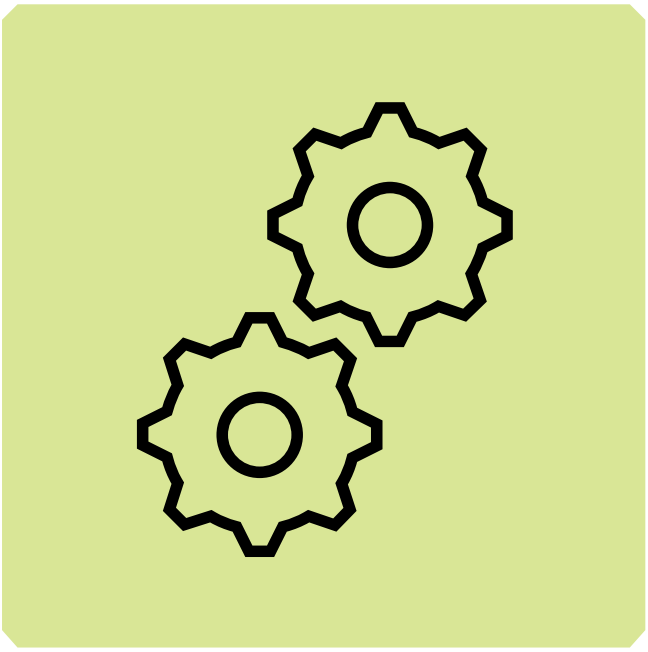
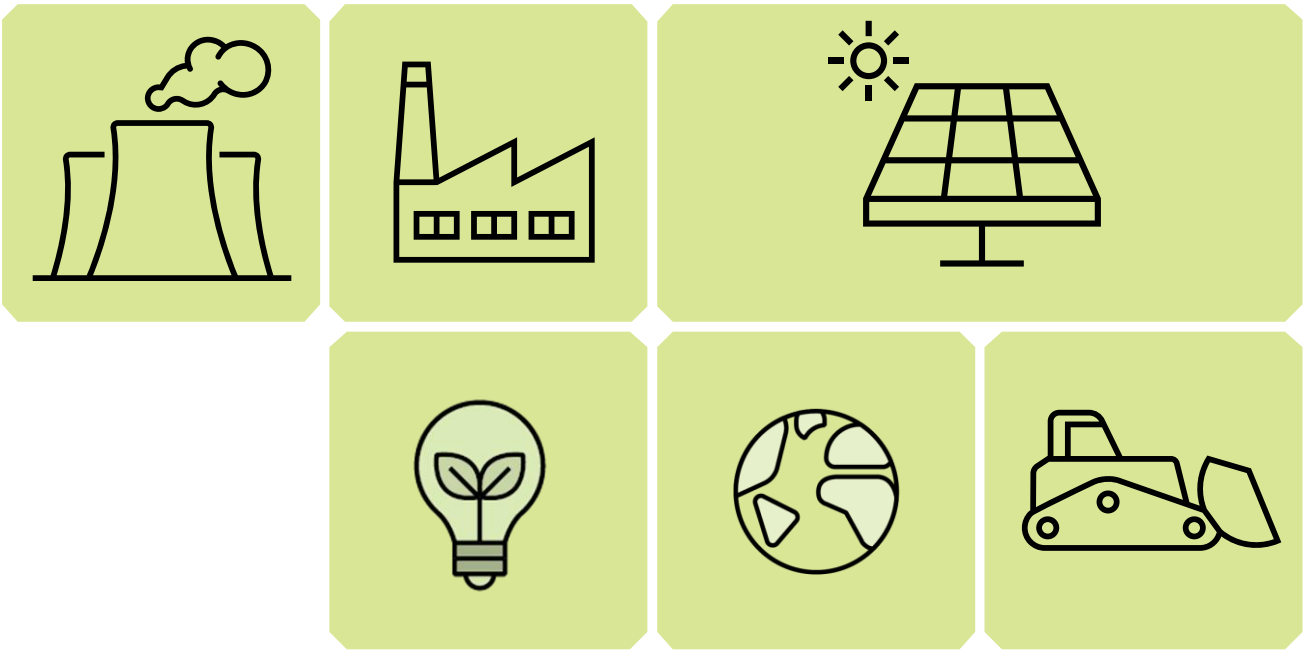
Australian Government
Clean Energy Regulator



Methods and measurement criteria guideline

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National Greenhouse and Energy Reporting

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Definitions and abbreviations

Term	Meaning
Department	Department of Climate Change, Energy, the Environment and Water. Federal department who is the policy agency for the NGER Legislation.
Facility	Has the meaning given by section 9 of the NGER Act. For more information on defining a facility under the NGER Scheme, see What is an NGER Facility[1].
GJ	Gigajoules
L	Litres
NGER	National Greenhouse and Energy Reporting
NGER Act	*National Greenhouse and Energy Reporting Act 2007*
NGER Legislation	The NGER Act, the NGER Regulations and the NGER Measurement Determination
NGER Measurement Determination	National Greenhouse and Energy Reporting (Measurement) Determination 2008
NGER Regulations	National Greenhouse and Energy Reporting Regulations 2008
Safeguard Mechanism	The Australian Government's mechanism to contribute to the achievement of Australia's greenhouse gas emissions reduction targets. See the Safeguard Mechanism[2] for more information.
Scope 1 emissions	Means the release of greenhouse gas into the atmosphere as a direct result of an activity or series of activities (including ancillary activities) that constitute the facility.
Scope 2 emissions	Means the release of greenhouse gas into the atmosphere as a direct result of one or more activities that generate electricity, heating, cooling or steam that is consumed by the facility but that do not form part of the facility.
t CO_2-e	Tonnes carbon dioxide equivalence

Terms in NGER legislation may have specific meanings within the law. These key words and phrases are normally identified under a heading such as Definitions, Interpretation or Dictionary or in other parts of the document.

