National Greenhouse and Energy Reporting (Measurement) Amendment Determination 2016 (No. 1)

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

Dated 4 May 2016

Greg Hunt

Greg Hunt
Minister for the Environment

Contents

1 Name

This is the *National Greenhouse and Energy Reporting (Measurement) Amendment Determination 2016 (No. 1)*.

2 Commencement

(1) Each provision of this instrument specified in column 1 of the table commences, or is taken to have commenced, in accordance with column 2 of the table. Any other statement in column 2 has effect according to its terms.

Commencement information

Column 1	Column 2	Column 3
Provisions	**Commencement**	**Date/Details**
1. The whole of this instrument	1 July 2016.	1 July 2016

Note: This table relates only to the provisions of this instrument as originally made. It will not be amended to deal with any later amendments of this instrument.

(2) Any information in column 3 of the table is not part of this instrument. Information may be inserted in this column, or information in it may be edited, in any published version of this instrument.

3 Authority

This instrument is made under the *National Greenhouse and Energy Reporting Act 2007*.

4 Schedules

Each instrument that is specified in a Schedule to this instrument is amended or repealed as set out in the applicable items in the Schedule concerned, and any other item in a Schedule to this instrument has effect according to its terms.

Schedule 1—Miscellaneous amendments

National Greenhouse and Energy Reporting (Measurement) Determination 2008

1 Paragraph 1.3(1)(c)

Omit "facilities;", substitute "facilities.".

2 Paragraph 1.3(1)(d)

Repeal the paragraph.

3 At the end of subsection 1.3(1)

Add:

Note: ***Facility*** has the meaning given by section 9 of the Act.

4 Subsection 1.3(2)

Omit ", scope 2 emissions and potential greenhouse gas emissions embodied in an amount of designated fuel", substitute "and scope 2 emissions".

5 Subsection 1.3(2) (notes 1, 2 and 3)

Repeal the notes.

6 Subsection 1.3(2) (note 4)

Omit "Note 4", substitute "Note".

7 Section 1.8

Repeal the following definitions:

(a) definition of ***designated fuel***;
(b) definition of ***invoice equivalent***;
(c) definition of ***gaseous designated fuel***;
(d) definition of ***liquid designated fuel***.

8 Section 1.8 (definition of *method*)

Repeal the definition, substitute:

method means a method specified in this determination for estimating emissions released from the operation of a facility in relation to a source.

9 Section 1.8

Repeal the following definitions:

(a) definition of ***natural gas supply pipeline***;
(b) definition of ***netted out number***;
(c) definition of ***Opt-in Scheme***;
(d) definition of ***OTN***;
(e) definition of ***point of liability***.

10 Section 1.8 (definition of *supply*)

Repeal the definition, substitute:

supply means supply by way of sale, exchange or gift.

11 Subsections 1.19(1) and (2)

Omit "or potential greenhouse gas emissions embodied in an amount of designated fuel".

12 Section 3.40A (paragraph (c) of the definition of *natural gas*)

Omit "that is captured for combustion where the production of coal is not intended to occur".

13 Section 4.66 (Step 1)

Repeal the step, substitute:

Step 1 Calculate the carbon content in fuel types (***i***) and carbonaceous input materials (***i***) delivered for the activity during the year measured in tonnes of carbon as follows:

$$\sum_i CCF_i \times Q_i$$

where:

Σ_i means sum the carbon content values obtained for all fuel types (***i***) and carbonaceous input materials (***i***).

CCF_i is the carbon content factor measured in tonnes of carbon for each appropriate unit of fuel type (***i***) mentioned in Schedule 3 or carbonaceous input material (***i***) consumed during the year from the operation of the activity.

Q_i is the quantity of fuel type (***i***) or carbonaceous input material (***i***) delivered for the activity during the year measured in an appropriate unit and estimated in accordance with criterion A in Divisions 2.2.5, 2.3.6, 2.4.6 and 4.2.5.

14 Subparagraph 4.100(1)(a)(i)

Omit "paragraph 4.16(1)(a)", substitute "paragraphs 4.16(1)(a) to (d)".

15 Subsection 5.11(2) (table item 9)

Omit "32.2". substitute "32.1".

16 Subsection 5.11(3) (table item 9 of the table headed "Default waste stream percentage for waste mix type")

Omit "32.2". substitute "32.1".

17 Section 6.4 (note 2)

Omit "2.23", substitute "2.26".

18 Subsection 8.1(1)

Omit ", a facility and a registered corporation".

19 Section 8.3 (heading)

Repeal the heading, substitute:

8.3 Required method

20 Subsection 8.3(1)

Omit "for a registered corporation".

21 Subsection 8.3(1)

Omit ", having regard to all of the facilities under the operational control of the corporation".

22 Subsection 8.3(2)

Omit "multiple".

23 Section 8.4

Omit all the words after "is used to", substitute "estimate scope 1 emissions for a source".

