Future Made in Australia (Guarantee of Origin) Methodology Determination 2025

I, Josh Wilson, Assistant Minister for Climate Change and Energy, make the following determination.

Dated 20 October 2025

Josh Wilson
Assistant Minister for Climate Change and Energy

Contents

Chapter 1—Introductory

Part 1.1—Preliminary

1 Name

This instrument is the *Future Made in Australia (Guarantee of Origin) Methodology Determination 2025*.

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	The later of: (a) the start of the day after this instrument is registered; and (b) immediately after the commencement of the *Future Made in Australia (Guarantee of Origin) Act 2024*.	

Note: This table relates only to the provisions of this instrument as originally made.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 section 29 of the *Future Made in Australia (Guarantee of Origin) Act 2024*.

4 Definitions

Note: A number of expressions used in this instrument are defined in the Act, including the following:

(a) delivery gate;
(b) delivery module;
(c) delivery profile;
(d) functional unit;
(e) greenhouse gas;
(f) holder;

(g) large-scale generation certificate;
(h) PGO certificate;
(i) production gate;
(j) production profile;
(k) REGO certificate;
(l) rules.

In this instrument:

Act means the *Future Made in Australia (Guarantee of Origin) Act 2024*.

batch period, for a batch of a product, means the period from the time when production of the batch commenced until the time the last part of the batch left the production gate for the product.

carbon dioxide equivalence has the same meaning as in the *National Greenhouse and Energy Reporting Act 2007.*

CHP plant (short for combined heat and power plant) means a power plant that generates:

(a) electricity; and
(b) heat, cooling or both heat and cooling.

CHP Tool is the document titled *Allocation of GHG Emissions from a Combined Heat and Power (CHP) Plant Guide to calculation worksheets (September 2006) v1.0* issued by the World Resource Institute and World Business Council for Sustainable Development.

Note: The Allocation of GHG Emissions from a Combined Heat and Power (CHP) Plant Guide to calculation worksheets (September 2006) v1.0 could in 2025 be viewed on the Greenhouse Gas Protocol's website (https://www.ghgprotocol.org).

CO_2-e: see ***carbon dioxide equivalence***.

co-product reduction in emissions intensity: see section 8.

dedicated pipeline, for the transport of a product, means a pipeline that only transports that product.

delivered emissions intensity: see section 6.

electrolysis production module: see subsection 25(2).

electrolysis production pathway: see subsection 25(1).

emissions means greenhouse gas emissions.

end of the delivery module, for a delivery module, is the point at which the delivery module has been completed.

final delivery module, for a batch of a product, means the delivery module immediately prior to the delivery gate for the product.

gas conditioning production module: see subsection 26(2).

gaseous fuel has the same meaning as in the NGER Measurement Determination.

input includes electricity, water, steam, fuel and synthetic gas.

input supplier means:

(a) in relation to a production pathway–a person who:
  (i) supplies an input for use in the production pathway for a product; and
  (ii) is not the holder of the production profile for that product;
(b) in relation to a delivery module—a person who:
  (i) supplies an input for use in the delivery module for a product; and
  (ii) is not the holder of the delivery profile for the delivery module for the product.

interim delivery module, for a batch of a product, means a delivery module that is not a final delivery module for the product.

intermediate storage tank production module: see subsection 26(1).

liquid fuel has the same meaning as in the NGER Measurement Determination.

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

parameter includes:

(a) an input or output for a production pathway; and
(b) an input or output for a delivery module; and
(c) a factor.

petroleum based greases has the same meaning as in the NGER Measurement Determination.

petroleum based oils has the same meaning as in Part 2.4 of the NGER Measurement Determination.

pipeline delivery module: see paragraph 34(1)(a).

post-production emissions intensity: see section 7.

production emissions intensity: see section 9.

solid fuel has the same meaning as in the NGER Measurement Determination.

stationary energy purposes has the same meaning as in subsection 2.20(2) of the NGER Measurement Determination.

storage vessel delivery module: see paragraph 34(1)(c).

transport energy purposes has the same meaning as in subsection 2.20(2) of the NGER Measurement Determination.

vehicle delivery module: see paragraph 34(1)(b).

5 Meaning of *production emissions intensity*

The ***production emissions intensity***, for a batch of a product specified in column 2 of an item in the table below, is the emissions intensity of the batch worked out in accordance with the section specified in column 3 for that item.

Column 1	Column 2	Column 3
Item	**Production pathway**	**Relevant section**
1	Hydrogen	Section 30

6 Meaning of *delivered emissions intensity*

The ***delivered emissions intensity***, for the transported quantity of a batch of a product specified in column 2 of an item in the table below, is the emissions intensity worked out in accordance with the section specified in column 3 for that item.

Column 1	Column 2	Column 3
Item	**Production pathway**	**Relevant section**
1	Hydrogen	Section 31

7 Meaning of *post-production emissions intensity*

The ***post-production emissions intensity***, for the transported quantity of a batch of a product specified in column 2 of an item in the table below, is the emissions intensity worked out in accordance with the section specified in column 3 for that item.

Column 1	Column 2	Column 3
Item	**Production pathway**	**Relevant section**
1	Hydrogen	Section 32

8 Meaning of *co-product reduction in emissions intensity* and *co-product*

(1) The ***co-product reduction in emissions intensity***, for a batch of a product produced in accordance with the production pathway specified in column 4 of an item in the table below, is the emissions intensity worked out in accordance with the section specified in column 5 for that item.

(2) The product specified in column 3 of an item in the table below is a ***co-product*** for the product specified in column 2 of that item if produced in accordance with the production pathway in column 4 of that item.

Column 1	Column 2	Column 3	Column 4	Column 5
Item	**Product**	**Co-product**	**Production pathway**	**Relevant section**
1	Hydrogen	Oxygen	Electrolysis production pathway	Section 33

Part 1.2—Methodology parameters and requirements

9 Monitoring and measuring requirements—general

If this instrument requires that a parameter be monitored or measured in accordance with this section:

(a) the parameter must be monitored or measured:

(i) in a manner consistent with the NGER Measurement Determination; or

(ii) if the parameter cannot be monitored or measured in accordance with subparagraph (i) – in accordance with the *National Measurement Act 1960*; or

(iii) in any other case—in accordance with standard industry practice; and

(b) the equipment used to monitor or measure the parameter must be calibrated:

(i) in a manner consistent with the NGER Measurement Determination; or

(ii) if the equipment cannot be calibrated in accordance with subparagraph (i)—by an accredited technician at intervals, and using methods, that are in accordance with the manufacturer's specifications.

10 Incorporated material

(1) This section applies if a provision of this instrument applies, adopts or incorporates, with or without modification, any matter contained in an instrument or other writing (the ***incorporated material***) in respect of a batch of a product.

(2) Unless otherwise specified in this instrument, the incorporated material is applied, adopted or incorporated as in force or existing at the start of the batch period.

Example: For the formula in subsection 15(5), the parameter ***EFelec,scope 2*** is determined in accordance with the NGER Measurement Determination as in force at the start of the relevant batch period.

(3) If the incorporated material is inconsistent with a provision of this instrument, that provision prevails to the extent of the inconsistency unless otherwise specified in this instrument.

11 Scope 1 emission factors

Determining the scope 1 emission factor

(1) For the parameter $\boldsymbol{EF_{ij}}$, the scope 1 emission factor for carbon dioxide, methane or nitrous oxide released from the combustion of a fuel in the circumstances specified in an item in column 2 of the table below is determined in accordance with the provision of the NGER Measurement Determination specified in column 3 for that item.

Column 1 Item	Column 2 Circumstances	Column 3 Provision of the NGER Measurement Determination
1	Combustion of solid fuels.	Part 1 of Schedule 1
2	Combustion of gaseous fuels for stationary energy purposes.	Part 2 of Schedule 1
3	Combustion of petroleum based oils or petroleum based greases for stationary energy purposes.	Part 3 of Schedule 1
4	Combustion of liquid fuels, other than petroleum based oils and petroleum based greases, for stationary energy purposes.	Part 3 of Schedule 1
5	Combustion of gaseous or liquid fuels for transport energy purposes.	Division 4.1 of Part 4 of Schedule 1
6	Combustion of liquid fuels by vehicles manufactured after 2004.	Division 4.2 of Part 4 of Schedule 1
7	Combustion of liquid fuels by trucks that meet the design standards mentioned in column 3 of the table in Division 4.3 of Part 4 of Schedule 1 of the NGER Measurement Determination.	Division 4.3 of Part 4 of Schedule 1

Missing scope 1 emission factors

(2) Subsection (3) applies if:

(a) a calculation in this instrument includes the parameter $\boldsymbol{EF_{ij}}$ for a feedstock or fuel type (the ***relevant feedstock or fuel***); and

(b) the emission factor for a greenhouse gas type released from the use of the relevant feedstock or fuel cannot be determined in accordance with subsection (1).

Example: The calculation in subsection 16(2) includes the parameter $\mathbf{EF_{ij}}$. The fuel type use to produce the batch is acetylene gas, a gaseous fuel used for a stationary energy purpose. When this instrument commenced, the table in Part 2 of Schedule 1 to the NGER Measurement Determination did not contain an emission factor for acetylene gas.

(3) The emission factor for the relevant feedstock or fuel which may be used for the purposes of the parameter $\boldsymbol{EF_{ij}}$ in the calculation is the scope 1 emission factor determined in accordance with subsection (1) for a feedstock or fuel type with:

(a) the same state of matter as the relevant feedstock or fuel; and

(b) if the relevant feedstock or fuel does not have biogenic carbon content—no biogenic carbon content; and

(c) the closest comparable carbon content to the relevant feedstock or fuel; and

(d) if more than one feedstock or fuel type satisfies paragraphs (a) to (c) for the relevant feedstock or fuel—the closest comparable energy content factor to the relevant feedstock or fuel.

Example: The relevant fuel is acetylene gas combusted for stationary energy purposes. When this instrument commenced, the table in Part 2 of Schedule 1 to the NGER Measurement

Determination (***the Table***) did not contain an emission factor for acetylene gas. Acetylene gas has zero biogenic carbon content. All the gaseous fuels in the Table similarly have no biogenic carbon content. Acetylene gas has a carbon content of 1.016×10^{-3} tC/m^3. The fuel or feedstock with the closest comparable carbon content in the Table is ethane, which has a carbon content of 0.97×10^{-3} tC/m^3. There is only one fuel in the Table which satisfies paragraphs (a) to (c) for acetylene gas, which means paragraph (d) does not apply. The scope 1 emission factor for ethane can therefore be used for the purposes of the parameter in the calculation.

