

# DRAFT FOR CONSULTATION

## **Climate Change (Stationary Energy and Industrial Processes) Regulations 2009 (Draft for Consultation)**

Governor-General

### **Order in Council**

At Wellington this                      day of                      2009

Present:  
in Council

Pursuant to section 163 of the Climate Change Response Act 2002, His Excellency the Governor-General, acting on the advice and with the consent of the Executive Council and on the recommendation of the Minister for Climate Change Issues, makes the following regulations.

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**Regulations**

- 1 Title**  
These regulations are the Climate Change (Stationary Energy and Industrial Processes) Regulations 2009 (Draft for Consultation).

## 2 Commencement

These regulations come into force on 1 January 2010.

### Part 1 Preliminary matters

## 3 Interpretation

- (1) In these regulations, unless the context otherwise requires,—
- Act** means the Climate Change Response Act 2002
- Aluminium Sector Greenhouse Gas Protocol** means the Aluminium Sector Greenhouse Gas Protocol (Addendum to the WRI/WBCSD Greenhouse Gas Protocol) produced by the International Aluminium Institute (October 2006)
- calorific value** means the energy content of a fuel on a gross or high heating value basis expressed in megajoules per kilogram
- chief executive** means the chief executive of the department responsible for the administration of Part 4 of the Act
- class** has the meaning in regulation 3A
- coal miner** means a person who is required to comply with regulations 9 and 10, or a wholly owned subsidiary of the person
- cubic metre**, in relation to gas, means a cubic metre of the gas measured at 15°C and at 101.325 kPa (absolute pressure)
- customs point** means the point where goods are entered for import under section 39 or export under section 49 of the Customs and Excise Act 1996
- energy content** means the gross energy content measured in joules, where a joule is the energy required to heat 1 cubic centimetre of water by 0.239°C, or the energy needed to lift a kilogram 102 millimetres
- gas miner** means a person who is required to comply with regulations 15 and 16, or a wholly owned subsidiary of the person
- obligation coal**—
- (a) means coal—
- (i) imported on or after 1 January 2010 by a person who is required to comply with regulations 6 and 7; or

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- (ii) mined on or after 1 January 2010 by a person who is required to comply with regulations 9 and 10; and
- (b) includes a product (for example coking coal) derived from coal referred to in paragraph (a)

**obligation fuel** has the same meaning as in regulation 3 of the Climate Change (Liquid Fossil Fuels) Regulations 2008

**opt-in coal participant** means a person who is required to comply with regulations 45 and 46

**opt-in natural gas participant** means a person who is required to comply with regulations 48 and 49

**point of sale**, in relation to mining or purchasing coal or natural gas, means the point at which the sale of coal or natural gas is deemed to have occurred in accordance with generally accepted accounting practice

**subsidiary** has the same meaning as in section 5 of the Companies Act 1993

**unique emissions factor** means a unique emissions factor that the chief executive has, under section 91 of the Act, approved a participant to use for the purpose of calculating emissions in accordance with these regulations.

- (2) In a formula used in these regulations, the symbol  $\Sigma$  means the summation of the calculated amounts that follow the symbol.
- (3) A unique emissions factor is in force for the purposes of these regulations if—
  - (a) its use to calculate emissions has been approved by the chief executive under section 91(1) of the Act; and
  - (b) the approval has not ceased to have effect under section 91(2) of the Act.

### **3A Meaning of class**

In these regulations, unless the context otherwise requires, **class**,—

- (a) in relation to importing coal, means—
  - (i) if there is no unique emissions factor in force in relation to the coal, a class of coal listed in the second column of Table 1 of Schedule 2:

- (ii) if a unique emissions factor is in force in relation to the coal, the class of coal to which the unique emissions factor relates:
- (b) in relation to mining coal and purchasing coal, means—
  - (i) if there is no unique emissions factor in force in relation to the coal, a class of coal listed in the second column of Table 2 of Schedule 2:
  - (ii) if a unique emissions factor is in force in relation to the coal, the class of coal to which the unique emissions factor relates:
- (c) in relation to importing natural gas, means a class of natural gas listed in the second column of Table 4 of Schedule 2:
- (d) in relation to mining or purchasing natural gas, means any of the following:
  - (i) a clearly defined quality of natural gas passing through a single point of sale meter:
  - (ii) natural gas sent to a low temperature separation plant:
  - (iii) liquefied petroleum gas:
  - (iv) commercial propane:
  - (v) commercial butane:
- (e) in relation to geothermal fluid, means—
  - (i) if there is no unique emissions factor in force in relation to the geothermal fluid, a class of geothermal fluid described in the second column of Part A or Part B of Table 5 of Schedule 2:
  - (ii) if a unique emissions factor is in force in relation to the geothermal fluid, the class of geothermal fluid to which the unique emissions factor relates:
- (f) in relation to used oil, waste oil, used tyres, or waste, means—
  - (i) if there is no unique emissions factor in force in relation to the used oil, waste oil, used tyres, or waste, a class of used oil, waste oil, used tyres or waste listed in the second column of Part A, B, or C of Table 6 of Schedule 2:
  - (ii) if there is a unique emissions factor in force in relation to used oil, waste oil, used tyres, or waste,

the class of used oil, waste oil, used tyres, or waste to which the unique emissions factor relates:

- (g) in relation to burnt lime, means—
  - (i) burnt lime (other than burnt dolomitic lime); or
  - (ii) burnt dolomitic lime.

**4 Chief executive may issue guidelines or standards**

- (1) The chief executive may, by notice in the *Gazette*, issue guidelines or standards in relation to the information required to be collected by these regulations.
- (2) The chief executive may, by notice in the *Gazette*, amend or revoke a guideline or standard.
- (3) A participant who complies with a guideline or standard that is issued under the regulation, and is in force, is to be treated as complying with the requirements of these regulations to which the guideline or standard relates.

**Part 2  
Stationary energy participants**

*Importing coal*

**5 Application of regulations 6 and 7**

- (1) A person must comply with regulations 6 and 7 if the person, in any year, is a participant under section 54(1)(a) of the Act in respect of the activity in Part 3 of Schedule 3 of the Act of importing coal.
- (2) Regulations 6 and 7 apply only if the coal is imported by the person on or after 1 January 2010.

**6 Collection of information for purpose of calculating emissions from importing coal**

- (1) The following information must be collected in relation to each class of coal for the year:
  - (a) the total number of tonnes of the class of coal imported by the person in the year, as recorded at the customs point; and

- (b) the calorific value of the coal referred to in paragraph (a); and
  - (c) the total number of tonnes of coal of the class exported by the person in the year, as recorded at the customs point; and
  - (d) the calorific value of the coal referred to in paragraph (c).
- (2) If the person wishes to include a stockpile adjustment in relation to a class of coal for the year under regulation 7(1), then the information specified in clause 3 of Schedule 1 must be collected.

**7 Method of calculating emissions from importing coal**

- (1) Emissions for the year in relation to each class of coal must be calculated in accordance with the following formula:

$$E = ((A \times CV_1) - (B \times CV_2) - (C \times CV_1)) \times EF$$

where—

A is the total number of tonnes of the class of coal imported by the person in the year, as recorded under regulation 6(1)(a)

B is—

- (a) the figure determined in accordance with Schedule 1 if the person—
  - (i) includes a stockpile adjustment for the class of coal; or
  - (ii) does not include a stockpile adjustment, but a stockpile adjustment was included when emissions from importing the class of coal were calculated and reported in the previous emissions return submitted for the activity; or
- (b) zero, if the person does not include a stockpile adjustment for the class of coal and—
  - (i) it is the person's first emission return for the activity; or
  - (ii) a stockpile adjustment was not included when emissions from importing the class of coal were calculated and reported in the

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- previous emissions return submitted for the activity
- C is the total number of tonnes of the class of coal exported by the person in the year as recorded under regulation 6(1)(c)
- CV<sub>1</sub> is the weighted average calorific value of the coal of the class imported or exported, as the case may be, calculated by reference to the information recorded under regulation 6(1)(b) or (d)
- CV<sub>2</sub> is—
- (a) the figure for CV<sub>2</sub> determined in accordance with Schedule 1 if the person—
    - (i) includes a stockpile adjustment for the class of coal; or
    - (ii) does not include a stockpile adjustment, but a stockpile adjustment was included when emissions from importing the class of coal were calculated and reported in the previous emissions return submitted for the activity; or
  - (b) zero, if B is zero
- E is the total emissions for the class of coal in tonnes
- EF is,—
- (a) in relation to a class of coal for which no unique emissions factor is in force, the emissions factor for the class of coal from Table 1 in Schedule 2;
  - (b) in relation to a class of coal for which a unique emissions factor is in force, the unique emissions factor.
- (2) An emissions return submitted by a person required to comply with this regulation must record the person's total emissions from the activity of importing coal in the relevant year, calculated by adding together the emissions for each class of coal calculated under subclause (1).
- (3) If a person who is required to comply with this regulation is required to submit an emissions return for a period other than a year, this regulation applies with any necessary modifications.