[1] https://cer.gov.au/schemes/national-greenhouse-and-energy-reporting-scheme/assess-your-obligations#what-is-an-nger-facility
[2] https://cer.gov.au/schemes/safeguard-mechanism

For more information on interpreting legislation see Federal Register of Legislation - Understanding Legislation[3].

Disclaimer

This guideline has been developed by the Clean Energy Regulator (CER) to assist entities to comply with their reporting obligations under the *National Greenhouse and Energy Reporting Act 2007*[4] (NGER Act) and associated legislation.

This guideline only applies to the 2025–26 NGER reporting year and should be read in conjunction with the NGER Act, National Greenhouse and Energy Regulations 2008[5] (NGER Regulations), and National Greenhouse and Energy Reporting (Measurement) Determination 2008[6] (NGER Measurement Determination), as in force for this reporting period. These laws and their interpretation are subject to change, which may affect the accuracy of the information contained in the guideline.

The guidance provided in this document is not exhaustive, nor does it consider all circumstances applicable to all entities. This guidance is not intended to comprehensively deal with its subject area, and it is not a substitute for independent legal advice. Although entities are not bound to follow the guidance provided in this document, they must ensure they meet their obligations under the National Greenhouse and Energy Reporting (NGER) Scheme[7] at all times. CER encourages all users of this guidance to seek independent legal advice before taking any action or decision based on this guidance.

CER and the Australian Government will not be liable for any loss or damage from any cause (including negligence) whether arising directly, incidentally, or as consequential loss, out of or in connection with, any use of this guideline or reliance on it, for any purpose.

If an entity chooses to meet their obligations under the NGER Scheme in a manner that is inconsistent with the guidance provided in this document, CER, or an independent auditor, may require the entity to demonstrate that they are compliant with requirements of the NGER Act, NGER Regulations, and/or the NGER Measurement Determination. Entities are responsible for determining their obligations under the law and for applying the law to their individual circumstances.

[3] https://www.legislation.gov.au/help-and-resources/understanding-legislation/reading-legislation
[4] https://www.legislation.gov.au/C2007A00175/latest/versions
[5] https://www.legislation.gov.au/F2008L02230/latest/versions
[6] https://www.legislation.gov.au/F2008L02309/latest/versions
[7] https://cer.gov.au/schemes/national-greenhouse-and-energy-reporting-scheme/assess-your-obligations

2025–26 updates

Changes in this document for the 2025–26 reporting year:

- Incorporation of information previous published within the CER's quick-help topics webpage
- Minor stylistic and formatting changes have also been made to this document.

Read about the changes to the NGER legislation for the 2025–26 reporting period[8].

1. Purpose of this guideline

Certain organisations have reporting obligations under the NGER Legislation, comprising the NGER Act, the NGER Regulations and the NGER Measurement Determination.

It is important that data relating to greenhouse gas emissions, energy consumption and energy production of corporations, provided under the NGER Scheme, is accurate and complies with the requirements of the legislation. The information is used to:

- inform government policy formulation and the Australian public
- meet Australia's international reporting obligations
- assist Commonwealth, State and Territory government programs and activities
- ensure, under the Safeguard Mechanism, that net covered emissions of greenhouse gases from the operation of a designated large facility do not exceed the baseline applicable to the facility.

The following information has been compiled to provide stakeholders with an understanding of how we will apply legislation with regards to method and measurement criterion selection and application through worked examples and elaborations. It is intended to assist stakeholders (reporters, auditors, and those who prepare NGER reports) with demonstrating compliance by providing practical examples of the application of the legislation.

This compilation is an extension of the Department of Climate Change, Energy, the Environment and Water's (Department) discontinued technical guidelines and is intended to provide industry stakeholders with an understanding of how the regulator interprets and applies the legislation. It is intended for educational purposes only.

Reporters are responsible for ensuring they meet the legislative requirements.

1.1. Focus of this guideline

The objective of this guideline is to promote an understanding of the methods used for estimating emissions and energy, the general requirements for measurement of emissions and energy and the compliant

[8] https://cer.gov.au/schemes/national-greenhouse-and-energy-reporting-scheme/report-emissions-and-energy/amendments-to-national-greenhouse-and-energy-reporting-legislation

reporting of measurement criteria for a facility under the NGER Act. See Defining a facility of National Greenhouse and Energy Reporting[9] for guidance on what constitutes a facility.

2. Methods for measurement—overview

Emissions are rarely measured through direct observation. They are most often estimated by reference to readily observable variables that are closely related to greenhouse gas emissions such as the quantity of fossil fuels consumed.