24 Subsection 8.5(1)

Omit "(1)".

25 Subsections 8.5(2) and (3)

Repeal the subsections.

26 Subsection 8.11(1)

Omit "subsection 8.5(1)", substitute "section 8.5".

27 Sections 8.12 and 8.13

Repeal the sections.

28 Section 8.14

Omit "from the operation of a facility that are", substitute "for a source that are".

29 Part 6 of Schedule 1

Repeal the Part, substitute:

Part 6—Indirect (scope 2) emission factors from consumption of purchased electricity from grid

Indirect (Scope 2) Emissions Factors from Consumption of Purchased Electricity from Grid		
Item	**State, Territory or grid description**	**Emission factor kg CO_2-e/kWh**
77	New South Wales and Australian Capital Territory	0.84
78	Victoria	1.09
79	Queensland	0.78
80	South Australia	0.53
81	South West Interconnected System in Western Australia	0.72
82	Tasmania	0.12

Indirect (Scope 2) Emissions Factors from Consumption of Purchased Electricity from Grid		
Item	**State, Territory or grid description**	**Emission factor kg CO_2-e/kWh**
83	Northern Territory	0.67

Schedule 2—Legacy waste

National Greenhouse and Energy Reporting (Measurement) Determination 2008

1 Section 1.8

Insert:

legacy emissions has the same meaning as in the *National Greenhouse and Energy Reporting (Safeguard Mechanism) Rule 2015*.

2 Section 1.8 (definitions of *legacy waste* and *non-legacy waste*)

Omit "2012", substitute "2016".

3 At the end of section 5.3

Add:

(4) If required, Division 5.2.7 is to be used to estimate legacy emissions.

Note: Division 5.2.7 will not be required unless the total amount of scope 1 emissions from the operation of the facility concerned during the year is more than 100 000 tonnes CO_2-e: see paragraphs (i) of item 1 and (j) of item 2 in the column headed "Matters to be identified" in the table in Part 6 of Schedule 3 to the *National Greenhouse and Energy Reporting Regulations 2008*.

4 At the end of section 5.17AA

Add:

Note: Section 5.22A sets out, for a landfill operator using method 1 in Division 5.2.2 to estimate emissions of methane released from legacy waste in a landfill, options and requirements related to sub-facility zones.

5 At the end of section 5.17L

Add:

Note 3: Section 5.22A sets out, for a landfill operator using method 1 in Division 5.2.2 to estimate emissions of methane released from legacy waste in a landfill, options and requirements related to sub-facility zones.

6 At the end of Part 5.2

Add:

Division 5.2.7—Legacy emissions and non-legacy emissions

5.22A Legacy emissions estimated using method 1—sub-facility zone options

(1) If a landfill operator estimates emissions of methane released from legacy waste in a landfill using method 1 in Division 5.2.2, the landfill operator may:

(a) take the whole landfill to be a sub-facility zone; or

(b) select sub-facility zones in accordance with subsections (2) and (3).

(2) The number of sub-facility zones the landfill operator may select:

(a) for sub-facility zones that contain only waste mix of the type mentioned in paragraph 5.11(1)(i)—is unlimited; and
(b) for all other sub-facility zones—must not exceed 4.

(3) A sub-facility zone:
(a) must cover an area of at least 1 hectare; and
(b) must be a single area within the landfill; and
(c) must have a uniform composition of waste mix types so that the estimates of the methane generated by the sub-facility zone are in accordance with section 1.13; and
(d) must not be subject to:
(i) landfill gas inflow from another sub-facility zone; or
(ii) landfill gas outflow to another sub-facility zone.

Note: Section 5.17AA sets out, for a landfill operator using method 2 in Division 5.2.3 or method 3 in Division 5.2.4, the number of sub-facility zones that the landfill operator may select and the requirements for sub-facility zones that the landfill operator must comply with.

5.22B Legacy emissions—formula and unit of measurement

(1) Emissions (the ***legacy emissions***) from legacy waste must be estimated in tonnes of CO_2-e using the following formula:

$$E_{lw} = \left[CH_{4genlw} - \gamma \left(Q_{caplw} + Q_{fllw} + Q_{trlw} \right) \right] \times \left(1 - OF \right)$$

where:

E_{lw} is the quantity of methane released by the landfill from legacy waste, measured in CO_2-e tonnes.

CH_{4genlw} is the quantity of methane generated from legacy waste, measured in CO_2-e tonnes.

γ is the factor 6.784 × 10-4 × 25 converting cubic metres of methane at standard conditions measured to CO_2-e tonnes.

Q_{caplw} is the quantity of methane captured for combustion from landfill legacy waste during a reporting year and estimated in accordance with section 5.22C.

Q_{fllw} is the quantity of methane flared from landfill legacy waste during the reporting year and estimated in accordance with section 5.22D.

