



Safeguard Mechanism: Prescribed production variables and default emissions intensities

This draft document refers only to production variables that are proposed to be amended in the *National Greenhouse and Energy Reporting (Safeguard Mechanism) Amendment (Production Variables Update) Rules (No. 2) 2023*

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Abbreviations and acronyms

Abbreviation	Definition
CO ₂	Carbon dioxide
CCS	Carbon Capture and Storage
CMWG	Coal mine waste gas
GJ	Gigajoules
LNG	Liquefied Natural Gas
LPG	Liquefied Petroleum Gas
NGER	National Greenhouse and Energy Reporting
t	tonnes
t CO ₂ -e	tonnes of CO ₂ equivalent

PURPOSE OF THIS DOCUMENT

This document is an extract of the ‘Safeguard Mechanism document’ ([Safeguard Mechanism document - DCCEEW](#)), containing material relevant to production variables that are being updated as a result of the Department of Climate Change, Energy, the Environment and Water (the Department) review that Safeguard Mechanism production variables incentivise low emissions production.

The Safeguard Mechanism document is referred to in section 16 of the *National Greenhouse and Energy Reporting (Safeguard Mechanism) Rule 2015* (Safeguard Rule) ([Federal Register of Legislation - Australian Government](#)). It is available on the Department of Climate Change, Energy, the Environment and Water (the Department) website. The purpose of this document is to **define production variables** for use in baselines made under the Safeguard Mechanism and determine what emissions are relevantly associated with each production variable in accordance with section 16 of the Safeguard Rule.

There are three types of emissions intensity values associated with production variables:

- **Default emissions intensity values:** are set by the Government and represent the industry average emissions intensity of production, calculated in accordance with the Framework.
- **Facility-specific emissions intensity values:** are set by the Clean Energy Regulator, after an application by a responsible emitter. They represent the emissions intensity of production at an individual facility.
- **Benchmarks:** are set by the Government and represent international best practice, adapted for an Australia context, and apply to new facilities and new products.

Production variable definitions, default emissions intensity values and benchmarks are published in Schedule 1 of the Safeguard Rule.

BACKGROUND

Defining prescribed production variables and default emissions intensities

The process of defining the production variables and default emissions intensity values was undertaken in accordance with the *Framework for developing default production variables and emissions-intensity values* (the Framework document). It involved extensive stakeholder consultation and independent technical expert review. As part of the reforms to the Safeguard Mechanism in 2023, production variables were reviewed to ensure they remain appropriate and effective in the context of declining baselines to contribute to Australia’s emissions reduction targets.

Production variable definitions and emissions source boundaries

Section 16 of the Safeguard Rule requires that when emissions are relevantly associated to production variables in an emissions intensity determination application, that must be done in a way that has regard to this document. This ensures that covered emissions are consistent between the facility-specific emissions intensity and the default emissions intensity for the same production variable.

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It is intended that all scope 1 NGER-reported emissions from a facility can be assigned to a production variable. Where a facility produces multiple products, emissions must be apportioned in a justifiable manner, making sure no emissions are counted more than once and the total emissions counted cannot be more than the total emissions from the facility. In some cases, emissions from a particular process will need to be apportioned among two or more production variables.

This document provides guidance for businesses and auditors on the emissions sources used in the development of default emissions intensity values, which emissions sources can be used in facility-specific emissions intensity calculations and how apportioning should be done.

The following sections set out the emissions sources that should be included in or excluded from emissions intensity calculations.

Note: Throughout this document, the terms ‘on-site’ and ‘off-site’ refer to the site of a facility

PRODUCTION VARIABLES

Hydrogen

1. Gaseous hydrogen

1.1. Production variable definition

1. Tonnes of gaseous hydrogen ($H_2(g)$) that:
 - (a) are in a gaseous state; and
 - (b) are produced as part of carrying on the gaseous hydrogen production activity at the facility; and
 - (c) are of saleable quality; and
 - (d) are not consumed in carrying on the liquefied hydrogen production activity in section 100 of this Schedule; and
 - (e) have not been counted as part of the liquefied hydrogen production variable in section 100 of this Schedule.
2. The metric in subsection (1) is applicable to a facility that conducts the activity of producing gaseous hydrogen through:
 - (a) the physical and chemical transformation of feedstocks that contain hydrogen to produce gaseous hydrogen; or
 - (b) the physical and chemical transformation of water (H_2O) to gaseous hydrogen through electrolysis.
3. The activity in subsection (2) is the ***gaseous hydrogen production activity***.

1.2. Inclusions

Scope 1 emissions from the following processes at the facility are included:

- the use of machinery, equipment and processes for the physical transformation described in the activity defining, including, for example:
 - hydrocarbon reforming;
 - coal gasification;
 - machinery used to move material within and as part of the activity, including compression;
 - control rooms, laboratories, and maintenance workshops;
 - on-site processing and/or disposal of waste materials;
 - on-site treatment of water and wastewater;
 - flaring as part of reforming process;
- recovery/capture and use of waste heat/energy within the activity;
- fuel use for processing of carbon dioxide (e.g. liquefaction or compression) for carbon capture and storage;

- combustion of fuel for steam and heat generation;
- other incidental, ancillary or supporting processes which are not included in another default, facility-specific or benchmark emissions intensity value.

1.3. Exclusions

Scope 1 emissions from the following processes should be excluded:

- fuel used for liquefaction of hydrogen;
- processes that are included in the definition of another production variable, such as ammonia and petroleum refining; and
- processes which do not occur within the facility;
- on-site electricity generation.

2. Liquefied hydrogen

2.1. Production variable definition

1. Tonnes of liquified hydrogen ($H_2(l)$) that:
 - (a) are in a liquid state; and
 - (b) are produced as part of carrying on the liquefied hydrogen production activity at the facility; and
 - (c) are produced using gaseous hydrogen that was produced by carrying on the gaseous hydrogen production activity at the facility; and
 - (d) are of saleable quality; and
 - (e) have been loaded onto a pipeline, transport vessel, tanker or other transportation system.
2. The metric in subsection (1) is applicable to a facility that conducts the activity of producing liquified hydrogen through the physical transformation of gaseous hydrogen ($H_2(g)$) into liquefied hydrogen that is in a liquid state on leaving the facility.
3. The activity in subsection (2) is the ***liquefied hydrogen production activity***.

2.2. Inclusions

Scope 1 emissions from the following processes at the facility are included:

- the use of machinery, equipment and processes for the physical transformation described in the activity defining, including, for example:
 - steam methane reforming;
 - coal gasification;
 - machinery used to move material within and as part of the activity;
 - control rooms, laboratories, and maintenance workshops;
 - on-site processing and/or disposal of waste materials
- recovery/capture and use of waste heat/energy within the activity;
- fuel combustion for compression of carbon dioxide for use in carbon capture and storage;

- fuel combustion for liquefaction of hydrogen and re-processing of boil off gases;
- fuel combustion for steam and heat generation;
- other incidental, ancillary or supporting processes which are not included in another default, facility-specific or benchmark emissions intensity value.

2.3. Exclusions

Scope 1 emissions from the following processes at the facility should be excluded:

- processes that are included in the definition of another production variable, such as ammonia and petroleum refining;
- processes which do not occur within the facility; and
- on-site electricity generation.

Steel manufacturing

There are eleven prescribed production variables for iron and steel manufacturing. Production variables are distinguished for primary steelmaking and cold ferrous feed steelmaking.

- Primary iron and steel manufacturing refers to the processing of raw materials into an iron or steel product.
- Cold ferrous feed steel manufacturing refers to the production of steel from cold ferrous feed.

General definitions

The ***manufacture of carbon steel from cold ferrous feed activity*** is the physical and chemical transformation of cold ferrous feed (such as ferrous scrap, hot briquetted iron, pig iron and flat iron) by heating and melting into liquid steel and the subsequent casting of the liquid steel to produce 1 or more of the following:

- a) continuously cast carbon steel products;
- b) ingots of carbon steel;
- c) hot rolled carbon steel products, which commenced hot rolling at a temperature above 800 °C.