Note: Schedule 3 to the NGER Measurement Determination sets out the carbon content for certain fuels and feedstocks.

(4) For paragraph (3)(d), the energy content factor for the feedstock or fuel is worked out in accordance with section 13.

(5) In this section:

biogenic carbon means carbon derived from plants or animals, but does not include peat or fossil carbon embedded in the earth.

12 Scope 3 emission factors

Determining the scope 3 emission factor

(1) For paragraph (b) of the parameter $\boldsymbol{EF}_{\textit{scope 3,i}}$, the scope 3 emission factor for the consumption of a fuel type (i), in kilograms of CO_2-e per gigajoule of fuel type (i), is:

(a) for the consumption of solid fuels—the emission factor in column 3 of the table in Part 4 of Schedule 1 for the relevant fuel type;

(b) for the consumption of liquid fuels—the emission factor in column 3 of the table in Part 5 of Schedule 1 for the relevant fuel type;

(c) for the consumption of gaseous fuels for transport energy purposes—the emission factor in column 3 of the table in Part 6 of Schedule 1 for the relevant fuel type;

(d) for the consumption of natural gas in an area connected to a natural gas distribution pipeline for stationary energy purposes—the emission factor in column 3 of the table in Part 7 of Schedule 1 for the State or Territory where the consumption occurs;

(e) for the consumption of natural gas in an area connected to a natural gas transmission pipeline for stationary energy purposes—the emission factor specified in column 4 of the table in Part 7 of Schedule 1 for the State or Territory where the consumption occurs.

Missing scope 3 emission factors

(2) Subsection (3) applies if:

(a) a calculation in this instrument includes the parameter $\boldsymbol{EF}_{\textit{scope 3,i}}$ for a feedstock or fuel type (the ***relevant feedstock or fuel***); and

(b) the emission factor for the relevant feedstock or fuel cannot be determined in accordance with subsection (1).

Example: The calculation in subsection 16(1) includes the parameter $\boldsymbol{EF}_{\textit{scope 3,i}}$ which, for paragraph (b) of the parameter, is the scope 3 emission factor for the fuel type used for

the production pathway for the batch (b)). The fuel used is E10 fuel which contains ethanol (C_2H_5OH). The table in Part 7 of Schedule 1 does not include an emission factor for E10 fuel.

(3) The emission factor for the relevant feedstock or fuel which may be used for the purposes of the parameter $\boldsymbol{EF}_{\boldsymbol{scope\ 3,i}}$ in the calculation is:

(a) if the relevant feedstock or fuel is provided by an input supplier and the input supplier provides an emission factor for the feedstock or fuel—the factor provided; or

(b) in any other case—the scope 3 emission factor determined in accordance with subsection (1) for a feedstock or fuel with:

(i) the same state of matter as the relevant feedstock or fuel; and

(ii) either:

(A) if the relevant feedstock or fuel has an energy content—the closest comparable energy content factor to the relevant feedstock or fuel; or

(B) in any other case—the closest comparable carbon content to the relevant feedstock or fuel.

Example: The relevant feedstock or fuel is ethanol. Ethanol is a liquid fuel. Pursuant to subsection 12(1), liquid fuels are determined in accordance with the table in Part 5 of Schedule 1. The liquid fuel in that table with the closest comparable energy content is liquefied petroleum gas, which has an energy content of 25.7 GJ/kL. The scope 3 emission factor for liquefied petroleum gas can therefore be used for the purposes of the parameter in the calculation.

Note: Schedule 3 to the NGER Measurement Determination sets out the carbon content for certain fuels and feedstocks.

(4) For sub-subparagraph (3)(b)(ii)(A), the energy content factor for the feedstock or fuel is worked out in accordance with section 13.

13 Energy content factor

(1) For the parameter $\boldsymbol{EC_i}$, the energy content factor for a fuel type (i) measured in the manner specified in the description in an item in column 2 of the following table is determined in accordance with column 3 for that item.

Column 1	Column 2	Column 3
Item	**Fuel type and unit of measurement**	**Energy content factor**
1	Solid fuels measured in tonnes.	The energy content factor, in gigajoules per tonne, is either: (a) as mentioned in Part 1 of Schedule 1 to the NGER Measurement Determination; or (b) estimated by analysis in accordance with the standard indicated for that energy content factor in Schedule 2 to the NGER Measurement Determination or an equivalent standard.
2	Gaseous fuels measured in cubic metres.	The energy content factor, in gigajoules per cubic metre, is either: (a) as mentioned in Part 2 of Schedule 1 to the NGER Measurement Determination; or (b) subject to subsection 13(2), estimated by analysis under Subdivision 2.3.3.2 of the NGER Measurement Determination.
3	Gaseous fuels measured in gigajoules.	The energy content factor is 1.
4	Liquid fuels measured in kilolitres.	The energy content factor, in gigajoules per kilolitre, is: (a) for stationary energy purposes—as mentioned in Part 3 of Schedule 1 to the NGER Measurement Determination; or (b) for transport energy purposes—as mentioned in Division 4.1 of Schedule 1 to the NGER Measurement Determination; or (c) estimated by analysis under Subdivision 2.4.3.2 of the NGER Measurement Determination.
5	Sulphur measured in tonnes.	The energy content factor for sulphur mentioned in Part 7 of Schedule 1 to the NGER Measurement Determination, in gigajoules per tonne.

Application of Subdivision 2.3.3.2 of the NGER Measurement Determination

(2) When estimating the energy content by analysis under Subdivision 2.3.3.2 of the NGER Measurement Determination for the purposes of paragraph (b) of column 3 of item 2 of the table above:

(a) item 2 of the table in section 2.25 of the NGER Measurement Determination does not apply; and

(b) all gaseous fuels (including fugitive emissions) other than pipeline quality gases must be analysed at least monthly.

14 Incomplete data set for the parameter ‘y’ (year)

(1) This section applies if the holder of the delivery profile does not have the data required for the period specified by the parameter ***y*** (year) for the purposes of the calculations in the following provisions:

(a) subsection 20(2);

(b) subsection 22(4);
(c) subsection 22(5);
(d) subsection 38(3);
(e) subsection 38(4).

(2) For the purposes of the calculation, the period specified by the parameter ***y*** (year) is the period that:

(a) includes the entire period for which the holder of the delivery profile has the data required for the period specified by the parameter ***y*** (year) for the purposes of the calculation; and

Example: The parameter ***Qstore,y*** in the calculation in subsection 22(4) requires the quantity of all products stored in the storage vessel for the duration of the financial year immediately prior to the financial year in which the batch period started. If the holder of the delivery profile does not have the data for that entire period, subsection (2)(a) provides that the period specified by the parameter ***y*** (year) includes the entire period for which the holder has that data.

(b) starts on the day which is at least one month, but not more than 12 months, before the start of the batch period; and

(c) ends on the day before the start of the batch period.

Example 1: The delivery module commenced operation on 15 March 2026. The batch period commenced on 18 September 2026. The holder of the delivery profile has the data required for entire period of operation. Year (y) is the period beginning on 15 March 2026 and ending on 17 September 2026.

Example 2: The delivery module commenced operation on 15 August 2025. The batch period commenced on 18 September 2026. The holder of the delivery profile has the data required for entire period of operation. The delivery module has been in operation for more than 12 months but has not been in operation for the full financial year immediately prior to the financial year in which the batch period started. Year (y) is the period beginning on 17 September 2025 and ending on 17 September 2026.

Chapter 2—Common source emissions

Note: This chapter contains methods for calculating emissions that are common to different production pathways and delivery modules.

Part 2.1—Common production emissions

15 Electricity supply and use

(1) The emissions from electricity used for the production pathway for the batch (b), $E_{elec,b}$, in kilograms of CO_2-e are worked out using the following formula:

$$E_{elec,b} = E_{elec,market,b} + E_{elec,hol,b}$$

where:

$E_{elec,market,b}$ is the emissions from purchased or acquired electricity used for the production pathway for the batch (b) in kilograms of CO_2-e, worked out in accordance with subsection (2).

$E_{elec,hol,b}$ is the emissions from electricity generated in a CHP plant by the holder of the production profile used for the production pathway for the batch (b), in kilograms of CO_2-e, worked out in accordance with subsection (7).

Supplied electricity

(2) For subsection (1), $E_{elec,market,b}$ is worked out using the following formula:

$$E_{elec,market,b} = \left(Q_{eligible,b} - Q_{rec,b}\right) \times EF_{elec}$$

where:

$Q_{eligible,b}$ is the eligible quantity of electricity used for the production pathway for the batch (b) in kilowatt hours, worked out in accordance with subsection (3).

$Q_{rec,b}$ is the quantity of electricity used for the production pathway for the batch (b) in kilowatt hours in respect of which a Renewable Energy Certificate has been surrendered, either:

(a) if the amount worked out in accordance with subsection (4) is less than or equal to $Q_{eligible,b}$—that amount; or

(b) if the amount worked out in accordance with subsection (4) is greater than $Q_{eligible,b}$—$Q_{eligible,b}$.

Note: If the value of $Q_{rec,b}$ is a negative value, the formula in subsection (2) will result in an increase in the emissions attributed to electricity supplied for the batch.

EF_{elec} is the emission factor for the electricity used for the production pathway for the batch (b) in kilograms of CO_2-e per kilowatt hour worked out in accordance with subsection (5).

(3) For subsection (2), $Q_{eligible,b}$ is worked out using the following formula:

$$Q_{eligible,b} = \left(Q_{elec,market,b} - Q_{elec,ex,b}\right) \times \left(100\% - (RPP + JRPP)\right) + \left(Q_{elec,ex,b} \times (100\% - JRPP)\right)$$

where:

$Q_{elec,market,b}$ is the quantity of purchased or acquired electricity used for the production pathway for the batch (b) in kilowatt hours, monitored or measured in accordance with section 9.

$Q_{elec,ex,b}$ is the quantity of exempt electricity used for the production pathway for the batch (b) in kilowatt hours worked out in accordance with subsection (6).

RPP is the renewable power percentage for the calendar year in which the batch period started.

JRPP is the Jurisdictional Renewable Power Percentage as a percentage for:

(a) the State or Territory where the production profile is located; and

(b) the financial year in which the batch period started.