*Mining coal*

**8 Application of regulations 9 and 10**

- (1) A person must comply with regulations 9 and 10 if the person, in any year, is a participant under section 54(1)(a) of the Act in respect of the activity in Part 3 of Schedule 3 of the Act of mining coal where the volume of coal mined exceeds 2 000 tonnes in a year.
- (2) Regulations 9 and 10 apply only if the coal is mined by the person on or after 1 January 2010.

**9 Collection of information for purpose of calculating emissions from mining coal**

- (1) The following information must be collected in relation to each class of coal for the year:
  - (a) the total number of tonnes of coal of the class mined by the person in the year, as recorded at the point of sale; and
  - (b) the calorific value of the coal referred to in paragraph (a); and
  - (c) the total number of tonnes of coal of the class exported in the year by the person, as recorded at the customs point; and
  - (d) the calorific value of the coal referred to in paragraph (c); and
  - (e) the total number of tonnes of coal of the class sold by the person to each opt-in coal participant (whether directly or by a wholly-owned subsidiary of the person) in the year, as recorded at the point of sale; and
  - (f) the calorific value of the coal referred to in paragraph (e); and
  - (g) the total number of tonnes of coal of the class combusted in the year by the person that is not coal recorded under paragraph (a); and
  - (h) the calorific value of the coal referred to in paragraph (g); and
  - (i) the total number of tonnes of coal of the class gifted or otherwise provided gratuitously to any person, including an employee, in the year that is not coal recorded under paragraph (a); and

- (j) the calorific value of the coal referred to in paragraph (i).
- (2) The following information must be collected in relation to all coal mined in a year:
  - (a) the total number of tonnes of coal mined that is within each of the categories in the second column of Part A of Table 3 of Schedule 2; and
  - (b) the total number of tonnes of methane flared or combusted for energy in the year.

**10 Method of calculating emissions from mining coal**

- (1) Emissions for the year in relation to each class of coal must be calculated in accordance with the following formula:

$$E = ((A \times CV) + (F \times CV) + (G \times CV) - (C \times CV) - (D \times CV)) \times EF$$

where—

- A is the total number of tonnes of coal of the class mined by the person in the year, as recorded under regulation 9(1)(a)
- C is the total number of tonnes of the class of coal exported by the person in the year, as recorded under regulation 9(1)(c)
- CV is the weighted average calorific value of the class of coal mined, combusted, gifted or otherwise provided gratuitously, as the case may be, calculated by reference to the information recorded under the relevant paragraph in regulation 9(1)
- D is the total number of tonnes of the class of coal sold to opt-in coal participants in the year, as recorded under regulation 9(1)(e)
- E is the total emissions for the class of coal in tonnes
- EF is,—
  - (a) in relation to a class of coal for which no unique emissions factor is in force, the emissions factor for the class of coal from Table 2 in Schedule 2;
  - (b) in relation to a class of coal for which a unique emissions factor is in force, the unique emissions factor

- F is the total number of tonnes of the class of coal combusted by the person in the year, as recorded under regulation 9(1)(f)
- G is the total number of tonnes of the class of coal gifted or otherwise provided gratuitously to any person, as recorded under regulation 9(1)(i).
- (2) An emissions return submitted by a person required to comply with this regulation must record the person's total emissions from the activity of mining coal in the relevant year, calculated as follows:

$$TE = \sum(E) + \sum(H \times EF_2) - (I \times EF_3)$$

where—

- E is the emissions for each class of coal for the year, as calculated under subclause (1)
- $EF_2$  is the emissions factor for fugitive coal seam gas in relation to coal mined from the relevant category, as specified in Part A of Table 3 of Schedule 2
- $EF_3$  is the emissions factor for flaring or combusting for energy specified in Part B of Table 3 of Schedule 2
- H is the total number of tonnes of coal mined by the person in the year that is within each of the categories in the second column of Part A of Table 3 of Schedule 2, as recorded under regulation 9(2)(a)
- I is the total number of tonnes of methane flared or combusted for energy by the person in the year, as recorded under regulation 9(2)(b)
- TE is the total emissions for the activity of mining coal for the year in tonnes.
- (4) If a person who is required to comply with this regulation is required to submit an emissions return for a period other than a year, this regulation applies with any necessary modifications.

### *Importing natural gas*

#### **11 Application of regulations 12 and 13**

- (1) A person must comply with regulations 12 and 13 if the person, in any year, is a participant under section 54(1)(a) of the Act in respect the activity in Part 3 of Schedule 3 of the Act

of importing natural gas where the volume of natural gas imported exceeds 10 000 litres in a year.

- (2) Subclause (3) and regulations 12 and 13 apply only if the natural gas is imported by the person on or after 1 January 2010.
- (3) In regulations 12 and 13, the total number of gigajoules of natural gas held by a person in a storage facility at 31 December in a year must be determined by subtracting the total number of gigajoules of natural gas of the class extracted from the facility from 31 December 2009 to 31 December in the year, from the total number of gigajoules of natural gas of the class injected into the facility in that period.

## **12 Collection of information for purpose of calculating emissions from importing natural gas**

- (1) The following information must be collected in relation to each class of natural gas for the year:
  - (a) the total number of cubic metres of natural gas of the class imported by the person in the year, as recorded at the customs point; and
  - (b) the calorific value of the natural gas referred to in paragraph (a); and
  - (c) the total number of cubic metres of natural gas of the class exported by the person in the year, as recorded at the customs point; and
  - (d) the calorific value of the natural gas referred to in paragraph (c).
- (2) The person must collect information showing the total gigajoules of each class of natural gas held in a storage facility as at 31 December in the year.
- (3) If the person wishes to include a storage adjustment in relation to a class of natural gas under regulation 13(1), then the following information must be collected:
  - (a) the total number of gigajoules of natural gas of the class injected into a gas storage facility by the person in the year; and
  - (b) the total number of gigajoules of natural gas of the class extracted from a gas storage facility by the person in the year.

**13 Method of calculating emissions from importing natural gas**

- (1) Emissions for the year in relation to each class of natural gas must be calculated in accordance with the following formula:

$$E = ((A \times CV) - (C \times CV) - B) \times EF$$

where—

A is the total number of cubic metres of natural gas of the class imported by the person in the year, as recorded under regulation 12(1)(a)

B is—

(a) the figure calculated under subclause (2) expressed in gigajoules, if the person includes a storage adjustment for the class of natural gas for the year; or

(b)  $-1 \times$  the total number of gigajoules of the class of natural gas held by the person in a storage facility as at 31 December in the previous year, if the person does not include a storage adjustment for the class of natural gas for the year but a storage adjustment for that class was included when emissions from importing the class of natural gas were calculated and reported in the previous emissions return submitted by the person for the activity; or

(c) zero, if the person does not include a storage adjustment for the class of natural gas and—

(i) it is the person's first emissions return for the activity; or

(ii) a storage adjustment was not included when emissions from importing natural gas of that class were calculated and reported in the previous emissions return submitted by the person for the activity

C is the total number of cubic metres of natural gas of the class exported by the person in the year, as recorded under regulation 12(1)(c)

CV is the weighted average calorific value of the class of natural gas imported or exported, as the case may be,

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calculated by reference to the information recorded under the relevant paragraph in regulation 12(1)

E is the emissions for the class of natural gas in tonnes

EF is the emissions factor for the class of natural gas from Table 4 in Schedule 2.

- (2) For the purposes of subclause (1), a storage adjustment (if included) must be calculated as follows:

$$B = (D - F)$$

where—

B is the storage adjustment for the class of natural gas for the year

D is the total number of gigajoules of natural gas of the class injected by the person into a gas storage facility in the year, as recorded under regulation 12(3)(a)

F is the total number of gigajoules of natural gas of the class extracted by the person from a gas storage facility in the year, as recorded under regulation 12(3)(b).

- (3) An emissions return submitted by a person required to comply with this regulation must record the person's total emissions from the activity of importing natural gas in the relevant year, calculated by adding together the emissions for each class of natural gas calculated under subclause (1).
- (4) If a person who is required to comply with this regulation is required to submit an emissions return for a period other than a year, this regulation applies with any necessary modifications.

*Mining natural gas*

**14 Application of regulation 15 and 16**

- (1) A person must comply with regulations 15 and 16 if the person, in any year, is a participant under section 54(1)(a) of the Act in respect of the activity in Part 3 of Schedule 3 of the Act of mining natural gas other than for export.
- (2) Regulations 15 and 16 apply to mined natural gas only if the natural gas is mined by the person on or after 1 January 2010.