Q_{trlw} is the quantity of methane captured for transfer out of the landfill from landfill legacy waste during the reporting year and estimated according to section 5.22E.

OF is the oxidation factor (0.1) for near surface methane in the landfill.

(2) Work out the ratio of methane generated by legacy waste deposited in a sub-facility zone to methane generated by all waste deposited in a sub-facility zone using the default ratio mentioned in subsection (3) or the method described in subsection (4).

Default ratios

(3) The default ratio of methane generated by landfill legacy waste deposited in a sub-facility zone to methane generated by all waste deposited in a sub-facility zone is:

(a) if all of the waste in the sub-facility zone is legacy waste—1; or

(b) if none of the waste in the sub-facility zone is legacy waste—0.

Method of working out ratio

(4) Work out the ratio of methane generated by legacy waste deposited in a sub-facility zone to methane generated by all waste deposited in a sub-facility zone using the following formula:

$$Lr_z = CH_{4genlwz} / \left(CH_{4genz}\right)$$

where:

***Lr*$_z$** is the ratio of methane generated by legacy waste deposited in a sub-facility zone to methane generated by all waste deposited in a sub-facility zone.

***CH*$_{4genlwz}$** is the quantity of methane generated from legacy waste in a sub-facility zone, measured in CO_2-e tonnes.

***CH4*$_{genz}$** is the methane generated from total waste deposited in a sub-facility zone, measured in CO_2-e tonnes.

5.22C How to estimate quantity of methane captured for combustion from legacy waste for each sub-facility zone

The quantity of methane captured for combustion from legacy waste during the reporting year for each sub-facility zone must be estimated using the following formula:

$$Q_{caplw\,z} = Q_{cap\,z} \times Lr_z$$

where:

***Q*$_{caplw\,z}$** is the quantity of methane captured for combustion from landfill legacy waste in each sub-facility zone during a reporting year.

***Q*$_{cap\,z}$** is the total quantity of methane in landfill gas captured for combustion from the sub-facility zone during the reporting year, measured in cubic metres in accordance with Division 2.3.6.

***Lr*$_z$** is the ratio of methane generated by legacy waste deposited in a sub-facility zone to methane generated by all waste deposited in a sub-facility zone.

5.22D How to estimate quantity of methane in landfill gas flared from legacy waste in a sub-facility zone

The quantity of methane in landfill gas flared from landfill legacy waste during the reporting year for each sub-facility zone must be estimated using the following formula:

$$Q_{fllw\,z} = Q_{fl\,z} \times Lr_z$$

where:

$Q_{fllw\,z}$ is the estimated quantity of methane in landfill gas flared from landfill legacy waste during the reporting year for each sub-facility zone.

$Q_{fl\,z}$ is the total quantity of methane in landfill gas flared from the sub-facility zone during the reporting year, measured in cubic metres in accordance with Division 2.3.6.

Lr_z is the ratio of methane generated by legacy waste deposited in a sub-facility zone to methane generated by all waste deposited in a sub-facility zone.

5.22E How to estimate quantity of methane captured for transfer out of landfill from legacy waste for each sub-facility zone

The quantity of methane captured for transfer out of the landfill from legacy waste for each sub-facility zone must be estimated using the following formula:

$$Q_{trlw\,z} = Q_{tr\,z} \times Lr_z$$

where:

$Q_{trlw\,z}$ is the estimated quantity of methane captured for transfer out of the landfill from legacy waste for each sub-facility zone.

$Q_{tr\,z}$ is the total quantity of methane in landfill gas transferred out of the sub-facility zone during the reporting year, measured in cubic metres in accordance with Division 2.3.6.

Lr_z is the ratio of methane generated by legacy waste deposited in a sub-facility zone to methane generated by all waste deposited in a sub-facility zone.

5.22F How to calculate the quantity of methane generated from legacy waste for a sub-facility zone ($CH_{4genlw\,z}$)

Calculate $CH_{4genlw\,z}$:

(a) using the estimates, equations and methods set out in sections 5.4 to 5.22K; and

(b) when using those estimates, equations and methods—by replacing:

(i) waste deposited in a landfill with legacy waste deposited in a sub-facility zone; and

(ii) the quantity of methane in landfill gas captured for combustion from the landfill with the quantity of methane in landfill gas captured for combustion from legacy waste in the sub-facility zone; and

(iii) the quantity of methane in landfill gas flared from the landfill with the quantity of methane in landfill gas flared from legacy waste in the sub-facility zone; and

(iv) the quantity of methane in landfill gas captured for transfer out of the landfill with the quantity of methane in landfill gas captured for transfer out of the landfill from legacy waste in the sub-facility zone.

5.22G How to calculate total methane generated from legacy waste

Total methane generated from legacy waste is equal to the sum of methane generated from legacy waste for all sub-facility zones and is calculated using the following formula:

$$CH_{4genlw} = \sum_z CH_{4genlw\,z}$$

where:

CH4$_{genlw}$ is the methane generated from legacy waste deposited at the landfill, measured in CO_2-e tonnes.

