion of the methane component of coal mine waste gas by operating the device in the period worked out at application time in accordance with subsection 43(3).

underground coal mine means a mine that allows the extraction of coal by mining at depth, after entry by shaft, adit or drift, without the removal of overburden.

6 Meaning of *existing regulatory obligation*

A coal mine lease holder has an ***existing regulatory obligation*** to destroy the methane component of coal mine waste gas drawn from an operating underground coal mine in relation to a coal mine waste gas project if at the application time:

- (a) the destruction is required by a law of a State or Territory; or
- (b) a law of a State or Territory prohibits the release of the gas from the mine without destruction.

7 Meaning of *material abatement*

If the historic abatement from the combustion of the methane component of coal mine waste gas from a mine worked out under section 40 is greater than 5 000 tonnes of CO₂-e, there has been ***material abatement*** from the combustion of the methane component of coal mine waste gas from the mine.

8 Meaning of *integrated monitoring system*

An ***integrated monitoring system*** is a system:

- (a) consisting of a device or group of devices; and
- (b) that simultaneously monitors:
 - (i) the volume of coal mine waste gas sent to a combustion device; and
 - (ii) whether the combustion device is operating; and
- (c) that monitors the fraction of the volume of coal mine waste gas sent to the combustion device that is methane.

Note: ***Operating*** is defined in section 5.

9 References to 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.
- (2) Subsection (1) does not apply if:
 - (a) the 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.

Part 2—Coal mine waste gas projects

10 Coal mine waste gas projects

- (1) For paragraph 106(1)(a) of the Act, this determination applies to an offsets project that:
 - (a) combusts some or all of the methane component of coal mine waste gas drawn from an operating underground coal mine by installing and operating one or more of the following:
 - (i) a flaring device;
 - (ii) an electricity production device; and
 - (b) does not involve the capture or use of coal seam methane; and
 - (c) does not involve the capture or use of coal mine waste gas drawn from a decommissioned underground coal mine.
- (2) A project covered by subsection (1) is a *coal mine waste gas project*.
- (3) A coal mine waste gas project that is an eligible offsets project may be:
 - (a) a new flaring project; or
 - (b) an expansion flaring project; or
 - (c) a new electricity production project; or
 - (d) an expansion electricity production project; or
 - (e) a displacement electricity production project.

Part 3—Project requirements

Division 1—General requirements

11 Operation of this Division

For paragraph 106(1)(b) of the Act, this Division sets out requirements that must be met for a coal mine waste gas project to be an eligible offsets project.

12 Requirements for a new flaring project

- (1) This section sets out requirements for a new flaring project.
- (2) The project must install and operate a flaring device.
- (3) There must have been no material abatement from the combustion of the methane component of coal mine waste gas from the mine at the application time.
- (4) Subsection (3) is satisfied if:
 - (a) for the financial year in which the application is made—at application time the project proponent has given the Regulator a declaration that no such material abatement has occurred; and
 - (b) for all previous financial years for which there is a NGER report relating to the mine—the NGER report for the financial year shows that no such material abatement has occurred.

13 Requirements for an expansion flaring project

- (1) This section sets out requirements for an expansion flaring project.
- (2) The project must install and operate a flaring device.
- (3) Some of the methane component of coal mine waste gas from the mine must have been combusted at the application time.
- (4) The proponent must have provided a statement at the application time as to:
 - (a) the sum of the recognised capacity of all existing flaring devices and existing electricity production devices for the coal mine waste gas project at the point of the highest total recognised capacity of all of the existing devices in the period between 24 April 2014 and the application time; and
 - (b) the recognised capacity of each existing device at that point.

14 Requirements for a new electricity production project

- (1) This section sets out requirements for a new electricity production project.
- (2) The project must install and operate an electricity production device.

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- (3) There must have been no material abatement from the combustion of the methane component of coal mine waste gas from the mine at the application time.
- (4) Subsection (3) is satisfied if:
 - (a) for the financial year in which the application is made—at application time the project proponent has given the Regulator a declaration that no such material abatement has occurred; and
 - (b) for all previous financial years for which there is a NGER report relating to the mine—the NGER report for the financial year shows that no such material abatement has occurred.

15 Requirements for an expansion electricity production project

- (1) This section sets out requirements for an expansion electricity production project.
- (2) The project must install and operate an electricity production device.
- (3) Some of the methane component of coal mine waste gas from the mine must have been combusted at the application time.
- (4) The proponent must have provided a statement at the application time as to:
 - (a) the sum of the recognised capacity of all existing flaring devices and existing electricity production devices for the coal mine waste gas project at the point of the highest total recognised capacity of all of the existing devices in the period between 24 April 2014 and the application time; and
 - (b) the recognised capacity of each existing device at that point.

16 Requirements for a displacement electricity production project

- (1) This section sets out requirements for a displacement electricity production project.
- (2) The project must install and operate an electricity production device.
- (3) If some of the methane component of coal mine waste gas from the mine has been combusted by one or more existing electricity production devices at the application time, the proponent must have provided a statement at the application time as to:
 - (a) the sum of the recognised capacity of all existing electricity production devices for the coal mine waste gas project at the point of the highest total recognised capacity of all of the existing devices in the period between 24 April 2014 and the application time; and
 - (b) the recognised capacity of each existing device at that point.

Note: Unlike a new electricity production project or an expansion electricity production project, the carbon dioxide equivalent net abatement amount for a displacement electricity production project does not take into account abatement from the combustion of the methane component of coal mine waste gas. Only the abatement from displacing electricity is taken into account.

Division 2—Additionality requirements

17 Requirements in lieu of regulatory additionality requirement

- (1) For subparagraph 27(4A)(b)(ii) of the Act, a requirement in lieu of the regulatory additionality requirement for a coal mine waste gas project (other than a displacement electricity production project) is that the coal mine lease holder must have no existing regulatory obligation to destroy the methane component of coal mine waste gas from the mine.
- (2) For subparagraph 27(4A)(b)(ii) of the Act, a requirement in lieu of the regulatory additionality requirement for a displacement electricity production project is that the project must install and operate an electricity production device.

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Part 4—Net abatement amounts

Division 1—Operation of this Part

18 Operation of this Part

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

19 Overview of gases accounted for in abatement calculations

The following table provides an overview of the greenhouse gases and emissions sources that are relevant to working out the carbon dioxide equivalent net abatement amount for a coal mine waste gas project.

| Greenhouse gases and emissions sources | | | |
|--|--------------------------------|--------------------|---|
| Item | Relevant emissions calculation | Emissions source | Greenhouse gas |
| 1 | Project abatement | Methane combustion | Methane (CH ₄) |
| 2 | Project emissions | Fuel consumption | Carbon dioxide (CO ₂) Methane (CH ₄) Nitrous oxide (N ₂ O) |
| 3 | Project emissions | Methane combustion | Carbon dioxide (CO ₂) Methane (CH ₄) Nitrous oxide (N ₂ O) |
| 4 | Project emissions | Unburned methane | Methane (CH ₄) |

Division 2—New flaring project method

20 Summary

The carbon dioxide equivalent net abatement for a new flaring project is the abatement achieved from installing and operating flaring devices less:

- (a) the emissions from operating the installed flaring devices; and
- (b) ancillary emissions of the project; and
- (c) any historic abatement.

21 Net abatement amount

- (1) The carbon dioxide equivalent net abatement amount for a new flaring project for the reporting period, in tonnes CO₂-e, is worked out:
- (a) if there has been no historic abatement—using subsection (2); or
 - (b) if there has been historic abatement that is not material abatement—using subsection (3).

No historic abatement

- (2) The carbon dioxide equivalent net abatement amount for the new flaring project for the reporting period, in tonnes CO₂-e, is worked out using the formula (*equation 1*):

$$A_N = A_P$$

where:

A_N means the carbon dioxide equivalent net abatement amount for the new flaring project for the reporting period, in tonnes CO₂-e.

A_P means the project emissions abated for the reporting period, in tonnes CO₂-e, worked out using equation 3.

Historic abatement that is not material abatement

- (3) The carbon dioxide equivalent net abatement amount for the new flaring project for the reporting period, in tonnes CO₂-e, is worked out using the formula (*equation 2*):

$$A_N = A_P - A_H \times \frac{T}{365}$$

where:

A_N means the carbon dioxide equivalent net abatement amount for the new flaring project for the reporting period, in tonnes CO₂-e.

A_P means the project emissions abated for the reporting period, in tonnes CO₂-e, worked out using equation 3.

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A_H means the historic abatement from the combustion of the methane component of coal mine waste gas from the mine, in tonnes CO₂-e, worked out using equation 35.