- 15 Collection of information for purpose of calculating emissions from natural gas mined other than for export**
- (1) The following information must be collected in relation to mined natural gas for the year:
- (a) the total number of tonnes of mined natural gas of each class sold (including for export) by the person in the year, as measured at the point of sale; and
  - (b) the total number of tonnes of mined natural gas of each class exported by the person in the year, as measured at the point of sale; and
  - (c) the total number of tonnes of mined natural gas of each class sold by the person to each opt-in natural gas participant (whether directly or by a wholly-owned subsidiary of the person) in the year, as measured at the point of sale; and
  - (d) the total number of tonnes of mined natural gas flared by the person in the year, as measured before the point of sale; and
  - (e) the total number of tonnes of mined natural gas used by the person before the point of sale in the year, that are not recorded under paragraph (d); and
  - (f) in respect of each of the quantities of mined natural gas referred to in paragraphs (a) to (e)—
    - (i) the total mass of CO<sub>2</sub> that results from the complete combustion of the gas, as determined by reference to the results of the tests in subclause (3); and
    - (ii) the total mass of the gas, as determined by reference to the results of the tests in subclause (3); and
    - (iii) the total terajoules of the gas, as determined by reference to the results of the tests in subclause (3).
- (2) The following information must be collected in relation to natural gas that is vented by the person in the year:
- (a) the total number of tonnes of natural gas vented by the person before the point of sale in the year; and
  - (b) in respect of the natural gas referred to in paragraph (a)—

- (i) the total mass of CO<sub>2</sub> in the gas, as determined by reference to the results of the tests in subclause (3);
  - (ii) the total mass of the gas, as determined by reference to the results of the tests in subclause (3); and
  - (iii) the total mass of CH<sub>4</sub> in the gas, as determined by reference to the results of the tests in subclause (3).
- (3) To obtain the information required by subclauses (1)(f) and (2)(b), the natural gas must be tested, by a person or laboratory that is accredited according to ISO 17025:2005 by International Accreditation New Zealand or an overseas accreditation agency recognised under New Zealand's mutual recognition arrangements, using gas chromatography in accordance with the following standards, (or equivalent standards or test methods related to an organisation that is listed in regulation 3(2) of the Climate Change (Unique Emissions Factors) Regulations 2009):
  - (a) GPA (Gas Processing Association) 2166:2005 (obtaining natural gas samples for analysis by gas chromatography, Parts 1–8); and
  - (b) ASTM D1945-03 (analysis of natural gas by gas chromatography).

**16 Method of calculating emissions from natural gas mined other than for export**

- (1) Emissions for the year in relation to each of the following quantities of mined natural gas must be calculated in accordance with the formula in subclause (2):
  - (a) each class of mined natural gas sold (including for export) by the person in the year; and
  - (b) each class of mined natural gas exported by the person in the year; and
  - (c) each class of mined natural gas sold by the person to opt-in gas participants in the year, (including via a wholly owned subsidiary); and
  - (d) mined natural gas flared by the person in the year; and

- (e) mined natural gas used by the person before the point of sale in the year.
- (2) The formula for the calculation of emissions under subclause (1) is—

$$E = [OF \times (A/B) \times C] + (D \times CEF) + (D \times NEF)$$

where—

- A is the total mass of CO<sub>2</sub> that results from the complete combustion of the quantity of natural gas for the year, as recorded under regulation 15(1)(f)(i)
- B is the total mass of the quantity of natural gas for the year, as recorded under regulation 15(1)(f)(ii)
- C is the total number of tonnes of the quantity of natural gas for the year, as recorded under regulation 15(1)(a) to (e)
- CEF is 0.027, the emissions factor for CH<sub>4</sub>
- D is total terajoules of the quantity of natural gas for the year, as recorded under regulation 15(1)(f)(iii)
- E is the emissions from the quantity of natural gas
- NEF is 0.031, the emissions factor for N<sub>2</sub>O
- OF is 0.995 (the oxidation factor).
- (3) Emissions in relation to venting by the person in the year must be calculated in accordance with the following formula:

$$V = [(A/B) \times C] + [21 \times (F/B) \times C]$$

where—

- A is the total mass of CO<sub>2</sub> in the vented natural gas for the year, as recorded under the regulation 15(2)(b)(i)
- B is the total mass of the vented natural gas for the year, as recorded under regulation 15(2)(b)(ii)
- C is the total number of tonnes of the vented natural gas for the year, as recorded under regulation 15(2)(a)
- F is the total mass of CH<sub>4</sub> of the vented natural gas for the year, as recorded under regulation 15(2)(b)(iii)
- V is the emissions, in tonnes, from venting.
- (4) Total emissions from the activity of mining natural gas other than for export for the year must be calculated as follows:

$$TE = \Sigma(ES) + \Sigma(EU) + \Sigma(EF) + \Sigma(V) + L - \Sigma(EE) - \Sigma(EO)$$

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where—

- EE is the emissions from each class of mined natural gas exported in the year, as calculated under subclause (2)
- EF is the is the emissions from flaring natural gas for the year, as calculated under subclause (2)
- EO is the emissions from each class of mined natural gas sold to opt-in participants in the year, as calculated under subclause (2)
- ES is the emissions from each class of mined natural gas sold in the year as calculated under subclause (2)
- EU is the emissions from using natural gas before the point of sale for the year, as calculated under subclause (2)
- L is the emissions for losses for the year calculated according to the following formula:

$$L = NGP \times NGL$$

where—

- NGP is the proportion of national gas production for the previous year that is attributed to the person, based on figures published by the chief executive on the website of the department of the chief executive for the purposes of this subclause; and
  - NGL is the figure for national gas losses for the preceding year published by the chief executive on the website of the department of the chief executive for the purposes of this subclause
  - TE is the total emissions for the activity of mining natural gas other than for export for the year
  - V is the emissions from venting for the year, as calculated under subclause (3).
- (5) If a person who is required to comply with this regulation is required to submit an emissions return for a period other than a year, this regulation applies with any necessary modifications.

*Using geothermal fluid*

**17 Application of regulations 18 and 19**

A person must comply with regulations 18 and 19 if the person, in any year, is a participant under section 54(1)(a) of the Act

in respect of the activity in Part 3 of Schedule 3 of the Act of using geothermal fluid for the purpose of generating electricity or industrial heat.

**18 Collection of information for purpose of calculating emissions from using geothermal fluid**

- (1) The following information must be collected in relation to each class of geothermal fluid used in the year for the purpose of generating electricity or industrial heat:
- (a) for a class referred to in Part A of Table 5 of Schedule 2, or a class defined in a unique emissions factor approval that relates to a plant that uses, or makes a particular use of, geothermal steam, the total number of tonnes of geothermal steam separated by the person in the year; and
  - (b) for a class referred to in Part B of Table 5 of Schedule 2, or a class defined in unique emissions factor approval by reference to a plant that uses, or makes a particular use of, geothermal fluid that does not relate to steam production, the total number of tonnes of 2-phase geothermal fluid used by the person in the year.
- (2) For the purposes of subclause (1)(a), **geothermal steam separated**—
- (a) includes non-condensable gases; but
  - (b) does not include fugitive steam released during well testing or well bleeding.

**19 Method of calculating emissions from using geothermal fluid**

- (1) Emissions in relation to each class of geothermal fluid referred to in regulation 18(1)(a) that is used for the purpose of generating electricity or industrial heat by the person in the year, must be calculated in accordance with the following formula:

$$E = A \times EF$$

where—

- A is the number of tonnes of geothermal steam separated by the person during the year, as recorded under regulation 18(1)(a)

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E is the total emissions in tonnes for the class of geothermal fluid used

EF is,—

- (a) in relation to a class of geothermal fluid listed in Part A of Table 5 in Schedule 2 for which no unique emissions factor is in force, the emissions factor for the class of geothermal fluid from that table; and
- (b) in relation to a class of geothermal fluid defined in an approval to use a unique emissions factor, the unique emissions factor.

- (2) Emissions in relation to each class of geothermal fluid referred to in regulation 18(1)(b) used for the purpose of generating electricity or industrial heat by the person in the year, must be calculated in accordance with the following formula:

$$E = A \times EF$$

where—

A is the number of tonnes of 2-phase geothermal fluid of the class used by the person during the year, as recorded under regulation 18(1)(b)

E is the total emissions in tonnes for the class of geothermal fluid used

EF is,—

- (a) in relation to a class of geothermal fluid listed in Part B of Table 5 in Schedule 2 for which no unique emissions factor is in force, the emissions factor for the class of geothermal fluid from that table; and
- (b) in relation to a class of geothermal fluid defined in an approval to use a unique emissions factor, the unique emissions factor.

- (3) An emissions return submitted by a person who is required to comply with this regulation must record the person's total emissions from the activity of using geothermal fluid for the purpose of generating electricity or industrial heat in the relevant year, calculated by adding together the emissions for each class of geothermal fluid used, as calculated under subclauses (1) and (2).

- (4) If a person who is required to comply with this regulation is required to submit an emissions return for a period other than a year, this regulation applies with any necessary modifications.

*Combusting used oil, waste oil, used tyres, or  
waste*

**20 Application of regulations 21 and 22**

A person must comply with regulations 21 and 22 if the person, in any year, is a participant under section 54(1)(a) of the Act in respect of the activity in Part 3 of Schedule 3 of the Act of combusting used oil, waste oil, used tyres, or waste for the purpose of generating electricity or industrial heat.