The ***hot-rolled long products activity*** is the hot-rolling of continuously cast carbon steel products (originally produced from a primary steel production activity or manufacture of carbon steel from cold ferrous feed activity) into carbon steel long products that:

- (a) are in coils or straight lengths; and
- (b) are generally produced in rod, bar and structural (section) mills; and
- (c) generally have a cross sectional shape such as I, T, Y, U, V, H, C, L, square, rectangular, round, flat, hexagonal, angle, channel, structural beam profile or rail profile.

The ***hot-rolled flat products activity*** is the hot rolling of continuously cast carbon steel products (originally produced from a primary steel production activity or manufacture of carbon steel from cold ferrous feed activity) into carbon steel flat products that:

- a) are flat in profile, such as plate and hot rolled coil; and
- b) are generally produced in hot strip mills and plate mills; and
- c) are generally greater than 600 mm in width; and
- d) are generally less than 150 mm in thickness.

carbon steel means material that:

- (a) contains by mass more iron (Fe) than any other single element; and
- (b) has a carbon (C) concentration less than 2%.

coke oven coke means the solid product obtained from the carbonisation of coal (principally coking coal) at a high temperature and includes coke breeze and foundry coke.

3. Coke oven coke

Production variable definition

1. Tonnes of coke oven coke on a dry weight basis that:
 - (a) Are produced as part of the coke oven coke manufacturing activity at the facility; and
 - (b) are of saleable quality; and
 - (c) are exported from the facility.
2. The metric in subsection (1) is applicable to a facility that conducts the activity of carbonisation of coal (principally coking coal) through the coke oven coke manufacturing process.
3. The activity in subsection (2) is the ***coke oven coke manufacturing activity***.

Inclusions

Scope 1 emissions from the following processes are included within the production variable:

- emissions attributable to the production of coke oven coke by:
 - the methods used to calculate the emissions of coke oven coke in accordance with the requirements in the *National Greenhouse and Energy Reporting (Measurement) Determination 2008*; and
 - the apportioning method used by the responsible emitter in their data submission to the Department for the purposes of calculating the default emissions intensity; and
- other incidental, ancillary or supporting processes which are not included in another default or facility-specific emissions intensity value.

Exclusions

Scope 1 emissions from the following processes are not taken to relate to the production variable and must be excluded:

- processes included in (or apportioned to) another production variable;
- processes which do not occur within the facility (such as imported coke);
- on-site electricity generation.

4. Lime

Production variable definition

1. Tonnes of lime on a dry weight basis that:
 - a) are produced as part of the lime manufacturing activity at the facility;

- b) are of saleable quality; and
 - c) are exported from the facility.
2. The metric in subsection (1) is applicable to a facility that conducts:
- a) either:
 - i. the primary iron production activity; or
 - ii. the primary steel production activity; and
 - b) the chemical and physical transformation of either or both limestone or dolomite, into lime (including burnt lime, burnt dolomite, or both).
3. The activity in subsection (2) is the ***lime manufacturing activity***.

Inclusions

Scope 1 emissions from the following processes are included within the production variable:

- the component of emissions attributable to the production of lime (including burnt lime and burnt dolomite) by:
 - the methods used to calculate the emissions of lime in accordance with the requirements in the *National Greenhouse and Energy Reporting (Measurement) Determination 2008*; and
 - the apportioning method used by the responsible emitter in their data submission to the Department for the purposes of calculating the default emissions intensity; and
- other incidental, ancillary or supporting processes which are not included in another default or facility-specific emissions intensity value.

Exclusions

Scope 1 emissions from the following processes are not taken to relate to the production variable and must be excluded:

- processes included in (or apportioned to) another production variable;
- processes which do not occur within the facility;
- on-site electricity generation.

5. Iron ore pellets

Production variable definition

1. Tonnes of iron ore pellets on a dry weight basis that:
- a) are produced as part of the iron ore pellets manufacturing activity at the facility; and
 - b) are exported from the facility; and
 - c) are of saleable quality.

2. The metric in subsection (1) is applicable to a facility that conducts the activity of manufacturing iron ore pellets.
3. The activity in subsection (2) is the ***iron ore pellets manufacturing activity***.

Inclusions

Scope 1 emissions from the following processes are included within the production variable:

- the component of emissions that is attributable to the production of iron ore pellets by:
 - the methods used to calculate the emissions of iron ore pellets in accordance with the requirements in the *National Greenhouse and Energy Reporting (Measurement) Determination 2008*; and
 - the apportioning method used by the responsible emitter in their data submission to the Department for the purposes of calculating the default emissions intensity; and
- other incidental, ancillary or supporting processes which are not included in another default or estimated emissions intensity value.

Exclusions

Scope 1 emissions from the following processes are not taken to relate to the production variable and must be excluded:

- processes included in (or apportioned to) another production variable;
- processes which do not occur within the facility;
- on-site electricity generation.

6. Primary Iron

Production variable definition

1. Tonnes of metallic iron products, calculated in accordance with subsection (4), that:
 - a) are produced as part of carrying on the primary iron production activity at the facility; and
 - b) are exported from the facility; and
 - c) are of saleable quality.
2. The metric in subsection (1) is applicable to a facility that conducts the activity of the chemical and physical processing of iron containing feeds into a crude iron product suitable for export from the facility

Examples: Pig iron, hot briquetted iron, reduced iron and cast iron are each a crude iron product that may be suitable for export from a facility.

3. The metric in subsection (2) is the ***primary iron production activity***.
4. For subsection (1), tonnes of metallic iron products are given by the following equation:

metallic iron products = $Q_p + 0.891 Q_i$

where:

Q_p is the quantity of metallic iron products, in tonnes, that are not produced using coke oven coke imported into the facility, excluding any gangue within the metallic iron products.

Q_i is the quantity of metallic iron products, in tonnes, that are produced using coke oven coke imported into the facility, excluding any gangue within the metallic iron products.

Note: Q_p may or may not have been produced with coke oven coke.

Example: The facility produces 100,000 tonnes of metallic iron products that meet the conditions specified in subsection 40(1). 10 per cent of the metallic iron products consists of gangue, in the form of a mixture of silica (SiO_2), calcium oxide (CaO), magnesium oxide (MgO) and aluminium oxide (Al_2O_3), corresponding to 10,000 tonnes of gangue in total. 50,000 tonnes of products were produced using a direct reduced iron process that does not use coke oven coke, 45,000 tonnes were produced using coke oven coke produced at the facility, and 5,000 tonnes were produced using coke oven coke imported to the facility.

As such, Q_p is equal to 85,500, reflecting that 95,000 tonnes of metallic iron products are produced without using coke oven coke imported into the facility, and subtracting 9,500 tonnes of gangue. Q_i is equal to 4,500, reflecting that 5,000 tonnes of metallic iron products are produced using coke oven coke imported into the facility, and subtracting 500 tonnes of gangue. The metric is equal to $85,500 + 0.890 \times 4,500$, or 89,505 tonnes.

Inclusions

Scope 1 emissions from the following processes are included in the production variable, as relevant:

- processing of feed material, including;
 - coke production that is used in steelmaking at the facility;
 - lime production that is used in steelmaking at the facility;
 - sinter production; and
 - pellet production.
- iron production: for the purpose of calculating a facility-specific emissions intensity value when a facility is engaged in the primary steel production activity, emissions from the production of molten iron are included;
- the component of emissions that is attributable to the production of primary iron by:
 - the methods used to calculate the emissions of iron ore pellets in accordance with the requirements in the *National Greenhouse and Energy Reporting (Measurement) Determination 2008*; and
 - the apportioning method used by the responsible emitter in their data submission to the Department for the purposes of calculating the default emissions intensity; and

- other incidental, ancillary or supporting processes which are not included in another default or facility-specific emissions intensity value.