$\sum_z$ is the sum of all sub-facility zones.

CH$_{4genlw\,z}$ is the quantity of methane generated from legacy waste in a sub-facility zone, measured in CO_2-e tonnes, calculated in accordance with section 5.22F.

5.22H How to calculate total methane captured and combusted from methane generated from legacy waste

Total methane captured and combusted from methane generated from legacy waste is equal to the sum of methane captured and combusted from methane generated from legacy waste for all sub-facility zones and is calculated using the following formula:

$$Q_{caplw} = \sum_z Q_{caplw\,z}$$

where:

Q$_{caplw}$ is the quantity of methane captured for combustion from landfill legacy waste during a reporting year.

$\sum_z$ is the sum of all sub-facility zones.

Q$_{caplw\,z}$ is the quantity of methane captured for combustion from each sub-facility zone during a reporting year, estimated in accordance with section 5.22C.

5.22J How to calculate total methane captured and transferred offsite from methane generated from legacy waste

Total methane captured and transferred offsite from methane generated from legacy waste is equal to the sum of methane captured and transferred offsite from methane generated from legacy waste for all sub-facility zones and is calculated using the following formula:

$$Q_{trlw} = \sum_z Q_{trlw\,z}$$

where:

Q$_{trlw}$ is the total methane captured and transferred offsite from methane generated from legacy waste deposited at the landfill.

$\sum_z$ is the sum of all sub-facility zones.

Q$_{trlw\,z}$ is the estimated quantity of methane captured for transfer out of the landfill from legacy waste for each sub-facility zone, estimated in accordance with section 5.22E.

5.22K How to calculate total methane flared from methane generated from legacy waste

Total methane flared from methane generated from legacy waste is equal to the sum of methane flared from methane generated from legacy waste for all sub-facility zones and is calculated using the following formula:

$$Q_{fllw} = \sum_z Q_{fllw\,z}$$

where:

Q_{fllw} is the quantity of methane flared from landfill legacy waste during the reporting year.

$\sum_z$ is the sum of all sub-facility zones.

$Q_{fllw\,z}$ is the quantity of methane in landfill gas from landfill legacy waste for each sub-facility zone during the reporting year, estimated in accordance with section 5.22D.

5.22L How to calculate methane generated in landfill gas from non-legacy waste

(1) Methane generated in landfill gas from non-legacy waste must be calculated using the following formula:

$$CH_{4gennlw} = CH_{4genj} - CH_{4genlw}$$

where:

$CH_{4gennlw}$ is the methane generated in landfill gas from non-legacy waste, measured in CO_2-e tonnes.

CH_{4genj} is the methane generated in landfill gas from total waste deposited at the landfill, measured in CO_2-e tonnes.

$CH4_{genlw}$ is the methane generated in landfill gas from legacy waste deposited at the landfill, measured in CO_2-e tonnes.

(2) Emissions from non-legacy waste must be calculated using the following formula, measured in CO_2-e tonnes:

$$E_{nlw} = E_j - E_{lw}$$

where:

E_{nlw} are the emissions from non-legacy waste.

E_j is the quantity of methane from waste deposited at the landfill, measured in CO_2-e tonnes:

E_{lw} is the quantity of methane from legacy waste deposited at the landfill, measured in CO_2-e tonnes.

5.22M Calculating amount of total waste deposited at landfill

To calculate the amount of total waste deposited at a landfill, add the amount of legacy waste deposited at the landfill to the amount of non-legacy waste deposited at the landfill.

Schedule 3—Carbon capture and storage

National Greenhouse and Energy Reporting (Measurement) Determination 2008

1 Section 1.8 (definition of *captured for permanent storage*)

Repeal the definition, substitute:

captured for permanent storage, in relation to a greenhouse gas, has the meaning given by section 1.19A.

2 Section 1.8 (definition of *carbon dioxide stream*)

Repeal the definition.

3 Section 1.8

Insert:

detection agent has the same meaning as in the *Offshore Petroleum and Greenhouse Gas Storage Act 2006*.

greenhouse gas stream means a stream consisting of a mixture of any or all of the following substances captured for injection into, and captured for permanent storage in, a geological formation:

(a) carbon dioxide, whether in a gaseous or liquid state;

(b) a greenhouse gas other than carbon dioxide, whether in a gaseous or liquid state;

(c) one or more incidental greenhouse gas-related substances, whether in a gaseous or liquid state, that relate to either or both of the greenhouse gases mentioned in paragraph (a) and (b);

(d) a detection agent, whether in a gaseous or liquid state;

so long as:

(e) the mixture consists overwhelmingly of either or both of the greenhouse gases mentioned in paragraphs (a) and (b); and

(f) if the mixture includes a detection agent—the concentration of the detection agent in the mixture is not more than the concentration prescribed in relation to the detection agent for the purposes of subparagraph (vi) of paragraph (c) of the definition of ***greenhouse gas substance*** in section 7 of the *Offshore Petroleum and Greenhouse Gas Storage Act 2006*.