**21 Collection of information for purpose of calculating emissions from combusting used oil, waste oil, used tyres, or waste**

The following information must be collected in relation to used oil, waste oil, used tyres, or waste combusted in the year for the purpose of generating electricity or industrial heat:

- (a) the total number of tonnes of each class of used or waste oil combusted by the person in the year; and
- (b) the calorific value of the used or waste oil referred to in paragraph (a); and
- (c) the total number of tonnes of obligation fuel component of each class of used or waste oil combusted by the person in the year; and
- (d) the calorific value of the obligation fuel component of the used or waste oil referred to in paragraph (c); and
- (e) the total number of tonnes of each class of used tyres combusted by the person in the year; and
- (f) the calorific value of the used tyres referred to in paragraph (e); and
- (g) the total number of tonnes of each class of waste combusted by the person in the year; and
- (h) the calorific value of each class of waste referred to in paragraph (g).

**22 Method of calculating emissions from combusting used oil, waste oil, used tyres, or waste**

- (1) Emissions in relation to each class of used or waste oil, used tyres, or waste combusted by the person in the year for the purpose of generating electricity or industrial heat, must be calculated in accordance with whichever of the following formulae is appropriate:

$$E_1 = ((A \times CVa) - (B \times CVb)) \times EF_1 \times 0.001$$

$$E_2 = F \times CVf \times EF_2 \times 0.001$$

$$E_3 = I \times CVi \times EF_3 \times 0.001$$

where—

A is the total number of tonnes of the class of used or waste oil combusted by the person in the year, as recorded under regulation 21(a)

B is the total number of tonnes of the obligation fuel component of the used or waste oil of the class combusted by the person in the year, as recorded under regulation 21(c)

CVa is the weighted average calorific value of the class of used or waste oil calculated by reference to the information recorded under regulation 21(b)

CVb is the weighted average calorific value of the obligation fuel component of the class of used or waste oil as calculated by reference to the information recorded under regulation 21(d)

CVf is the weighted average calorific value of the class of used tyres calculated by reference to the information recorded under regulation 21(f)

CVi is the weighted average calorific value of the class of waste as recorded under regulation 21(i)

E<sub>1</sub> is the emissions for the class of used or waste oil combusted in the year

E<sub>2</sub> is the emissions for the class of used tyres combusted in the year

E<sub>3</sub> is the emissions for the class of waste combusted in the year

EF<sub>1</sub> is,—

- (a) in relation to a class of used or waste oil for which no unique emissions factor is in force, the emissions factor for the class of used or waste oil from Part A of Table 6 in Schedule 2:
- (b) in relation to a class of used or waste oil for which a unique emissions factor is in force, the unique emissions factor
- EF<sub>2</sub> is,—
- (a) in relation to a class of used tyres for which no unique emissions factor is in force, the emissions factor for used tyres from Part B of Table 6 in Schedule 2:
- (b) in relation to a class of used tyres for which a unique emissions factor is in force, the unique emissions factor
- EF<sub>3</sub> is—
- (a) in relation to a class of waste for which no unique emissions factor is in force, the emissions factor for the class of waste from Part C of Table 6 in Schedule 2:
- (b) in relation to a class of waste for which a unique emissions factor is in force, the unique emissions factor
- F is the total number of tonnes of the class of used tyres combusted by the person in the year, as recorded under regulation 21(e)
- I is the total number of tonnes of the class of waste, as recorded under regulation 21(g).
- (2) An emissions return submitted by a person who is required to comply with this regulation must record the person's total emissions from the activity of combusting used oil, waste oil, used tyres, or waste for the purpose of generating electricity or industrial heat in the relevant year calculated as follows:
- $$TE = \Sigma(E_1) + \Sigma(E_2) + \Sigma(E_3)$$
- where—
- E<sub>1</sub> is the emissions for each class of used or waste oil combusted in the year, as calculated under subclause (1)

- $E_2$  is the emissions for each class of used tyres combusted in the year, as calculated under subclause (1)
- $E_3$  is the emissions for each class of waste combusted in the year, as calculated under subclause (1)
- TE is the total emissions in tonnes for the activity of combusting used oil, waste oil, used tyres, or waste for the purpose of generating electricity or industrial heat for the year.
- (3) If a person who is required to comply with this regulation is required to submit an emissions return for a period other than a year, this regulation applies with any necessary modifications.

*Refining petroleum*

**23 Application of regulations 24 and 25**

A person must comply with regulations 24 and 25 if the person, in any year, is a participant under section 54(1)(a) of the Act in respect of the activity in Part 3 of Schedule 3 of the Act of refining petroleum where the refining involves the use of intermediate crude oil products for energy or feedstock purposes.

**24 Collection of information for purpose of calculating emissions from refining petroleum**

The following information must be collected in relation to intermediate crude oil products used for energy or feedstock purposes in petroleum refining in the year:

- (a) the total number of tonnes of asphalt used for combustion by the person in the year; and
- (b) the total number of tonnes of fuel oil used for combustion by the person in the year; and
- (c) the total number of tonnes of refinery gas used for combustion or hydrogen manufacture by the person in the year; and
- (d) the total number of tonnes of other intermediate crude oil used for combustion or hydrogen manufacture by the person in the year.

- 25 Method of calculating emissions from refining petroleum**
- (1) Emissions in relation to intermediate crude oil products used for energy or feedstock purposes in petroleum refining by the person in the year must be calculated in accordance with the following formula:
- $$E = (A \times EF) + (B \times EF) + (C \times EF) + (D \times EF)$$
- where—
- A is the total number of tonnes of asphalt used for combustion by the person in the year, as recorded under regulation 24(a)
- B is the total number of tonnes of fuel oil used for combustion by the person in the year, as recorded under regulation 24(b)
- C is the total number of tonnes of refinery gas used for combustion or hydrogen manufacture by the person in the year, as recorded under regulation 24(c)
- D is the total number of tonnes of other intermediate crude oil used for combustion or hydrogen manufacture by the person in the year, as recorded under regulation 24(d)
- E is the emissions in tonnes from the activity of refining petroleum
- EF is the relevant emissions factor as specified in Table 7 of Schedule 2.
- (2) If a person required to comply with this regulation is required to submit an emissions return for a period other than a year, this regulation applies with any necessary modifications.

### **Part 3**

#### **Industrial processes participants**

##### *Producing iron or steel*

- 26 Application of regulations 27 and 28**
- A person must comply with regulations 27 and 28 if the person, in any year, is a participant under section 54(1)(a) of the Act in respect of the activity in subpart 1 of Part 4 of Schedule 3 of the Act of producing iron or steel.

**27 Collection of information for purpose of calculating emissions from producing iron or steel**

- (1) The following information must be collected in relation to iron or steel produced:
- (a) the total number of tonnes of each type of reducing agent (for example, general industrial coke or coal), other than obligation coal, used by the person in the year; and
  - (b) the total carbon content of each type of reducing agent used by the person in the year; and
  - (c) the total number of tonnes of uncalcined limestone used by the person in the year; and
  - (d) the total number of tonnes of uncalcined dolomite used by the person in the year.
- (2) For the purposes of subclause (1)(a), tonnes of reducing agent must be measured on a dry, ash free basis.

**28 Method of calculating emissions from producing iron or steel**

- (1) Emissions in relation to iron or steel produced by the person in the year, must be calculated in accordance with the following formula:

$$E = (\Sigma(A \times B) \times EF_1) + (C \times EF_2) + (D \times EF_3)$$

where—

- A is the total number of tonnes of each type of reducing agent, other than obligation coal, used by the person in the year, as recorded under regulation 27(a)
- B is the total carbon content of the relevant type of reducing agent used by the person in the year, as recorded under regulation 27(b)
- C is the total number of tonnes of uncalcined limestone used by the person in the year, as recorded under regulation 27(c), expressed in tonnes of calcium carbonate
- D is the total number of tonnes of uncalcined dolomite used by the person in the year, as recorded under regulation 27(d), expressed in tonnes of calcium magnesium carbonate

- E is the emissions from the activity of producing iron or steel
- EF<sub>1</sub> is the emissions factor for carbon content from Table 1 in Schedule 3
- EF<sub>2</sub> is the emissions factor for uncalcined limestone used from Table 1 in Schedule 3
- EF<sub>3</sub> is the emissions factor for uncalcined dolomite used from Table 1 in Schedule 3
- (2) If a person who is required to comply with this regulation is required to submit an emissions return for a period other than a year, this regulation applies with any necessary modifications.

*Producing aluminium*

**29 Application of regulations 30 and 31**

A person must comply with regulations 30 and 31 if the person, in any year, is a participant under section 54(1)(a) of the Act in respect of the activity in subpart 1 of Part 4 of Schedule 3 of the Act of producing aluminium, resulting in the consumption of anodes or the production of anode effects.