This guideline outlines the methods that allow for both direct emissions monitoring and the estimation of emissions through the of tracking of related variables. The methods reflect the approaches taken globally, for example for the estimation of national greenhouse gas inventories, the EU guidelines, and the United States Environmental Protection Agency's Mandatory Greenhouse Gas Reporting Rule[10].

At its simplest, emissions may be estimated by reference to reportable data such as fossil fuel consumption and the use of specified emission factors provided in this guideline. For example, emissions from fuel combustion data on consumption of a fuel would be multiplied by a specific emission factor for that fuel to generate an emissions estimate.

Greater levels of complexity, technical equipment and expertise may in some circumstances produce more accurate estimates of emissions at the facility level. For example, sampling and direct analysis of the carbon content and other characteristics will lead to a more accurate estimate of actual emissions generated by its use at a facility. In Australia, this approach to estimation of emissions has been used for several years in the electricity industry.

Direct monitoring of emissions is also an approach that reporters may find useful in accurately estimating their emissions. While not common, direct monitoring already occurs in the coal industry, where state legislation requires the monitoring of methane levels for health and safety reasons.

The 4 methods are described in general terms in chapters 2.1 to 2.4 of this guideline. These 4 general types of method are used for estimating emissions in the NGER Measurement Determination for a range of sources. Reporters are given a choice of methods they may use for estimating emissions, however not all methods are available for estimating emissions from all sources.

Methods for estimating emissions have been developed to be compatible with existing emission estimation practices where possible. The guidance documents published by CER are intended to assist reporters to meet their NGER obligations by drawing on existing processes particularly for higher order methods (2, 3 and 4 set out below).

The provision for reporters to select methods for the estimation of emissions also allows reporters to make their own judgements to balance the costs of using the higher methods with the benefits of potentially more accurate emission estimates.

It is intended that the reporter indicate the method used for reporting each source. For example, the reporter can apply different methods for different fuels and different methods for individual gases. Where appropriate, the reporter can use different methods to estimate emissions from 'separate instances of a source' (section 1.9A of the NGER Measurement Determination) and 'separate occurrences of a source'

[9] https://cer.gov.au/document_page/defining-facility-national-greenhouse-and-energy-reporting
[10] https://www.epa.gov/regulations-emissions-vehicles-and-engines/final-rule-mandatory-reporting-greenhouse-gases

(section 1.9B of the NGER Measurement Determination). Not all methods are available for all sources or for all gases. For example, for solid fuels only Method 1 is available for methane and nitrous oxide, whereas 4 methods are available for carbon dioxide.

2.1. Method 1

Method 1 within the NGER Scheme is the default method for determining emissions, and it:

- Provides estimation procedures derived directly from the methodologies used by the department for the preparation of Australia's National Greenhouse Accounts. The use of methodologies from the National Greenhouse Accounts anchors Method 1 within the international guidelines adopted by the United Nations Framework Convention on Climate Change (UNFCCC) for the estimation of greenhouse emissions.
- Specifies the use of default emission factors in the estimation of emissions. These emission factors are national average factors determined by the department using the Australian Greenhouse Emissions Information System (AGEIS).
- Is likely to be most useful for emission sources where the source is relatively homogenous, such as from the combustion of standard liquid fossil fuels and where the emissions resulting from combustion will be very similar across most facilities.

2.2. Method 2

Method 2 employs industry-based sampling and applies Australian or international standards, or their equivalent, to analysis of fuels and raw materials. Method 2:

- Enables corporations to undertake additional measurements, for example, the qualities of fuels consumed at a facility, to gain more accurate estimates for emissions for a particular facility.
- Draws on the large body of Australian and international documentary standards prepared by standards organisations to provide the benchmarks for procedures for the analysis of, typically, the critical chemical properties of the fuels being combusted.
- Is likely to be most useful for fuels which exhibit some variability in key qualities, such as carbon content, from source to source. This is the case for coal in Australia.
- Is based on technical guidelines that were used by reporters under the Generator Efficiency Standards program. The option to report using this higher order approach is extended by the NGER Measurement Determination from the electricity industry to all major consumers of fossil fuels.

Method 2 may also use an emission factor for each piece of equipment performing an activity and require the calculation of 'average hours of operation of equipment (or component)' (section 3.73B, 3.73G, 3.73LA, 3.73LB, 3.73R, 3.78D, 3.78I, and 3.96). This is to be interpreted as the average number of hours a given equipment or component type is operated over the entire NGER reporting year. Do not include hours when equipment or components are used for non-NGER reportable activities or not in use due to maintenance or other reasons.

2.3. Method 3

Method 3 requires sampling and analysis based on Australian or international standards or their equivalent standards for fuels and raw materials. These methods are very similar to Method 2, except that they require reporters to comply with Australian or international documentary standards for sampling (of fuels or raw materials) or equivalent as well as for the analysis of fuels.

As for Method 2, Method 3 may also use an emission factor for each piece of equipment performing an activity and require the calculation of 'average hours of operation of equipment (or component)'. The same interpretations and limitations noted above apply.

There is a substantial body of documented procedures on monitoring practices and state and territory government regulatory experience that provide the principal sources of guidance for the establishment of Methods 2 and 3.