T means the total number of days in the reporting period.

- (4) The project emissions abated for the reporting period, in tonnes CO₂-e, is worked out using the formula (**equation 3**):

$$A_P = M_{Com} - (E_{MD} + E_{An})$$

where:

A_P means the project emissions abated for the reporting period, in tonnes CO₂-e.

M_{Com} means the volume of the methane component of coal mine waste gas combusted by the project in the reporting period, in tonnes CO₂-e, worked out using equation 4.

E_{MD} means the emissions from the methane component of coal mine waste gas combusted by the project in the reporting period, in tonnes CO₂-e, worked out using equation 5.

E_{An} means the ancillary project emissions for the reporting period, in tonnes CO₂-e, worked out using equation 36.

- (5) The volume of the methane component of coal mine waste gas combusted by the project in the reporting period, in tonnes CO₂-e, is worked out using the formula (**equation 4**):

$$M_{Com} = \gamma \times DE \times \sum_h Q_{CH_4,h}$$

where:

M_{Com} means the volume of the methane component of coal mine waste gas combusted by the project in the reporting period, in tonnes CO₂-e.

γ means the factor for converting a quantity of methane from cubic metres to tonnes CO₂-e in section 3.21 of the NGER (Measurement) Determination.

DE has the value of 0.98.

Note: This is the default methane destruction efficiency for a flaring device.

$Q_{CH_4,h}$ means the volume of the methane component of coal mine waste gas sent to device h as part of the project in the reporting period, in cubic metres, worked out:

- (a) using equation 12; or
- (b) using an integrated monitoring system.

h means an installed flaring device.

- (6) The emissions from the methane component of coal mine waste gas combusted by the project in the reporting period, in tonnes CO₂-e, is worked out using the formula (**equation 5**):
-

$$E_{MD} = \sum_h \sum_j E_{MD,h,j}$$

where:

E_{MD} means the emissions from the methane component of coal mine waste gas combusted by the project in the reporting period, in tonnes CO₂-e.

$E_{MD,h,j}$ means the emissions of gas type j released from the combustion of the methane component of coal mine waste gas by device h as part of the project in the reporting period, in tonnes CO₂-e, worked out using equation 13.

h means an installed flaring device.

Division 3—Expansion flaring project method

22 Summary

The carbon dioxide equivalent net abatement amount for an expansion flaring project is the abatement achieved from installing and operating flaring devices (subject to a baseline) less:

- (a) the emissions from operating the installed flaring devices; and
- (b) ancillary emissions of the project.

The abatement achievable from existing flaring devices and existing electricity production devices is used to determine a baseline for working out the abatement achieved by the project. Only abatement above this baseline is counted as abatement achieved by the project.

23 Net abatement amount

- (1) The carbon dioxide equivalent net abatement amount for an expansion flaring project for the reporting period, in tonnes CO₂-e, is worked out using the formula (*equation 6*):

$$A_N = A_P$$

where:

A_N means the carbon dioxide equivalent net abatement amount for the expansion flaring project for the reporting period, in tonnes CO₂-e.

A_P means the project emissions abated for the reporting period, in tonnes CO₂-e, worked out using equation 7.

- (2) The project emissions abated for the reporting period, in tonnes CO₂-e, is worked out using the formula (*equation 7*):

$$A_P = M_{Com} - (E_{MD} + E_{An})$$

where:

A_P means the project emissions abated for the reporting period, in tonnes CO₂-e.

M_{Com} means the volume of the methane component of coal mine waste gas combusted by the project in the reporting period, in tonnes CO₂-e, worked out using equation 8.

E_{MD} means the emissions from the methane component of coal mine waste gas combusted by the project in the reporting period, in tonnes CO₂-e, worked out using equation 9.

E_{An} means the ancillary project emissions for the reporting period, in tonnes CO₂-e, worked out under equation 36.

- (3) The volume of the methane component of coal mine waste gas combusted by the project in the reporting period, in tonnes CO₂-e, is worked out using the formula (**equation 8**):

$$M_{Com} = \gamma \times \sum_t \text{Maximum} [DE \times X_{Fl,t} + X_{Gen,t}, 0]$$

where:

M_{Com} means the volume of the methane component of coal mine waste gas combusted by the project in the reporting period, in tonnes CO₂-e.

γ means the factor for converting a quantity of methane from cubic metres to tonnes CO₂-e in section 3.21 of the NGER (Measurement) Determination.

DE has the value of 0.98.

Note: This is the default methane destruction efficiency for a flaring device.

$X_{Fl,t}$ means the volume of the methane component of coal mine waste gas sent to installed and existing flaring devices as part of the project during time interval t less the baseline for the methane component of coal mine waste gas sent to flaring devices for the project, in cubic metres, worked out using equation 10.

$X_{Gen,t}$ means the volume of the methane component of coal mine waste gas sent to existing electricity production devices as part of the project during time interval t less the baseline for the methane component of coal mine waste gas sent to electricity production devices for the project, in cubic metres, worked out using equation 11.

- (4) The emissions from the methane component of coal mine waste gas combusted by the project in the reporting period, in tonnes CO₂-e, is worked out using the formula (**equation 9**):

$$E_{MD} = \sum_h \sum_j E_{MD,h,j}$$

where:

E_{MD} means the emissions from the methane component of coal mine waste gas combusted by the project in the reporting period, in tonnes CO₂-e.

$E_{MD,h,j}$ means the emissions of gas type j released from the combustion of the methane component of coal mine waste gas by device h as part of the project in the reporting period, in tonnes CO₂-e, worked out using equation 13.

h means an installed flaring device.

24 Volume of methane sent to combustion devices

Methane sent to flaring devices

- (1) The volume of the methane component of coal mine waste gas sent to installed and existing flaring devices as part of the project during time interval t less the baseline for the methane component of coal mine waste gas sent to flaring devices for the project, in cubic metres, is worked out using the formula (**equation 10**):

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$$X_{Fl,t} = \sum_h \left(Q_{CH_4,h,t} \times O_{h,t} \right) + \sum_m \left(Q_{CH_4,m,t} \times O_{m,t} \right) - B_{CH_4,Fl}$$

where:

$X_{Fl,t}$ means the volume of the methane component of coal mine waste gas sent to installed and existing flaring devices as part of the project during time interval t less the baseline for the methane component of coal mine waste gas sent to flaring devices for the project, in cubic metres.

$Q_{CH_4,h,t}$ (or $Q_{CH_4,m,t}$) means the volume of the methane component of coal mine waste gas sent to device h (or m) as part of the project during time interval t, in cubic metres, worked out in accordance with the monitoring requirements.

$O_{h,t}$ (or $O_{m,t}$) means a binary function which has the value 1 if device h (or m) is operating during time interval t and 0 if it is not.

Note: **Operating** is defined in section 5.

$B_{CH_4,Fl}$ means the baseline for the methane component of coal mine waste gas sent to flaring devices for the project during time interval t, in cubic meters, worked out using equation 37.

h means an installed flaring device.

m means an existing flaring device.

Methane sent to electricity production devices

- (2) The volume of the methane component of coal mine waste gas sent to existing electricity production devices as part of the project during time interval t less the baseline for the methane component of coal mine waste gas sent to electricity production devices for the project, in cubic metres, is worked out using the formula (**equation 11**):

$$X_{Gen,t} = \sum_m \frac{Q_{EG,m,t} \times F_{MWh \rightarrow GJ}}{Eff_m \times EC_{CMWG}} - B_{CH_4,Gen}$$

where:

$X_{Gen,t}$ means the volume of the methane component of coal mine waste gas sent to existing electricity production devices as part of the project during time interval t less the baseline for the methane component of coal mine waste gas sent to electricity production devices for the project, in cubic metres.

$Q_{EG,m,t}$ means the quantity of electricity produced by device m during time interval t, in megawatt hours, worked out in accordance with the monitoring requirements.

$F_{MWh \rightarrow GJ}$ has the value of 3.6.

Note: This is the factor converting energy in megawatt hours to gigajoules.

Eff_m means the electrical efficiency of device m, which, subject to subsection (4), has:

- (a) the value specified by the manufacturer of the device in the technical specifications for the equipment, with reference to Australian Standard AS 4594.1 or equivalent; or
- (b) the default value of 0.36.

EC_{CMWG} means the energy content factor of coal mine waste gas, in gigajoules per cubic metre, worked out in accordance with the monitoring requirements.

B_{CH₄,Gen} means the baseline for the methane component of coal mine waste gas sent to electricity production devices for the project during time interval *t*, in cubic meters, worked out using equation 38.

m means an existing electricity production device.