Exclusions

Scope 1 emissions from the following processes are not taken to relate to the production variable and must be excluded:

- processes included in (or apportioned to) another production variable. For the purpose of calculating a facility-specific emissions intensity value when a facility is engaged in the primary steel production activity, emissions from the production of steel from molten iron are excluded;
- processes which do not occur within the facility (e.g. coke imported to the facility) and
- on-site electricity generation.

7. Primary steel

Production variable definition

1. Tonnes of continually cast carbon steel products and ingots of carbon steel, calculated in accordance with subsection (4), that:
 - a) are produced as part of carrying on the primary steel manufacturing activity at the facility; and
 - b) are of saleable quality.
2. The metric in subsection (1) is applicable to a facility that conducts the activity of producing continuously cast carbon steel products and ingots of carbon steel through the chemical and physical transformation of iron feed material into crude carbon steel products and hot-rolled carbon steel products.
3. The activity in subsection (2) is the ***primary steel manufacturing activity***.
4. For subsection (1), tonnes of continually cast carbon steel products and ingots of carbon steel are given by the following equation:

$$\text{Tonnes of continually cast carbon steel products and ingots of carbon steel} = Q_p + 0.900 Q_i$$

where:

Q_p is the quantity of primary steel that is not produced using coke oven coke imported into the facility.

Q_i is the quantity of primary steel that is produced using coke oven coke imported into the facility.

Note: Q_p may or may not have been produced with coke oven coke.

Example: The facility produces 100,000 tonnes of continually cast carbon steel products and ingots of carbon steel that meet the conditions specified in subsection 40(1). 50,000 tonnes the products were produced using an electric arc furnace process that does not

use coke oven coke, 45,000 tonnes were produced using coke oven coke produced at the facility, and 5,000 tonnes were produced using coke oven coke imported to the facility. The metric is equal to $95,000 + 0.900 \times 5,000$, or 99,500 tonnes.

Inclusions

Scope 1 emissions from the following processes are included within the production variable:

- processing of feed material, including;
 - coke production that is used in steelmaking at the facility;
 - lime production that is used in steelmaking at the facility;
 - sinter production; and
 - pellet production.
- iron production that is used in steelmaking at the facility;
- steelmaking;
- the component of emissions from the activity of primary steel manufacturing that is attributable to the production of continuously cast carbon steel products by:
 - the methods used to calculate the emissions of continuously cast carbon steel in accordance with the requirements in the *National Greenhouse and Energy Reporting (Measurement) Determination 2008*; and
 - the apportioning method used by the responsible emitter in their data submission to the Department for the purposes of calculating the default emissions intensity; and
- other incidental, ancillary or supporting processes which are not included in another default or facility-specific emissions intensity value.

Exclusions

Scope 1 emissions from the following processes are not taken to relate to the production variable and must be excluded:

- processes included in (or apportioned to) another production variable (e.g. hot-rolling into flat or long products);
- processes which do not occur within the facility (e.g. the production of coke that is imported to the facility); and
- on-site electricity generation.

8. Hot-rolled long products (primary steel)

Production variable definition

1. Tonnes of hot-rolled carbon steel long products that:
 - (a) are produced as part of carrying on the hot-rolled carbon steel long products activity at the facility; and

- (b) are in coils or straight lengths; and
 - (c) are generally produced in rod, bar and structural (section) mills; and
 - (d) generally have a cross sectional shape such as I, T, Y, U, V, H, C, L, square, rectangular, round, flat, hexagonal, angle, channel, structural beam profile or rail profile; and
 - (e) are of saleable quality.
2. The metric in subsection (1) is applicable to a facility that conducts:
- (a) the hot-rolled long products activity; and
 - (b) the primary steel production activity.

Inclusions

Scope 1 emissions from the following processes are included within the activity boundary:

- the direct emissions from machinery, equipment and processes used for the physical and/or chemical transformation described in the activity definition;
- the component of emissions from the activity of primary steel manufacturing that is attributable to the production of continuously cast carbon steel products by:
 - the methods used to calculate the emissions of continuously cast carbon steel in accordance with the requirements in the *National Greenhouse and Energy Reporting (Measurement) Determination 2008*; and
 - the apportioning method used by the responsible emitter in their data submission to the Department for the purposes of calculating the default emissions intensity; and
- other incidental, ancillary or supporting processes which are not included in another default or facility-specific emissions intensity value.

Exclusions

Scope 1 emissions from the following processes are not taken to relate to the activity and must be excluded:

- any stand-alone finishing processes, including, but not limited to, cold-rolling, annealing, pickling or coating of steel products;
- processes which do not occur within the facility; and
- on-site electricity generation.

9. Hot-rolled flat products (primary steel)

Production variable definition

1. Tonnes of hot-rolled carbon steel flat products that:
 - (a) are produced as part of carrying on the hot-rolled carbon steel flat products activity at the facility; and
 - (b) are flat in profile, such as plate and hot rolled coil; and
 - (c) are generally produced in hot strip mills and plate mills; and
 - (d) are generally greater than 600 mm in width; and
 - (e) are generally less than 150 mm in thickness; and
 - (f) are of saleable quality.
3. The metric in subsection (1) is applicable to a facility that conducts:
 - (a) the hot-rolled flat products activity; and
 - (b) the primary steel manufacturing activity.

Inclusions

Scope 1 emissions from the following processes are included within the activity boundary:

- the use of machinery, equipment and processes for the physical and/or chemical transformation described in the activity definition;
- the component of emissions from the activity of primary steel manufacturing that is attributable to the production of continuously cast carbon steel products by:
 - the methods used to calculate the emissions of continuously cast carbon steel in accordance with the requirements in the *National Greenhouse and Energy Reporting (Measurement) Determination 2008*; and
 - the apportioning method used by the responsible emitter in their data submission to the Department for the purposes of calculating the default emissions intensity; and
- other incidental, ancillary or supporting processes which are not included in another default or facility-specific emissions intensity value.

Exclusions

Scope 1 emissions from the following processes are not taken to relate to the activity and must be excluded:

- any stand-alone finishing processes, including, but not limited to, cold-rolling, annealing, pickling or coating of steel products;
- processes which do not occur within the facility; and
- on-site electricity generation.

10. Continuously cast carbon steel products and ingots of carbon steel (cold ferrous feed)

Production variable definition

1. Tonnes of continuously cast carbon steel products and ingots of carbon steel that:

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- (a) are produced as part of carrying on the manufacture of carbon steel products from cold ferrous feed activity at the facility; and
 - (b) are not produced as part of carrying on the primary steel manufacturing activity at the facility; and
 - (c) are of saleable quality.
2. The metric in subsection (1) is applicable to a facility that produces continuously cast carbon steel products and ingots of carbon steel through the physical and chemical transformation of cold ferrous feed (such as ferrous scrap, hot briquetted iron, pig iron and flat iron) to produce 1 or more of the following:
 - (a) continuously cast carbon steel products;
 - (b) ingots of carbon steel.
 - (c) hot-rolled carbon steel products, which commenced hot-rolling at a temperature above 800 °C.
3. the activity in subsection (2) is the ***manufacture of carbon steel products from cold ferrous feed activity***.

Inclusions

Scope 1 emissions from the following processes are included within the production variable:

- processing of cold ferrous feed;
- steelmaking: for the purpose of calculating a facility-specific emissions intensity value when a facility is engaged in the primary steel production activity, emissions from the production of steel from molten iron are included;
- the component of emissions from the activity of manufacture of carbon steel products from cold ferrous feed that is attributable to the production of continuously cast carbon steel products by:
 - the methods used to calculate the emissions of continuously cast carbon steel in accordance with the requirements in the *National Greenhouse and Energy Reporting (Measurement) Determination 2008*; and
 - the apportioning method used by the responsible emitter in their data submission to the Department for the purposes of calculating the default emissions intensity; and
- other incidental, ancillary or supporting processes which are not included in another default or facility-specific emissions intensity value.