(4) For subsection (2), $Q_{rec,b}$ is worked out using the following formula:

$$Q_{rec,b} = \left(REC_{surr,b} - REC_{hol,b}\right) \times 1000$$

where:

$REC_{surr,b}$ is the quantity of electricity used for the production pathway for the batch (b) in respect of which a Renewable Energy Certificate has been surrendered in megawatt hours.

$REC_{hol,b}$ is the quantity of electricity generated by the holder of the production profile and used for the production pathway for the batch (b) in respect of which a Renewable Energy Certificate has been, or is expected to be, created in megawatt hours.

(5) For subsection (2), EF_{elec} is worked out using the following formula:

Note: The emission factor for the supplied market that is worked out in accordance with subsection (5) is commonly referred to as the 'residual mix factor'.

$$EF_{elec} = EF_{elec,scope\ 2} + EF_{elec,scope\ 3}$$

where:

$EF_{elec,scope\ 2}$ is the scope 2 residual mix factor in kilograms of CO_2-e per kilowatt hour in column 3 of the table in Part 6 of Schedule 1 to the NGER Measurement Determination for the State or Territory where the electricity used for the production pathway for the batch (b) was generated.

$EF_{elec,scope\ 3}$, the scope 3 emission factor for purchased or acquired electricity in kilograms of CO_2-e per kilowatt hour, is 0.11.

(6) For subsection (3), $Q_{elec,ex,b}$ is worked out using the following formula:

$$Q_{elec,ex,b} = \frac{Q_{elec,ex,y}}{Q_{elec,market,y}} \times Q_{elec,market,b}$$

where:

$Q_{elec,ex,y}$ is the quantity of purchased or acquired electricity supplied to the holder of the production profile for the year (y) in megawatt hours monitored or measured in accordance with section 9 that:

(a) has been, or is expected to be, claimed against an exemption under the REE Act; or

(b) has been acquired under an acquisition that is not a relevant acquisition within the meaning of section 31 of the REE Act.

$Q_{elec,market,y}$ is the quantity of purchased or acquired electricity supplied to the holder of the production profile for the year (y) in megawatt hours, monitored or measured in accordance with section 9.

$Q_{elec,market,b}$ is the quantity of purchased or acquired electricity used for the production pathway for the batch (b) in kilowatt hours, monitored or measured in accordance with section 9.

y is either:

(a) the financial year immediately prior to the financial year in which the batch period started; or

(b) the calendar year immediately prior to the calendar year in which the batch period started.

Electricity generated by the holder of the production profile in a CHP plant

(7) For subsection (1), $E_{elec,hol,b}$ is worked out using the following formula:

$$E_{elec,hol,b} = CHP_{e,b} \times E_{fuel,CHP,b}$$

where:

$CHP_{e,b}$ is the proportion of the total emissions attributable to the electricity generated in the CHP plant by the holder of the production profile and used for the production pathway for the batch (b), worked out in accordance with subsection (8).

$E_{fuel,CHP,b}$ is the emissions from the fuel used to operate the CHP plant for the production pathway for the batch (b), worked out in accordance with subsection (9).

(8) For subsection (7), the proportion of the total emissions attributable to the electricity generated in a CHP Plant by the holder of the production profile and used for the production pathway for the batch (b), CHP_e, is determined in accordance with the CHP Tool as follows:

(a) if using the ***efficiency method***—the emissions share attributable to electricity production divided by the total direct emissions from CHP plant;
(b) if using the ***work potential method*** or the ***energy content method***—the fraction of total emissions to allocate to the electricity energy stream.

(9) For subsection (7), the emissions from fuel used to operate the CHP plant for the production pathway for the batch (b) in kilograms of CO_2-e, $\boldsymbol{E_{fuel,CHP,b}}$, are calculated using the following formula:

$$\boldsymbol{E_{fuel,CHP,b} = \sum_{i} \left\{ Q_{i,CHP,b} \times EC_i \times \left(EF_{scope1,i} + EF_{scope3,i} \right) \right\}}$$

where:

$\boldsymbol{Q_{i,CHP,b}}$ is the quantity of the fuel type (i) used to operate the CHP plant for the production pathway for the batch (b), monitored or measured in accordance with section 9.

$\boldsymbol{EC_i}$ is the energy content factor for the fuel type (i) determined in accordance with section 13.

$\boldsymbol{EF_{scope1,i}}$ is the scope 1 emission factor for the fuel type (i) in kilograms of CO_2-e per gigajoule calculated in accordance with subsection (10).

$\boldsymbol{EF_{scope\ 3,i}}$ is the scope 3 emission factor for the fuel type (i) in kilograms of CO_2-e per gigajoule as determined in accordance with:
(a) if there is a registered PGO certificate in respect of the batch of the fuel type (i)—the PGO certificate; or
(b) in any other case—in accordance with section 12.

(10) For subsection (9), $\boldsymbol{EF_{scope1,i,}}$ is worked out using the following formula:

$$\boldsymbol{EF_{scope1,i} = \sum_{j} EF_{ij}}$$

where:

$\boldsymbol{EF_{ij}}$ is the scope 1 emission factor for each greenhouse gas type (j) released from the use of the fuel type (i), in kilograms of CO_2-e per gigajoule of fuel type (i), determined in accordance with section 11.

Definitions

(11) In this section:

created means:
(a) for a REGO certificate—registered under section 104 of the Act;
(b) for a large-scale generation certificate—created and registered under the REE Act.

exemption has the same meaning as in the REE Act.

Jurisdictional Renewable Power Percentage, for a State or Territory for a financial year, means the percentage known as the jurisdictional renewable power percentage for the State or Territory for the financial year published in the NGAF.

NGAF means the document titled *National Greenhouse Accounts Factors* published by the Department as existing from time to time.

Note: The NGAF could in 2025 be viewed on the Department's website (https://www.dcceew.gov.au).

REE Act means the *Renewable Energy (Electricity) Act 2000*.

Renewable Energy Certificate means a certificate that:

(a) is one of the following:

(i) a large-scale generation certificate surrendered under section 28A of the REE Act, other than a certificate:

(A) created in contravention of section 24 or 25 of that Act; or

(B) surrendered to meet a liable entity's obligations under Subdivision A of Division 1 of Part 5 or section 95 of that Act; or

(ii) a REGO certificate, other than a certificate created in contravention of section 103 of the Act; and

(b) is not in respect of electricity that was generated more than 1 year before the start of the batch period.

renewable power percentage has the same meaning as in the REE Act.

surrendered means:

(a) for a REGO certificate—retired under section 107 of the Act;

(b) for a large-scale generation certificate—surrendered under the REE Act.

16 Fuel supply and use

(1) The emissions from fuel used for the production pathway for the batch (b) in kilograms of CO_2-e, $E_{fuel,b}$, are calculated using the following formula:

$$E_{fuel,b} = \sum_{i} \{Q_{i,b} \times EC_i \times (EF_{scope1,i} + EF_{scope3,i})\}$$

where:

$Q_{i,b}$ is the quantity of the fuel type (i) used for the production pathway for the batch (b), other than fuel used to operate a CHP plant, monitored or measured in accordance with section 9.

EC_i is the energy content factor for the fuel type (i) determined in accordance with section 13.

$EF_{scope1,i}$ is the scope 1 emission factor for the fuel type (i) in kilograms of CO_2-e per gigajoule calculated in accordance with subsection (2).

$EF_{scope\ 3,i}$ is the scope 3 emission factor for the fuel type (i) in kilograms of CO_2-e per gigajoule as determined in accordance with:

(a) if there is a registered PGO certificate in respect of the batch of the fuel type (i)—the PGO certificate; or

(b) in any other case—in accordance with section 12.

(2) For subsection (1), $EF_{scope1,i,}$ is worked out using the following formula:

$$EF_{scope1,i} = \sum_{j} EF_{ij}$$

where:

EF_{ij} is the scope 1 emission factor for each greenhouse gas type (j) released from the use of the fuel type (i), in kilograms of CO_2-e per gigajoule of fuel type (i), determined in accordance with section 11.

17 Water supply

(1) The emissions from water used for the production pathway for the batch (b), $E_{water,is,b}$, in kilograms of CO_2-e are calculated using the following formula:

$$E_{water,is,b} = \sum_{x} Q_{water,x,b} \times EF_{water,x}$$

where:

$Q_{water,x,b}$ is the quantity of water used for the production pathway for the batch (b) which has been provided by an input supplier from water source (x) in kilograms, monitored or measured in accordance with section 9.

$EF_{water,x}$ is the emission factor for the water source (x) in kilograms of CO_2-e per kilogram, worked out in accordance with subsection (2).

(2) For subsection (1), the emission factor for the water source (x), $EF_{water,x}$ in kilograms of CO_2-e per kilogram is:

(a) if the water has not been subject to an advanced treatment process—the emission factor specified in column 3 of an item in the table in Part 1 of Schedule 1 for the water source in column 2 of the of that item;

(b) if the water has been subject to an advanced treatment process—the sum of the factors specified in:

(i) column 3 of an item in the table in Part 1 of Schedule 1 for the water source in column 2 of that item; and

(ii) column 4 of an item in the table in Part 2 of Schedule 1 for the advanced treatment process mentioned in column 2 of that item;

(c) in any case—calculated in accordance with subsection (3).

(3) For paragraph (2)(c), the emission factor for the water source (x), $EF_{water,x}$, is worked out using the following formula:

$$EF_{water,x} = \frac{E_{water,is,x,y}}{Q_{water,x,y}}$$

where:

$E_{water,is,x,y}$ is the total scope 1 and 2 emissions for the water source (x) for the year (y) in kilograms of CO_2-e, provided by the input supplier.

$Q_{water,x,y}$ is the quantity of water from the water source (x), other than treated or untreated wastewater that has been collected and redistributed, for the year (y) in kilograms, provided by the input supplier.

y is the financial year immediately prior to the financial year in which the batch period started.

(4) In this section:

advanced treatment process means a process described in an item in column 2 of the table in Part 2 of Schedule 1 that produces water of the quality described in column 3 of that item.

18 Steam supply and use

(1) The emissions from steam used for the production pathway for the batch (b), $E_{steam,b}$, in kilograms of CO_2-e is worked out using the following formula:

$$E_{steam,b} = E_{steam,is,b} + E_{steam,hol,b}$$

where:

$E_{steam,is,b}$ is the emissions from steam supplied by an input supplier for the production pathway for the batch (b) in kilograms of CO_2-e, worked out in accordance with subsection (2).

$E_{steam,hol,b}$ is the emissions from steam generated in a CHP plant by the holder of the production profile used for the production pathway for the batch (b), in kilograms of CO_2e, worked out in accordance with subsection (6).