- (3) If the value of $X_{Gen,t}$ is greater than zero for time interval *t*, then the value of $X_{Gen,t}$ is taken to be zero for the time interval.
- (4) The same value of Eff_m must be used for that parameter for all time intervals in all reporting periods.

Division 4—General calculations for flaring methods**25 Volume of methane sent to combustion device**

The volume of the methane component of coal mine waste gas sent to device h as part of the project in the reporting period, in cubic metres, is worked out using the formula (*equation 12*):

$$Q_{CH_4,h} = \sum_t Q_{CH_4,h,t} \times O_{h,t}$$

where:

$Q_{CH_4,h}$ means the volume of the methane component of coal mine waste gas sent to device h as part of the project in the reporting period, in cubic metres.

$Q_{CH_4,h,t}$ means the volume of the methane component of coal mine waste gas sent to device h as part of the project during time interval t , in cubic metres, worked out in accordance with the monitoring requirements.

$O_{h,t}$ means a binary function which has the value 1 if device h is operating during time interval t and 0 if it is not.

Note: **Operating** is defined in section 5.

h means an installed flaring device.

26 Emissions

The emissions of gas type j released from the combustion of the methane component of coal mine waste gas by device h as part of the project in the reporting period, in tonnes CO₂-e, is worked out using the formula (*equation 13*):

$$E_{MD,h,j} = \frac{Q_{CH_4,h} \times EC_{CMWG} \times EF_j}{1000} \times OF_{FI}$$

where:

$E_{MD,h,j}$ means the emissions of gas type j released from the combustion of the methane component of coal mine waste gas by device h as part of the project in the reporting period, in tonnes CO₂-e.

Note: Gas type j is carbon dioxide, methane or nitrous oxide.

$Q_{CH_4,h}$ means the volume of the methane component of coal mine waste gas sent to device h as part of the project in the reporting period, in cubic metres, worked out:

- (a) for a new flaring project:
 - (i) using equation 12; or
 - (ii) using an integrated monitoring system; or
- (b) for an expansion flaring project—using equation 12.

EC_{CMWG} means the energy content factor of coal mine waste gas, in gigajoules per cubic metre, worked out in accordance with the monitoring requirements.

EF_j means the emission factor for gas type j released from the combustion of the methane component of coal mine waste gas that is captured for combustion, in kilograms of CO₂-e per gigajoule, worked out in accordance with the monitoring requirements.

OF_{FI} means the factor for OF_{if} in section 3.14 of the NGER (Measurement) Determination.

h means an installed flaring device.

Division 5—New electricity production project method

27 Summary

The carbon dioxide equivalent net abatement amount for a new electricity production project is the abatement achieved from installing and operating electricity production devices less:

- (a) the emissions from operating the installed electricity production devices; and
- (b) ancillary emissions of the project; and
- (c) certain parameters associated with electricity production; and
- (d) any historic abatement.

28 Net abatement amount

- (1) The carbon dioxide equivalent net abatement amount for a new electricity production project for the reporting period, in tonnes CO₂-e, is worked out:
 - (a) if there has been no historic abatement—using subsection (2); or
 - (b) if there has been historic abatement that is not material abatement—using subsection (3).

No historic abatement

- (2) The carbon dioxide equivalent net abatement amount for the new electricity production project for the reporting period, in tonnes CO₂-e, is worked out using the formula (*equation 14*):

$$A_N = A_P + A_G$$

where:

A_N means the carbon dioxide equivalent net abatement amount for the new electricity production project, for the reporting period, in tonnes CO₂-e.

A_P means the project emissions abated for the reporting period, in tonnes CO₂-e, worked out using equation 16.

A_G means the displaced electricity emissions from electricity production in the reporting period, in tonnes CO₂-e, worked out using equation 28.

Historic abatement that is not material abatement

- (3) The carbon dioxide equivalent net abatement amount for the new electricity production project for the reporting period, in tonnes CO₂-e, is worked out using the formula (*equation 15*):

$$A_N = A_P + A_G - A_H \times \frac{T}{365}$$

where:

A_N means the carbon dioxide equivalent net abatement amount for the new electricity production project for the reporting period, in tonnes CO₂-e.

A_P means the project emissions abated for the reporting period, in tonnes CO₂-e, worked out using equation 16.

A_G means the displaced electricity emissions from electricity production in the reporting period, in tonnes CO₂-e, worked out using equation 28.

A_H means the historic abatement from the combustion of the methane component of coal mine waste gas from the mine, in tonnes CO₂-e, worked out using equation 35.

T means the total number of days in the reporting period.

- (4) The project emissions abated for the reporting period, in tonnes CO₂-e, is worked out using the formula (**equation 16**):

$$A_P = M_{Com} - (E_{MD} + E_{An})$$

where:

A_P means the project emissions abated for the reporting period, in tonnes CO₂-e.

M_{Com} means the volume of the methane component of coal mine waste gas combusted by the project in the reporting period, in tonnes CO₂-e, worked out using equation 17.

E_{MD} means the emissions from the methane component of coal mine waste gas combusted by the project in the reporting period, in tonnes CO₂-e, worked out using equation 18.

E_{An} means the ancillary project emissions for the reporting period, in tonnes CO₂-e, worked out using equation 36.

- (5) The volume of the methane component of coal mine waste gas combusted by the project in the reporting period, in tonnes CO₂-e, is worked out using the formula (**equation 17**):

$$M_{Com} = \gamma \times \sum_h Q_{CH_4,h}$$

where:

M_{Com} means the volume of the methane component of coal mine waste gas combusted by the project in the reporting period, in tonnes CO₂-e.

γ means the factor for converting a quantity of methane from cubic metres to tonnes CO₂-e in section 3.21 of the NGER (Measurement) Determination.

$Q_{CH_4,h}$ means the volume of the methane component of coal mine waste gas sent to device h as part of the project in the reporting period, in cubic metres, worked out:

- (a) using equation 26; or
- (b) using an integrated monitoring system.

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h means an installed electricity production device.

- (6) The emissions from the methane component of coal mine waste gas combusted by the project in the reporting period, in tonnes CO₂-e, is worked out using the formula (*equation 18*):

$$E_{MD} = \sum_h \sum_j E_{MD,h,j}$$

where:

E_{MD} means the emissions from the methane component of coal mine waste gas combusted by the project in the reporting period, in tonnes CO₂-e.

E_{MD,h,j} means the emissions of gas type *j* released from the combustion of the methane component of coal mine waste gas by device *h* as part of the project in the reporting period, in tonnes CO₂-e, worked out using equation 27.

h means an installed electricity production device.

Division 6—Expansion electricity production project method

29 Summary

The carbon dioxide equivalent net abatement amount for an expansion electricity production project is the abatement achieved from installing and operating electricity production devices (subject to a baseline) less:

- (a) the emissions from operating the installed electricity production devices; and
- (b) ancillary emissions of the project; and
- (c) certain parameters associated with electricity production.

The abatement achievable from existing flaring devices and existing electricity production devices is used to determine a baseline for working out the abatement achieved by the project. Only abatement above this baseline is counted as abatement achieved by the project.

30 Net abatement amount

- (1) The carbon dioxide equivalent net abatement amount for an expansion electricity production project for the reporting period, in tonnes CO₂-e, is worked out using the formula (*equation 19*):

$$A_N = A_P + A_G$$

where:

A_N means the carbon dioxide equivalent net abatement amount for the expansion electricity production project for the reporting period, in tonnes CO₂-e.

A_P means the project emissions abated for the reporting period, in tonnes CO₂-e, worked out using equation 20.

A_G means the displaced electricity emissions from electricity production in the reporting period, in tonnes CO₂-e, worked out using equation 28.

- (2) The project emissions abated for the reporting period, in tonnes CO₂-e, is worked out using the formula (*equation 20*):

$$A_P = M_{Com} - (E_{MD} + E_{An})$$

where:

A_P means the project emissions abated for the reporting period, in tonnes CO₂-e.

M_{Com} means the volume of the methane component of coal mine waste gas combusted by the project in the reporting period, in tonnes CO₂-e, worked out using equation 21.

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E_{MD} means the emissions from the methane component of coal mine waste gas combusted by the project in the reporting period, in tonnes CO₂-e, worked out using equation 22.

E_{An} means the ancillary project emissions for the reporting period, in tonnes CO₂-e, worked out using equation 36.

- (3) The volume of the methane component of coal mine waste gas combusted by the project in the reporting period, in tonnes CO₂-e, is worked out using the formula (*equation 21*):

$$M_{Com} = \gamma \times \sum_t \text{Maximum}[DE \times X_{Fl,t} + X_{Gen,t}, 0]$$

where:

M_{Com} means the volume of the methane component of coal mine waste gas combusted by the project in the reporting period, in tonnes CO₂-e.