**30 Collection of information for purpose of calculating emissions from producing aluminium**

The following information must be collected in relation to aluminium produced:

- (a) the total number of tonnes of carbon dioxide resulting from baked anodes used by the person in the year, as calculated in accordance with the Aluminium Sector Greenhouse Gas Protocol; and
- (b) the total number of tonnes of carbon dioxide resulting from pitch volatiles used by the person in the year, as calculated in accordance with the Aluminium Sector Greenhouse Gas Protocol; and
- (c) the total number of tonnes of carbon dioxide resulting from packing material, other than obligation coal, used by the person in the year as calculated in accordance with the Aluminium Sector Greenhouse Gas Protocol; and

- (d) the total number of tonnes of hot metal aluminium produced by the person in the year; and
- (e) the anode effect minutes per cell-day (excluding non-steady state emissions and as defined in Appendix C of the Aluminium Sector Greenhouse Gas Protocol); and
- (f) the slope coefficient for C<sub>2</sub>F<sub>6</sub> (in kg C<sub>2</sub>F<sub>6</sub>/tAl) and for CF<sub>4</sub> (in kg CF<sub>4</sub>/tAl), as provided by the Aluminium Sector Greenhouse Gas Protocol.

**31 Method of calculating emissions from producing aluminium**

- (1) Emissions in relation to aluminium produced by the person in the year, must be calculated in accordance with the following formula:

$$E = A + B + C + [D \times F \times ((G \times H) + (I \times J))/1000]$$

where—

- A is the total number of tonnes of carbon dioxide resulting from baked anodes used by the person in the year, as recorded under regulation 30(a)
- B is the total number of tonnes of carbon dioxide resulting from pitch volatiles used by the person in the year, as recorded under regulation 30(b)
- C is the total number of tonnes of carbon dioxide resulting from packing material used by the person in the year, as recorded under regulation 30(c)
- D is the total number of tonnes of hot metal aluminium produced in the year, as recorded under regulation 30(d)
- E is the emissions in tonnes from the production of aluminium
- F is the anode effect minutes per cell-day, as recorded under regulation 30(e)
- G is the slope coefficient for C<sub>2</sub>F<sub>6</sub>, as recorded under regulation 30(f)
- H is 9 200 (the global warming potential for C<sub>2</sub>F<sub>6</sub>)
- I is the slope coefficient for CF<sub>4</sub>, as recorded under regulation 30(f)
- J is 6 500 (the global warming potential for CF<sub>4</sub>).

- (2) If a person who is required to comply with this regulation is required to submit an emissions return for a period other than a year, this regulation applies with any necessary modifications.

*Producing clinker or burnt lime*

**32 Application of regulations 33 and 34**

A person must comply with regulations 33 and 34 if the person in any year, is a participant under section 54(1)(a) of the Act in respect of the activity in subpart 1 of Part 4 of Schedule 3 of the Act of producing clinker or burnt lime, resulting in calcination of limestone, or calcium carbonates.

**33 Collection of information for purpose of calculating emissions from producing clinker or burnt lime**

The following information must be collected in relation to clinker and each class of burnt lime produced:

- (a) the total number of tonnes of cement clinker produced by the person in the year; and
- (b) the total number of tonnes of each class of burnt lime produced by the person in the year.

**34 Method of calculating emissions from producing clinker or burnt lime**

- (1) Emissions in relation to clinker and each class of burnt lime produced by the person in the year must be calculated in accordance with the following formula:

$$E = (A \times EF_1 \times B) + \sum(C \times EF_2)$$

where—

- A is the total number of tonnes of cement clinker produced by the person in the year, as recorded under regulation 33(a), expressed in tonnes of calcium oxide
- B is the cement kiln dust correction factor from Table 2 in Schedule 3
- C is the total number of tonnes of each class of burnt lime produced by the person in the year, as recorded under regulation 33(b)
- E is the emissions in tonnes from the production of clinker or burnt lime

EF<sub>1</sub> is the emissions factor for calcium oxide in clinker production from Table 2 in Schedule 3

EF<sub>2</sub> is the emissions factor for the class of burnt lime production from Table 2 in Schedule 3.

- (2) If a person who is required to comply with this regulation is required to submit an emissions return for a period other than a year, this regulation applies with any necessary modifications.

*Producing glass using soda ash*

**35 Application of regulations 36 and 37**

A person must comply with regulations 36 and 37 if the person, in any year, is a participant under section 54(1)(a) of the Act in respect of the activity in subpart 1 of Part 4 of Schedule 3 of the Act of producing glass using soda ash.

**36 Collection of information for purpose of calculating emissions from producing glass**

The following information must be collected in relation to the glass produced in the year:

- (a) the total number of tonnes of soda ash used by the person in the year; and
- (b) the total number of tonnes of uncalcined limestone used by the person in the year; and
- (c) the total number of tonnes of uncalcined dolomite used by the person in the year.

**37 Method of calculating emissions from producing glass**

- (1) Emissions in relation to the glass produced by the person in the year, must be calculated in accordance with the following formula:

$$E = (A \times EF_1) + (B \times EF_2) + (C \times EF_3)$$

where—

- A is the total number of tonnes of soda ash used by the person in the year, as recorded under regulation 36(a)
- B is the total number of tonnes of uncalcined limestone used by the person in the year, as recorded under regulation 36(b), expressed as tonnes of calcium carbonate

- C is the total number of tonnes of uncalcined dolomite used by the person in the year, as recorded under regulation 36(c), expressed as tonnes of calcium magnesium carbonate
- E the total emissions in tonnes from the production of glass
- EF<sub>1</sub> is the emissions factor for soda ash from Table 3 in Schedule 3
- EF<sub>2</sub> is the emissions factor for uncalcined limestone from Table 3 in Schedule 3.
- EF<sub>3</sub> is the emissions factor for uncalcined dolomite from Table 3 in Schedule 3.
- (2) If a person who is required to comply with this regulation is required to submit an emissions return for a period other than a year, this regulation applies with any necessary modifications.

*Producing gold*

**38 Application of regulations 39 and 40**

A person must comply with regulations 39 and 40 if the person, in any year, is a participant under section 54(1)(a) of the Act in respect of the activity in subpart 1 of Part 4 of Schedule 3 of the Act of producing gold.

**39 Collection of information for purpose of calculating emissions from producing gold**

The following information must be collected in relation to gold produced:

- (a) the total number of tonnes of uncalcined limestone used by the person in producing gold in the year; and
- (b) the total number of tonnes of uncalcined dolomite used by the person in producing gold in the year.

**40 Method of calculating emissions from producing gold**

- (1) Emissions in relation to the gold produced by the person in the year must be calculated in accordance with the following formula:

$$E = (A \times EF_1) + (B \times EF_2)$$

where—

- A is the total number of tonnes of uncalcined limestone used by the person in the year, as recorded under regulation 39(a), expressed as tonnes of calcium carbonate
- B is the total number of tonnes of uncalcined dolomite used by the person in the year, as recorded under regulation 39(b), expressed as tonnes of calcium magnesium carbonate
- E is the total emissions in tonnes from the production of gold
- EF<sub>1</sub> is the emissions factor for uncalcined limestone from Table 4 in Schedule 3.
- EF<sub>2</sub> is the emissions factor for uncalcined dolomite from Table 4 in Schedule 3
- (2) If a person who is required to comply with this regulation is required to submit an emissions return for a period other than a year, this regulation applies with any necessary modifications.

*Producing cable*

**41 Application of regulations 42 and 43**

A person must comply with regulations 42 and 43 if the person, in any year, is a participant under section 54(1)(a) of the Act in respect of the activity in subpart 1 of Part 4 of Schedule 3 of the Act of producing cable using a nitrogen cure process.

**42 Collection of information for purpose of calculating emissions from producing cable using nitrogen cure process**

Information must be collected about the total number of tonnes of nitrogen used by the person in producing cable in the year.

**43 Method of calculating emissions from producing cable using nitrogen cure process**

- (1) Emissions in relation to cable produced by the person in the year must be calculated in accordance with the following formula:

$$E = A \times EF$$

where—

A is the total number of tonnes of nitrogen used by the person in the year, as recorded under regulation 42

E is the emissions in tonnes from the production of cable

EF is the emissions factor for producing cable using nitrogen, as specified in Table 5 in Schedule 3.

- (2) If a person who is required to comply with this regulation is required to submit an emissions return for a period other than a year, this regulation applies with any necessary modifications.

## **Part 4**

### **Opt-in participants**

#### *Purchasing coal*

#### **44 Application of regulations 45 and 46**

- (1) A person must comply with regulations 45 and 46 if the person, in any year, is a participant under section 54(1)(b) of the Act in respect of the activity in Part 4 of Schedule 4 of the Act of purchasing coal from 1 or more participants who mine coal where the total coal purchased exceeds 250 000 tonnes per year.
- (2) Regulations 45 and 46 apply only if the coal is mined—
- (a) on or after 1 January 2010; and
  - (b) by a person who is required to comply with regulations 9 and 10.

#### **45 Collection of information for purpose of calculating emissions: purchasing coal**

- (1) The following information must be collected in relation to each class of coal for the year:
- (a) the total number of tonnes of coal of the class purchased from each coal miner in the year, as recorded at the point of sale; and
  - (b) the calorific value of the coal referred to in paragraph (a); and
  - (c) the total number of tonnes of coal of the class purchased from a coal miner that are exported by the person in the year, as recorded at the customs point; and

- (d) the calorific value of the coal referred to in paragraph (c).
- (2) If the person wishes to include a stockpile adjustment for the class of coal under regulation 46(1), then the person must also collect the information specified in clause 3 of Schedule 1.