Steam from an input supplier

(2) For subsection (1), $E_{steam,is,b}$ is worked out using the following formula:

$$E_{steam,is,b} = \sum_{x} Q_{steam,x,b} \times EF_{steam,x}$$

where:

$Q_{steam,x,b}$ is the quantity of steam supplied by an input supplier for the production pathway for the batch (b) from source (x) in gigajoules, monitored or measured in accordance with section 9.

$EF_{steam,x}$ is either:

(a) 109.375 kilograms of CO_2-e per gigajoule; or

(b) the supplier specific emission factor for steam from a source (x) in kilograms of CO_2-e per gigajoule steam, worked out in accordance with subsection (3).

(3) For paragraph (b) of $EF_{steam,x}$ in subsection (2), $EF_{steam,x}$ is worked out using the following formula:

$$EF_{steam,x} = \frac{E_{steam,is,y}}{Q_{steam,is,y}}$$

where:

$E_{steam,is,y}$ is the scope 1 and scope 3 emissions related to steam production by the input supplier for the year (y) in kilograms of CO_2-e, worked out in accordance with subsection (4).

$Q_{steam,is,y}$ is the quantity of steam produced by the input supplier for the year (y) in gigajoules, provided by the input supplier.

y is the financial year immediately prior to the financial year in which the batch period started.

(4) For subsection (3), $E_{steam,is,y}$ is worked out using the following formula:

$$E_{steam,is,y} = CHP_{s,y} \times \sum_{i} \{Q_{i,is,y} \times EC_i \, (EF_{scope1,i} + EF_{scope3,i})\}$$

where:

$CHP_{s,y}$ is:

(a) if the steam is produced in a CHP plant—the proportion of the total emissions attributable to the steam generated from the CHP plant, determined in accordance with subsection (7) for the year (y); or

(b) in any other case—1.

$Q_{i,is,y}$ is:

(a) if the steam is produced in a CHP plant—the quantity of the relevant fuel type (i) used in the CHP plant for the year (y) in litres, kilograms or gigajoules, provided by the input supplier; or

(b) in any other case—the quantity of the relevant fuel type (i) used in steam production for the site where the steam is generated for the year (y) in litres, kilograms or gigajoules, provided by the input supplier.

EC_i is the energy content factor for the fuel type (i) determined in accordance with section 13.

$EF_{scope\ 1,i}$ is the scope 1 emission factor for the relevant fuel type (i) in kilograms of CO_2-e per gigajoule, worked out in accordance with subsection (5).

$EF_{scope\ 3,i}$ is the scope 3 emission factor for the relevant fuel type (i) in kilograms of CO_2-e per gigajoule as determined in accordance with:

(a) if there is a registered PGO certificate in respect of the batch of the relevant fuel type (i)—the PGO certificate; or

(b) in any other case—in accordance with section 12.

y is the financial year immediately prior to the financial year in which the batch period started.

(5) For subsection (4), $EF_{scope1,i}$ is worked out using the following formula:

$$EF_{scope1,i} = \sum_{i} EF_{ij}$$

where:

EF_{ij} is the scope 1 emission factor for each greenhouse gas type (j) released from the use of the fuel type (i), in kilograms of CO_2-e per gigajoule of fuel type (i), determined in accordance with section 11.

Steam generated by the holder of the production profile in a CHP plant

(6) For subsection (1), $E_{steam,hol,b}$ is worked out using the following formula:

$$E_{steam,hol,b} = CHP_{s,b} \times E_{fuel,CHP,b}$$

where:

$CHP_{s,b}$ is the proportion of the total emissions attributable to the steam generated by the CHP plant for the batch (b), worked out in accordance with subsection (7).

$E_{fuel,CHP,b}$ is the emissions from the fuel used to operate the CHP plant for the batch (b), worked out in accordance with subsection (8).

(7) For paragraph (a) of the definitions of $CHP_{s,y}$ in subsection (4) and $CHP_{s,b}$ in subsection (6), $CHP_{s,y}$ and $\mathbf{CHP_{s,b}}$ are determined in accordance with the CHP Tool as follows:

(a) if using the ***efficiency method***—the emissions share attributable to steam production divided by the total direct emissions from CHP plant;

(b) if using the ***work potential method*** or the ***energy content method***—the fraction of total emissions to allocate to the steam energy stream.

(8) For subsection (6), the emissions from fuel used to operate the CHP plant for the production pathway for the batch (b) in kilograms of CO_2-e, $E_{fuel,CHP,b}$, are calculated using the following formula:

$$E_{fuel,CHP,b} = \sum_{i} \left\{ Q_{i,CHP,b} \times EC_i \times \left(EF_{scope1,i} + EF_{scope3,i} \right) \right\}$$

where:

$Q_{i,CHP,b}$ is the quantity of the fuel type (i) used to operate the CHP plant for the production pathway for the batch (b), monitored or measured in accordance with section 9.

EC_i is the energy content factor for the fuel type (i) determined in accordance with section 13.

$EF_{scope1,i}$ is the scope 1 emission factor for the fuel type (i) in kilograms of CO_2-e per gigajoule calculated in accordance with subsection (9).

$EF_{scope\ 3,i}$ is the scope 3 emission factor for the fuel type (i) in kilograms of CO_2-e per gigajoule as determined in accordance with:

(a) if there is a registered PGO certificate in respect of the batch of the fuel type (i)—the PGO certificate; or

(b) in any other case—in accordance with section 12.

(9) For subsection (8), $EF_{scope1,i,}$ is worked out using the following formula:

$$EF_{scope1,i} = \sum_{j} EF_{ij}$$

where:

EF_{ij} is the scope 1 emission factor for each greenhouse gas type (j) released from the use of the fuel type (i), in kilograms of CO_2-e per gigajoule of fuel type (i), determined in accordance with section 11.

19 Synthetic gas use

(1) The emissions from synthetic gas contained in equipment used for the production pathway for the batch, $E_{leaks,b}$, in kilograms of CO_2-e are worked out using the following formula:

$$E_{leaks,b} = \frac{t_b}{8.76} \times \sum_{jk} Stock_{jk} \times L_{jk}$$

where:

t_b is the duration of the batch period in hours.

$Stock_{jk}$ is the stock of the gas type (j) contained in the equipment type (k) in CO_2-e in tonnes, determined in accordance with subsection (2).

L_{jk} is:

(c) if the gas type (j) is sulphur hexafluoride—the default annual leakage rate in column 4 of the table in subsection 4.102(4) of the NGER Measurement Determination for the equipment type (k) in column 2 of the table for that item; or

(d) if the gas type (j) is hydrofluorocarbons—the default annual leakage rate in column 3 of the table in subsection 4.102(4) of the NGER Measurement Determination for the equipment type (k) in column 2 of the table for that item.

k is the equipment type used for the production pathway for the batch listed in column 2 of the table in subsection 4.102(4) of the NGER Measurement Determination.

j is the type of gas contained in the equipment type (k).

(2) For subsection (1), $\boldsymbol{Stock_{jk}}$ is worked out using the following formula:

$$\boldsymbol{Stock_{jk} = Capacity_{jk} \times GWP_j}$$

Where:

$\boldsymbol{Capacity_{jk}}$ is the stated capacity of the gas type (j) in the equipment type (k) according to the manufacturer's nameplate in tonnes.

$\boldsymbol{GWP_j}$ is the Global Warming Potential of the gas type (j) determined in accordance with section 2.02 of the *National Greenhouse and Energy Reporting Regulations 2008*.

k is the equipment type used for the production pathway for the batch listed in column 2 of the table in subsection 4.102(4) of the NGER Measurement Determination.

j is the type of gas contained in the equipment type (k).

Part 2.2—Common post-production emissions

20 Pipeline delivery module—pipeline emissions

(1) The emissions for the transport of one or more functional units of a batch of a product (the ***transported quantity***) in accordance with the pipeline delivery module, $\boldsymbol{E_{pipe,transported}}$, in kilograms of CO_2-e are worked out using the following formula:

$$\boldsymbol{E_{pipe,transported} = Q_{b,transported} \times EF_{pipe,y}}$$

where:

$\boldsymbol{Q_{b,transported}}$ is the amount of product in the transported quantity in the unit of measurement of the functional unit of the product, measured:

(a) if the product enters the pipeline delivery module immediately after the production pathway has been completed—in accordance with the formula or method specified for working out the amount of the product in a batch of the product for the production pathway; or

(b) in any other case—in accordance with the formula or method specified for working out the amount of the product that reaches the end of the delivery module immediately prior to the pipeline delivery module.

$\boldsymbol{EF_{pipe,y}}$ is the pipeline-specific emission factor for the year (y) in kilograms of CO_2-e per functional unit, worked out in accordance with subsection (2).

y is the financial year immediately prior to the financial year in which the batch period started.

(2) For subsection (1), $\boldsymbol{EF_{pipe,y}}$ is worked out using the following formula:

$$\boldsymbol{EF_{pipe,y} = \frac{E_{pipe,elec,y} + E_{pipe,fuel,y}}{Q_{pipe,y}}}$$

where:

$\boldsymbol{E_{pipe,elec,y}}$ is emissions for the electricity supplied for the pipeline delivery module for the year (y) in kilograms of CO_2-e, worked out in accordance with section 15, subject to the following:

(a) a reference in section 15:
  (i) to production pathway is taken to be a reference to pipeline delivery module; and
  (ii) to batch (b) is taken to be a reference to year (y), other than a reference to the batch in the parameter $\boldsymbol{EF_{scope3,i}}$ in subsection 15(9); and
  (iii) to production profile is taken to be a reference to delivery profile; and
(b) the value of the parameter $\boldsymbol{Q_{elec,ex,b}}$ in subsection 15(3) is taken to be zero; and
(c) subsection 15(6) does not apply.

$\boldsymbol{E_{pipe,fuel,y}}$ is the emissions from the fuel used for the pipeline delivery module for the year (y) in kilograms of CO2-e, worked out in accordance with section 16 where a reference in that provision:

(b) to production pathway is taken to be a reference to pipeline delivery module; and
(c) to batch (b) is taken to be a reference to year (y).

$\boldsymbol{Q_{pipe,y}}$ is the total amount of product injected into the pipeline for the year (y) in the unit of measurement of the functional unit of the product, monitored or measured in accordance with section 9.

y is the financial year immediately prior to the financial year in which the batch period started.

Note: Section 14, which provides for an alternate definition of ***y*** where the holder of the delivery profile has an incomplete data set, applies to this subsection.