Exclusions

Scope 1 emissions from the following processes are not taken to relate to the activity and must be excluded:

- processes included in (or apportioned to) another production variable e.g. hot-rolling into flat or long products. For the purpose of calculating a facility-specific emissions intensity value when a facility is engaged in the primary steel production activity, emissions from the production of molten iron are excluded;
- processes which do not occur within the facility; and

- on-site electricity generation.

11. Hot-rolled long products (cold ferrous feed)

Production variable definition

1. Tonnes of hot-rolled carbon steel long products that:
 - (a) are produced as part of carrying on the hot-rolled carbon steel long products activity at the facility; and
 - (b) are in coils or straight lengths; and
 - (c) are generally produced in rod, bar and structural (section) mills; and
 - (d) generally have a cross sectional shape such as I, T, Y, U, V, H, C, L, square, rectangular, round, flat, hexagonal, angle, channel, structural beam profile or rail profile; and
 - (e) are of saleable quality.
2. The metric in subsection (1) is applicable to a facility that:
 - a) conducts the hot rolled long products activity; and
 - b) either:
 - i. conducts the manufacture of carbon steel products from cold ferrous feed activity; or
 - ii. is a stand-alone hot-rolling mill.

Inclusions

Scope 1 emissions from the following processes are included within the activity boundary:

- the direct emissions from machinery, equipment and processes used for the physical and/or chemical transformation described in the activity definition;
- the component of emissions attributable to the production of hot-rolled long products by:
 - the methods used to calculate the emissions of continuously cast carbon steel in accordance with the requirements in the *National Greenhouse and Energy Reporting (Measurement) Determination 2008*; and
 - the apportioning method used by the responsible emitter in their data submission to the Department for the purposes of calculating the default emissions intensity; and
- other incidental, ancillary or supporting processes which are not included in another default or facility-specific emissions intensity value.

Exclusions

Scope 1 emissions from the following processes are not taken to relate to the activity and must be excluded:

- any stand-alone finishing processes, including, but not limited to, cold-rolling, annealing, pickling or coating of steel products;
- processes which do not occur within the facility; and
- on-site electricity generation.

12. Hot-rolled flat products (cold ferrous feed)

Production variable definition

1. Tonnes of hot-rolled carbon steel flat products that:
 - (a) are produced as part of carrying on the hot-rolled carbon steel flat products activity at the facility; and
 - (b) are flat in profile, such as plate and hot rolled coil; and
 - (c) are generally produced in hot strip mills and plate mills; and
 - (d) are generally greater than 600 mm in width; and
 - (e) are generally less than 150 mm in thickness; and
 - (f) are of saleable quality.
2. The metric in subsection (1) is applicable to a facility that:
 - a) conducts the hot-rolled flat products activity; and
 - b) either:
 - i. conducts the manufacture of carbon steel products from cold ferrous feed activity; or
 - ii. is a stand-alone hot rolling mill.

Inclusions

Scope 1 emissions from the following processes are included within the activity boundary:

- the use of machinery, equipment and processes for the physical and/or chemical transformation described in the activity definition;
- the component of emissions attributable to the production of hot-rolled flat products by:
 - the methods used to calculate the emissions of continuously cast carbon steel in accordance with the requirements in the *National Greenhouse and Energy Reporting (Measurement) Determination 2008*; and
 - the apportioning method used by the responsible emitter in their data submission to the Department for the purposes of calculating the default emissions intensity; and
- other incidental, ancillary or supporting processes which are not included in another default or facility-specific emissions intensity value.

Exclusions

Scope 1 emissions from the following processes are not taken to relate to the activity and must be excluded:

- any stand-alone finishing processes, including, but not limited to, cold-rolling, annealing, pickling or coating of steel products;
- processes which do not occur within the facility; and
- on-site electricity generation.

13. Treated steel flat products

Production variable definition

1. Tonnes of treated steel flat products that:
 - (a) are produced as part of carrying on the treated steel flat products activity at the facility; and
 - (b) are flat in profile, such as plate and coil; and
 - (c) have not previously been included as a tonne of treated steel flat products under this section; and
 - (d) have been treated with one or a combination of the following processes:
 - a. annealing;
 - b. metal coating;
 - c. painting.
 - (e) are of saleable quality.
2. The metric in subsection (1) is applicable to a facility that conducts the activity of transforming hot-rolled steel coil, using a combination of physical or chemical processes, into treated steel flat products that:
 - (a) are flat in profile, such as plate and coil; and
 - (b) have involved the pickling and cold-rolling of hot-rolled steel coil; and
 - (c) have been treated with one or a combination of the following processes:
 - a. annealing;
 - b. metal coating;
 - c. painting.
3. The activity in subsection (2) is the ***treated steel flat products activity***.

Inclusions

Scope 1 emissions from the following processes are included:

- the use of machinery, equipment and processes for the physical and/or chemical transformation described in the activity definition, including, for example:
 - the pickling, cold reduction, annealing, metal coating and painting processes;
 - machinery used to move materials within the facility, including mobile equipment;

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- control rooms, laboratories, maintenance workshops;
- machinery used to create non-electrical energy for use in the activity;
- the processing of by-products where it involves the recovery of materials for re-use within the activity or is necessary for the activity to proceed as described;
- the on-site recovery and processing of steel scrap; and
- on-site processing of waste materials and by-products from the activity;
- waste heat recovery within the facility;
- steam produced on-site that is not used to produce electricity;
- warehousing or storage of activity outputs, raw materials and consumables used by the activity where this is at the same location as the activity;
- water and waste treatment (including gases) necessary for the activity to be conducted;
- on-site transportation of steel products;
- complementary processes, such as packaging, head office, administrative and marketing operations, where they are undertaken at the site of the facility; and
- other incidental, ancillary or supporting processes which are not included in another default or estimated emissions intensity value.

It is intended that all scope 1 NGER-reported emissions from a facility can be assigned to a production variable, but where a facility produces multiple products, emissions cannot be counted more than once.

A facility can assign emissions from ancillary services or processes (which do not relate to a specific output) to one production variable only, or apportion those emissions among production variables as described above.

Exclusions

Scope 1 emissions from the following processes are not taken to relate to the activity and must be excluded:

- any upstream processes, including, but not limited to the production of hot-rolled steel coil;
- processes which do not occur within the facility; and
- on-site electricity generation.

Mining

14. Mine rehabilitation

Production variable definition

1. Total gigajoules of energy input that:
 - a. are used for the purpose of mine rehabilitation; and
 - b. have not been counted for another production variable at the facility.
2. The metric in subsection (1) is applicable to a facility:
 - a. that undertakes mine rehabilitation within the facility by conducting any of the following activities (the **rehabilitation activities**):
 - i. haulage of material;
 - ii. shaping and contouring of landforms;
 - iii. revegetation;
 - iv. management of tailings and wastewater;
 - v. associated activities such as dust suppression;
 - b. where the rehabilitation activities:
 - i. are in excess of those required for the mine's normal operation; and
 - ii. are not associated with on-site electricity generation; and
 - iii. do not fall within the scope of any other production variable in this Schedule.

Examples: Mine rehabilitation of an entire pit. Mine rehabilitation ramping up as production drops towards mine closure. Mine rehabilitation at the end of a mine's life following cessation of production

3. The activity in subsection (2) is the **mine rehabilitation activity**.
4. Without limitation, the quantity of the metric in subsection (1) may be evidenced by:
 - a. third party contracts; or
 - b. fuel purchase receipts; or
 - c. fuel use records from a fuel management system; or
 - d. evidence of an activity scheduled in an approved mining and rehabilitation plan, relating to the mine rehabilitation activity.

Scope of the activity

The mining production variables include emissions from progressive and continuous rehabilitation, so the rehabilitation production variable is primarily intended to apply to mine rehabilitation at the end of a mine's life when the mine ceases production.