2.4. Method 4

Rather than analysing the chemical properties of inputs (or in some cases, products) or considering the equipment in use, Method 4 provides approaches based on direct monitoring of greenhouse gas emissions arising from an activity. This approach can provide a higher level of accuracy compared to Methods 1 to 3. Although it is more data intensive than other approaches. Direct monitoring already occurs, for example, in underground coal mines reflecting the nature of the emission process and the importance of relatively accurate data to support health and safety objectives.

Method 4 requires direct monitoring of emission systems on either a continuous or a periodic basis:

- Continuous Emissions Monitoring (CEM) equipment must operate for more than 90% of the period for which it is used to monitor an emission, as per subsection 1.26(4) of the NGER Measurement Determination. This does not include downtime for equipment calibration.
- Periodic Emissions Monitoring (PEM) equipment must comply with relevant standards and produce data that is representative of the full year. Further information on the operation of PEM can be found under Division 1.3.3 of the NGER Measurement Determination.

2.5. Scope 2 emissions estimation methods—overview

Scope 2 emissions arise from the consumption of an energy commodity which was produced outside of the facility. Scope 2 emission account for the scope 1 emissions which were required to produce the energy commodity.

In NGER, scope 2 emissions arise from the consumption of electricity which was produced at another facility. By reporting scope 2 emissions, the electricity consumer is accounting for the scope 1 emissions which were required to produce the electricity. The location-based and market-based methods for the estimation of scope 2 emissions are given in chapter 7 of the NGER Measurement Determination.

Mandatory location-based methods for estimating scope 2 emissions

Location-based scope 2 emissions must be reported as per section 7.2 and 7.3 of the NGER Measurement Determination, provided facilities meet the relevant thresholds.

These methods employ an emission factor of tonnes of scope 1 emissions per kilowatt hour of electricity consumed. Scope 2 emission factors for the consumption of purchased electricity from Australia's major electricity grids are updated annually to reflect the latest data on the mix of electricity generation sources, which is a major determinant of the emission factors. Chapter 7 of the NGER Measurement Determination also covers how to estimate scope 2 emissions from the purchase and loss of other sources (sources other than the purchase and loss of electricity from a State or Territory's main electricity grid).

Voluntary market-based method for estimating scope 2 emissions

NGER reporters may choose to **additionally** report market-based scope 2 emissions as per section 7.4 of the NGER Measurement Determination. This method allows NGER reporters to reflect actions they take that incentivise renewable electricity generation. These actions include voluntary surrenders of large-scale generation certificates (LGCs) and purchases of GreenPower electricity. Read more in the Voluntary market-based scope 2 emissions guideline[11].

2.6. Energy estimation methods—overview

Methods for the estimation of the energy content of fuels produced and fuels consumed are set out in chapter 6 of the NGER Measurement Determination.

Information used for the estimation of emissions from fuel combustion as set out in chapter 2 of the NGER Measurement Determination will also be used as the data for estimating energy from the consumption of fuels. Separate collection of data is required for the quantities of energy produced and in some cases where energy is consumed and not combusted.

2.7. Temporary unavailability of method

Reporters must observe the requirements in section 1.19 of the NGER Measurement Determination relating to 'down time' of equipment or measurement systems to monitor emissions. Down time is the period during which a mechanical or technical failure of equipment or a failure of measurement systems prevents fulfilment of the method's measurement requirements. The duration of down time accumulates over the reporting period but does not include time taken for calibration of equipment.

This 'down time' requirement is applicable to all emissions sources. It is of particular relevance to thermal power stations conducting continuous monitoring of fuel quantities (for example, flow meters or weightometers under Methods 1, 2 and 3) and composition under Method 2 or 3.

Emissions during a period of down time must be estimated in a manner consistent with the general principles in section 1.13 of the NGER Measurement Determination. Records documenting the method of estimation used, including justification of its consistency with the general principles, must be retained in accordance with section 22 of the NGER Act.

There is a duration threshold within section 1.19:

- If the duration of down time within a reporting period is 6 weeks (42 days) or less, it is not necessary to notify the CER. You must still estimate emissions compliantly and maintain records as above.
- If the duration of down time exceeds 6 weeks within a reporting period, within 6 weeks after the day when down time first exceeds 6 weeks, the registered controlling corporation or responsible emitter must inform CER in writing of the following:
  - the reason why down time is more than 6 weeks
  - how the reporter plans to minimise down time
  - how emissions have been estimated during the down time.

[11] https://cer.gov.au/document_page/voluntary-market-based-scope-2-emissions-guideline

In practice, the requirements relating to down time are of most relevance for continuous emissions monitoring (CEM) using Method 4 which must operate for more than 90% of the period for which it is used to monitor emissions. However, the down time requirements apply to all methods for all emissions sources. Periodic emissions monitoring (PEM) using Method 4 can also be affected, noting that if monthly emissions monitoring is applied, only one measurement period can be missed before you are required to notify the CER. It also applies to all other emissions sources – for example, failure of a meter to measure flow of gas to a combustion source, even when using Method 1, 2 or 3.