21 Vehicle delivery module—vehicle emissions

(1) The emissions for the transport of one or more functional units of a batch of a product (the ***transported quantity***) in accordance with the vehicle delivery module, $E_{veh,transported}$, in kilograms of CO_2-e are worked out using the following formula:

$$E_{veh,transported} = \sum_{J} E_{veh,J}$$

where:

$E_{veh,J}$ is the emissions from a vehicle for the journey (J) in kilograms of CO_2-e worked out using one of the following methods:

(a) the no-apportionment method in subsection (2); or

(b) the apportionment method in subsection (3); or

(c) the load distance method in subsection (5).

J is the journey where the transported quantity and the product's packaging is transported in accordance with the vehicle delivery module.

No-apportionment method

(2) For paragraph (a) of the definition of $E_{veh,J}$ in subsection (1), $E_{veh,J}$ is worked out using the following formula:

$$E_{veh,J} = E_{veh,fuel,J} + E_{veh,elec,J} + E_{veh,leaks,J}$$

where:

$E_{veh,fuel,J}$ is the emissions from the fuel used for the vehicle delivery module for the journey (J), in kilograms of CO_2-e, worked out in accordance with section 16 where a reference in that provision:

(a) to production pathway is taken to be a reference to vehicle delivery module; and

(b) to batch (b) is taken to be a reference to journey (J).

$E_{veh,elec,J}$ is the emissions from electricity used for the vehicle delivery module for the journey (J), in kilograms of CO_2-e, worked out in accordance with section 15, subject to the following:

(a) a reference in section 15:

(i) to production pathway is taken to be a reference to vehicle delivery module; and

(ii) to batch (b) is taken to be a reference to year (y), other than a reference to the batch in the parameter $EF_{scope3,i}$ in subsection 15(9); and

(iii) to production profile is taken to be a reference to delivery profile; and

(b) the value of the parameter $Q_{elec,ex,b}$ in subsection 15(3) is taken to be zero; and

(c) subsection 15(6) does not apply.

$E_{veh,leaks,J}$ is the emissions from the synthetic gas contained in the equipment used for the vehicle delivery module for the journey (J), in kilograms of CO_2-e, worked out in accordance with section 19, where a reference in that provision:

(a) to production pathway is taken to be a reference to vehicle delivery module;

(b) to batch is taken to be a reference to journey (J); and

(c) to batch period is taken to be a reference to journey (J).

J is the journey where the transported quantity and the product's packaging is transported in accordance with the vehicle delivery module.

Apportionment method

(3) For paragraph (b) of the definition of $E_{veh,J}$ in subsection (1), $E_{veh,J}$ is worked out using the following formula:

$$E_{veh,J} = \sum_{s} E_{veh,s} \times \frac{Q_{b,transported}}{Q_{product,s}}$$

where:

$E_{veh,s}$ is the emissions from the vehicle for the section of the journey (s) in kilograms of CO_2-e, worked out is accordance with subsection (4).

$Q_{product,s}$ is the total load transported, including packaging, in kilograms for the section of the journey (s), monitored or measured in accordance with section 9.

$Q_{b,transported}$ is the sum of the following, in kilograms:

(a) the amount of product in the transported quantity, measured:

(i) if the product enters the vehicle delivery module immediately after the production pathway has been completed—in accordance with the formula or method specified for working out the amount of the product in a batch of the product for the production pathway; or

(ii) in any other case—in accordance with the formula or method specified for working out the amount of the product that reaches the end of the delivery module immediately prior to the vehicle delivery module; and

(b) the product's packaging, monitored or measured in accordance with section 9.

s is a section of the journey (J) where the total load transported by the vehicle is constant.

J is the journey where the transported quantity and the product's packaging is transported in accordance with the vehicle delivery module.

(4) For subsection (3), $E_{veh,s}$ is worked out using the following formula:

$$E_{veh,s} = E_{veh,fuel,s} + E_{veh,elec,s} + E_{veh,leaks,s}$$

where:

$E_{veh,fuel,s}$ is the emissions from the fuel used for the vehicle delivery module for the section of the journey (s) in kilograms of CO_2-e, worked out in accordance with section 16 where a reference in that provision:

(a) to production pathway is taken to be a reference to vehicle delivery module; and

(b) to batch (b) is taken to be a reference to section of the journey (s).

$E_{veh,elec,s}$ is the emissions from electricity used for the vehicle delivery module for the section of the journey (s) in kilograms of CO_2-e worked out in accordance with section 15, subject to the following:

(a) a reference in section 15:

(i) to production pathway is taken to be a reference to vehicle delivery module; and

(ii) to batch (b) is taken to be a reference to section of the journey (s), other than a reference to the batch in the parameter $EF_{scope3,i}$ in subsection 15(9); and

(iii) to production profile is taken to be a reference to delivery profile; and

(b) the value of the parameter $Q_{elec,ex,b}$ in subsection 15(3) is taken to be zero; and

(c) subsection 15(6) does not apply.

$E_{veh,leaks,s}$ is the emissions from the synthetic gas contained in the equipment used for the vehicle delivery module for the section of the journey (s), in kilograms of CO_2-e, worked out in accordance with section 19, where a reference in that provision:

(a) to production pathway is taken to be a reference to vehicle delivery module; and

(b) to batch is taken to be a reference to section of the journey (s); and

(c) to batch period is taken to be a reference to section of the journey (s).

s is a section of the journey (J) where the total load transported by the vehicle is constant.

J is the journey where the transported quantity and the product's packaging is transported in accordance with the vehicle delivery module.

Load distance method

(5) For paragraph (c) of the definition of $E_{veh,J}$ in subsection (1), $E_{veh,J}$ is worked out using the following formula:

$$E_{veh,J} = Q_{b,transported} \times D_J \times EF_{veh} + E_{veh,leaks,J}$$

where:

$\boldsymbol{Q_{b,transported}}$ is the sum of the following, in kilograms:

(a) the amount of product in the transported quantity, measured:

(i) if the product enters the vehicle delivery module immediately after the production pathway has been completed—in accordance with the formula or method specified for working out the amount of the product in a batch of the product for the production pathway; or

(ii) in any other case—in accordance with the formula or method specified for working out the amount of the product that reaches the end of the delivery module immediately prior to the vehicle delivery module; and

(b) the product's packaging, monitored or measured in accordance with section 9.

$\boldsymbol{D_J}$ is the distance of the journey (J), in kilometres, monitored or measured in accordance with section 9.

$\boldsymbol{EF_{veh}}$, in kilograms of CO_2-e per kilogram-kilometre, is:

(a) the emission factor specified in column 3 of an item in the table in Part 3 of Schedule 1 for the vehicle used to transport the transported quantity specified in column 2 for that item; or

(b) the emission factor worked out in accordance with subsection (6).

$\boldsymbol{E_{veh,leaks,J}}$ is:

(a) if $\boldsymbol{EF_{veh}}$ is worked out in accordance with subsection (6)—zero; and

(b) in any other case—the emissions from synthetic gas contained in the equipment used for the vehicle delivery module for the journey (J), in kilograms of CO_2-e, worked out in accordance with section 19, where a reference in that provision:

(i) to production pathway is taken to be a reference to vehicle delivery module;

(ii) to batch is taken to be a reference to journey (J); and

(iii) to batch period is taken to be a reference to journey (J).

J is the journey where the transported quantity and the product is transported in accordance with the vehicle delivery module.

(6) For paragraph (b) of the definition of $\boldsymbol{EF_{veh}}$ in subsection (5), $\boldsymbol{EF_{veh}}$, in kilograms of CO_2-e per kilogram-kilometre, is worked out using the following formula:

$$\boldsymbol{EF_{veh} = \frac{E_{fleet,SJ}}{Q_{fleet,SJ} \times D_{fleet,SJ}}}$$

where:

$\boldsymbol{E_{fleet,SJ}}$ is the total emissions from the holder of the delivery profile's fleet of a particular type of vehicle over the sample journey (SJ) in kilograms of CO_2-e, worked out in accordance with subsection (7).

$\boldsymbol{Q_{fleet,SJ}}$ is the total load transported, including packaging, in kilograms by the holder of the delivery profile's fleet of a particular type of vehicle over the sample journey (SJ), monitored or measured in accordance with section 9.

$\boldsymbol{D_{fleet,SJ}}$ is the distance of the sample journey (SJ) in kilometres, monitored or measured in accordance with section 9.

SJ is the sample journey for the particular type of vehicle which must be at least 5 separate trips with a total distance of more than 1,000 kilometres.

(7) For subsection (6), $\boldsymbol{E_{fleet,SJ}}$ is worked out using the following formula:

$$\boldsymbol{E_{fleet,SJ} = E_{fleet,fuel,SJ} + E_{fleet,elec,SJ} + E_{fleet,leaks,SJ}}$$

where:

$\boldsymbol{E_{fleet,fuel,SJ}}$ is the emissions from the fuel used for the vehicle delivery module for the sample journey (SJ) in kilograms of CO_2-e, worked out in accordance with section 16 where a reference in that provision:

(b) to production pathway is taken to be a reference to vehicle delivery module; and

(c) to batch (b) is taken to be a reference to sample journey (SJ).

$\boldsymbol{E_{fleet,elec,SJ}}$ is the emissions from electricity used for the vehicle delivery module for the sample journey (SJ), in kilograms of CO_2-e worked out in accordance with section 15, subject to the following:

(a) a reference in section 15:

(i) to production pathway is taken to be a reference to vehicle delivery module; and

(ii) to batch (b) is taken to be a reference to sample journey (SJ), other than a reference to the batch in the parameter $\boldsymbol{EF_{scope3,i}}$ in subsection 15(9); and

(iii) to production profile is taken to be a reference to delivery profile; and

(b) the value of the parameter $\boldsymbol{Q_{elec,ex,b}}$ in subsection 15(3) is taken to be zero; and

(c) subsection 15(6) does not apply.

$\boldsymbol{E_{fleet,leaks,SJ}}$ is the emissions from the synthetic gas contained in the equipment used for the vehicle delivery module for the sample journey (SJ), in kilograms of CO_2-e, worked out in accordance with section 19, where a reference in that provision:

(a) to production pathway is taken to be a reference to vehicle delivery module;

(b) to batch is taken to be a reference to sample journey (SJ); and

(c) to batch period is taken to be a reference to sample journey (SJ).

SJ is the sample journey for the particular type of vehicle which must be at least 5 separate trips with a total distance of more than 1,000 kilometres.