However, in limited circumstances the production variable may be applicable to rehabilitation activities which occur concurrently with mining activities if the level of rehabilitation is clearly beyond usual levels, specifically:

- The rehabilitation activity is significant and discrete from the operating areas of the mine (e.g. rehabilitation of an entire pit within a pit complex).
- The rehabilitation activity is ramping up in the lead up into the mine closure phase. This could be demonstrated by a drop in production and mine closure plans, alongside plans showing an increase in rehabilitation activities beyond the usual level.

For operating mines, the rehabilitation projection variable:

- Does not cover activities that are considered part of the mining activity, such as hauling waste material from the operating part of the mine. This includes if the trucks deliver the waste to the rehabilitation site because hauling waste material is part of normal mine operation.
 - However, hauling material from the waste dump to the rehabilitation activity is not part of normal operating mine activity and would be included.
- Does cover associated activities if they are an element of the rehabilitation activity, such as dust suppression. If the supporting service is shared between the operating mine and the rehabilitation activity, then the energy use needs to be apportioned. An example is a water tanker that suppresses dust generated from both the operating mine and the rehabilitation activity. This may not be practical, in which case associated activities can be excluded for simplicity.

Inclusions

Scope 1 emissions from the following processes are included within the production variable:

- energy use for rehabilitation activities and associated services.

Exclusions

Scope 1 emissions from the following processes are not taken to relate to the activity and must be excluded:

- on-site electricity generation;
- processes or parts of processes that are included in the definition of another production variable, e.g. run-of-mine ore production variables; and
- processes that do not occur within the facility.

15. Lithium ore mining

Production variable definition

1. Tonnes of lithium ore, on a wet basis, that:
 - a. are produced as part of carrying on the lithium ore mining activity at the facility; and
 - b. are of saleable quality.
2. The metric in subsection (1) is applicable to a facility that undertakes lithium ore mining activity through the physical extraction of lithium bearing minerals.
3. The activity in subsection (2) is the lithium ore mining activity.

Scope of the activity

Lithium ore is mined from both open-cut and underground mines based on the physical characteristics of the mine and the most economically efficient mining method. Both mining methods are covered by this production variable. The lithium ore mined undergoes crushing, screening, and typically, on-site processing of the ore.

The production variable includes all development processes required to allow extraction of the lithium ore, including development of new mining areas through the life of the facility. This includes land clearing and removal and storage of topsoil for later use.

Processing of lithium ore

Lithium ore from the Run of Mine is first passed through a crushing and screening circuit to reduce the particle size to allow the ore to undergo further processing.

Lithium ore, once crushed, then goes through a grinding mill before being processed predominantly through Magnetic Separation, Dense Media Separation or Flotation methods. These approaches are not mutually exclusive with lithium miners adopting a combination of methods to process lithium ore to meet market demands.

The processing of lithium ore primarily uses electrically driven machinery.

Any emissions from the processing of lithium ore that occur on-site are included in the production variable.

Measurement of lithium ore

The output of the activity is defined as tonnes of lithium ore, that is, lithium ore produced by mining operations that is suitable for (or has been through) primary crushing. The measurement of this output is expected to be based on company records of the quantity of lithium ore mined or other industry measurement standards as applicable. The measurement of the output for the issue of a baseline is by tonne of lithium ore on a wet basis that is produced at the facility, or transportation away from the facility, where the lithium ore was mined.

Mine rehabilitation

Rehabilitation for individual mines may occur at a facility while other mines are operated, or at the end of life of the facility. The rehabilitation which occurs during the continued operation of the mine are included in the production variable. End of mine life rehabilitation is not included in the production variable.

Inclusions

Scope 1 emissions from the following processes are included within the production variable:

- Use of on-site machinery, equipment and processes for the development, extraction and treatment of mineral described in the activity definition, including, for example:
 - machinery used to move materials within the facility, including mobile equipment;
 - on-site processing of waste materials from the activity; and
 - the storage and loading of the lithium ore into a medium of transportation such as trucks or rail trains;
 - transportation of inputs used in the activity to storage at the facility, where the transport activity wholly occurs within the facility;
 - transportation of the output of the activity from storage at the facility, where the transport activity wholly occurs within the facility;
- complementary processes, such as packaging, head office, administrative and marketing operations, which occur within the boundary of the facility that is undertaking the activity; and
- other incidental, ancillary or supporting processes which are not included in another default or facility-specific emissions intensity value.

Exclusions

Scope 1 emissions from the following processes are not taken to relate to the activity and must be excluded:

- on-site electricity generation;
- processes that are included in the definition of another production variable; and
- processes that do not occur within the facility.

Ethylene and polyethylene

16. Ethene (ethylene)

Production variable definition

1. Tonnes of 100% equivalent ethene (ethylene (C₂H₄)) that is contained within ethene that:
 - (a) has a concentration of ethene equal to or greater than 99% by mass; and
 - (b) is produced as part of carrying on the ethene production activity at the facility; and
 - (c) is of saleable quality.
2. The metric in subsection (1) is applicable to a facility that conducts the activity of producing ethene (ethylene (C₂H₄)) through the chemical transformation of hydrocarbons to produce ethene that has a concentration of ethene equal to or greater than 99% by mass (the **ethene production activity**).

Inclusions

Scope 1 emissions from the following processes at the facility are included:

- steam cracking ethane to produce ethylene with supplemental feedstocks used at times, including naphtha, liquefied petroleum gas or its components propane and butane;
- the use of machinery, equipment and processes for the physical and/or chemical transformation described in the activity definition, including, for example:
 - machinery used to move materials within the facility, including mobile equipment;
 - control rooms, laboratories, maintenance workshops;
 - machinery used to create non-electrical energy for use in the activity;
 - the processing of by-products where they involve the recovery of materials for re-use within the activity or are necessary for the activity to proceed as described;
 - processing of by-products and waste materials from the activity; and
- waste heat recovery within the facility; and
- the production of steam in boilers for use in the activity; and
- other incidental, ancillary or supporting processes which are not included in another default or estimated emissions intensity value.

A facility can assign emissions from ancillary services or processes (which do not relate to a specific output) to one production variable only, or apportion those emissions among production variables as described above.

Exclusions

Scope 1 emissions from the following processes must be excluded:

- upstream production of ethane, propane, butane, LPG, naphtha or other hydrocarbon

feedstock;

- the production and transfer of steam for export;
- downstream processing of ethylene to polyethylene;
- on-site electricity production;
- importation of ethylene from a source off-site; and
- processes that do not occur within the facility.

17. Polyethylene

Production variable definition

1. Tonnes of pelletised polyethylene that:
 - (a) has a standard density equal to or greater than 0.910 g/cm³; and
 - (b) is produced as part of carrying on the polyethylene production activity at the facility; and
 - (c) is of saleable quality.
2. The metric in subsection (1) is applicable to a facility that conducts the activity of producing polyethylene through the chemical transformation ethene (ethylene (C₂H₄)) to produce polyethylene with a standard density equal to or greater than 0.910 g/cm³ (the polyethylene production activity).
3. In this section:

standard density, for polyethylene, means the density of polyethylene moulded to a thickness of 1.9 mm using Procedure C of Annex A1 to ASTM D4703-16 (2016).

Note: In 2021, the standard could be accessed from <http://www.astm.org>.

Inclusions

Scope 1 emissions from the following processes at the facility are included:

- polymerisation of ethene (ethylene) with additives, including comonomers, resins and other additives to produce linear low density polyethylene, low density polyethylene and high density polyethylene;
- the use of machinery, equipment and processes for the physical and/or chemical transformation described in the activity definition, including, for example:
 - machinery used to move materials within the facility, including mobile equipment;
 - control rooms, laboratories, maintenance workshops;
 - machinery used to create non-electrical energy for use in the activity;
 - the processing of by-products where they involve the recovery of materials for re-use within the activity or are necessary for the activity to proceed as described;
 - processing of by-products and waste materials from the activity; and

- waste heat recovery within the facility;
- the production of steam in boilers for use in the activity; and
- other incidental, ancillary or supporting processes which are not included in another default or estimated emissions intensity value.