γ means the factor for converting a quantity of methane from cubic metres to tonnes CO₂-e in section 3.21 of the NGER (Measurement) Determination.

DE has the value of 0.98.

Note: This is the default methane destruction efficiency for a flaring device.

$X_{Fl,t}$ means the volume of the methane component of coal mine waste gas sent to existing flaring devices as part of the project during time interval t less the baseline for the methane component of coal mine waste gas sent to flaring devices for the project, in cubic metres, worked out using equation 23.

$X_{Gen,t}$ means the volume of the methane component of coal mine waste gas sent to installed and existing electricity production devices as part of the project during time interval t less the baseline for the methane component of coal mine waste gas sent to electricity production devices for the project, in cubic metres, worked out using equation 24.

- (4) The emissions from the methane component of coal mine waste gas combusted by the project in the reporting period, in tonnes CO₂-e, is worked out using the formula (*equation 22*):

$$E_{MD} = \sum_h \sum_j E_{MD,h,j}$$

where:

E_{MD} means the emissions from the methane component of coal mine waste gas combusted by the project in the reporting period, in tonnes CO₂-e.

$E_{MD,h,j}$ means the emissions of gas type j released from the combustion of the methane component of coal mine waste gas by device h as part of the project in the reporting period, in tonnes CO₂-e, worked out using equation 27.

h means an installed electricity production device.

31 Volume of methane sent to combustion devices

Methane sent to flaring devices

- (1) The volume of the methane component of coal mine waste gas sent to existing flaring devices as part of the project during time interval t less the baseline for the methane component of coal mine waste gas sent to flaring devices for the project, in cubic metres, is worked out using the formula (**equation 23**):

$$X_{Fl,t} = \sum_m \left(Q_{CH_4,m,t} \times O_{m,t} \right) - B_{CH_4,Fl}$$

where:

$X_{Fl,t}$ means the volume of the methane component of coal mine waste gas sent to existing flaring devices as part of the project during time interval t less the baseline for the methane component of coal mine waste gas sent to flaring devices for the project, in cubic metres.

$Q_{CH_4,m,t}$ means the volume of the methane component of coal mine waste gas sent to device m as part of the project during time interval t , in cubic metres, worked out in accordance with the monitoring requirements.

$O_{m,t}$ means a binary function which has the value 1 if device m is operating during time interval t and 0 if it is not.

Note: **Operating** is defined in section 5.

$B_{CH_4,Fl}$ means the baseline for the methane component of coal mine waste gas sent to flaring devices for the project during time interval t , in cubic meters, worked out using equation 37.

m means an existing flaring device.

- (2) If the value of $X_{Fl,t}$ is greater than zero for time interval t , then the value of $X_{Fl,t}$ is taken to be zero for the time interval.

Methane sent to electricity production devices

- (3) The volume of the methane component of coal mine waste gas sent to installed and existing electricity production devices as part of the project during time interval t less the baseline for the methane component of coal mine waste gas sent to electricity production devices for the project, in cubic metres, is worked out using the formula (**equation 24**):

$$X_{Gen,t} = \sum_h \frac{Q_{EG,h,t} \times F_{MWh \rightarrow GJ}}{Eff_h \times EC_{CMWG}} + \sum_m \frac{Q_{EG,m,t} \times F_{MWh \rightarrow GJ}}{Eff_m \times EC_{CMWG}} - B_{CH_4,Gen}$$

where:

$X_{Gen,t}$ means the volume of the methane component of coal mine waste gas sent to installed and existing electricity production devices as part of the project during time interval t less the baseline for the methane component of coal mine waste gas sent to electricity production devices for the project, in cubic metres.

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$Q_{EG,h,t}$ (or $Q_{EG,m,t}$) means the quantity of electricity produced by device h (or m) during time interval t , in megawatt hours, worked out in accordance with the monitoring requirements.

$F_{MWh \rightarrow GJ}$ has the value of 3.6.

Note: This is the factor converting energy in megawatt hours to gigajoules.

Eff_h (or Eff_m) means the electrical efficiency of device h (or m), which, subject to subsection (4), has:

- (a) the value specified by the manufacturer of the device in the technical specifications for the equipment, with reference to Australian Standard AS 4594.1 or equivalent; or
- (b) the default value of 0.36.

EC_{CMWG} means the energy content factor of coal mine waste gas, in gigajoules per cubic metre, worked out in accordance with the monitoring requirements.

$B_{CH_4,Gen}$ means the baseline for the methane component of coal mine waste gas sent to electricity production devices for the project during time interval t , in cubic meters, worked out using equation 38.

h means an installed electricity production device.

m means an existing electricity production device.

- (4) The same value of Eff_h and Eff_m must be used for that parameter for all time intervals in all reporting periods.

Division 7—Displacement electricity production project method

32 Summary

The carbon dioxide equivalent net abatement amount for a displacement electricity production project is the abatement achieved from installing and operating electricity production devices (subject to a baseline) less certain parameters associated with electricity production. However, unlike a new electricity production project or an expansion electricity production project, the carbon dioxide equivalent net abatement amount for a displacement electricity production project does not take into account abatement from the combustion of the methane component of coal mine waste gas. Only the abatement from displacing electricity is taken into account.

The abatement achievable from existing electricity production devices (if any) is used to determine a baseline for working out the abatement achieved by the project. Only abatement above this baseline is counted as abatement achieved by the project.

33 Net abatement amount

The carbon dioxide equivalent net abatement amount for a displacement electricity production project for the reporting period, in tonnes CO₂-e, is worked out using the formula (*equation 25*):

$$A_N = A_G$$

where:

A_N means the carbon dioxide equivalent net abatement amount for the displacement electricity production project for the reporting period, in tonnes CO₂-e.

A_G means the displaced electricity emissions from electricity production in the reporting period, in tonnes CO₂-e, worked out using equation 28.

Division 8—General calculations for electricity production methods

34 Volume of methane sent to combustion device

- (1) The volume of the methane component of coal mine waste gas sent to device h as part of the project in the reporting period, in cubic metres, is worked out using the formula (*equation 26*):

$$Q_{CH_4,h} = \sum_h \frac{Q_{EG,h} \times F_{MWh \rightarrow GJ}}{Eff_h \times EC_{CMWG}}$$

where:

$Q_{CH_4,h}$ means the volume of the methane component of coal mine waste gas sent to device h as part of the project in the reporting period, in cubic metres.

$Q_{EG,h}$ means the quantity of electricity produced by device h in the reporting period, in megawatt hours, worked out in accordance with the monitoring requirements.

$F_{MWh \rightarrow GJ}$ has the value of 3.6.

Note: This is the factor converting energy in megawatt hours to gigajoules.

Eff_h means the electrical efficiency of device h , which, subject to subsection (2), has:

- (a) the value specified by the manufacturer of the device in the technical specifications for the equipment, with reference to Australian Standard AS 4594.1 or equivalent; or
- (b) the default value of 0.36.

EC_{CMWG} means the energy content factor of coal mine waste gas, in gigajoules per cubic metre, worked out in accordance with the monitoring requirements.

h means an installed electricity production device.

- (2) The same value of Eff_h must be used for that parameter for all time intervals in all reporting periods.

35 Emissions

The emissions of gas type j released from the combustion of the methane component of coal mine waste gas by device h as part of the project in the reporting period, in tonnes CO₂-e, is worked out using the formula (*equation 27*):

$$E_{MD,h,j} = \frac{Q_{CH_4,h} \times EC_{CMWG} \times EF_j}{1000}$$

where:

$E_{MD,h,j}$ means the emissions of gas type j released from the combustion of the methane component of coal mine waste gas by device h as part of the project in the reporting period, in tonnes CO₂-e.

Note: Gas type j is carbon dioxide, methane or nitrous oxide.

$Q_{CH,p,h}$ means the volume of the methane component of coal mine waste gas sent to device h as part of the project in the reporting period, in cubic metres, worked out:

- (a) for a new electricity production project:
 - (i) using equation 26; or
 - (ii) using an integrated monitoring system; or
- (b) for an expansion electricity production project—using equation 26.

EC_{CMWG} means the energy content factor of the coal mine waste gas, in gigajoules per cubic metre, worked out in accordance with the monitoring requirements.

EF_j means the emission factor for gas type j released from the combustion of the methane component of coal mine waste gas that is captured for combustion, in kilograms of CO₂-e per gigajoule, worked out in accordance with the monitoring requirements.

h means an installed electricity production device.