(8) To avoid doubt, a reference in this section to a vehicle includes a reference to more than one vehicle.

22 Storage vessel delivery module—storage vessel emissions

(1) The emissions for the storage of one or more functional units of a batch of product (the ***stored quantity***) in accordance with the storage vessel delivery module, $\boldsymbol{E_{store,product}}$, in kilograms of CO_2-e are worked out using either:

(a) the direct reporting method in subsection (2); or

(b) the quantity storage method in subsection (3).

Direct reporting method

(2) For paragraph (1)(a), $\boldsymbol{E_{store,product}}$ is worked out using the following formula:

$$\boldsymbol{E_{store,product} = E_{store,elec,t} + E_{store,steam,t} + E_{store,leaks,t} + E_{store,fuel,t}}$$

where:

$\boldsymbol{E_{store,elec,t}}$ is the emissions for the electricity used for the storage vessel delivery module for the time period (t), in kilograms of CO_2-e worked out in accordance with section 15, subject to the following:

(a) a reference in section 15:

(i) to production pathway is taken to be a reference to storage vessel delivery module; and

(ii) to batch (b) is taken to be a reference to time period (t), other than a reference to the batch in the parameter $\boldsymbol{EF_{scope3,i}}$ in subsection 15(9); and

(iii) to production profile is taken to be a reference to delivery profile; and

(b) the value of the parameter $\boldsymbol{Q_{elec,ex,b}}$ in subsection 15(3) is taken to be zero; and

(c) subsection 15(6) does not apply.

$\boldsymbol{E_{store,steam,t}}$ is the emissions from the steam used for the storage vessel delivery module for the time period (t) kilograms of CO_2-e, worked out in accordance with section 18, where a reference in that provision:

(a) to production pathway is taken to be a reference to storage vessel delivery module, other than a reference to production pathway in the parameter $\boldsymbol{E_{fuel,CHP,b}}$ in subsection (6); and

(b) to batch (b) is taken to be a reference to time period (t), other than a reference to the batch in the parameter $\boldsymbol{EF_{scope3,i}}$ in subsections (4) or (8); and

(c) to production profile is taken to be a reference to delivery profile; and

(d) to batch period is taken to be a reference to time period (t).

$\boldsymbol{E_{store,leaks,t}}$ is the emissions from synthetic gas contained in the equipment used for the storage vessel delivery module for the time period (t), in kilograms of CO_2-e, worked out in accordance with section 19, where a reference in that provision:

(a) to production pathway is taken to be a reference to storage vessel delivery module;
(b) to batch is taken to be a reference to time period (t); and
(c) to batch period is taken to be a reference to time period (t).

$E_{store,fuel,t}$ is the emissions from the fuel used for the storage vessel delivery module for the time period (t) in kilograms of CO^2-e, worked out in accordance with section 16 where a reference in that provision:
(a) to production pathway is taken to be a reference to storage vessel delivery module; and
(b) to batch (b) is taken to be a reference to time period (t).

t is the time period during which the stored quantity (q) is loaded, unloaded, compressed, cooled, dried and purified for the purposes of the storage vessel delivery module.

Quantity storage method

(3) For paragraph (1)(b), $E_{store,product}$ is worked out using the following formula:

$$E_{store,product} = Q_{store,product} \times EF_{store,y}$$

where:

$Q_{store,product}$ is the amount of product in the stored quantity in the unit of measurement of the functional unit of the product, measured:
(a) if the product enters the storage vessel delivery module immediately after the production pathway has been completed—in accordance with the formula or method specified for working out the amount of the product in a batch of the product for the production pathway; or
(b) in any other case—in accordance with the formula or method specified for working out the amount of the product that reaches the end of the delivery module immediately prior to the storage vessel delivery module.

$EF_{store,y}$ is the storage vessel-specific emission factor for the year (y) in kilograms of CO_2-e per functional unit of product, worked out in accordance with subsection (4).

y is the financial year immediately prior to the financial year in which the batch period started.

(4) For subsection (3), $EF_{store,y}$ is worked out using the following formula:

$$EF_{store,y} = \frac{E_{store,y}}{Q_{store,y}}$$

where:

$E_{store,y}$ is the emissions for storage of the product in the storage vessel for the year (y), in kilograms of CO_2-e, worked out in accordance with subsection (5).

$Q_{store,y}$ is the total amount of product put into the storage vessel in accordance with the storage vessel delivery module for the year (y), in the unit of measurement of the functional unit of the product, monitored or measured in accordance with section 9.

y is the financial year immediately prior to the financial year in which the batch period started.

Note: Section 14, which provides for an alternate definition of y where the holder of the delivery profile has an incomplete data set, applies to this subsection.

(5) For subsection (4), $E_{store,y}$ is worked out using the following formula:

$$E_{store,y} = E_{store,elec,y} + E_{store,steam,y} + E_{store,leaks,y} + E_{store,fuel,y}$$

where:

$E_{store,elec,y}$ is the emissions from electricity used for the storage vessel delivery module for the year (y) in kilograms of CO_2-e, worked out in accordance with section 15, subject to the following:

(a) a reference in section 15:
  (i) to production pathway is taken to be a reference to storage vessel delivery module; and
  (ii) to batch (b) is taken to be a reference to year (y), other than a reference to the batch in the parameter $EF_{scope3,i}$ in subsection 15(9); and
  (iii) to production profile is taken to be a reference to delivery profile; and

(b) the value of the parameter $Q_{elec,ex,b}$ in subsection 15(3) is taken to be zero; and

(c) subsection 15(6) does not apply.

$E_{store,steam,y}$ is the emissions from the steam used for the storage vessel delivery module for the year (y) in kilograms of CO_2-e, worked out in accordance with section 19, where a reference in that provision:

(a) to production pathway is taken to be a reference to storage vessel delivery module; and

(b) to batch (b) is taken to be a reference to year (y), other than a reference to the batch in the parameter $EF_{scope3,i}$ in subsections (4) or (8); and

(c) to production profile is taken to be a reference to delivery profile; and

(d) to batch period is taken to be a reference to year (y).

$E_{store,leaks,y}$ is the emissions from synthetic gas contained in the equipment used for the storage vessel delivery module for the year (y), in kilograms of CO_2-e, worked out in accordance with section 19, where a reference in that provision:

(a) to production pathway is taken to be a reference to storage vessel delivery module;

(b) to batch is taken to be a reference to year (y); and

(c) to batch period is taken to be a reference to year (y).

$\boldsymbol{E_{store,fuel,y}}$ is the emissions from the fuel used for the storage vessel delivery module for the year (y) in kilograms of CO2-e, worked out in accordance with section 16 where a reference in that provision:

(a) to production pathway is taken to be a reference to storage vessel delivery module; and

(b) to batch (b) is taken to be a reference to year (y); and

y is the financial year immediately prior to the financial year in which the batch period started.

Note: Section 14, which provides for an alternate definition of ***y*** where the holder of the delivery profile has an incomplete data set, applies to this subsection.

Chapter 3—Hydrogen production pathway

Part 3.1—Production of hydrogen

Division 3.1.1—Hydrogen functional unit and batch size

23 Hydrogen functional unit

The ***functional unit*** of hydrogen is 1 kilogram of hydrogen.

24 Hydrogen batch size

(1) For the purpose of sub-paragraph 29(4)(d)(i) of the Act, the amount of hydrogen in a batch produced in accordance with a production pathway for hydrogen is the amount measured at the production gate for the product at the facility.

(2) For the purposes of subsection (1), the amount of hydrogen in a batch must be monitored or measured in accordance with section 9.

Division 3.1.2—Production pathway—electrolysis

25 Electrolysis production pathway

(1) The ***electrolysis production pathway*** is a production pathway for hydrogen.

(2) The ***electrolysis production module*** is the process of physically and chemically transforming water (H_2O) into hydrogen (H_2) and oxygen (O_2) via a splitting process by electrolysis to produce hydrogen.

(3) The electrolysis production module is a minimum module for the electrolysis production pathway.

(4) The following are sources of emissions for the electrolysis production pathway:
  (a) electricity supply and use for the pathway;
  (b) water supply for the pathway;
  (c) steam supply and use for the pathway;
  (d) synthetic gas use for the pathway;
  (e) fuel supply and use for the pathway.

Note: Pursuant to subsection 29(6) of the Act, a source of emissions relating to a production pathway for a product is a ***production emissions source*** for the production pathway.

(5) If a source of emissions mentioned in subsection (4) exists for the electrolysis production pathway, the emissions must be monitored, measured and reported in accordance with the following:
  (a) for electricity supply and use—section 15;
  (b) for water supply—section 17;
  (c) for steam supply and use—section 18;
  (d) for synthetic gas use—section 19.

(e) for fuel supply and use—section 16.

26 Optional modules—electrolysis

(1) The ***intermediate storage tank production module*** is the process of storing hydrogen in a vessel after the electrolysis production module has been completed.

(2) The ***gas conditioning production module*** is the process of conditioning hydrogen after the electrolysis production module has been completed so that the product is ready to be delivered or consumed.

(3) The intermediate storage tank production module and the gas conditioning production module are optional modules for the electrolysis production pathway.

Note: An optional module is a production module that forms part of the production pathway. All sources of emissions for the electrolysis production pathway, including for optional modules for that production pathway, are specified in subsection 25(4).

(4) In this section:

conditioning includes purifying, drying, compressing, pumping and cooling.

Division 3.1.3—Hydrogen emissions

27 Hydrogen production emissions

The emissions for the production of a batch (b) of hydrogen, $\boldsymbol{E_{pathway,b}}$, in kilograms of CO_2-e, are the sum of the emissions for the batch from all sources of emissions for the production pathway less any amount that the emissions may be reduced by in accordance with the following provisions:

(a) for the electrolysis production pathway—section 29.

28 Hydrogen post-production emissions

The post-production emissions for the transport or storage of one or more functional units of a batch (b) of hydrogen in accordance with one or more delivery modules (the ***transported quantity***), $\boldsymbol{E_{del,transported}}$, are the sum of the emissions from all sources of post-production emissions for the delivery modules for the transported quantity in kilograms of CO_2-e.

Note: Where the transported quantity has been stored or transported in accordance with more than one delivery module, the post-production emissions for the transported quantity are the sum of emissions from all sources of post-production emissions for each delivery module.