A facility can assign emissions from ancillary services or processes (which do not relate to a specific output) to one production variable only, or apportion those emissions among production variables as described above.

Exclusions

Scope 1 emissions from the following processes must be excluded:

- upstream production of ethylene;
- upstream production of ethane, propane, butane, LPG, naphtha or other hydrocarbon feedstock;
- the production and transfer of steam for export;
- on-site electricity production;
- importation of polyethylene from a source off-site; and
- processes that do not occur within the facility.

18. Exported steam related to the ethene production activity

Production variable definition

1. Gigajoules of steam that:
 - (a) are generated at the facility by heating water; and
 - (b) are transferred or exported to another facility for use at that facility:
 - i. as part of a commercial arrangement requiring the transfer of steam to the recipient facility; and
 - ii. for use at the recipient facility.
2. The metric in subsection (1) is applicable to a facility that conducts the ethene production activity.
3. The gigajoules of steam in subsection (1) must be:
 - a) measured consistently with the NGER (Measurement) Determination, including the principles in section 1.13 and reporting requirements under the NGER Regulations;

and

- b) calculated as total steam exported for a reporting period; and
- c) measured at the point of transfer out of the facility.

Note: The amount of gigajoules of a mass of steam at a particular temperature and pressure can be calculated by multiplying the specific steam enthalpy corresponding to that temperature and pressure by the mass of that steam.

Inclusions

Scope 1 emissions from the following processes at the facility are included:

- The component of emissions from the activity of heating water to produce steam that is attributable to the production of exported steam by:
 - the methods used to calculate the emissions of exported steam in accordance with subsection 3 of the definition and the requirements in the *National Greenhouse and Energy Reporting (Measurement) Determination 2008*; and
 - the apportioning method used by the responsible emitter in their data submission to the Department for the purposes of calculating the default emissions intensity; and

It is intended that all Scope 1 NGER-reported emissions from a facility can be assigned to a production variable, but where a facility produces multiple products, emissions cannot be counted more than once.

Measurement of Steam Exported

The output metric of the activity is defined as gigajoules of steam generated at the facility during the reporting period and transferred to another facility as part of a commercial arrangement. The measurement of steam should be undertaken in accordance with methods described in the *National Greenhouse and Energy Reporting (Measurement) Determination 2008* (if any) and reporting requirements under the NGER Regulations for each reporting period.

If exported steam is measured in a metric other than gigajoules, it should be converted to gigajoules. The amount of gigajoules corresponding to a mass of steam at a particular temperature and pressure can be calculated by multiplying the specific steam enthalpy corresponding to that temperature and pressure by the mass of that steam.

Exclusions

Scope 1 emissions from the following processes must be excluded:

- steam generated and used on-site, for example for electricity generation or another process at the facility;
- processes that are included in the definition of another production variable, e.g. production of ethene or production of polyethylene;
- on-site electricity generation; and
- processes that do not occur within the facility.

Biofuels

General definitions

In this section:

Biofuel has the same meaning as in the *National Greenhouse and Energy Reporting Regulations 2008*.

biofuel feedstocks means non-fossilised and biodegradable organic material originating from plants, animals and micro-organisms, including:

- (a) products, by-products, residues and waste from industry (such as the agriculture and forestry industries); and
- (b) non-fossilised and biodegradable organic components of commercial, industrial, construction, demolition, and municipal waste.

Examples: Soybean oil, canola oil, technical corn oil, palm fatty acid distillate, pongamia pinnata, used cooking oil, tall oil, spent bleaching earth oil, brassica carinata, tallow, POME oil and empty fruit bunches are each biofuel feedstocks.

biofuel production activity means the production of a biofuel through the physical and chemical transformation of biofuel feedstocks.

Examples: Gasification, Fischer-Trops synthesis, hydrothermal conversions and hydroprocessing are processes involving the production of biofuel through the physical and chemical transformation of biofuel feedstocks.

renewable aviation kerosene has the same meaning as in the *National Greenhouse and Energy Reporting Regulations 2008*.

renewable diesel has the same meaning as in the *National Greenhouse and Energy Reporting Regulations 2008*.

19. Renewable aviation kerosene

Production variable definition

1. Kilolitres of renewable aviation kerosene that:
 - a) are produced through the biofuel production activity at the facility; and
 - b) are of saleable quality.
2. The metric in subsection (1) is applicable to a facility that conducts the activity of producing renewable aviation kerosene through a **biofuel production activity**.

Inclusions

Scope 1 emissions from the following processes at the facility are included:

- the use of on-site machinery, equipment and processes for the physical and/or chemical transformation of biofuel feedstocks including:
 - machinery used to create heat and/or non-electrical energy for use in the activity;

- machinery used to move materials within and as part of the activity;
- the processing of by-products (e.g. bio-naphtha) where it involves the recovery of materials for re-use within the activity or is necessary for the activity to proceed as described;
- processing of by-product and waste materials from the activity;
- Waste heat recovery within the facility; and
- other incidental, ancillary or supporting processes which are not included in another default or facility-specific emissions intensity value.

Exclusions

Scope 1 emissions from the following processes must be excluded:

- feedstock preparation included in another production variable, or occurs off-site;
- upstream feedstock production; gathering and transfer;
- refining of petroleum feedstocks;
- processes that are included in the definition of another production variable (e.g. renewable diesel and petroleum refining);
- processes which do not occur within the facility; and
- on-site electricity generation.

20. Renewable diesel

Production variable definition

1. Kilolitres of renewable diesel that:
 - (a) are produced through the biofuel production activity at the facility; and
 - (b) are of saleable quality.
2. The metric in subsection (1) is applicable to a facility that conducts the activity of producing renewable diesel through a ***biofuel production activity***.

Inclusions

Scope 1 emissions from the following processes at the facility are included:

- The use of on-site machinery, equipment and processes for the physical and/or chemical transformation of biofuel feedstocks including:
 - machinery used to create heat and/or non-electrical energy for use in the activity;
 - machinery used to move materials within and as part of the activity;
- the processing of by-products (e.g. bio-naphtha) where it involves the recovery of materials for re-use within the activity or is necessary for the activity to proceed as described;
- processing of by-product and waste materials from the activity;

- Waste heat recovery within the facility; and
- other incidental, ancillary or supporting processes which are not included in another default or facility-specific emissions intensity value.

Exclusions

Scope 1 emissions from the following processes must be excluded:

- feedstock preparation included in another production variable, or occurs off-site;
- upstream feedstock production; gathering and transfer;
- refining of petroleum feedstocks;
- processes that are included in the definition of another production variable (e.g. renewable aviation kerosene and petroleum refining);
- processes which do not occur within the facility; and
- on-site electricity generation.

Rail transport

Rail transport is the use of technology to power rolling stock to transport passengers or freight on a rail system.

There are four prescribed production variables for rail transport. All fall under the *activity of rail transport*.

General definitions

ANZSIC industry classification and code means an industry classification and code for that classification published in the Australian and New Zealand Standard Industrial Classification (ANZSIC), 2006.

bulk freight includes goods that consist of large quantities of homogenous product that is generally non-containerised and conveyed in wagons, such as iron ore, coal and grain.

dedicated line includes:

- (a) a line that only services the rail transport needs of a single business enterprise or corporate group; and
- (b) a vertically integrated rail system:
 - (i) where the rail infrastructure manager and the user of the rail system is under common control or part of a common corporate group; and
 - (ii) that wholly or predominantly serves the rail transport needs of a single business enterprise or corporate group.

freight includes a saleable good.

net-tonne-kilometre means the unit of measure representing the movement over a distance of one kilometre of one tonne of freight. The weight of the rolling stock (such as tractive vehicle and rail car) is excluded.

passenger-kilometre means the unit of measure representing the movement over a distance of one kilometre of one passenger.

Note: facilities that are not in the rail freight transport or rail passenger transport sectors are excluded from the use of rail transport production variables.