Note: A greenhouse gas is ***captured for permanent storage*** in a geological formation if the gas is captured by, or transferred to, the holder of a licence, lease or approval mentioned in section 1.19A, under a law mentioned in that section, for the purpose of being injected into a geological formation (however described) under the licence, lease or approval.

incidental greenhouse gas-related substance**,** in relation to a greenhouse gas that is captured from a particular source material, means:

(a) any substance that is incidentally derived from the source material; or

(b) any substance that is incidentally derived from the capture; or

(c) if the captured greenhouse gas, whether in a pure form or in a mixture with other substances, is transported—any substance that is incidentally derived from the transportation; or

(d) if the captured greenhouse gas, whether in a pure form or in a mixture with other substances, is injected into a part of a geological formation—any substance that is incidentally derived from the injection; or

(e) if the captured greenhouse gas, whether in a pure form or in a mixture with other substances, is stored in a part of a geological formation—any substance that is incidentally derived from the storage.

4 At the end of section 1.11

Add:

; (c) Division 1.2.3 provides requirements in relation to carbon capture and storage.

5 Section 1.19A

Omit "carbon dioxide", substitute "a greenhouse gas".

6 Section 1.19B (heading)

Repeal the heading, substitute:

1.19B Deducting greenhouse gas that is captured for permanent storage

7 Subsection 1.19B(1)

Omit "carbon dioxide" (first occurring), substitute "a greenhouse gas".

8 Subsection 1.19B(1)

Omit "carbon dioxide" (second occurring), substitute "the greenhouse gas".

9 Paragraph 1.19B(1)(a)

Omit "carbon dioxide", substitute "greenhouse gas".

10 Paragraph 1.19B(1)(b)

Omit "carbon dioxide", substitute "the greenhouse gas".

11 Paragraph 1.19B(2)(a)

Omit "carbon dioxide is captured", substitute "greenhouse gas is captured".

12 Subparagraph 1.19B(2)(a)(i)

Omit "carbon dioxide", substitute "the greenhouse gas, measured in CO_2-e tonnes,".

13 Subparagraph 1.19B(2)(a)(ii)

Omit "carbon dioxide" (wherever occurring), substitute "greenhouse gas".

14 Subparagraph 1.19B(2)(a)(iii)

Omit "carbon dioxide", substitute "the greenhouse gas".

15 Paragraph 1.19B(2)(b)

Omit "carbon dioxide is transferred", substitute "greenhouse gas is transferred".

16 Subparagraph 1.19B(2)(b)(i)

Omit "carbon dioxide", substitute "the greenhouse gas, measured in CO_2-e tonnes,".

17 Subparagraph 1.19B(2)(b)(ii)

Omit "carbon dioxide" (wherever occurring), substitute "greenhouse gas".

18 Subparagraph 1.19B(2)(b)(iii)

Omit "carbon dioxide", substitute "the greenhouse gas".

19 Subsection 1.19B(3)

Omit "carbon dioxide", substitute "the greenhouse gas".

20 Section 1.19C

Omit "carbon dioxide" (first occurring), substitute "a greenhouse gas".

21 Section 1.19C

Omit "carbon dioxide" (second occurring), substitute "the greenhouse gas".

22 Paragraph 1.19C(a)

Omit "carbon dioxide" (first occurring), substitute "the greenhouse gas".

23 Paragraph 1.19C(a)

Omit "carbon dioxide" (second occurring), substitute "greenhouse gas".

24 Paragraph 1.19C(b)

Omit "carbon dioxide" (first occurring), substitute "the greenhouse gas".

25 Paragraph 1.19C(b)

Omit "carbon dioxide" (second occurring), substitute "greenhouse gas".

26 Section 1.19D

Omit "carbon dioxide" (first occurring), substitute "a greenhouse gas".

27 Section 1.19D

Omit "carbon dioxide" (second occurring), substitute "the greenhouse gas".

28 Section 1.19E (heading)

Repeal the heading, substitute:

1.19E Measure of quantity of captured greenhouse gas

29 Subsection 1.19E(1)

Omit "captured carbon dioxide", substitute "a greenhouse gas that is captured".

30 Subsection 1.19E(2)

Omit "carbon dioxide" (wherever occurring), substitute "greenhouse gas".

31 Subparagraph 1.19E(2)(b)(ii)

Omit "section 1.19N", substitute "section 1.19GA".

32 Subsection 1.19E(3)

Omit "carbon dioxide", substitute "greenhouse gas".

33 Subsection 1.19E(4)

Omit "carbon dioxide" (first occurring), substitute "the greenhouse gas".

34 Subsection 1.19E(4)

Omit "carbon dioxide" (second occurring), substitute "greenhouse gas".