**46 Method of calculating emissions in relation to purchasing coal**

- (1) Emissions for the year in relation to each class of coal, must be calculated in accordance with the following formula:

$$E = ((A \times CV_1) - (B \times CV_2) - (C \times CV_1)) \times EF$$

where—

A is the total number of tonnes of coal of the class purchased from coal miners in the year, as recorded under regulation 45(1)(a)

B is—

- (a) the figure determined in accordance with Schedule 1, if the person—
  - (i) includes a stockpile adjustment for the class of coal; or
  - (ii) does not include a stockpile adjustment, but a stockpile adjustment was included when emissions from purchasing the class of coal were calculated and reported in the previous emissions return submitted for the activity; or
- (b) zero, if the person does not include a stockpile adjustment for the class of coal and—
  - (i) it is the person's first emission return for the activity; or
  - (ii) a stockpile adjustment was not included when emissions from purchasing the class of coal were calculated and reported in the previous emissions return submitted for the activity

C is the total number of tonnes of coal of the class exported by the person in the year, as recorded under regulation 45(1)(c)

- $CV_1$  is the weighted average calorific value of the class of coal calculated by reference to the information recorded under the relevant paragraph in regulation 45(1)
- $CV_2$  is—
- (a) the figure for  $CV_2$  determined in accordance with Schedule 1 if the person—
    - (i) includes a stockpile adjustment for the class of coal; or
    - (ii) does not include a stockpile adjustment, but a stockpile adjustment was included when emissions from importing the class of coal were calculated and reported in the previous emissions return submitted for the activity; or
  - (b) zero, if B is zero
- E is the emissions in tonnes from the class of coal purchased
- EF is,—
- (a) in relation to a class of coal for which no unique emissions factor is in force, the emissions factor for the class of coal from Table 2 in Schedule 2; or
  - (b) in relation to a class of coal for which a unique emissions factor is in force, the unique emissions factor.
- (2) An emissions return submitted by a person who is required to comply with this regulation must record the person's total emissions from the activity of purchasing coal in the relevant year, calculated by adding together the emissions for each class of coal purchased calculated under subclause (1).
- (3) If a person who is required to comply with this regulation is required to submit an emissions return for a period other than a year, this regulation applies with any necessary modifications.

*Purchasing natural gas*

**47 Application of regulations 48 and 49**

- (1) A person must comply with regulations 48 and 49 if the person, in any year, is a participant under section 54(1)(b) of the Act

in respect of the activity in Part 4 of Schedule 4 of the Act of purchasing natural gas from 1 or more participants who mine natural gas where the total natural gas purchased exceeds 2 petajoules in a year.

- (2) Regulations 48 and 49 apply only if the purchased natural gas (**opt-in natural gas**) is mined—
- (a) on or after 1 January 2010; and
  - (b) by a person who is required to comply with regulations 15 and 16.

**48 Collection of information for purpose of calculating emissions from natural gas mined other than for export**

- (1) The following information must be collected in relation to each class of opt-in natural gas for the year:
- (a) the total number of tonnes of opt-in natural gas of the class purchased by the person from each gas miner in the year, as measured at the point of sale; and
  - (b) the total number of tonnes of opt-in natural gas of the class exported by the person in the year, as measured at the point of sale; and
  - (c) in respect of each of the quantities of opt-in natural gas referred to in paragraphs (a) and (b)—
    - (i) the total mass of CO<sub>2</sub> that results from the complete combustion of the gas, as determined by reference to the results of the tests in subclause (2); and
    - (ii) the total mass of the gas, as determined by reference to the results of the tests in subclause (2); and
    - (iii) the total terajoules of the gas, as determined by reference to the results of the tests in subclause (2).
- (2) To obtain the information required by subclause (1)(c), the natural gas must be tested, by a person or laboratory that is accredited according to ISO 17025:2005 by International Accreditation New Zealand or an overseas accreditation agency recognised under New Zealand's mutual recognition arrangements, using gas chromatography in accordance with the following standards, (or equivalent standards, or test methods

related to an organisation, that is listed in regulation 3(2) of the Climate Change (Unique Emissions Factors) Regulations 2009):

- (a) GPA (Gas Processing Association) 2166:2005 (obtaining natural gas samples for analysis by gas chromatography, Parts 1–8); and
  - (b) ASTM D1945-03 (analysis of natural gas by gas chromatography).
- (3) Information must be collected in relation to the total number of gigajoules of opt-in natural gas held in a storage facility at 31 December in the year.
- (4) In addition, if the person elects to include a storage adjustment under regulation 49(3), then the person must also collect the following information:
- (a) the total number of gigajoules of opt-in natural gas injected in the year into a gas storage facility by the person; and
  - (b) the total number of gigajoules of opt-in natural gas extracted in the year from a gas storage facility by the person.
- (5) In subclause (3), the total number of gigajoules of natural gas held by a person in a storage facility at 31 December in a year must be determined by subtracting the total number of gigajoules of opt-in natural gas extracted from the facility from 31 December 2009 to 31 December in the year, from the total number of gigajoules of natural gas injected into the facility in that period.

**49 Method of calculating emissions in relation to purchasing natural gas**

- (1) Emissions for the year in relation to each of the following quantities of natural gas must be calculated in accordance with the formula in subclause (2):
- (a) each class of opt-in natural gas purchased by the person in the year; and
  - (b) each class of opt-in natural gas exported by the person in the year.
- (2) The formula for the calculation of emissions under subclause (1) is—

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$$E = [OF \times (A/B) \times C] + (D \times CEF) + (D \times NEF)$$

where—

- A is the total mass of CO<sub>2</sub> that results from the complete combustion of the quantity of natural gas, as recorded under regulation 48(1)(c)(i)
- B is the total mass of the natural gas, as recorded under regulation 48(1)(c)(ii)
- C is the total number of tonnes of the quantity of natural gas, as recorded under regulation 48(1)(a) or (b)
- CEF is 0.027 (the emissions factor for CH<sub>4</sub>)
- D is the total terajoules of the quantity of natural gas, as recorded under regulation 48(1)(c)(iii)
- E is the emissions from the quantity of natural gas
- NEF is 0.031 (the emissions factor for N<sub>2</sub>O)
- OF is 0.995 (the oxidation factor).

- (3) Total emissions from the activity of purchasing natural gas for the year must be calculated as follows:

$$TE = \Sigma(EP) - \Sigma(EE) - S$$

where—

- EE is the emissions from each class of opt-in natural gas exported by the person in the year, as calculated under subclause (2)
- EP is the emissions from each class of opt-in natural gas purchased by the person in the year, as calculated under subclause (2)
- S is—
  - (a) if the person elects to include a storage adjustment for opt-in natural gas for the year, the figure calculated as follows:

$$S = (G - H) \times EF$$

where—

- G is the total number of gigajoules of opt-in natural gas injected in the year by the person into a gas storage facility, as recorded under regulation 48(4)(a)
- EF is 0.053 (the emissions factor for specification gas)

- H is the total number of gigajoules of opt-in natural gas extracted in the year from a gas storage facility by the person, as recorded under regulation 48(4)(b); or
- (b) if the person elects not to include a storage adjustment for opt-in natural gas purchased in the year but a storage adjustment was included when emissions from purchasing natural gas were calculated and reported in the previous emissions return submitted for the activity, the total number of gigajoules of opt-in natural gas held by the person in a storage facility at 31 December in the previous year, as recorded under regulation 48(5); or
  - (c) zero, if the person does not include a storage adjustment for opt-in natural gas for the year and—
    - (i) it is the person's first emissions return for the activity; or
    - (ii) a storage adjustment was not included when emissions from purchasing natural gas were calculated and reported in the previous emissions return submitted for the activity
- TE is the total emissions for the activity of purchasing natural gas from 1 or more participants who mine natural gas where the total natural gas purchased exceeds 2 petajoules per year.
- (4) If a person who is required to comply with this regulation is required to submit an emissions return for a period other than a year, this regulation applies with any necessary modifications.
-

## Schedule 1

rr 6, 7, 45, 46

### Stockpile adjustments for activities of importing and purchasing coal

#### 1 Interpretation

In this Schedule—

**joint stockpile** means a stockpile that is made up of—

- (a) imported coal of more than one class; or
- (b) coal purchased from a coal miner of more than one class; or
- (c) imported coal and coal purchased from a coal miner.

#### 2 Status of examples

- (1) An example is only illustrative of the provision it relates to and does not limit the provision.
- (2) If an example and the provision it relates to are inconsistent, the provision prevails.