The CER may direct Method 1 be used to estimate emissions during the down time if Method 2, 3 or 4 has been used to estimate emissions for the source and if the down time exceeds 6 weeks in a reporting period. If you are unsure whether an instance of technical or mechanical failure of equipment or measurement systems constitutes a temporary unavailability of method, please contact us at cer-nger-reporting@cer.gov.au to clarify.

Example 1 – temporary unavailability of method under 6 weeks

In this example, a flow meter continuously measuring natural gas at point of combustion (criterion AAA) at a generator experienced a technical fault whereby the quantity of fuel combusted was not measured for one day of operation.

As the quantity of fuel combusted was unable to be compliantly measured under criterion AAA, the reporter estimated emissions for the down time period of the meter in a manner consistent with the general principles in section 1.13 of the NGER Measurement Determination.

This was done by comparing historical records of fuel combustion against records of electricity production at the generator. The reporter also considered the generator's efficiency as stated by the manufacturer and was able to produce an estimate of emissions for the day. Details of this method of estimation and the decision-making process were recorded in line with the record keeping requirements of section 22 of the NGER Act. There were two other days during the reporting period where the flow meter experienced similar failures and a similar procedure for estimating emissions was followed. As the cumulative down time was below 6 weeks, it was not necessary to notify the CER.

Example 2 – temporary unavailability of method over 6 weeks

In this example, a gas chromatograph measuring the quantity of hydrocarbons in a gas stream being sent to a flare sustained damage and was no longer accurately measuring the gas stream. Emissions from the flare were estimated under Method 2 which requires measurement of the hydrocarbon quantities.

The defect was identified one week after its occurrence, and a replacement part was ordered. In the meantime, emissions from the source were estimated based on historical data of gas stream composition and records of the estimation method were retained.

Delivery of the replacement component was then delayed by 7 weeks. As the reporter became aware that the expected duration of down time was going to exceed 6 weeks, they notified the CER in writing of:

- the nature of the failure of the equipment (the gas chromatograph)
- the reason the down time will exceed 6 weeks (delay in replacement delivery)
- details on how emissions have been estimated during the down time
- plans for minimising down time where possible.

Upon receiving the notification, the CER considered whether to require Method 1 be used to estimate emissions from the source for the reporting period, instead of Method 2.

2.8. Constraints on methods

The consistent use of reporting methods over multiple reporting periods is an important principle for measuring emissions and energy. To promote consistency, restrictions have been placed on when methods may be applied. Method restrictions for a source of emissions are provided in Division 1.2.2 of the NGER Measurement Determination. With respect to any separate occurrence of a source, a reporter must continue to use the same estimation method for at least 4 consecutive reporting years. A reporter may switch to a higher method at any time but must use the higher method for at least 4 years before changing to a lower method.

This principle is consistent with the approach that applies to the preparation of national inventories. Chapter 5 of Volume 1 of the 2006 Intergovernmental Panel on Climate Change (IPCC) Guidelines[12] for National Greenhouse Gas Inventories provides a detailed discussion of the issue.

Constraints are also applied when estimating fugitive emissions from the following natural gas sources:

- Subdivision 3.3.6A.1—Onshore natural gas production, other than emissions that are vented or flared—wellheads

[12] https://www.ipcc-nggip.iges.or.jp/public/2006gl/vol1.html

- Subdivision 3.3.6B.1—Offshore natural gas production, other than emissions that are vented or flared—offshore platforms
- Division 3.3.6C—Natural gas gathering and boosting (other than emissions that are vented or flared)
- Division 3.3.6E—Natural gas processing (other than emissions that are vented or flared)
- Division 3.3.7A—Natural gas storage (other than emissions that are vented or flared)
- Division 3.3.7B—Natural gas liquefaction, storage and transfer (other than emissions that are vented or flared).

For the sources listed above, if Method 2 or 3 is used for a particular source then all applicable gases and other sources that apply to the facility must also be estimated using the same method. For example, the use of Method 2 under section 3.73B for a given facility, means that all other available Methods 2 must be used in Divisions 3.3.6B, 3.3.6C, 3.3.6E, 3.3.7A and 3.3.7B of the NGER Measurement Determination if those Divisions are applicable to the facility.

3. What are measurement criteria?

Measurement criteria categories indicate the quality of data that is obtained when reporters use different types of information or through application of methods of measurement. The measurement criteria set out how the following are to be estimated:

- the amount of fuel consumed or combusted for a source[13]
- the amount of fuel related to fugitive emissions from the extraction, production, processing and distribution of fossil fuels
- the amount of carbonates consumed, synthetic gas emitted, and fuel used as a feedstock or as carbon reductant related to industrial process emissions
- the amount of waste for a source.

3.1. General definitions

There are 4 different measurement criteria that can broadly be defined as follows:

- Criterion A - quantity verified by invoices[14]
- Criterion AA - quantity verified by stockpile change estimation and invoices
- Criterion AAA - quantity measured at point of sale, consumption or production using measuring equipment calibrated to a measurement requirement as specified in the NGER Measurement Determination

[13] A 'source' is defined in section 1.10 of the NGER Measurement Determination.
[14] To use criterion A, the invoice(s) must refer to a particular amount of a particular fuel delivered to a particular facility. An 'invoice' includes delivery records.

- Criterion BBB - quantity measured or estimated in accordance with industry practice if the equipment used to measure combustion of the fuel is not calibrated to a measurement requirement.