29 Co-product reduction of emissions for electrolysis production pathway

(1) The amount by which the emissions for the production of a batch of hydrogen in accordance with the electrolysis production pathway may be reduced, $\boldsymbol{E_{O2sale,b}}$, in kilograms of CO_2-e is worked out using the following formula:

$$E_{O_2sale,b} = 7.5\% \times R_{O_2sale,b} \times E_{minM,b}$$

where:

$R_{O2sale,b}$ is either:

(a) if the percentage worked out in accordance with subsection (2) is less than 100%—that percentage;

(a) in any other case—100%.

Note: $R_{02sale,b}$ represents the ratio of oxygen sold compared to oxygen produced in the batch.

$E_{minM,b}$ is the emissions for the electrolysis production module for the batch (b) in kilograms of CO_2-e.

Note: 7.5% represents the portion of emissions from a kilogram of hydrogen produced by electrolysis that is attributable to a kilogram of oxygen sold.

(2) For paragraph (a) of the definition of $R_{O2sale,b}$ in subsection (1), $R_{O2sale,b}$ is worked out using the following formula:

$$R_{O_2sale,b} = \frac{S_{O_2}}{7.94 \times Q_{pathway,b}}$$

where:

S_{O2} is the quantity of oxygen in kilograms produced in the course of producing a batch (b) of hydrogen in accordance with the electrolysis production pathway that has been sold:

(a) by the holder of the production profile to another person; and

(b) for an amount that is not less than its market value at the time of sale.

$Q_{pathway,b}$ is either:

(a) if the intermediate storage tank production module is used to produce the batch (b) and the duration of the batch period is less than the time it took to fill the vessel for the purpose of the module—the quantity of product in kilograms:

(i) measured after the minimum production module has been completed, but before the intermediate storage tank production module has commenced, in relation to the product; and

(ii) measured and monitored in accordance with section 9; or

(b) in any other case—the amount of hydrogen in the batch (b) in kilograms worked out in accordance with section 24.

Note: 7.94 is the kilograms of oxygen produced per kilogram of hydrogen produced by electrolysis.

Division 3.1.4—Hydrogen emissions intensity

30 Production emissions intensity—hydrogen

(1) The emissions intensity for the production of a batch of hydrogen, $EI_{,b}$, is worked out:

(a) if the intermediate storage tank production module is used to produce the batch (b) and the duration of the batch period is less than the time it took to fill the vessel for the purpose of the module—in accordance with subsection (2); and

(b) in any other case—in accordance with subsection (5).

Note: The production emissions intensity for the batch must be included on the PGO certificate in accordance with the rules.

(2) For paragraph (1)(a), $EI_{,b}$ is worked out:

(a) if the value of $Q_{pathway,b}$ is equal to or greater than the value of Q_b—in accordance with subsection (3); and

(b) if the value of $Q_{pathway,b}$ is less than the value of Q_b—in accordance with subsection (4).

(3) For paragraph (2)(a), EI_b is worked out using the following formula:

$$EI_b = \frac{E_{pathway,b}}{Q_{pathway,b}}$$

where:

$E_{pathway,b}$ is the emissions attributable to the batch (b) in kilograms of CO_2-e, worked out in accordance with section 27.

$Q_{pathway,b}$ has the meaning given by subsection (6).

(4) For paragraph (2)(b), EI_b is worked out using the following formula:

$$EI_b = \frac{E_{pathway,b} + \left(Q_b - Q_{pathway,b}\right) \times EI_{b-1}}{Q_b}$$

where:

$E_{pathway,b}$ is the emissions for the production of the batch (b) in kilograms of CO_2-e, worked out in accordance with section 27.

$Q_{pathway,b}$ has the meaning given by subsection (6).

Q_b has the meaning given by subsection (6).

EI_{b-1} is:

(a) if the batch is the first batch of the product produced by the holder of the production profile —worked out in accordance with subsection (3); or

(b) in any other case—the production emissions intensity for the batch produced by the holder of the production profile immediately prior to the batch (b) in kilograms of CO_2-e per kilogram.

(5) For paragraph (1)(b), $\boldsymbol{EI_b}$ is worked out using the following formula:

$$EI_b = \frac{E_{pathway,b}}{Q_b}$$

where:

$\boldsymbol{E_{pathway,b}}$ is the emissions attributable to the batch (b) in kilograms of CO_2-e, worked out in accordance with section 27.

$\boldsymbol{Q_b}$ has the meaning given by subsection (6).

(6) In this section:

$\boldsymbol{Q_b}$ is the amount of product in the batch (b) in kilograms worked out in accordance with section 24.

$\boldsymbol{Q_{pathway,b}}$ is the amount of product produced for the batch (b) in kilograms measured:

(a) after the minimum production module has been completed, but before the intermediate storage tank production module has commenced, in relation to the product; and

(b) in accordance with section 9.

31 Delivered emissions intensity—hydrogen

The emissions intensity for the production and storage or transport for one or more functional units of a batch (b) of hydrogen (the ***transported quantity***), $\boldsymbol{EI_{del,product}}$, in kilograms of CO_2-e is worked out using the following formula:

$$EI_{del,product} = \frac{EI_b \times Q_{b,transported} + E_{del,product}}{Q_{del,product}}$$

where:

$\boldsymbol{EI_b}$ is the emissions intensity for the production of the batch of hydrogen, worked out in accordance with section 30.

$\boldsymbol{Q_{b,transported}}$ is the amount of product in the transported quantity in kilograms worked out in accordance with section 24 where a reference in that section to batch is taken to be a reference to transported quantity.

$\boldsymbol{E_{del,product}}$ is the post-production emissions for the transported quantity worked out in accordance with section 28.

$\boldsymbol{Q_{del,product}}$ is the amount of product in the transported quantity that reached the delivery gate worked out in accordance with Division 3.2.2 of Part 3.2.

Note: The production and post-production emissions intensity for the batch must be included on the PGO certificate in accordance with the rules.

32 Post-production emissions intensity—hydrogen

The emissions intensity for the storage or transport of one or more functional units of a batch (b) of hydrogen (the ***transported quantity***), $EI_{postprod,product}$, in kilograms of CO_2-e per kilogram of hydrogen, is worked out using the following formula:

$$EI_{postprod,product} = EI_{del,product} - EI_b$$

where:

$EI_{del,product}$ is the delivered emissions intensity for the transported quantity worked out in accordance with section 31.

EI_b is the production emissions intensity for the batch (b) worked out in accordance with section 30.

Note: The production and post-production emissions intensity for the batch must be included on the PGO certificate in accordance with the rules.

33 Co-product reduction in emissions intensity—hydrogen by electrolysis

The amount by which the emissions intensity for the production of a batch (b) of hydrogen may be reduced, $EI_{O2sale,b}$, in kilograms of CO_2-e per kilogram of hydrogen is worked out using the following formula:

$$EI_{O_2sale,b} = \frac{E_{O_2sale,b}}{Q_b}$$

where:

$E_{O2sale,b}$ has the meaning given by section 29.

Q_b is the amount of product in the batch (b) in kilograms worked out in accordance with section 24.

Note: The production and post-production emissions intensity for the batch must be included on the PGO certificate in accordance with the rules.

Part 3.2—Delivery of hydrogen

Division 3.2.1—Delivery modules

34 Delivery modules

(1) Each of the following methods for storing or transporting hydrogen is a ***delivery module*** for hydrogen:

(a) transport by dedicated pipeline, including injecting hydrogen into the pipeline (the ***pipeline delivery module***);

(b) transport by vehicle, including loading hydrogen onto a vehicle or unloading it from a vehicle for the purpose of transporting it (the ***vehicle delivery module***);

(c) storage in a storage vessel (the ***storage vessel delivery module***).

(2) The following are sources of emissions relating to the delivery modules mentioned in subsection (1):

(a) for the pipeline delivery module—pipeline emissions;

(b) for the vehicle delivery module—vehicle emissions;

(c) for the storage vessel delivery module—storage vessel emissions.

Note: Pursuant to subsection 29(7) of the Act, a source of emissions relating to a delivery module for a product is a ***post-production emissions source*** for the delivery module.

(3) The sources of emissions for a delivery module mentioned in subsection (2) must be monitored, measured and reported in accordance with:

(a) for pipeline emissions—section 20; and

(b) for vehicle emissions—section 21; and

(c) for storage vessel emissions—section 22.

Division 3.2.2—Delivered amount—hydrogen

35 Amount of hydrogen that reaches the delivery gate or end of delivery module

Amount that reaches the delivery gate

(1) Where a delivery module is the final delivery module for the hydrogen, the amount of hydrogen that reaches the delivery gate is worked out as follows:

(a) for the pipeline delivery module:

(i) if the pipeline is a single access pipeline—in accordance with section 36;

(ii) in any other case—in accordance with section 38;

(b) for the vehicle delivery module—in accordance with either section 37 or section 38;

(c) for the storage vessel delivery module—in accordance with section 38.

(2) Where no delivery module is required to convey the hydrogen from the production gate to a delivery gate, the amount of hydrogen that reaches the delivery gate is worked out in accordance with section 39.

Example: The holder of a production profile for hydrogen has a connection directly from their production gate to a shared network pipeline. Hydrogen that reaches the production gate effectively reaches the delivery gate at the same time and does not require the use of a delivery module.

Amount that reaches the end of the delivery module

(3) Where the delivery module is an interim delivery module for the hydrogen, the amount of hydrogen that reaches the end of the delivery module is worked out in accordance with the following provisions where a reference in the provision to delivery gate is taken to be a reference to end of the delivery module:

(a) for the pipeline delivery module:

(i) if the pipeline is a single access pipeline—in accordance with section 36;

(ii) in any other case—in accordance with section 38;

(b) for the vehicle delivery module—in accordance with either section 37 or section 38;

(c) for the storage vessel delivery module—in accordance with section 38.

(4) In this section:

single access pipeline, for the pipeline delivery module, means a pipeline that:

(a) is a dedicated pipeline for hydrogen; and

(b) has a single input point for the hydrogen; and

(c) has a single delivery gate for the hydrogen.

36 Single-access pipeline delivered amount

Where one or more functional units of a batch of hydrogen (the ***transported quantity***) are transported in accordance with the pipeline delivery module, the amount of hydrogen that reaches the delivery gate is the amount measured:

(a) at the closest practicable point to the delivery gate; and

(b) over a length of time equal to the time taken to inject the transported quantity into the delivery module; and

(c) in accordance with section 9.

37 Vehicle transport delivered amount

(1) Where one or more functional units of a batch of hydrogen (the ***transported quantity***) are transported in accordance with the vehicle delivery module, the amount of hydrogen that reaches the delivery gate is the amount measured:

(a) at the closest practicable point to the delivery gate; and

(b) in accordance with section 9.