35 Subsection 1.19E(5)

Omit "carbon dioxide", substitute "greenhouse gas".

36 Subsection 1.19E(6)

Omit "carbon dioxide" (first occurring), substitute "greenhouse gas".

37 Subsection 1.19E(6)

Omit "concentration of carbon dioxide", substitute "the concentration of the greenhouse gas".

38 Section 1.19F (heading)

Repeal the heading, substitute:

1.19F Volume of greenhouse gas stream—criterion A

39 Subsection 1.19F(1)

Omit "carbon dioxide", substitute "greenhouse gas".

40 Section 1.19G (heading)

Repeal the heading, substitute:

1.19G Volume of greenhouse gas stream—criterion AAA

41 Subsection 1.19G(1)

Omit "carbon dioxide", substitute "greenhouse gas".

42 Subsection 1.19G(2)

Omit "carbon dioxide" (first and second occurring), substitute "greenhouse gas".

43 Subparagraph 1.19G(2)(a)(i)

Repeal the subparagraph, substitute:

(i) for a compressed greenhouse gas stream—section 1.19H; and

44 Subparagraph 1.19G(2)(a)(ii)

Omit "carbon dioxide", substitute "greenhouse gas".

45 Paragraph 1.19G(3)(a)

Omit "carbon dioxide", substitute "greenhouse gas".

46 Subsection 1.19G(4) (table, heading to column headed "Maximum daily quantity of carbon dioxide stream cubic metres/day")

Repeal the heading, substitute:

Maximum daily quantity of greenhouse gas stream (cubic metres/day)

47 After section 1.19G

Insert:

1.19GA Volume of greenhouse gas stream—criterion BBB

For subparagraph 1.19E(2)(b)(ii), criterion BBB is the estimation of the volume of the captured greenhouse gas stream from the operation of the facility during a year measured in accordance with industry practice, if the equipment used to measure the volume of the captured greenhouse gas stream does not meet the requirements of criterion AAA.

Note: An estimate obtained using industry practice must be considered with the principles in section 1.13.

48 Section 1.19H (heading)

Repeal the heading, substitute:

1.19H Volumetric measurement—compressed greenhouse gas stream

49 Subsection 1.19H(1)

Omit "carbon dioxide stream that is not super-compressed", substitute "compressed greenhouse gas stream".

50 After subsection 1.19H(1)

Insert:

(1A) For this section and subparagraph 1.19G(2)(a)(i), a compressed greenhouse gas stream does not include either of the following:

(a) a super-compressed greenhouse gas stream;

(b) a greenhouse gas stream that is compressed to a super-critical state.

51 Paragraphs 1.19H(2)(a) and (b)

Omit "carbon dioxide" (wherever occurring), substitute "greenhouse gas".

52 Section 1.19I (heading)

Repeal the heading, substitute:

1.19I Volumetric measurement—super-compressed greenhouse gas stream

53 Subsections 1.19I(1) and (2)

Omit "carbon dioxide", substitute "greenhouse gas".

54 Section 1.19N

Repeal the section.

55 Division 3.4.2 (heading)

Repeal the heading, substitute:

Division 3.4.2—Transport of greenhouse gases

56 Section 3.89

Omit "carbon dioxide" (wherever occurring), substitute "a greenhouse gas".

57 Subsection 3.90(1)

Omit "carbon dioxide", substitute "a greenhouse gas".

58 Subsections 3.90(2) and (3)

Repeal the subsections, substitute:

Emissions from transport of a greenhouse gas involving transfer

(2) If the greenhouse gas is transferred to a relevant person for injection by the person in accordance with a licence, lease or approval mentioned in section 1.19A, one of the following methods must be used for estimating fugitive emissions of the greenhouse gas that result from the transport of the greenhouse gas stream for that injection:

(a) method 1 under section 3.91 (which deals with injection);

(b) method 2 under section 3.77 (which deals with transport), applied in relation to the greenhouse gas as if it were a type of natural gas.

Note 1: There is no method 3 or 4 for subsection (2).

Note 2: The same emissions cannot be counted under both the method mentioned in paragraph (2)(a) (injection) and the method mentioned in paragraph (2)(b) (transport).

Emissions from transport of a greenhouse gas not involving transfer

(2A) Subsection (3) applies if:

(a) the greenhouse gas is captured by a relevant person for injection in accordance with a licence, lease or approval mentioned in section 1.19A; and

(b) the greenhouse gas is not transferred to another person for the purpose of injection.

(3) One of the following methods must be used for estimating fugitive emissions of the greenhouse gases that result from the transport of the greenhouse gas stream for that injection:

(a) method 1 under section 3.92 (which deals with injection);

(b) method 2 under section 3.77 (which deals with transport), applied in relation to the greenhouse gas as if it were a type of natural gas.

Note 1: There is no method 3 or 4 for subsection (3).