  Industry practice forms the basis of criterion BBB and can be used for the measurement of quantities of fuels consumed, quantities of fuels produced, and amount of electricity consumed, if measurement equipment does not meet the requirements of criterion AAA. Note: An estimate obtained using industry practice must be consistent with the principles in section 1.13 of the NGER Measurement Determination.

- If the acquisition involves a commercial transaction, one of criterion **A**, **AA or AAA** may be used.
- If you are estimating fuels using only invoices issued by a vendor, then you must use Criterion **A**.
- If the acquisition does not involve a commercial transaction, criterion **AAA or BBB** must be used.
- Criterion **AAA** is only to be used where measuring equipment is calibrated to a measurement requirement as specified in the NGER Measurement Determination. Point-of-sale measurement can only be used if stockpile requirements are met in accordance with the NGER Measurement Determination.
- Criterion **BBB** is not to be used where a commercial transaction has taken place.
- Please read sections 4–9 below for further details.

It is important not to confuse the required apportioning of fuel quantities to different fuel items in Schedule 1 of the NGER Measurement Determination as enabling the 'BBB' measurement criterion, because of a perception that the apportioned quantities are not subject to a commercial transaction.

Whilst the apportionment of different fuel types may be required, this apportionment does not change the fact that the fuel was acquired by the facility through a commercial transaction. This includes apportionment of fuels consumed by contractors employed to conduct activities within the facility. Fuels acquired by contractors through commercial transactions cannot be estimated using measurement criterion BBB. They must be estimated using either A, AA, or AAA.

Please note that measurement criteria can have different requirements for each source type and some criteria are not available for some types of sources. Moreover, there may be multiple options or sub-criteria to choose from within each criterion. For example, criterion AAA can be applied in several ways depending on whether there is a commercial transaction involved in the acquisition of the fuel.

Table 1 below summarises the measurement criteria that are available for different fuels and emissions sources. The number of check marks in each cell represent the number of sub-criteria within each criterion. For instance, criterion AAA for solid fuels has 3 check marks because it is comprised of the following sub-criteria:

- Fuel consumed involves a commercial transaction and is measured at the point of sale[15]

[15] This represents a simplification of the subcategories. Please see the 'Solid fuels' divisions of the NGER Measurement Determination for more details.

- Fuel consumed involves a commercial transaction and is measured at the point of consumption. If used for a facility during a reporting year, an alternative sub-criterion or criterion cannot be used in subsequent years for that facility.
- Fuel consumed does NOT involve a commercial transaction and is measured at the point of consumption.

Table 1 – Available measurement criteria.

	NGER Measurement Determination	Criterion A	Criterion AA	Criterion AAA	Criterion BBB
Carbon capture and storage	Section 1.19E	✓	-	✓✓	✓
Solid fuels	Division 2.2.5	✓	✓✓	✓✓✓	✓
Gaseous fuels	Division 2.3.6	✓	✓	✓✓✓	✓
Liquid fuels	Division 2.4.6	✓	✓	✓✓✓	✓
Carbonates	Division 4.2.5	✓	✓	✓✓✓✓	✓
Solid waste	Section 5.5	✓✓	-	✓	✓

Note: The number of check marks in each cell represent the number of sub-criteria within each criterion.

3.2. Constraints on measurement criterion

The consistent use of criteria for measurement over multiple reporting periods is an important principle for measuring emissions and energy. To promote consistency, restrictions have been placed on the how measurement criteria can be used. Restrictions on criteria for measurement are provided in Part 1.3, and Divisions 2.2.5, 2.3.6, 2.4.6 and 4.2.5 of the NGER Measurement Determination.

In general, for solid, gaseous, and liquid fuel and consumption of carbonates, once criterion AA is used (and in some circumstances, once AAA is used) to estimate a quantity of fuel during a year, then in each year following, only that criterion is to be used.

This principle is consistent with the approach that applies to the preparation of national inventories. Chapter 5 of Volume 1 of the 2006 IPCC Guidelines[16] for National Greenhouse Gas Inventories provides a detailed discussion of the issue.

[16] https://www.ipcc-nggip.iges.or.jp/public/2006gl/vol1.html

4. Measurement criteria for carbon capture and storage

The volume of the greenhouse gas stream containing the captured greenhouse gas must be estimated:

- if the greenhouse gas stream is transferred to a relevant person[17], using:
  - criterion A - as evidenced in certificates issued by the relevant person
  - criterion AAA - by undertaking volumetric measurement in accordance with sections 1.19H or 1.19I of the NGER Measurement Determination and gas measuring equipment that complies with section 1.19J. The gas measuring equipment must, for a given flow, also comply with transmitter and accuracy requirements detailed in subsection 1.19G(4).
- if the greenhouse gas stream is captured by the relevant person and is neither transferred to the relevant person nor transferred by the relevant person to another person, using:
  - criterion AAA - as detailed in the previous point
  - criterion BBB - by undertaking volumetric measurement in accordance with industry practice, providing the measuring equipment does not meet the requirements of criterion AAA.