(2) The amount of hydrogen measured under subsection (1) does not include an amount of the transported quantity that is returned to the holder of the delivery profile or the holder of the production profile.

38 Module-specific loss method delivered amount

(1) Where one or more functional units of a batch of hydrogen (the ***transported quantity***) are stored or transported in accordance with a delivery module (the ***relevant delivery module***), the amount of hydrogen that reaches the delivery gate, $Q_{del,product}$, in kilograms, is worked out using the following formula:

$$Q_{del,product} = Q_{b,transported} \times (1 - LR_m) - Q_{self,product}$$

where:

$Q_{b,transported}$ is the amount of product in the transported quantity (q) in kilograms, measured:

(a) if the product enters the relevant delivery module immediately after the production pathway has been completed—in accordance with section 24; or

(b) in any other case—in accordance with the method or formula specified in subsection 35(3) for working out the amount of the product that reaches the end of the delivery module immediately prior to the relevant delivery module.

LR_m is:

(a) if the relevant delivery module (m) is the storage vessel delivery module and the vessel is a large hydrogen storage vessel—worked out in accordance with subsection (4);

(b) if the relevant delivery module (m) is the pipeline delivery module—either:

(i) worked out in accordance with subsection (2); or

(ii) 0.0035; or

(c) in any other case—worked out in accordance with subsection (2) or subsection (4).

Note: LR_m represents the loss rate for the delivery module (m).

$Q_{self,product}$ is the amount of product in the transported quantity (q) consumed by the holder of the delivery profile for the purposes of the relevant delivery module (m) in kilograms, monitored or measured in accordance with section 9.

Note: $Q_{self,product}$ represents the amount of product in the transported quantity that is consumed as an energy source for the delivery module and therefore does not reach the delivery gate.

m is the relevant delivery module used to store or transport the transported quantity (q).

(2) For sub-paragraph (b)(i) and paragraph (c) of the definition of LR_m in subsection (1), the loss rate for the relevant delivery module, LR_m, is either:

(a) if the amount worked out in accordance with subsection (3) is greater than or equal to zero—that number; or

(b) in any other case—zero.

(3) For subsection (2), $\boldsymbol{LR_m}$ is worked out using the following formula:

$$\boldsymbol{LR_m = \frac{Q_{in,m,y} - Q_{out,m,y}}{Q_{in,m,y}}}$$

where:

$\boldsymbol{Q_{in,m,y}}$ is the total amount of product put into the equipment used to store or transport the product in accordance with the relevant delivery module (m) for the year (y) in kilograms, monitored or measured in accordance with section 9.

$\boldsymbol{Q_{out,m,y}}$ is the total amount of product taken out of the equipment used to store or transport the product in accordance with the relevant delivery module (m) for the year (y) in kilograms, monitored or measured in accordance with section 9.

Note: $\boldsymbol{Q_{out,m,y}}$ includes any amount of product taken out by the holder of the delivery profile.

y is the financial year immediately prior to the financial year in which the batch period started.

Note: Section 14, which provides for an alternate definition of ***y*** where the holder of the delivery profile has an incomplete data set, applies to this subsection.

(4) For paragraph (a) and (c) of the definition of $\boldsymbol{LR_m}$ in subsection (1), $\boldsymbol{LR_m}$, is worked out using the following formula:

$$\boldsymbol{LR_m = \frac{\left(Q_{in,m,y} + Q_{m,start,y}\right) - \left(Q_{out,m,y} + Q_{m,end,y}\right)}{Q_{in,m,y}}}$$

where:

$\boldsymbol{Q_{m,start,y}}$ is the total amount of product in the equipment used to store or transport the product in accordance with the relevant delivery module (m) at the start of the year (y) in kilograms, monitored or measured in accordance with section 9.

$\boldsymbol{Q_{m,end,y}}$ is the total amount of product in the equipment used to store or transport the product in accordance with the relevant delivery module (m) at the end of the year (y) in kilograms, monitored or measured in accordance with section 9.

$\boldsymbol{Q_{in,m,y}}$ is the total amount of product put into the equipment used to store or transport the product in accordance with the relevant delivery module (m) for the year (y) in kilograms, monitored or measured in accordance with section 9.

$\boldsymbol{Q_{out,m,y}}$ is the total amount of product taken out of the equipment used to store or transport the product in accordance with the relevant delivery module (m) for the year (y) in kilograms, monitored or measured in accordance with section 9.

Note: ***Qout,m,y*** includes any amount of product taken out by the holder of the delivery profile.

y is the financial year immediately prior to the financial year in which the batch period started.

Note: Section 14, which provides for an alternate definition of ***y*** where the holder of the delivery profile has an incomplete data set, applies to this subsection.

(5) In this section:

large hydrogen storage vessel means a vessel for storing hydrogen that has a storage capacity greater than 1,000 kilograms.

39 Direct delivery delivered amount

Where one or more functional units of a batch of hydrogen (the ***transported quantity***) reach a delivery gate without being stored or transported in accordance with a delivery module, the amount of hydrogen that reaches the delivery gate is the same as the amount of hydrogen that reaches the production gate, monitored or measured in accordance with section 9.

Schedule 1—Emission factors

Part 1—Scope 3 emission factors for water sources

Note: See paragraphs 17(2)(a) and 17(2)(b).

Column 1	Column 2	Column 3
Item	**Water source**	**Emission factors for water source in kg of CO_2-e per kg of water**
1	Brackish water	0
2	Desalinated brackish water that has been treated so that it is of a quality suitable for use in a cooling tower	0.001958
3	Desalinated seawater that has been treated so that it is of a quality suitable for use in a cooling tower	0.004520
4	Potable water from New South Wales	0.000424657
5	Potable water from Queensland	0.000367407
6	Potable water from South Australia	0.000295843
7	Potable water from Tasmania	0.000271544
8	Potable water from the Australian Capital Territory	0.000437289
9	Potable water from the Northern Territory	0.000596397
10	Potable water from Victoria	0.000300693
11	Potable water from Western Australia	0.000673111
12	Raw wastewater	0
13	Seawater	0
14	Treated wastewater	0
15	Untreated captured rainwater	0
16	Untreated groundwater	0
17	Untreated surface water	0

Part 2—Scope 3 emission factor supplements for advanced water treatment processes

Note: See paragraph 17(2)(b) and subsection 17(4).

Column 1	Column 2	Column 3	Column 4
Item	**Advanced treatment process**	**Water quality post-treatment process**	**Emission factor in kg of CO2-e per kg of water**
1	Ultrapure membrane process	Water for electrolyser feed-water quality Conductivity less than 0.1 micro-Siemens per centimetre (µS/cm) and total silica less than 0.01 milligrams per litre (mg/L)	0.001836
2	Ultrapure thermal process	Water for electrolyser feed-water quality Conductivity less than 0.1 µS/cm and total silica less than 0.01 mg/L	0.036991
3	Demineralised or deionised via electro-deionisation	Boiler feedwater for steam generation quality Conductivity less than 1 µS/cm, total silica less than 0.02 mg/L and less than 0.08 Total Organic Carbon	0.001741
4	Water softening by ion exchange	Water hardness less than 0.02 mmol/L	0.000335
5	Ultrafiltered membrane process	Particulate matter larger than 0.01 µm removed and turbidity below 0.1 Nephelometric Turbidity Units	0.004356
6	Filtered clarifier	Total suspended solids reduced to below 1 mg/L or turbidity less than 10 Nephelometric Turbidity Units	0.000509

Part 3—Emission factors for vehicles

Note: See paragraph (a) of the parameter EF_{veh} in subsection 21(5).

Column 1	Column 2	Column 3
Item	**Type of vehicle**	**Emission factor in kg of CO_2-e per kg-km**
1	Train	0.00001464
2	Cargo ship	0.00003334
3	Articulated truck (including a road train)	0.00006944
4	Rigid truck with a gross vehicle mass of more than 3.5 tonnes	0.00021505
5	Light commercial vehicle with a gross vehicle mass of up to 3.5 tonnes	0.00308084
6	Aircraft	0.0453

Part 4—Scope 3 emission factors for solid fuel consumption

Note: See section 12.

Column 1	Column 2	Column 3
Item	**Fuel type**	**Emission factor in kg of CO_2-e per GJ**
1	Bituminous coal	3.0
2	Sub-bituminous coal	2.5
3	Brown coal (lignite)	0.4
4	Coking coal	6.4

Part 5—Scope 3 emission factors for liquid fuel consumption

Note: See section 12.

Column 1	Column 2	Column 3
Item	**Fuel type**	**Emission factor in kg CO_2-e per GJ**
1	Petroleum based oils	18.0
2	Petroleum based greases	18.0
3	Automotive gasoline or petrol (other than for use as fuel in an aircraft)	17.2
4	Aviation gasoline	18.0
5	Kerosene (other than for use as fuel in an aircraft)	18.0
6	Aviation turbine fuel or kerosene	18.0
7	Heating oil	18.0
8	Diesel oil	17.3
9	Fuel oil	18.0
10	Liquefied aromatic hydrocarbons	18.0
11	Mineral turpentine or white spirits	18.0
12	Liquefied petroleum gas (LPG)	20.2
13	Naphtha	18.0
14	Petroleum coke	18.0
15	Refinery gas and liquids	18.0
16	Refinery coke	18.0
17	Crude oil & Refinery Stock	13.9
18	Petroleum based products other than those mentioned in the items above	18.0

Part 6—Scope 3 emission factors for gas consumption for transport energy purposes

Note: See section 12.

Column 1	Column 2	Column 3
Item	**Fuel type**	**Emission factor in kg CO_2-e per GJ**
1	Compressed natural gas	18.0
2	Liquefied natural gas	18.0

Part 7—Scope 3 emission factors for natural gas consumption for stationary energy purposes

Note: See section 12.

Column 1	Column 2	Column 3	Column 4
Item	**State or Territory**	**Emission factor in kg CO_2-e per GJ—area connected to a distribution pipeline**	**Emission factor in kg CO_2-e per GJ—area connected to a transmission pipeline**
1	Australian Capital Territory	13.1	14.0
2	New South Wales	13.1	14.0
3	Northern Territory	4.1	4.0
4	Queensland	8.8	7.9
5	South Australia	10.7	10.6
6	Tasmania	4.0	4.0
7	Victoria	4.0	4.0
8	Western Australia	4.1	4.0