36 Displaced electricity emissions

- (1) The displaced electricity emissions from electricity production in the reporting period, in tonnes CO₂-e, is worked out using the formula (**equation 28**):

$$A_G = NEG_p \times EF_{Elec}$$

where:

A_G means the displaced electricity emissions from electricity production in the reporting period, in tonnes CO₂-e.

NEG_p means the net amount of electricity produced by the combustion of coal mine waste gas by installed and existing electricity production devices as part of the project in the reporting period, in megawatt hours, worked out using equation 29.

EF_{Elec} means:

- (a) for electricity supplied to an electricity grid that is a grid in relation to which the NGA Factors document, in force on the declaration day, includes an emissions factor—that factor, in kilograms CO₂-e per kilowatt hour (or its equivalent of tonnes CO₂-e per megawatt hours); or
- (b) for electricity supplied otherwise than in paragraph (a) (whether to a grid or not):
 - (i) if the receiver of the electricity is able to provide an emissions factor that reflects the emissions intensity of the displaced electricity (worked out in accordance with subsection (3)) and is applicable on

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- the declaration day—that factor, in kilograms CO₂-e per kilowatt hour (or its equivalent of tonnes CO₂-e per megawatt hours); or
- (ii) otherwise—the emissions factor, in kilograms CO₂-e per kilowatt hour (or its equivalent of tonnes CO₂-e per megawatt hours), for off-grid electricity included in the NGA Factors document in force on the declaration day; or
- (c) for electricity produced for the purposes of the mine or the project proponent:
- (i) if the project proponent is able to provide an emissions factor that reflects the emissions intensity of the displaced electricity (worked out in accordance with subsection (3)) and is applicable on the declaration day—that factor, in kilograms CO₂-e per kilowatt hour (or its equivalent of tonnes CO₂-e per megawatt hours); or
 - (ii) otherwise—the emissions factor, in kilograms CO₂-e per kilowatt hour (or its equivalent of tonnes CO₂-e per megawatt hours), for off-grid electricity included in the NGA Factors document in force on the declaration day.
- (2) For the definition of EF_{Elec} in subsection (1), **displaced electricity** is electricity that would have been produced for the receiver, the mine or the project proponent (as the case may be) if electricity had not instead been produced as part of the project.
- (3) For subparagraphs (b)(i) and (c)(i) of the definition of EF_{Elec} in subsection (1), the emissions factor must:
- (a) be worked out on a sent-out basis; and
 - (b) be worked out using a measurement or estimation approach that is consistent with the NGER (Measurement) Determination; and
 - (c) if the displaced electricity would have been produced from more than one source—reflect the weighted average of the emissions intensity applicable on the declaration day of all the sources.
- (4) The net amount of electricity produced by the combustion of coal mine waste gas by installed and existing electricity production devices as part of the project (**NEG_p**) in the reporting period, in megawatt hours, is worked out using the formula (**equation 29**):

$$NEG_p = TEG - \left(FSL + AUX + \left(DEG \times \left(1 - MLF \right) \right) \right)$$

where:

NEG_p means the net amount of electricity produced by the combustion of coal mine waste gas by installed and existing electricity production devices as part of the project in the reporting period, in megawatt hours.

TEG means the total amount of electricity produced as part of the project in the reporting period, in megawatt hours, worked out using equation 30.

FSL means the amount of electricity produced using energy sources that are not coal mine waste gas by installed and existing electricity production devices as

part of the project in the reporting period, in megawatt hours, worked out using equation 32.

AUX means the auxiliary loss for the project in the reporting period, in megawatt hours, worked out in accordance with the monitoring requirements.

DEG means the amount of electricity transmitted or distributed as part of the project in the reporting period (other than electricity used by installed and existing electricity production devices as part of the project or the local distribution network), in megawatt hours, worked out in accordance with the monitoring requirements.

MLF means the marginal loss factor for the project which is:

- (a) if the project is part of the national electricity market:
 - (i) the factor published by the Australian Energy Market Operator Limited (ACN 072 010 327) that was valid for the most number of days in the reporting period; or
 - (ii) if more than one factor satisfies subparagraph (i) in the reporting period—the average of all the factors that satisfy subparagraph (i) in the reporting period; or
 - (b) in any other case:
 - (i) the factor determined by the relevant authority of the State or Territory in which the device is located that was valid for the most number of days in the reporting period; or
 - (ii) if more than one factor satisfies subparagraph (i) in the reporting period—the average of all the factors that satisfy subparagraph (i) in the reporting period.
- (5) The following electricity is disregarded for the purposes of equation 29:
- (a) electricity that was not used to directly meet demand for electricity;
 - (b) electricity produced by a device where an approval to use coal mine waste gas as an energy source:
 - (i) is required by a Commonwealth, State, Territory or local government authority; and
 - (ii) the nominated person for the device is unable to give evidence of that approval.
- (6) If the amount calculated using equation 29 exceeds 1 megawatt hour and results in an amount that is not a whole megawatt hour, the amount must be rounded down to the nearest megawatt hour.

37 Electricity produced by project

- (1) The total amount of electricity produced as part of the project in the reporting period, in megawatt hours, is worked out using the formula (**equation 30**):

$$\text{TEG} = \sum_t \text{Maximum}[X_t, 0]$$

where:

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TEG means the total amount of electricity produced as part of the project in the reporting period, in megawatt hours.

X_t means the amount of electricity produced by installed and existing electricity production devices as part of the project during time interval t less the baseline for electricity production for the project, in megawatt hours, worked out using equation 31.

- (2) The amount of electricity produced by installed and existing electricity production devices as part of the project during time interval t less the baseline for electricity production for the project, in megawatt hours, is worked out using the formula (**equation 31**):

$$X_t = \sum_h Q_{EG,h,t} + \sum_m Q_{EG,m,t} - B_{EG}$$

where:

X_t means the amount of electricity produced by installed and existing electricity production devices as part of the project during time interval t less the baseline for electricity production for the project, in megawatt hours.

Q_{EG,h,t} (or **Q_{EG,m,t}**) means the quantity of electricity produced by device h (or m) during time interval t in the reporting period, in megawatt hours, worked out in accordance with the monitoring requirements.

B_{EG} means the baseline for electricity production for the project, in megawatt hours, worked out using equation 34.

h means an installed electricity production device.

m means an existing electricity production device.

Note: For a new electricity production project there will be no device m and therefore no B_{EG}. This may also be the case for a displacement electricity production project.

38 Electricity produced by using fuel other than coal mine waste gas

- (1) The amount of electricity produced using energy sources that are not coal mine waste gas by installed and existing electricity production devices as part of the project in the reporting period, in megawatt hours, is worked out using the formula (**equation 32**):

$$FSL = F_{GJ \rightarrow MWh} \times \sum_i Z_i$$

where:

FSL means the amount of electricity produced using energy sources that are not coal mine waste gas by installed and existing electricity production devices as part of the project in the reporting period, in megawatt hours.

F_{GJ→MWh} has the value of 1/3.6.

Note: This is the factor converting energy in gigajoules to megawatt hours.

Z_i means the energy content of fuel type i that is not coal mine waste gas consumed in the reporting period, in gigajoules, worked out using equation 33.

- (2) The energy content of fuel type i that is not coal mine waste gas consumed in the reporting period, in gigajoules, is worked out using the formula (*equation 33*):

$$Z_i = Q_{FSL,i} \times EC_{FSL,i}$$

where:

Z_i means the energy content of fuel type i that is not coal mine waste gas consumed in the reporting period, in gigajoules.

$Q_{FSL,i}$ means the quantity of fuel type i consumed by installed and existing electricity production devices as part of the project in the reporting period, in appropriate units, worked out in accordance with the monitoring requirements.

$EC_{FSL,i}$ means the energy content factor of fuel type i , in appropriate units, worked out in accordance with the monitoring requirements.

Note: **Energy** includes the fuels and energy commodities listed in Schedule 1 to the *NGER Regulations 2008*. See the definition of **energy** in section 7 of the *National Greenhouse and Energy Reporting Act 2007* and regulation 2.03 of the *NGER Regulations 2008*.

39 Baseline for electricity production

- (1) The baseline for electricity production for the project, in megawatt hours, is worked out using the formula (*equation 34*):

$$B_{EG} = \sum_m Q_{Gen,Cap,m} \times AF_{Gen,m}$$

where:

B_{EG} means the baseline for electricity production for the project, in megawatt hours.

$Q_{Gen,Cap,m}$ means the recognised capacity of device m during time interval t , in megawatt hours, worked out at the application time in accordance with subsection (3).

$AF_{Gen,m}$ means the annual availability factor of device m which, subject to subsection (4) has:

- (a) the value calculated in accordance with the standard maintenance cycle specified by the manufacturer; or
- (b) the default value of 1.

m means an existing electricity production device.