Note 2: The same emissions cannot be counted under both the method mentioned in paragraph (3)(a) (injection) and the method mentioned in paragraph (3)(b) (transport).

59 Subdivision 3.4.2.2 (heading, first occurring)

Repeal the heading, substitute:

Subdivision 3.4.2.2—Emissions from transport of greenhouse gases involving transfer

60 Section 3.91

Repeal the section, substitute:

3.91 Method 1—emissions from transport of greenhouse gases involving transfer

For subsection 3.90(2), method 1 is:

$$E_j = \gamma_j \left(RCCS_j - Q_{inj} \right)$$

where:

E_j is the emissions of gas type (***j***), during the year from transportation of greenhouse gas captured for permanent storage to the storage site, measured in CO_2-e tonnes.

γ_j is the factor for converting a quantity of gas type (***j***) from cubic metres at standard conditions of pressure and temperature to CO_2-e tonnes, being:

(a) for methane—$6.784 \times 10^{-4} \times 21$; and

(b) for carbon dioxide—1.861×10^{-3}; and

(c) for any other gas type—the appropriate conversion factor for the gas type.

Q_{inj} is the quantity of greenhouse gas injected into the storage site during the year and measured in cubic metres at standard conditions of pressure and temperature.

$RCCS_j$ is the quantity of gas type (***j***) captured during the year worked out under Division 1.2.3 and measured in cubic metres at standard conditions of pressure and temperature.

61 Subdivision 3.4.2.2 (heading, second occurring)

Repeal the heading, substitute:

Subdivision 3.4.2.3—Emissions from transport of greenhouse gases not involving transfer

62 Section 3.92

Repeal the section, substitute:

3.92 Method 1—emissions from transport of greenhouse gases not involving transfer

For subsection 3.90(3), method 1 is:

$$E_j = \gamma_j \left(RCCS_j - Q_{inj} \right)$$

where:

E*$_j$** is the emissions of gas type (j***), during the year from transportation of greenhouse gas captured for permanent storage to the storage site, measured in CO_2-e tonnes.

γ*$_j$** is the factor for converting a quantity of gas type (j***) from cubic metres at standard conditions of pressure and temperature to CO_2-e tonnes, being:

(a) for methane—$6.784 \times 10^{-4} \times 21$; and

(b) for carbon dioxide—1.861×10^{-3}; and

(c) for any other gas type—the appropriate conversion factor for the gas type.

***Q*$_{inj}$** is the quantity of greenhouse gas injected into the storage site during the year and measured in cubic metres at standard conditions of pressure and temperature.

RCCS*$_j$** is the quantity of gas type (j***) captured during the year worked out under Division 1.2.3 and measured in cubic metres at standard conditions of pressure and temperature.

63 At the end of Part 3.4

Add:

Division 3.4.3—Injection of greenhouse gases

Subdivision 3.4.3.1—Preliminary

3.93 Application

This Division applies to fugitive emissions of greenhouse gases from the injection of a greenhouse gas captured for permanent storage into a geological formation.

Note: A greenhouse gas is ***captured for permanent storage*** in a geological formation if the gas is captured by, or transferred to, the holder of a licence, lease or approval mentioned in section 1.19A, under a law mentioned in that section, for the purpose of being injected into a geological formation (however described) under the licence, lease or approval.

3.94 Available methods

(1) For estimating fugitive emissions of greenhouse gases released during a year from the injection of a greenhouse gas captured for permanent storage into a geological formation, the methods set out in this section must be used.

Process vents, system upsets and accidents

(2) Method 2 under section 3.95 must be used for estimating fugitive emissions of greenhouse gases that result from deliberate releases from process vents, system upsets and accidents.

Fugitive emissions of greenhouse gases other than from process vents, system upsets and accidents

(3) One of the following methods must be used for estimating fugitive emissions of greenhouse gases from the injection of a greenhouse gas captured for permanent storage into a geological formation that are not the result of deliberate releases from process vents, system upsets and accidents:

(a) method 2 under section 3.96;

(b) method 3 under section 3.97.

Note: There is no method 1, 3 or 4 for subsection (2) and no method 1 or 4 for subsection (3).

Subdivision 3.4.3.2—Fugitive emissions from deliberate releases from process vents, system upsets and accidents

3.95 Method 2—fugitive emissions from deliberate releases from process vents, system upsets and accidents

Method 2 is the same as the approach mentioned in section 5.3 or 5.7.1 of the API Compendium.

Subdivision 3.4.3.3—Fugitive emissions from injection of greenhouse gases (other than emissions from deliberate releases from process vents, system upsets and accidents)

3.96 Method 2—fugitive emissions from injection of a greenhouse gas into a geological formation (other than deliberate releases from process vents, system upsets and accidents)

(1) Method 2 is:

$$E_{ij} = \sum_k \left(Q_{ik} \times EF_{ijk} \right)$$

where:

$\boldsymbol{EF_{ijk}}$ is the emission factor (***j***) measured in CO_2-e tonnes that passes through each equipment type (***k***) mentioned in section 6.1 of the API Compendium, if the equipment type was used in the injection of a greenhouse gas into the geological formation.