#### 3 Information to be collected for purposes of stockpile adjustment

- (1) A person who wishes to include a stockpile adjustment in relation to a class of coal under regulation 7(1) or 46(1) must collect information about—
  - (a) the total number of tonnes of any stockpile of coal of the class owned by the person as at 1 January in the year; and
  - (b) the calorific value of the coal referred to in paragraph (a); and
  - (c) the total number of tonnes of coal of the class added to the stockpile in the year; and
  - (d) the calorific value of the coal referred to in paragraph (c); and
  - (e) the total number of tonnes of coal of the class removed from the stockpile in the year.
- (2) If a person wishes to include a stockpile adjustment in relation to a class of coal on a joint stockpile, subclause (1)(e) must be read as referring to the total tonnes of coal removed from the joint stockpile in the year.

- (3) Despite subclause (1)(a) and (b), if a person includes a stockpile adjustment in relation to a class of coal in 1 year, and includes a stockpile adjustment in relation to the same stockpile of the class in the following year:
- (a) the total number of tonnes of coal of the class in the stockpile at 1 January in the following year is the figure for SCclosing for the stockpile from the previous year, as determined under clause 4 or 5; and
  - (b) the calorific value of the coal in the stockpile at 1 January in the following year is the figure for CV<sub>2</sub> for the stockpile from the previous year, as determined under clause 7.

**4 Calculating B where stockpile contains single class of imported coal or purchased coal**

- (1) This clause applies where a person includes a stockpile adjustment in relation to a class of coal under regulation 7(1) or 46(1) and the stockpile contains only one class of coal.
- (2) B in the formula in regulation 7(1) or 46(1) must be calculated as follows:

$$B = \text{SCclosing} - \text{SCopening}$$

where—

SCclosing is the total number of tonnes of the stockpile of the class of coal at 31 December determined under subclause (3)

SCopening is,—

- (a) for the year beginning 1 January 2010, zero; or
  - (b) for any other year,—
    - (i) the total number of tonnes of the stockpile of the class of coal at 1 January recorded under clause 3(1)(a); or
    - (ii) if clause 3(3) applies, SCclosing for the stockpile of the class of coal from the previous year.
- (3) SCclosing must be determined as follows:
- $$\text{SCclosing} = \text{SCopening} + \text{TCadded} - \text{TCremoved}$$
- where—
- SCopening has the same meaning as in subclause (2); and

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TC<sub>added</sub> is the total number of tonnes of coal of the class added to the stockpile during the year, as recorded under clause 3(1)(c)

TC<sub>removed</sub> is the total number of tonnes of coal of the class removed from the stockpile during the year, as recorded under clause 3(1)(e).

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**Example**

A participant has a stockpile of imported lignite. At 1 January in the year, the stockpile contained 5 000 tonnes of lignite. During the year 60 000 tonnes of imported lignite were added and 40 000 were removed.

$$B = (5\,000 + 60\,000 - 40\,000) - 5\,000 = 20\,000 \text{ tonnes}$$

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**5 Calculating B where stockpile of class of coal is joint stockpile**

- (1) This clause applies if a person includes a stockpile adjustment in relation to a class of coal under regulation 7(1) or 46(1) and the relevant stockpile is a joint stockpile.
- (2) However, a person must not include a stockpile adjustment in relation to a class of coal on a joint stockpile unless a stockpile adjustment is also included in relation to all other classes of coal on the stockpile.
- (3) B in the formula in regulation 7(1) or 46(1) must be calculated as follows:

$$B = SC_{\text{closing}} - SC_{\text{opening}}$$

where—

SC<sub>closing</sub> is the tonnes of coal of the class on the stockpile at 31 December in the year, as determined under subclause (4)

SC<sub>opening</sub> is,—

- (a) for the year beginning 1 January 2010, zero; or
- (b) for any other year,—
  - (i) the total number of tonnes of the stockpile of the class of coal at 1 January recorded under clause 3(1)(a); or

- (ii) if clause 3(3) applies, SCclosing for the stockpile of the class of coal from the previous year.
- (4) SCclosing for a class of coal must be determined as follows:  
$$\text{SCclosing} = (\text{SCopening} + \text{TCadded}) - (\text{TSremoved} \times ((\text{SCopening} + \text{TCadded})/\text{TS}))$$

where—

SCopening has the same meaning as in subclause (3)

TCadded is the total number of tonnes of coal of the class added to the stockpile during the year, as recorded under clause 3(1)(c)

TSremoved is the total number of tonnes of coal removed from the stockpile during the year, as recorded under clause 3(1)(e) and 3(2)

TS is the total tonnes of coal on or added to the stockpile during the year, as determined under subclause (5).

- (5) TS must be determined as follows:

$$\text{TS} = \text{TSopening} + \text{TSadded}$$

where—

TSopening is,—

- (a) for the year beginning 1 January 2010, zero; or
- (b) for any other year, the total number of tonnes of the stockpile of coal at 1 January—
- (i) determined by adding together the figures for all classes of imported coal or purchased coal that constitute the stockpile, as recorded under clause 3(1)(a); or
- (ii) if clause 3(3) applies, determined by adding together the figures for SCclosing for all classes of imported coal or purchased coal that constitute the stockpile, from the previous year.

TSadded is the total number of tonnes of coal added to the stockpile during the year, determined by adding together the figures for all classes of imported coal or purchased coal that were added to the stockpile during the year, as recorded under clause 3(1)(c)

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**Example**

A participant has a stockpile made up of imported and purchased lignite. At 1 January in the year, the stockpile contained 20 000 tonnes of lignite (10 000 tonnes of imported coal and 10 000 tonnes of purchased coal). During the year 60 000 tonnes of imported lignite were added (40 000 of a new class to which a unique emissions factor applied, and 20 000 other tonnes) and 20 000 tonnes of purchased lignite were added. 50 000 tonnes of lignite were removed during the year.

Three calculations are necessary. Two to determine the stockpile adjustment for the two classes of imported coal and one for the class of purchased coal.

*Imported coal of the class to which the default emissions factor applies*

$$\begin{aligned} B &= 15\,000 \text{ (SCclosing)} - 10\,000 \text{ (SCopening)} = 5\,000 \text{ tonnes} \\ \text{SCclosing} &= 10\,000 + 20\,000 - (50\,000 \times (10\,000 + 20\,000) / (20\,000 + 80\,000)) \\ &= 30\,000 - (50\,000 \times 30\,000 / 100\,000) \\ &= 30\,000 - 15\,000 \\ &= 15\,000 \end{aligned}$$

*Imported coal of the class to which the unique emission factor applies*

$$\begin{aligned} B &= 20\,000 \text{ (SCclosing)} - 0 \text{ (SCopening)} = 20\,000 \text{ tonnes} \\ \text{SCclosing} &= 0 + 40\,000 - (50\,000 \times (0 + 40\,000) / (20\,000 + 80\,000)) \\ &= 40\,000 - (50\,000 \times 40\,000 / 100\,000) \\ &= 40\,000 - 20\,000 \\ &= 20\,000 \end{aligned}$$

*Purchased coal*

$$\begin{aligned} B &= 15\,000 \text{ (SCclosing)} - 10\,000 \text{ (SCopening)} = 5\,000 \text{ tonnes} \\ \text{SCclosing} &= 10\,000 + 20\,000 - (50\,000 \times (10\,000 + 20\,000) / (20\,000 + 80\,000)) \\ &= 30\,000 - (50\,000 \times 30\,000 / 100\,000) \\ &= 30\,000 - 15\,000 \\ &= 15\,000 \end{aligned}$$

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**6 Calculating B where stockpile adjustment is not included in year, but was included in previous emissions return for activity**

- (1) This clause applies if a person does not include a stockpile adjustment for a class of coal, but a stockpile adjustment was included when emissions from the class of coal were calculated and reported in the previous emissions return submitted for the activity of importing coal or purchasing coal from a coal miner, as the case may be.
- (2) If this clause applies, B must be calculated as follows:  
$$B = -1 \times SC_{\text{closing}}$$
 for the stockpile of the class of coal from the previous year, (as determined and recorded under clause 3 or 4, as the case may be).