- (2) The summation over m is to be performed over all existing electricity production devices at the point of the highest total recognised capacity of all of the existing devices in the period between 24 April 2014 and the application time.

Note: The summation over m results in a fixed quantity and is the same for all equal time intervals.

- (3) The recognised capacity of device m during time interval t is calculated by multiplying the manufacturer's specifications for the maximum electricity capable of being produced by operating the device per unit time, with the result expressed in megawatt hours.

Part 4 Net abatement amounts

Division 8 General calculations for electricity production methods

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- (4) The same value of $AF_{Gen,m}$ must be used for that parameter for all time intervals in all reporting periods.

Division 9—General calculations for flaring and electricity production methods

40 Historic abatement

The *historic abatement* from the combustion of the methane component of coal mine waste gas from the mine, in tonnes CO₂-e, is worked out using the formula (*equation 35*):

$$A_H = 5.775 \times E_H$$

where:

A_H means the historic abatement from the combustion of the methane component of coal mine waste gas from the mine, in tonnes CO₂-e.

E_H means the greater of:

- (a) the highest total emissions resulting from the combustion of the methane component of coal mine waste gas as reported in any NGER report relating to the mine, in tonnes CO₂-e; and
- (b) the total emissions released as a result of the combustion of the methane component of coal mine waste gas from the mine, in tonnes CO₂-e, and determined in accordance with reporting requirements under the *National Greenhouse and Energy Reporting Act 2007* in the period between:
 - (i) the start of the current NGER reporting year; and
 - (ii) the application time.

Note 1: 5.775 is the dimensionless conversion factor to convert historic emissions from the combustion of the methane component of coal mine waste gas to historic abatement from the combustion of the methane component of coal mine waste gas.

Note 2: If the result of equation 35 is greater than 5 000 tonnes CO₂-e, there has been material abatement (see section 7) and the project cannot be a new flaring project or a new electricity production project.

41 Ancillary project emissions

- (1) The ancillary project emissions for the reporting project, in tonnes CO₂-e, is worked out using the formula (*equation 36*):

$$E_{An} = \left(Q_{Elec} \times EF_{Elec} \right) + \sum_i \sum_j \frac{Q_{SE,i} \times EC_i \times EF_{i,j}}{1000}$$

where:

E_{An} means the ancillary project emissions for the reporting period, in tonnes CO₂-e.

Q_{Elec} means the quantity of electricity consumed from the operation of the project that is not produced by the project in the reporting period (if any), in megawatt hours, worked out in accordance with the monitoring requirements.

EF_{Elec} means:

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- (a) for electricity obtained from an electricity grid that is a grid in relation to which the NGA Factors document, in force on the declaration day, includes an emissions factor—that factor, in kilograms CO₂-e per kilowatt hour (or its equivalent of tonnes CO₂-e per megawatt hours); or
- (b) for electricity obtained otherwise (whether from a grid or not):
 - (i) if the supplier of the electricity is able to provide an emissions factor that reflects the emissions intensity of the electricity (worked out in accordance with subsection (2)) and is applicable on the declaration day—that factor, in kilograms CO₂-e per kilowatt hour (or its equivalent of tonnes CO₂-e per megawatt hours); or
 - (ii) otherwise—the emissions factor, in kilograms CO₂-e per kilowatt hour (or its equivalent of tonnes CO₂-e per megawatt hours), for off-grid electricity included in the NGA Factors document in force on the declaration day.

$Q_{SE,i}$ means the quantity of additional fuel type *i* that is not coal mine waste gas combusted for stationary energy purposes from the operation of the project in the reporting period (if any), in units appropriate for the application of the energy content factor (EC_i), worked out in accordance with the monitoring requirements.

EC_i means the energy content factor of fuel type *i* combusted for stationary energy purposes in Part 1, 2 or 3 (as appropriate) of Schedule 1 to the NGER (Measurement) Determination, in gigajoules per kilolitre (or other appropriate units).

EF_{ij} means the emission factor for each gas type *j* released due to the combustion of fuel type *i* for stationary energy purposes in Part 1, 2 or 3 (as appropriate) of Schedule 1 to the NGER (Measurement) Determination, in kilograms of CO₂-e per gigajoule of fuel type *i*.

Note: The emission factor incorporates relevant oxidisation factors for the gas type.

- (2) For subparagraph (b)(i) of the definition of EF_{Elec} in subsection (1), the emissions factor must be worked out:
 - (a) on a sent-out basis; and
 - (b) using a measurement or estimation approach that is consistent with the NGER (Measurement) Determination.
- (3) In working out the ancillary project emissions, the project proponent must include any emissions that are reasonably associated with any energy required for the collection, transport and combustion of the coal mine waste gas combusted as part of the project.
- (4) This includes any emissions resulting from the combustion of fossil fuel or the consumption of electricity purchased from a State, Territory or electricity grid by the following:
 - (a) compressors, blowers or coal mine waste gas gathering systems;
 - (b) transporting coal mine waste gas for the purposes of combusting it as part of the project.

- (5) However, emissions relating to equipment installed for the safety of the mine are not ancillary project emissions.
- (6) If the project is an expansion electricity production project or expansion flaring project, in working out the ancillary project emissions for the project the proponent must include the proportion of emissions associated with the operation of the following:
- (a) installed flaring devices;
 - (b) installed electricity production devices;
 - (c) supporting equipment for those devices.

Note: The proportion of emissions associated with existing devices are not ancillary project emissions. This includes emissions from devices mentioned in paragraph (c) to the extent those emissions are associated with the operation of existing devices.

42 Baseline for the methane component of coal mine waste gas sent to flaring devices

- (1) The baseline for the methane component of coal mine waste gas sent to flaring devices for the project during time interval t , in cubic meters, is worked out using the formula (*equation 37*):

$$B_{CH_4,FI} = \sum_m Q_{FI,Cap,m} \times AF_{FI,m}$$

where:

$B_{CH_4,FI}$ means the baseline for the methane component of coal mine waste gas sent to flaring devices for the project during time interval t , in cubic meters.

$Q_{FI,Cap,m}$ means the recognised capacity of device m during time interval t , in cubic metres, worked out at the application time in accordance with subsection (3).

$AF_{FI,m}$ means the annual availability factor of device m which, subject to subsection (4), has:

- (a) the value calculated in accordance with the standard maintenance cycle specified by the manufacturer; or
- (b) the default value of 1.

m means an existing flaring device.

- (2) The summation over m is to be performed over all existing flaring devices at the point of the highest total recognised capacity of all of the existing devices in the period between 24 April 2014 and the application time.

Note: The summation over m results in a fixed quantity and is the same for all equal time intervals.

- (3) The recognised capacity of device m during time interval t is calculated by:
- (a) multiplying the manufacturer's specifications for the maximum energy released per unit time by the time interval in appropriate units, with the result expressed in gigajoules; and
 - (b) converting the result of paragraph (a) to cubic metres by multiplying it by the factor 37.7×10^{-3} gigajoules per cubic metre.

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- (4) The same value of $AF_{Fl,m}$ must be used for that parameter for all time intervals in all reporting periods.

43 Baseline for the methane component of coal mine waste gas sent to electricity production devices

- (1) The baseline for the methane component of coal mine waste gas sent to electricity production devices for the project during time interval t , in cubic meters, is worked out using the formula (*equation 38*):

$$B_{CH_4,Gen} = \sum_m \frac{Q_{Gen,Cap,m} \times F_{MWh \rightarrow GJ}}{Eff_m \times EC_{CMWG}} \times AF_{Gen,m}$$

where:

$B_{CH_4,Gen}$ means the baseline for the methane component of coal mine waste gas sent to electricity production devices for the project during time interval t , in cubic meters.

$Q_{Gen,Cap,m}$ means the recognised capacity of device m during time interval t , in megawatt hours, worked out at the application time in accordance with subsection (3).

$F_{MWh \rightarrow GJ}$ has the value of 3.6.

Note: This is the factor converting energy in megawatt hours to gigajoules.

Eff_m means the electrical efficiency of device m , which, subject to subsection (4), has:

- (a) the value specified by the manufacturer of the device in the technical specifications for the equipment, with reference to Australian Standard AS 4594.1 or equivalent; or
- (b) the default value of 0.36.

EC_{CMWG} means the energy content factor of coal mine waste gas, in gigajoules per cubic metre, worked out in accordance with the monitoring requirements.

$AF_{Gen,m}$ means the annual availability factor of device m which, subject to subsection (4), has:

- (a) the value calculated in accordance with the standard maintenance cycle specified by the manufacturer; or
- (b) the default value of 1.

m means an existing electricity production device.