21. Net-tonne-kilometres of bulk freight on a dedicated line

Production variable definition

1. Net-tonne-kilometres of bulk freight that:
 - (a) result from carrying on the rail transport activity at the facility; and
 - (b) is transported by rail:
 - (i) only using a dedicated line; or
 - (ii) using a dedicated line for over 70% of the journey.
2. The metric in subsection (1) is applicable to a facility that:
 - (a) conducts the activity of **rail transport**; and
 - (b) transports bulk freight by rail wholly or partly on one or more dedicated lines; and
 - (c) is in the rail freight transport ANZSIC industry classification and code 471.
3. The net-tonne-kilometres must be measured consistently with relevant industry practice.

Inclusions

Scope 1 emissions from the following processes are included:

- combustion of fuels on-board rolling stock to drive the propulsion system for the purpose of transferring passengers and freight on a rail system;
- combustion of fuels on-board rolling stock for the generation of electricity to drive the propulsion system for the purpose of transferring passengers and goods on a rail system. For example, a diesel engine connected to an electrical generator, creating electricity that powers electric traction motors;
- electricity generated by the propulsion system of rolling stock that is consumed within the rolling stock;
- direct emissions from, and electricity use of, machinery and equipment used for supporting rail freight or passenger transport. For example, vehicles and equipment used in rail system maintenance activities;
- water and waste treatment (including fugitive emissions) necessary to support rail system maintenance activities. For example, water and waste treatment for maintenance camps along the rail system;

- complementary activities, such as packaging, head office, administrative and marketing operations, which occur within the boundary of the facility that is undertaking the activity; and
- other incidental, ancillary or supporting processes which are not included in another default or facility-specific emissions intensity value.

The default emissions intensity value for the net-tonne-kilometres of bulk freight on a dedicated line activity includes all scope 1 NGER-reported emissions from the facilities relevant for setting the default intensity value, except scope 1 emissions from on-site electricity generation.

Exclusions

Scope 1 emissions from the following processes must be excluded:

- electricity generated on rolling stock not sent to the propulsion system or traction motors of the rolling stock;
- manufacturing process emissions; and
- processes which do not occur within the facility.

22. Net-tonne-kilometres of bulk freight on a non-dedicated line

Production variable definition

1. Net-tonne-kilometres of bulk freight that:
 - (a) result from carrying on the rail transport activity at the facility; and
 - (b) is transported by rail; and
 - (c) either:
 - (i) does not use a dedicated line; or
 - (ii) uses a dedicated line for 70% or less of the journey.
2. The metric in subsection (1) is applicable to a facility that:
 - (a) conducts the activity of ***rail transport***; and
 - (b) transports bulk freight by rail wholly or partly on one or more non-dedicated lines; and
 - (c) is in the rail freight transport ANZSIC industry classification and code 471.
3. The net-tonne kilometres must be measured consistently with relevant industry practice.

Inclusions

Scope 1 emissions from the following processes are included:

- combustion of fuels on-board rolling stock to drive the propulsion system for the purpose of transferring passengers and goods on a rail system;

- combustion of fuels on-board rolling stock for the generation of electricity to drive the propulsion system for the purpose of transferring passengers and goods on a rail system. For example, a diesel engine connected to an electrical generator, creating electricity that powers electric traction motors;
- electricity generated by the propulsion system of rolling stock that is consumed within the rolling stock;
- direct emissions from, and electricity use of, machinery and equipment used for supporting rail freight or passenger transport. For example, vehicles and equipment used in rail system maintenance activities;
- water and waste treatment (including fugitive emissions) necessary to support rail system maintenance activities. For example, water and waste treatment for maintenance camps along the rail system;
- complementary activities, such as packaging, head office, administrative and marketing operations, which occur within the boundary of the facility that is undertaking the activity; and
- other incidental, ancillary or supporting processes which are not included in another default or estimated emissions intensity value.

When calculating facility-specific emissions intensity values, a facility can assign emissions which do not relate to a specific output either to one production variable only, or apportion those emissions among production variables on a justifiable basis.

Exclusions

Scope 1 emissions from the following processes must be excluded:

- electricity generated on the rolling stock not sent to the propulsion system or traction motors of the rolling stock;
- manufacturing process emissions; and
- processes which do not occur within the facility.

23. Net-tonne-kilometres of non-bulk freight

Production variable definition

1. Net-tonne-kilometres of freight that:
 - (a) result from carrying on the rail transport activity at the facility; and
 - (b) is transported by rail; and
 - (c) is not bulk freight.
2. The metric in subsection (1) is applicable to a facility that:
 - (a) conducts the activity of ***rail transport***; and
 - (b) transports freight that is not bulk freight; and
 - (c) is in the rail freight transport ANZSIC industry classification and code 471.

3. The net-tonne kilometres must be measured consistently with relevant industry practice.

Inclusions

Scope 1 emissions from the following processes are included:

- combustion of fuels on-board rolling stock to drive the propulsion system for the purpose of transferring passengers and goods on a rail system;
- combustion of fuels on-board rolling stock for the generation of electricity to drive the propulsion system for the purpose of transferring passengers and goods on a rail system. For example, a diesel engine connected to an electrical generator, creating electricity that powers electric traction motors;
- electricity generated by the propulsion system of rolling stock that is consumed within the rolling stock;
- direct emissions from, and electricity use of, machinery and equipment used for supporting rail freight or passenger transport. For example, vehicles and equipment used in rail system maintenance activities;
- water and waste treatment (including fugitive emissions) necessary to support rail system maintenance activities. For example, water and waste treatment for maintenance camps along the rail system;
- complementary activities, such as packaging, head office, administrative and marketing operations, which occur within the boundary of the facility that is undertaking the activity; and
- other incidental, ancillary or supporting processes which are not included in another default or estimated emissions intensity value.

Exclusions

Scope 1 emissions from the following processes must be excluded:

- electricity generated on the rolling stock not sent to the propulsion system or traction motors of the rolling stock;
- manufacturing process emissions; and
- processes which do not occur within the facility.

24. Passenger-kilometres of rail passenger transport

Production variable definition

1. Passenger-kilometres that result from carrying on the rail transport activity at the facility.
2. The metric in subsection (1) is applicable to a facility that:
 - (a) conducts the activity of ***rail transport***; and
 - (b) transports passengers; and

- (c) is in the rail passenger transport ANZSIC industry classification and code 472.
3. The passenger-kilometres must be measured consistently with relevant industry practice.

Inclusions

Scope 1 emissions from the following processes are included:

- combustion of fuels on-board rolling stock to drive the propulsion system for the purpose of transferring passengers and goods on a rail system;
- combustion of fuels on-board rolling stock for the generation of electricity to drive the propulsion system for the purpose of transferring passengers and goods on a rail system. For example, a diesel engine connected to an electrical generator, creating electricity that powers electric traction motors;
- electricity generated by the propulsion system of rolling stock that is consumed within the rolling stock;
- direct emissions from, and electricity use of, machinery and equipment used for supporting rail freight or passenger transport. For example, vehicles and equipment used in rail system maintenance activities;
- water and waste treatment (including fugitive emissions) necessary to support rail system maintenance activities. For example, water and waste treatment for maintenance camps along the rail system;
- complementary activities, such as packaging, head office, administrative and marketing operations, which occur within the boundary of the facility that is undertaking the activity; and
- other incidental, ancillary or supporting processes which are not included in another default or estimated emissions intensity value.

The default emissions intensity value for the passenger-kilometres of rail passenger transport activity includes all scope 1 NGER-reported emissions from the facilities relevant for setting the default intensity value, except scope 1 emissions from on-site electricity generation.

Exclusions

Scope 1 emissions from the following processes must be excluded:

- electricity generated on the rolling stock not sent to the propulsion system or traction motors of the rolling stock;
- manufacturing process emissions; and
- processes which do not occur within the facility.