**7 Calculating CV<sub>2</sub> for purposes of regulation 7(1) or 46(1)**

- (1) In regulation 7(1) or 46(1), if the person—
- (a) is claiming a stockpile adjustment, CV<sub>2</sub> is the figure calculated under subclause (2)
- (b) is not claiming a stockpile adjustment for the class of coal in the current year, but claimed a stockpile adjustment when emissions from the class of coal were calculated and reported in the previous emissions return, CV<sub>2</sub> is the figure that was used as CV<sub>2</sub> when calculating emissions for the stockpile of the class of coal in the previous year's emissions return.
- (2) For the purposes of subclause (1)(a), CV<sub>2</sub> must be calculated as follows:

$$CV_2 = \frac{(SC_{\text{opening}} \times CV_{\text{opening}}) + \sum(TC_{\text{added}} \times CV_{T_{\text{added}}})}{SC_{\text{opening}} + T_{\text{added}}}$$

where—

SC<sub>opening</sub> is SC<sub>opening</sub> for the class of coal from either clause 4 or 5, as the case may be

CV<sub>opening</sub> is the calorific value of the stockpile as at 1 January in the year, as recorded under clause 3(1)(b)

TC<sub>added</sub> is the tonnes of the class of coal added, as recorded under clause 3(1)(c)

CV<sub>Tadded</sub> is the CV of the tonnes of coal added, as recorded under clause 3(1)(d)

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**Example**

A participant has a stockpile of lignite. At 1 January in the year, the stockpile contained 5 000 tonnes of lignite with a calorific value of 17 MJ /kg. During the year the participant adds 3 shipments of lignite as follows:

(a) 60 000 tonnes with CV of 16.95 MJ /kg

(b) 18 000 tonnes with CV of 16.75 MJ /kg

(c) 22 000 tonnes with CV of 17.26 MJ /kg

$$\begin{aligned} CV_2 &= \frac{(5\,000 \times 17) + [(60\,000 \times 16.95) + (18\,000 \times 16.75) + (22\,000 \times 17.26)]}{5\,000 + 100\,000} \\ &= \frac{1\,783\,220}{105\,000} \\ &= 16.98 \end{aligned}$$

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**Schedule 2** rr 3, 7, 9, 10, 13, 16, 19, 22,  
25, 46, 49

**Emissions factors for stationary energy**

In this schedule—

**bituminous coal**—

- (a) means coal—
  - (i) the gross calorific value of which is greater than 17.44 MJ/kg, measured on an ash free but bed (or in-ground) moist basis as defined by ISO 1170:1977 (Coal – calculation of analyses to different bases); and
  - (ii) the crucible swelling index of which is greater than zero as measured according to ISO 501:2003 (Hard Coal – determination of the coal swelling number); and
- (b) includes anthracite

**lignite** means coal of which the gross calorific value is less than or equal to 17.44 MJ/kg, measured on an ash free but bed (or in-ground) moist basis as defined by ISO 1170:1977 (Coal – calculation of analyses to different bases)

**peat** means combustible, soft, porous, or compressed sedimentary deposit of plant origin with a high water content

**sub-bituminous coal** means coal—

- (a) the gross calorific value of which is greater than 17.44 MJ/kg, measured on an ash free but bed (or in-ground) moist basis as defined by ISO 1170:1977 (Coal – calculation of analyses to different bases); and
- (b) the crucible swelling index of which is zero as measured according to ISO 501:2003 (Hard Coal – determination of the coal swelling number).

Table 1

Emissions source category	Importing coal	
	Class	Emissions factor tCO <sub>2</sub> e/GJ
Coal	Lignite or peat	0.0950
	Sub-bituminous	0.0908
	Bituminous	0.0883

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Schedule 2

**Table 2**

**Mining coal**

<b>Emissions source category</b>	<b>Class</b>	<b>Emissions factor tCO<sub>2</sub>e/GJ</b>
Coal	Lignite – Waimumu & Roxburgh mines	0.0917
	Lignite – all other mines, or peat	0.0950
	Sub-bituminous	0.0908
	Bituminous	0.0883

**Table 3**

**Fugitive coal seam gas**

*Part A—Underground and surface*

<b>Emissions source category</b>	<b>Category of coal</b>	<b>Emissions factor tCO<sub>2</sub>e/t</b>
Fugitive emissions	Coal mined from surface mining (including post-mining)	0.018
	Bituminous coal mined from underground mining (including post-mining)	0.385
	Sub-bituminous coal mined from underground mining (including post mining)	0.288

*Part B—Flaring and combusting for energy*

<b>Emissions source category</b>		<b>Emissions factor tCO<sub>2</sub>e/t</b>
Fugitive emissions	Difference between flaring and venting (ie the reduction in GWP)	17.885

**Table 4**

**Importing natural gas**

<b>Emissions source category</b>	<b>Class</b>	<b>Emissions factor tCO<sub>2</sub>e/GJ</b>
Natural gas	Commercial propane	0.056
	Commercial butane	0.061

Table 4—*continued*

Emissions source category	Class	Emissions factor tCO <sub>2</sub> e/GJ
	LPG (P60:B40)	0.060
	Liquefied natural gas	0.052

Table 5  
Geothermal fluid

*Part A*

Emissions source category	Class Geothermal fluid used by	Emissions factor tCO <sub>2</sub> e/t steam
Using geothermal fluid	Warakei A, B and Binary Power Plants	0.0055*
	Poihipi Road Geothermal Plant	0.0043*
	Ohaaki Power Plant	0.0419*
	Mokai I and II Power Plant	0.0069
	Mokai Greenhouse	0.00
	Rotokawa I Power Plant	0.0214
	Kawerau I Industrial Use	0.1024*
	Kawerau II Power Plant	0.0275
	Kawerau KA24 Binary Power Plant	0.1024*
	Ngawha I and Ngawha II Power Plants	0.2120
	Any other plant or process using geothermal steam to produce electricity or industrial heat	0.2120

\*field data in the absence of plant specific data

*Part B*

Emissions source category	Class Geothermal fluid used by	Emissions factor tCO <sub>2</sub> e/t2-phase fluid
Using geothermal fluid	Tauhara Tenon	0.0055*

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Schedule 2

Table 5—*continued*  
Part B—*continued*

<b>Emissions source category</b>	<b>Class</b>	<b>Emissions factor tCO<sub>2</sub>e/t2-phase fluid</b>
	<b>Geothermal fluid used by</b> Any other plant or process using geothermal fluid to produce electricity or industrial heat through a process other than production of geothermal steam *field data in the absence of plant specific data	0.0055

Table 6  
Combusting used oil, waste oil, used tyres,  
and waste

*Part A—Used oil and waste oil*

<b>Emissions source category</b>	<b>Class</b>	<b>Emissions factor tCO<sub>2</sub>e/TJ</b>
Used oil or waste oil	Used or waste oil consisting of or containing non-biomass	71.47
	Biomass sourced used or waste oil *excludes CO <sub>2</sub>	1.87*

*Part B—Used tyres*

<b>Emissions source category</b>	<b>Class</b>	<b>Emissions factor tCO<sub>2</sub>e/TJ</b>
Used tyres	Used tyres	137.87

*Part C—Waste*

<b>Emission Source Category</b>	<b>Class</b>	<b>Emissions factor tCO<sub>2</sub>e/TJ</b>
Waste	Municipal waste – biomass	1.87*

Table 6—*continued*  
Part C—*continued*

<b>Emission Source Category</b>	<b>Class</b>	<b>Emissions factor tCO<sub>2</sub>e/TJ</b>
	Municipal waste consisting of or containing non-biomass	116.87
	Solid biofuels – wood and wood waste	1.87*
	Solid biofuels – sulphate lyes	1.25*
	Solid biofuels – charcoal	5.44*
	Solid biofuels – other than wood, wood waste, sulphate lyes or charcoal	1.87*

Table 7  
Refining petroleum

<b>Emissions source category</b>	<b>Intermediate crude oil product</b>	<b>Emissions factor ktCO<sub>2</sub>e/t</b>
Refining crude oil	Refinery gas	5.53
	Fuel oil	3.02
	Asphalt	3.12
	Other intermediate crude oil	3.15

**Schedule 3** rr 28, 34, 37, 40, 43  
**Emissions factors for industrial processes**

Table 1  
Producing iron or steel

<b>Emissions source category</b>	<b>Emissions factor tCO<sub>2</sub>e/t</b>
Carbon content	3.67
Uncalcined limestone (CaCO <sub>3</sub> )	0.44
Uncalcined dolomite (CaMg(CO <sub>3</sub> ) <sub>2</sub> )	0.48

Table 2  
Producing clinker or burnt lime

<b>Emissions source category</b>	<b>Emissions factor tCO<sub>2</sub>e/t</b>
Production of clinker (CaO)	0.79
Cement kiln dust correction factor	1.02
Production of burnt lime (CaO)	0.79
Production of burnt dolomitic lime (CaO.MgO)	0.91

Table 3  
Producing glass

<b>Emissions source category</b>	<b>Emissions factor tCO<sub>2</sub>e/t</b>
Soda ash	0.42
Uncalcined limestone (CaCO <sub>3</sub> )	0.44
Uncalcined dolomite (CaMg(CO <sub>3</sub> ) <sub>2</sub> )	0.48

Table 4  
Producing gold

<b>Emissions source category</b>	<b>Emissions factor tCO<sub>2</sub>e/t</b>
Uncalcined limestone (CaCO <sub>3</sub> )	0.44
Uncalcined dolomite (MgCa(CO <sub>3</sub> ) <sub>2</sub> )	0.48

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**Table 5  
Producing cable**

<b>Emissions source category</b>	<b>Emissions factor tCO<sub>2</sub>e/t</b>
Producing cable using nitrogen cure process	486.7

Clerk of the Executive Council.

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**Explanatory note**

*This note is not part of the regulations, but is intended to indicate their general effect.*

These regulations, which come into force on 1 January 2010, set out the requirements for the collection of information and the calculation of emissions under section 62 of the Climate Change Response Act 2002 in relation to stationary energy and industrial processes.

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Date of notification in *Gazette*:  
These regulations are administered by the Ministry for the Environment.

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