5. Measurement criteria for solid fuels

The quantity of solid fuel consumed must be estimated:

- if the solid fuel acquired involves a commercial transaction, using:
  - criterion A - as evidenced by invoices issued by the vendor of the fuel.
  - criterion AA - by estimating the change in the quantity of the stockpile of the fuel using the survey approach (subsection 2.15(2C) of the NGER Measurement Determination) or the error allowance approach (subsection 2.15(2D)).

    Once an approach has been selected for a facility for a reporting year, that same approach must be used for each subsequent year unless there is a significant change in stockpile management, and this results in the current approach being less accurate than the alternative approach.

    The quantity of fuel added to the fuel stockpile must be evidenced by invoices issued by the vendor of the fuel.

    If criterion AA is used for a facility in a year, then, in each subsequent year, only criterion AA can be used for that facility.

[17] A 'relevant person' means a person mentioned in paragraph 1.19A(a), (b), (c), (d), (e) or (f) of the NGER Measurement Determination. It broadly refers to holders of federal or state licences, leases or approvals for carbon capture and storage.

- criterion AAA - by measuring at the point of consumption or at the point-of-sale using measuring equipment calibrated to a measurement requirement.

  The point-of-sale measurement can only be used if the change in stockpile of the fuel is less than 1% of the total average combustion or consumption for the year and, at the beginning of the year, the stockpile quantity is less than 5% of total combustion or consumption for the year.

  If criterion AAA's point of combustion or consumption measurement is used for a facility in a year, then, in each subsequent year, only this point of combustion or consumption measurement can be used for the facility.

- if the solid fuel acquired does not involve a commercial transaction, using:

  - criterion AAA - by measuring at the point of combustion or consumption using measuring equipment calibrated to a measurement requirement.

    Note that a different criterion can still be used in subsequent years.

  - criterion BBB - by measuring combustion/consumption in accordance with industry practice providing measurement equipment does not meet the requirements of criterion AAA.

6. Measurement criteria for gaseous fuels

The quantity of gaseous fuel combusted or consumed must be estimated:

- if the gaseous fuel acquired involves a commercial transaction, using:

  - criterion A - as evidenced by invoices issued by the vendor of the fuel.

  - criterion AA - by estimating the change in the quantity of the stockpile of the fuel as evidenced by invoices issued by the vendor of the fuel.

    If criterion AA is used for a facility in a year, then, in each subsequent year, only criterion AA can be used for that facility.

  - criterion AAA - by measuring at the point of combustion/consumption or the point of sale in accordance with sections 2.32 or 2.33 of the NGER Measurement Determination using gas measuring equipment that complies with section 2.34. The gas measuring equipment must, for a given flow, also comply with transmitter and accuracy requirements detailed in subsection 2.31(4).

    The point-of-sale measurement can only be used if the change in stockpile of the fuel is less than 1% of the total average combustion/consumption for the year and, at the beginning of the year, the stockpile quantity is less than 5% of total combustion/consumption for the year.

    If criterion AAA's point of combustion or consumption measurement is used for a facility in a year, then, in each subsequent year, only this point of combustion or consumption measurement can be used for the facility.

- if the gaseous fuel acquired does not involve a commercial transaction, using:
  - criterion AAA - by measuring at the point of combustion or consumption using measuring equipment calibrated to a measurement requirement.

    Note that a different criterion can still be used in subsequent years.
  - criterion BBB - by measuring combustion or consumption in accordance with industry practice providing measurement equipment does not meet the requirements of criterion AAA.

    For sources of landfill gas captured for production of electricity, the energy content may be estimated using the electrical efficiency factor specified by the manufacturer of the internal combustion engine used to generate electricity. If no electrical efficiency factor is specified, then a 36% fuel to electricity conversion factor is to be used.

7. Measurement criteria for liquid fuels

The quantity of liquid fuel combusted or consumed must be estimated:

- if the liquid fuel acquired involves a commercial transaction, using:
  - criterion A - as evidenced by invoices issued by the vendor of the fuel.

    Criterion A is suitable for use when fuel quantities are apportioned to different fuel items in Schedule 1 of the NGER Measurement Determination for different energy purposes, if any commercial transaction is involved. This includes reporting for on-site fuel management systems.

    For more information on reporting liquid fuels at open cut coal mines, see chapter 9.1 of the Estimating emissions and energy from coal mining guideline[18].
  - criterion AA - by estimating the change in the quantity of the stockpile of the fuel as evidenced by invoices issued by the vendor of the fuel.

    If criterion AA is used for a facility in a year, then, in each subsequent year, only criterion AA can be used for that facility.

    Criterion AA is suitable for use when fuel quantities are apportioned to different fuel items in Schedule 1 of the NGER Measurement Determination for different energy purposes, if any commercial transaction is involved. This includes reporting for on-site fuel management systems.

    For more information on reporting liquid fuels at open cut coal mines, see chapter 9.1 of the Estimating emissions and energy from coal mining guideline[19].

[18] https://cer.gov.au/document_page/estimating-emissions-and-energy-coal-mining-guideline
[19] https://cer.gov.au/document_page/estimating-emissions-and-energy-coal-mining-guideline

- criterion AAA - by measuring at the point of combustion or consumption or at the point of sale at ambient temperatures and converted to standard temperatures using measuring equipment calibrated to a measurement requirement.