- (2) The summation over m is to be performed over all existing electricity production devices at the point of the highest total recognised capacity of all of the existing devices in the period between 24 April 2014 and the application time.

Note: The summation over m results in a fixed quantity and is the same for all equal time intervals.

- (3) The recognised capacity of device m during time interval t is calculated by multiplying the manufacturer's specifications for the maximum electricity

capable of being produced by operating the device per unit time, with the result expressed in megawatt hours.

- (4) The same value of $AF_{Gen,m}$ and Eff_m must be used for that parameter for all time intervals in all reporting periods.

Part 5—Reporting, record-keeping and monitoring requirements

Note Other reporting, record keeping and monitoring requirements are set out in regulations and rules made under the Act.

Division 1—Offsets report requirements

44 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 a coal mine waste gas project that is an eligible offsets project.

45 Determination of certain factors and parameters

- (1) If, in the circumstances described in paragraph 9(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 include the following information for the factor or parameter:
 - (a) the versions of the instrument or writing used;
 - (b) the start and end dates of each use;
 - (c) 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.
- (2) If a parameter is determined under section 48 for the purpose of working out the carbon dioxide equivalent net abatement amount for a coal mine waste gas project for a reporting period, the offsets report about the project for the reporting period must include the following information for the parameter:
 - (a) the name of the parameter;
 - (b) the start and end dates of the non-monitored period for which the parameter was determined;
 - (c) the value of the parameter and how that value was calculated;
 - (d) the reasons why the project proponent failed to monitor the parameter as required by the monitoring requirements.

Division 2—Monitoring requirements

46 Operation of this Division

For paragraph 106(3)(d) of the Act, this Division sets out:

- (a) requirements to monitor a coal mine waste gas project that is an eligible offsets project (see section 47); and
- (b) certain consequences if the project proponent fails to monitor the project as required (see section 48).

47 Monitoring requirements

- (1) The project proponent for a coal mine waste gas project must monitor a parameter set out in an item of the following table in accordance with the instructions in the item.

| Monitored parameters | | | | |
|----------------------|--|---|-------|---|
| Item | Parameter | Description | Unit | Measurement procedure (including frequency as required) |
| 1 | $Q_{CH_4,h}$, if worked out using an integrated monitoring system | Volume of the methane component of coal mine waste gas sent to device h as part of the project in the reporting period | m^3 | <p>Estimated using an integrated monitoring system in accordance with:</p> <p>(a) Subdivision 2.3.3.2 of the NGER (Measurement) Determination; and</p> <p>(b) the AAA criterion in Division 2.3.6 of the NGER (Measurement) Determination; and</p> <p>(c) subsections (2) and (3).</p> <p>Frequency:</p> <p>(d) the volume of coal mine waste gas sent to device h must be monitored at a frequency of at least once every 15 minutes, but not more frequent than once per second; and</p> <p>(e) the fraction of the volume of coal mine waste gas that is methane must be monitored at a frequency of at least once a month</p> |
| 2 | $Q_{CH_4,h,t}$ (or $Q_{CH_4,m,t}$) | Volume of the methane component of coal mine waste gas sent to device h (or device m) as part of the project during time interval t | m^3 | <p>Estimated in accordance with:</p> <p>(a) Subdivision 2.3.3.2 of the NGER (Measurement) Determination; and</p> <p>(b) the AAA criterion in Division 2.3.6 of the NGER (Measurement) Determination; and</p> <p>(c) subsections (2) and (3).</p> <p>Frequency:</p> <p>(d) the volume of coal mine waste gas sent</p> |

Part 5 Reporting, record-keeping and monitoring requirements

Division 2 Monitoring requirements

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| Monitored parameters | | | | |
|----------------------|---------------------------------|--|--------------------------|--|
| Item | Parameter | Description | Unit | Measurement procedure (including frequency as required) |
| | | | | to device h must be monitored: (i) at a frequency of at least once every 15 minutes, but not more frequent than once per second; and (ii) at the same frequency as $O_{h,t}$ (or $O_{m,t}$); and (e) the fraction of the volume of coal mine waste gas that is methane must be monitored at a frequency of at least once a month |
| 3 | $Q_{EG,h}$ | Quantity of electricity produced by device h in the reporting period | MWh | Estimated in accordance with Part 6.1 of the NGER (Measurement) Determination. Frequency—continuous |
| 4 | $Q_{EG,h,t}$ (or $Q_{EG,m,t}$) | Quantity of electricity produced by device h (or device m) during time interval t | MWh | Estimated in accordance with Part 6.1 of the NGER (Measurement) Determination. Frequency—continuous |
| 5 | $O_{h,t}$ (or $O_{m,t}$) | Binary function which has the value 1 if device h (or m) is operating during time interval t and 0 if it is not | N/A | Whether the device is operating is determined in accordance with: (a) for flaring devices—the manufacturer’s specifications for the device at the commencement of the project and subsections (4) to (6); or (b) for electricity production devices—the manufacturer’s specifications for the device at the commencement of the project. Frequency—at least once every 15 minutes, but not more frequent than once per second, and at the same frequency as $Q_{CH_4,h,t}$ (or $Q_{CH_4,m,t}$) |
| 6 | EF_j (for equation 13) | Emission factor for gas type j released from the combustion of the methane component of coal mine waste gas that is captured for | kg CO ₂ -e/GJ | Worked out: (a) where j is methane—using the emission factor for methane released from the combustion of the methane component of coal mine waste gas that is captured for combustion in item 19 of Schedule 1 to the NGER (Measurement) Determination; and (b) where j is nitrous oxide—using the |

| Monitored parameters | | | | |
|-----------------------------|--------------------------|---|--------------------------|--|
| Item | Parameter | Description | Unit | Measurement procedure (including frequency as required) |
| | | combustion | | <p>emission factor for nitrous oxide released from the combustion of the methane component of coal mine waste gas that is captured for combustion in item 19 of Schedule 1 to the NGER (Measurement) Determination; and</p> <p>(c) where j is carbon dioxide—using one of the following options:</p> <p>(i) using the emission factor for carbon dioxide released from the combustion of the methane component of coal mine waste gas that is captured for combustion in item 19 of Schedule 1 to the NGER (Measurement) Determination;</p> <p>(ii) in accordance with section 2.22 of the NGER (Measurement) Determination;</p> <p>(iii) in accordance with section 2.26 of the NGER (Measurement) Determination.</p> <p>However, the option used to work out EF_j, where j is carbon dioxide, must be used for all installed devices that are part of the project and:</p> <p>(d) if the option in subparagraph (c)(ii) is used in a reporting period, then only an option in subparagraph (c)(ii) or (iii) may be used in the next reporting period; and</p> <p>(e) if the option in subparagraph (c)(iii) is used in a reporting period, then only that option may be used in any subsequent reporting period.</p> <p>Frequency—in accordance with the NGER (Measurement) Determination</p> |
| 7 | EF_j (for equation 27) | Emission factor for gas type j released from the combustion of the methane component of coal mine waste gas that is captured for combustion | kg CO ₂ -e/GJ | <p>Worked out:</p> <p>(a) where j is methane—using one of the following options:</p> <p>(i) using the emission factor for methane released from the combustion of the methane component of coal mine waste gas that is captured for combustion in item 19 of Schedule 1 to the NGER</p> |

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| Monitored parameters | | | | |
|-----------------------------|------------------|--------------------|-------------|--|
| Item | Parameter | Description | Unit | Measurement procedure (including frequency as required) |
| | | | | <p>(Measurement) Determination;</p> <p>(ii) using the emission factor that applies in estimating emissions of methane in section 2.27 of the NGER (Measurement) Determination; and</p> <p>(b) where j is nitrous oxide—using the emission factor for nitrous oxide released from the combustion of the methane component of coal mine waste gas that is captured for combustion in item 19 of Schedule 1 to the NGER (Measurement) Determination; and</p> <p>(c) where j is carbon dioxide—using one of the following options:</p> <p>(i) using the emission factor for carbon dioxide released from the combustion of the methane component of coal mine waste gas that is captured for combustion in item 19 of Schedule 1 to the NGER (Measurement) Determination;</p> <p>(ii) in accordance with section 2.22 of the NGER (Measurement) Determination;</p> <p>(iii) in accordance with section 2.26 of the NGER (Measurement) Determination.</p> <p>However, the option used to work out EF_j, where j is methane, must be used for all installed electricity production devices and if the option in subparagraph (a)(ii) is used in a reporting period, then only that option may be used in any subsequent reporting period.</p> <p>However, the option used to work out EF_j, where j is carbon dioxide, must be used for all installed electricity production devices and:</p> <p>(d) if the option in subparagraph (c)(ii) is used in a reporting period, then only an option in subparagraph (c)(ii) or (iii) may be used in the next reporting period; and</p> <p>(e) if the option in subparagraph (c)(iii) is used in a reporting period, then only that</p> |