Petroleum refining

25. Petroleum refining

Production variable definition

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1. Kilolitres of the following substances that are used in carrying on the activity of petroleum refining at the facility in accordance with subsection (2):
 - a) stabilised crude petroleum oil at 15 °C and 1 atmosphere; and
 - b) condensate at 15 °C and 1 atmosphere; and
 - c) biogenic oils at 15 °C and 1 atmosphere; and
 - d) liquid synthetic hydrocarbons at 15 °C and 1 atmosphere; and
 - e) alcohol feedstocks at 15 °C and 1 atmosphere; and
 - f) waste or recycled material that has undergone pyrolysis; and
 - g) eligible petroleum feedstocks at 15 °C and 1 atmosphere; and
 - h) bio-crude or bio-intermediates produced from thermochemical processes.
2. A substance mentioned in paragraphs (1)(a) to (h) is used in carrying on the activity of petroleum refining if the substance is, or is to be, refined:
 - (a) by 1 or both of the processes mentioned in paragraphs (3)(a) and (b); and
 - (b) into either of the following:
 - (i) 1 or more petroleum products mentioned in paragraphs (3)(c) and (d);
 - (ii) other by products which result from carrying on the petroleum refining activity.
3. The metric in subsection (1) is applicable to a facility that conducts the activity of petroleum refining through the chemical and physical transformation of stabilised crude petroleum oil, which may be supplemented with 1 or more of condensate, biogenic oils, liquid synthetic hydrocarbons, alcohol feedstocks, waste or recycled material that has undergone pyrolysis, eligible petroleum feedstocks or bio-crude or bio-intermediates produced from thermochemical processes, to produce a range of refined petroleum products through the following processes:
 - (a) the distillation of stabilised crude petroleum oil, condensate, tallow, vegetable oil and other petroleum feedstocks;
 - (b) the adjustment of the molecular weight and structure of hydrocarbons (such as that which occurs through catalytic or hydro cracking, steam or catalytic reforming, polymerisation, isomerisation or alkylation);
 - (c) the blending of products from distillation and adjustment of molecular weight and structure to produce Australian and international standard diesel, jet fuel and unleaded petrol;
 - (d) the production of 2 or more of the following refinery products saleable in Australian or international markets:
 - (i) hydrogen;
 - (ii) ethane;
 - (iii) propane;
 - (iv) refinery grade propylene;
 - (v) polymer grade propylene;

- (vi) liquefied petroleum gas;
- (vii) butane;
- (viii) naphtha;
- (ix) aviation gasoline;
- (x) before oxygenate blend;
- (xi) kerosene;
- (xii) heating oil;
- (xiii) solvents;
- (xiv) lubricant base stocks;
- (xv) leaded petrol;
- (xvi) waxes;
- (xvii) bitumen.

4. However, the metric in subsection (1) is not applicable to a facility unless:

- (a) each of the processes mentioned in paragraphs (3)(a) to (d) are conducted within the year at the facility; and
- (b) the combined volume of diesel, jet fuel, unleaded petrol, lubricant base stocks and bitumen at 15°C and 1 atmosphere produced from stabilised crude petroleum, condensate, biogenic oils, liquid synthetic hydrocarbons, alcohol feedstocks, waste or recycled material that has undergone pyrolysis, eligible petroleum feedstocks and bio-crude or bio-intermediates produced from thermochemical processes is equal to or greater than 75% of the total kilolitres of stabilised crude petroleum, condensate, biogenic oils, liquid synthetic hydrocarbons, alcohol feedstocks, waste or recycled material that has undergone pyrolysis, eligible petroleum feedstocks and bio-crude or bio-intermediates produced from thermochemical processes used in the year at the facility.

5. The activity in subsection (3) is the ***petroleum refining activity***.

In this section:

condensate has the same meaning as in the *Excise Act 1901*.

eligible petroleum feedstocks means any 1 or more of the following that were not produced through the conduct of the petroleum refining activity carried on at another facility in Australia:

- (a) catalytic cracker feedstocks that are processed in the catalytic cracker in carrying on the petroleum refining activity and have a density of 0.84 to 0.98 kg/L at 15°C and 1 atmosphere;
- (b) hydro cracker unit feedstocks that are processed in the hydro cracking unit in carrying on the petroleum refining activity and have a density of 0.84 to 0.98 kg/L at 15 °C and 1 atmosphere;
- (c) reformer unit feedstocks that are used to produce reformat in carrying on the petroleum refining activity and have a density of 0.6 to 0.80 kg/L at 15 °C and 1 atmosphere;
- (d) alkylation unit feedstocks that are used to produce alkylate in carrying on the petroleum refining activity and have a density of 0.55 to 0.62 kg/L at 15 °C and 1 atmosphere;

- (e) bitumen feedstocks that are used to produce bitumen in carrying on the petroleum refining activity and have a density greater than or equal to 0.95 kg/L at 15 °C and 1 atmosphere;
- (f) lubricant base stock feedstocks that are used to produce lubricant base stocks in carrying on the petroleum refining activity and have a density of 0.84 to 0.98 kg/L at 15 °C and 1 atmosphere.

stabilised crude petroleum oil has the meaning given in the Australian Taxation Office Interpretative Decision, ATO ID 2008/154, published on 18 November 2008.

unleaded petrol means all grades of unleaded petrol meeting Australian or international standards, including standard unleaded petrol, premium unleaded petrol and other proprietary forms of unleaded petrol.

Inclusions

Scope 1 emissions from the following processes at the facility are included:

- the activity of petroleum refining as defined in Schedule 3 of the Safeguard Rule; and
- all scope 1 NGER-reported emissions from the facilities relevant for setting the default intensity value, except scope 1 emissions from on-site electricity generation.

Exclusions

Scope 1 emissions from the following processes must be excluded:

- upstream stabilisation of crude petroleum oil;
- processes which do not occur within the facility;
- on-site electricity generation.

Manufacturing (other)

26. Sodium cyanide

Production variable definition

1. Tonnes of 100% equivalent sodium cyanide (NaCN) on a dry weight basis that is contained within sodium cyanide products:
 - (a) produced as part of carrying on the sodium cyanide production activity at the facility; and
 - (b) of saleable quality.
2. The metric in subsection (1) is applicable to a facility that conducts the activity of producing sodium cyanide through all of the following processes:
 - (a) the chemical transformation of methane, anhydrous ammonia (NH₃) and air to produce hydrogen isocyanine (HCN);
 - (b) the chemical transformation of hydrogen isocyanine (HCN) and caustic soda to produce sodium cyanide (NaCN).

3. The activity in subsection (2) is the ***sodium cyanide production activity***.

Inclusions

Scope 1 emissions from the following processes at the facility are included:

- production of hydrogen isocyanine;
- the use of machinery, equipment and processes for the physical and/or chemical transformation described in the activity definition, including, for example:
 - machinery used to move materials within the facility, including mobile equipment;
 - control rooms, laboratories, maintenance workshops;
 - machinery used to create non-electrical energy for use in the activity;
 - the processing of by-products where they involve the recovery of materials for re-use within the activity or are necessary for the activity to proceed as described;
 - processing of by-products and waste materials from the activity; and
- other incidental, ancillary or supporting processes which are not included in another default or estimated emissions intensity value.

Exclusions

Scope 1 emissions from the following processes must be excluded:

- upstream production of the anhydrous ammonia feedstock;
- upstream production of the hydrogen feedstock (such as natural gas extraction and distribution or synthesis gas production);
- processes that do not occur within the facility; and
- on-site electricity generation.

Nickel manufacturing

General definitions

intermediate nickel products mean:

- (a) nickel matte;
- (b) mixed nickel-cobalt hydroxide precipitate where the concentration of nickel is between 20 and 47% (inclusive) by mass;
- (c) mixed nickel-cobalt sulphide precipitate where the concentration of nickel is between 43 and 57% (inclusive) by mass;
- (d) basic nickel carbonate where the concentration of nickel is between 40 and 45% (inclusive) by mass;
- (e) crude nickel sulphate where the concentration of nickel is equal to or greater than 21% (inclusive) by mass.