  The point-of-sale measurement can only be used if the change in stockpile of the fuel is less than 1% of the total average combustion or consumption for the year and, at the beginning of the year, the stockpile quantity is less than 5% of total combustion or consumption for the year.

  If criterion AAA's point of combustion or consumption measurement is used for a facility in a year, then, in each subsequent year, only this point of combustion or consumption measurement can be used for the facility.

- if the liquid fuel acquired does not involve a commercial transaction, using:

  - criterion AAA - by measuring at the point of combustion or consumption at ambient temperatures and converted to standard temperatures using measuring equipment calibrated to a measuring requirement.

    Note that a different criterion can still be used in subsequent years.

  - criterion BBB - by measuring combustion or consumption using an accepted industry measuring device or in accordance with industry practice, if the measuring equipment does not meet the requirements of criterion AAA. Industry practice may include use of logbooks, fuel cards or fleet management software.

    BBB measurement criterion is usually not applicable – this is because diesel (and other fuel) is typically acquired by the facility through a commercial transaction. BBB measurement criterion is only available if acquisition of the fuel does not involve a commercial transaction, such as from production of the fuel.

8. Measurement criteria for carbonates

The measurement criteria for carbonates apply when estimating emissions from the following sources:

- cement clinker production
- lime production
- calcination of carbonates in an industrial process
- soda ash production.

The quantity of carbonates consumed, or the quantity of products derived from carbonates must be estimated:

- if the acquisition of carbonates or the dispatch of products derived from carbonates involves a commercial transaction, using:

  - criterion A - as evidenced by invoices issued by the vendor of the carbonates or products.

- criterion AA - by estimating the change in the quantity of the stockpile of the carbonates or products as evidenced by invoices issued by the vendor of the carbonates or products.

  If criterion AA is used for a facility in a year, then, in each subsequent year, only criterion AA can be used for that facility.

- criterion AAA - by measuring at the point of consumption of the carbonates or the point of production of the products derived from carbonates, using measuring equipment calibrated to a measurement requirement.

  The quantity of the carbonates consumed can also be measured at the point of sale but only if the change in stockpile of the carbonates is less than 1% of the total consumption for the year and, at the beginning of the year, the stockpile quantity is less than 5% of total consumption of carbonates for the year.

  If criterion AAA's point of consumption is used for a facility in a year, then, in each subsequent year, only this point of consumption measurement can be used for the facility.

- if the acquisition of carbonates or the dispatch of products derived from carbonates does not involve a commercial transaction, using:

  - criterion AAA - by measuring at the point of consumption of the carbonates or the point of production of the products derived from carbonates, using measuring equipment calibrated to a measurement requirement.

    Note that a different criterion can still be used in subsequent years.

  - criterion BBB - by measuring the consumption of carbonates or the products derived from carbonates in accordance with industry practice, if the measuring equipment does not meet the requirements of criterion AAA.

9. Measurement criteria for solid waste

The tonnage of waste received at a landfill must be estimated using:

- criterion A - as evidenced by invoices or measured in accordance with state or territory legislation.

- criterion AAA - by measuring the quantities of solid waste received at the landfill using measuring equipment calibrated to a measurement requirement.

- criterion BBB - by estimating the quantities of solid waste received at the landfill in accordance with industry estimation practices. Industry practice includes weighbridges, receipts, invoices, other documents or records, or population and per-capita waste generation rates.

10. Measurement criteria where data relates to a contractor's activities

In many cases, activities that form part of a facility are undertaken by contractors. This means that reporters are required to get data from their contractors to complete their NGER reports. It is common for a combination of invoices, logbook or fuel card data to be used to estimate the amount of fuel used by contractors while conducting activities at a facility.

In some cases, the amount of fuel purchased by a contractor will be partially used at the facility and partially used for activities that take place outside of a facility. Where this is the case, the reporter or contractor needs to determine and document a way to apportion the total amount invoiced between fuel consumed for the purposes of the facility and fuel consumed for other purposes.

The reporter should take the following into account in assessing a contractor's activities:

- For criteria A or AA, the quantities estimated from invoices will permit estimates made by the contractor of the quantity of fuel consumed by the contractor within the facility. This estimate must be based on the invoiced amounts and apportion of the quantity that has been consumed within the facility in a manner which meets the requirements of section 1.13 of the NGER Measurement Determination.
- If stockpiles are involved, estimates must be undertaken under criterion AA and comply with the requirements for estimating stockpiles.
- If fuels are estimated using measurement equipment capable of meeting the requirements for criterion AAA for each fuel type, criterion AAA will continue to be acceptable.

Note: If the fuel is purchased by a contractor, the term 'commercial transaction' has a meaning broader than invoices. It can include contracts with or without directly attributable renumeration for the services provided.

When a contractor conducts an activity in the reporting year that meets the requirement of 4.30 of the NGER Regulations, the reporter must report the additional information about the contractor listed in the regulation. More information is available in the Contracts and leasing guideline[20].

11. More information

For more information, please contact CER:

Email: cer-nger-reporting@cer.gov.au

Phone: 1300 553 542 within Australia

Website: www.cer.gov.au[21]

[20] https://cer.gov.au/document_page/contracts-and-leasing-guideline
[21] http://www.cer.gov.au/