| Monitored parameters | | | | |
|-----------------------------|-------------------|--|--|---|
| Item | Parameter | Description | Unit | Measurement procedure (including frequency as required) |
| | | | | option may be used in any subsequent reporting period. Frequency—in accordance with the NGER (Measurement) Determination |
| 8 | Q _{Elec} | Quantity of electricity consumed from the operation of the project that is not produced by the project in the reporting period (if any) | MWh | Evidenced by invoices, contractual arrangements or industry metering records. Frequency—continuous |
| 9 | Q _{SE,i} | Quantity of additional fuel type i that is not coal mine waste gas combusted for stationary energy purposes in the reporting period (if any) | Units appropriate for the application of the energy content factor (<i>EC_i</i>) | Estimated in accordance with Division 2.2.5, 2.3.6 or 2.4.6 (as appropriate) of the NGER (Measurement) Determination. Frequency—continuous |
| 10 | AUX | Auxiliary loss for the project in the reporting period | MWh | Estimated in accordance with Part 6.1 of the NGER (Measurement) Determination: (a) including the amount of electricity used to produce electricity and to operate and maintain electricity production devices that are part of the project; and (b) not including any electricity used for network support and control ancillary services. If the project also produces electricity using an energy source that is not coal mine waste gas, the project proponent may deduct auxiliary losses that are attributable to that source from the total auxiliary loss for the project proportionate to the amount of electricity produced from that source. Note: See regulation 16 of the <i>Renewable Energy (Electricity) Regulations 2001</i> in relation to working out the auxiliary loss from energy sources that are not eligible energy sources. Frequency—in accordance with the NGER (Measurement) Determination |
| 11 | DEG | Amount of | MWh | Monitored in accordance with the metering |

Part 5 Reporting, record-keeping and monitoring requirements

Division 2 Monitoring requirements

Section 47

| Monitored parameters | | | | |
|-----------------------------|--|--|-------------------|---|
| Item | Parameter | Description | Unit | Measurement procedure (including frequency as required) |
| | | electricity transmitted or distributed that is part of the project in the reporting period (other than electricity used by installed and existing electricity production devices as part of the project or the local distribution network) | | requirements applicable to the region where the project is located. Measured: (a) if the project is part of the national electricity market—at the metering point determined under the National Electricity Rules in force at the time of measurement; or (b) in any other case—at the metering point determined at the time of measurement by a relevant authority of the State or Territory where the project is located. If measured in gigajoules, the quantity of megawatt hours is calculated by dividing the amount in gigajoules by the conversion factor of 3.6. Frequency—continuous |
| 12 | $Q_{FSL,i}$ | Quantity of fuel type <i>i</i> consumed as part of the project in the reporting period | Appropriate units | Estimated in accordance with section 6.5 of the NGER (Measurement) Determination. Frequency—as fuel is consumed |
| 13 | $EC_{FSL,i}$ | Energy content factor of fuel type <i>i</i> | Appropriate units | Estimated in accordance with section 6.5 of the NGER (Measurement) Determination. Frequency—in accordance with the NGER (Measurement) Determination |
| 14 | EC_{CMWG} (other than for equation 27) | Energy content factor of coal mine waste gas | GJ/m ³ | Estimated using the energy content factor of coal mine waste gas that is captured for combustion in item 19 of Schedule 1 to the NGER (Measurement) Determination. Frequency—in accordance with the NGER (Measurement) Determination |
| 15 | EC_{CMWG} (for equation 27) | Energy content factor of coal mine waste gas | GJ/m ³ | Either: (a) using the energy content factor of coal mine waste gas that is captured for combustion in item 19 of Schedule 1 to the NGER (Measurement) Determination; or (b) by analysis in accordance with Subdivision 2.3.3.2 of the NGER (Measurement) Determination. However, the option used to work out |

| Monitored parameters | | | | |
|-----------------------------|------------------|--------------------|-------------|---|
| Item | Parameter | Description | Unit | Measurement procedure (including frequency as required) |
| | | | | <p>EC_{CMWG} must be used for all installed electricity production devices and if the option in paragraph (b) is used in a reporting period, then only that option may be used in any subsequent reporting period.</p> <p>Frequency—in accordance with the NGER (Measurement) Determination</p> |

$Q_{CH_4,h}$, $Q_{CH_4,h,t}$ or $Q_{CH_4,m,t}$

- (2) To estimate $Q_{CH_4,h}$ (if worked out using an integrated monitoring system), $Q_{CH_4,h,t}$ or $Q_{CH_4,m,t}$ the project proponent must use:
- a flow computer to estimate the volume of coal mine waste gas sent to device h (or m); and
 - either of the following to measure the methane component of coal mine waste gas sent to device h (or m):
 - a gas chromatograph;
 - a gas analyser.
- (3) However, if a gas analyser is used:
- the maximum upper bound percentage uncertainty, expressed as a decimal fraction (U_h), associated with the measurement of the fraction of the volume of coal mine waste gas that is methane that is sent to each device h must be calculated according to standard methods; and
 - the quantity of methane is adjusted by multiplying $Q_{CH_4,h}$, $Q_{CH_4,h,t}$ or $Q_{CH_4,m,t}$ by the factor $(1-U_h)$.

$O_{h,t}$ (or $O_{m,t}$)

- (4) Subject to subsections (5) and (6), the project proponent may use one of the following methods to measure whether flaring device h (or m) is operating in time interval t:
- temperature measurement;
 - a UV detection sensor coupled to a flare management system;
 - another internationally recognised apparatus for monitoring the operation of a flaring device.
- (5) If temperature measurement is used, then the device is taken not to be operating in a time interval if:
- there is no record of the temperature of the exhaust gas of the flare for the time interval; or
 - the recorded temperature is less than 500°C for any period in the time interval.

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- (6) If a UV detection sensor or another internationally recognised apparatus is used, then the device is taken not to be operating in a time interval if:
- (a) there is no record of the operation of the device for the time interval or;
 - (b) the operation of the device falls below one of the following operational thresholds for any period in the time interval;
 - (i) if the manufacturer has specified an operational threshold for the device—that threshold;
 - (ii) otherwise—the internationally recognised standard for the device.

48 Consequence of failure to monitor certain parameters

- (1) If, during a particular period (the *non-monitored period*) in a reporting period, a project proponent for a coal mine waste gas project fails to monitor a parameter as required by the monitoring requirements, the value of the parameter for the purpose of working out the carbon dioxide equivalent net abatement amount for the reporting period is to be determined for the non-monitored period in accordance with the following table.

| Consequence of not meeting requirement to monitor certain parameters | | |
|---|---|--|
| Item | Parameter | Determination of parameter for non-monitored period |
| 1 | Each of the following: (a) EF_j (for equations 13 and 27); (b) EC_{CMWG} (for equation 27) | The parameter is: (a) for any cumulative period of up to 3 months in any 12 months of a crediting period for the project—the factor for the gas set out in item 19 of Schedule 1 to the NGER (Measurement) Determination multiplied by 1.1; and (b) for any period in excess of that 3 months—the factor for the gas set out in item 19 of Schedule 1 to the NGER (Measurement) Determination multiplied by 1.5 |
| 2 | Each of the following: (a) Q_{Elec} ; (b) $Q_{SE,i}$; (c) AUX; (d) DEG; (e) $Q_{FSL,i}$; (f) $EC_{FSL,i}$ | The project proponent must make a conservative estimate of the parameter having regard to: (a) any relevant measuring or estimation approaches or requirements that apply to the parameter under the NGER (Measurement) Determination; and (b) any relevant historical data for the project; and (c) any other data for the project that relates to the parameter; and (d) any other matter the project proponent considers relevant |

- (2) To avoid doubt, this section does not prevent the Regulator from taking action under the Act, or regulations or rules made under the Act, in relation to the project proponent’s failure to monitor a parameter as required by the monitoring requirements.

- Note: Examples of action that may be taken include the following:
- (a) if the failure constitutes a breach of a civil penalty provision in section 194 of the Act (which deals with project monitoring requirements), the Regulator may apply for a civil penalty order in respect of the breach;
 - (b) if false or misleading information was given to the Regulator in relation to the failure, the Regulator may revoke the project’s section 27 declaration under regulations or rules made for the purposes of section 38 of the Act;

- (c) if the giving of false or misleading information in relation to the failure led to the issue of Australian carbon credit units, the Regulator may require all or some of those units to be relinquished under section 88 of the Act.