$\boldsymbol{E_{ij}}$ is the fugitive emissions (***j***) from the injection of a greenhouse gas into a geological formation during the reporting year, measured in CO_2-e tonnes.

$\boldsymbol{\Sigma_k}$ is the emissions (***j***) measured in CO_2-e tonnes and estimated by summing up the emissions released from each equipment type (***k***) mentioned in section 6.1 of the API Compendium, if the equipment type was used in the injection of a greenhouse gas into the geological formation.

Q_{ik} is the total of the quantities of greenhouse gas measured in tonnes that pass through each equipment type (***k***) mentioned in section 6.1 of the API Compendium, if the equipment type was used in the injection of a greenhouse gas into the geological formation.

(2) For ***EF_{ijk}*** in subsection (1), the emission factors are:

(a) the emission factors listed for the equipment type in section 6.1 of the API Compendium; or

(b) if the manufacturer of the equipment supplies equipment specific emissions factors for the equipment type—those factors.

3.97 Method 3—fugitive emissions from injection of greenhouse gases (other than deliberate releases from process vents, system upsets and accidents)

Method 3 is the same as an approach mentioned in Appendix C to the API Compendium.

Note: For this method, any approach mentioned in Appendix C to the API Compendium may be used.

Division 3.4.4—Storage of greenhouse gases

Subdivision 3.4.4.1—Preliminary

3.98 Application

This Division applies to fugitive emissions to the atmosphere of greenhouse gases from geological formations used for storage of a greenhouse gas captured for permanent storage.

Note: A greenhouse gas is ***captured for permanent storage*** in a geological formation if the gas is captured by, or transferred to, the holder of a licence, lease or approval mentioned in section 1.19A, under a law mentioned in that section, for the purpose of being injected into a geological formation (however described) under the licence, lease or approval.

3.99 Available method

For estimating fugitive emissions of greenhouse gases released during a year from a geological formation used for the permanent storage of a greenhouse gas, method 2 set out in section 3.100 must be used.

Note: There is no method 1, 3 or 4 for this Division.

Subdivision 3.4.4.2—Fugitive emissions from the storage of greenhouse gases

3.100 Method 2—fugitive emissions from geological formations used for the storage of greenhouse gases

(1) Method 2 is:

$$C_{cst} = C_{ost} + Q_{inj} - E_{co_2}$$

where:

C_{cst} is the closing stock of a stored greenhouse gas at the storage site for the reporting year, measured in CO_2-e tonnes.

C_{ost} is the opening stock of a stored greenhouse gas at the storage site for the reporting year, determined in accordance with subsection (2), measured in CO_2-e tonnes.

E_{CO_2} is the fugitive emissions to the atmosphere of greenhouse gas during the reporting year from the geological storage formation, determined in accordance with subsection (3), measured in CO_2-e tonnes.

Q_{inj} is the quantity of a greenhouse gas injected into the geological formation during the reporting year, measured in CO_2-e tonnes.

Note: This formula represents C_{cst} (the closing stock) as the cumulative mass of a greenhouse gas injected into the geological formation in all years since the commencement of injection, less any fugitive emissions to the atmosphere.

The closing stock of a greenhouse gas in the storage site for the reporting year is derived from the opening stock determined in accordance with subsection (2), the quantity injected into the geological formation during the reporting year, and estimates of fugitive emissions to the atmosphere determined in accordance with subsection (3).

(2) For the factor C_{ost} in subsection (1), the opening stock of a greenhouse gas in the storage site for the reporting year is:

(a) for the first reporting year in which this method is used to calculate fugitive emissions—zero; and

(b) for each reporting year other than the first reporting year—the closing stock of a greenhouse gas in the storage site for the previous reporting year, determined in accordance with subsection (1).

(3) For the factor E_{CO_2}, fugitive emissions to the atmosphere from geological formations used for the permanent storage of a greenhouse gas are to be estimated from data obtained for monitoring and verification obligations under a licence, lease or approval mentioned in section 1.19A (meaning of ***captured for permanent storage***).

Schedule 4—Application and transitional provisions

National Greenhouse and Energy Reporting (Measurement) Determination 2008

1 Chapter 9

Repeal the Chapter, substitute:

Chapter 9—Application and transitional provisions

9.1 Amendments made by the *National Greenhouse and Energy Reporting (Measurement) Amendment Determination 2016 (No. 1)*

(1) The amendments made by Schedules 1, 2 and 3 to the *National Greenhouse and Energy Reporting (Measurement) Amendment Determination 2016 (No. 1)* apply in relation to the financial year starting on 1 July 2016 and later financial years.

(2) This section is repealed on 1 November 2016.