

National Greenhouse and Energy Reporting (NGER) Scheme

2023 Proposed Amendments

Consultation Paper

National Inventory Systems and International Reporting Branch
Department of Climate Change, Energy, the Environment and Water



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Acknowledgement of Country

We acknowledge the Traditional Custodians of Australia and their continuing connection to land and sea, waters, environment and community. We pay our respects to the Traditional Custodians of the lands we live and work on, their culture, and their Elders past and present.

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Overview

The National Greenhouse and Energy Reporting (NGER) Scheme

The National Greenhouse and Energy Reporting (NGER) Scheme is Australia's national system for reporting greenhouse gas emissions, energy consumption and energy production by Australian corporations.

The NGER Scheme is a key data source which supports Australia's international and domestic reporting obligations and informs domestic climate and energy policies. Emissions reported under the NGER Scheme underpin the operation of the Safeguard Mechanism.

NGER Scheme legislation includes:

- the *National Greenhouse and Energy Reporting Act 2007* (the NGER Act);
- the *National Greenhouse and Energy Reporting Regulations 2008* (the NGER Regulations); and
- the *National Greenhouse and Energy Reporting (Measurement) Determination 2008* (the Measurement Determination).

The NGER Scheme requires the reporting of greenhouse gas emissions from:

- the combustion of fuel for energy;
- the extraction, production, flaring, processing and distribution of fossil fuels, and from carbon capture and storage;
- industrial processes where a mineral, chemical or metal product is formed using a chemical reaction that generates greenhouse gases as a by-product, as well as emissions of hydrofluorocarbons and sulphur hexafluoride resulting from their use by certain industries; and
- waste disposal – either in landfill, from management of wastewater or from waste incineration.

The NGER Scheme is regularly reviewed by the Department for opportunities to improve the accuracy of estimates while being cognisant of reporting burden.

The NGER Scheme is administered by the Clean Energy Regulator (CER). Further information on NGER reporting is available at the [CER's website](#).

2023 Proposed Amendments

This consultation paper outlines the following proposed updates to the NGER Scheme:

- Introduction of an optional supplementary ‘market-based method’ for determining emissions associated with the **consumption of electricity (‘scope 2’ emissions)** (section A);
- An update to Method 1 for estimating emissions of methane from **Queensland open cut mines** to reflect improvements in data availability (section B);
- An update to Method 1 for estimating **methane released from landfills** (other than from flaring of methane) (section C);
- Creation of two new fuel types, **renewable paraffinic diesel** and **renewable paraffinic kerosene** (section D); and
- Other minor amendments (section E).

These proposed changes will be implemented through amendments to the Measurement Determination as set out in the Exposure Draft published with this paper, and associated amendments to the NGER Regulations as set out in this paper. The Department is seeking views on the practical operation and application of the proposed amendments.

This consultation will inform the finalisation of the draft amendment instruments, which will be legislative instruments for the purposes of the *Legislation Act 2003*.

The amendments are proposed to commence on 1 July 2023 and would apply to NGER reports submitted by 31 October 2024 for the 2023–24 NGER reporting year.

Climate Change Authority review of the NGER Scheme

Every five years the Climate Change Authority (the CCA) is required to conduct a review of the operation of the NGER legislation (section 76A of the NGER Act). The next review will be conducted this year.

In the context of the Safeguard Mechanism reforms passed by Parliament on 30 March 2023, the Government will request the CCA to include in its review recommendations to improve methane measurement, reporting and verification. The CCA will consult on its review in due course. The Government notes the interest of stakeholders in looking at the work of the Metcoal Methane Partnership and Oil and Gas Methane Partnership 2.0, direct measurement requirements and source and site reconciliation as part of this review. Any changes resulting from the review would be taken through annual update processes, including the next update where practicable.

Information for respondents

Monday 3 April 2023	Consultation draft available on the Department’s Consultation Hub .
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Friday 28 April 2023	Submissions close.
Commencement	The amendments are proposed to commence on 1 July 2023 and would apply to NGER reports submitted by 31 October 2024 for the 2023–24 NGER reporting year.

Submissions

Submissions are invited from all interested stakeholders. Submissions should be lodged electronically via the consultation website.

Submissions will be made publicly available. If you wish for your submission to be kept confidential, this should be clearly indicated in your submission.

Summary of amendments

A: Optional, supplementary market-based method for calculating scope 2 emissions from electricity consumption

The Department proposes to introduce an optional, supplementary ‘market-based method’ for calculating the emissions associated with electricity consumed from the grid, or generated and consumed by a facility behind its meter (‘scope 2’ emissions). The intent of including this supplementary approach is to centralise the rules around market-based scope 2 reporting and to support voluntary reporting, including under the Corporate Emissions Reduction Transparency (CERT) and Climate Active initiatives.

The market-based method will be available in parallel to the existing ‘location-based method’ which remains compulsory for all NGER reporters meeting the scope 2 reporting threshold specified in section 7.1(2) of the Measurement Determination. In light of experience in implementing the new method and broader government climate policy objectives, consideration will be given to whether the new method should become mandatory (in addition to the current mandatory location-based method) in future; either through NGER or other Commonwealth legislation.

The market-based method enables NGER reporters to make unique claims on the zero emissions intensity attributable to renewable electricity purchases and reflect these in their scope 2 emissions reporting.

The market-based method will initially only allow the use of eligible Renewable Energy Certificates (RECs) comprising Large-scale Generation Certificates (LGCs) and GreenPower purchases.

The market-based method makes use of a residual mix factor (RMF). The RMF is an emission factor derived from the emissions and generation on-grid Australia-wide, adjusted for the generation associated with LGCs where generation occurred during the period of RMF calculation.

The RMF will be calculated nationally as a single factor applicable in all States and Territories, as LGCs can be traded and surrendered Australia-wide. Through future refinement of available data on REC creations and surrenders, it may be possible to disaggregate the RMF to more granular spatial and temporal levels.

Small solar self-consumption

The Department has calculated an estimate of rooftop small solar generation which is self-consumed 'behind the meter'. This has been deducted from the estimated amount of generation from small solar used to calculate both the existing location-based method emission factors and the market-based method's RMF. The estimate for Australia has been taken from a peer-reviewed paper, Mckenna et al (2019)¹. The estimate of small solar self-consumption has been independently verified by the Department with data on small solar operations taken from [PVoutput.org](https://pvoutput.org). The Department will examine the possibility of updating this estimate in future as this independent dataset grows or other data becomes available.

NGER registration thresholds

Scope 2 emissions calculated using the location-based method will continue to be used for the purpose of assessing whether an entity exceeds the emissions thresholds in section 13 of the NGER Act.

Publication of NGER data

It is intended that estimates of scope 2 emissions from the market-based method will be incorporated into the existing statutory NGER data publication.

Market-based method for calculating scope 2 emissions from consumption of electricity

The market-based method for calculating scope 2 emissions from consumption of electricity is:

$$Y = [((Q - E) \times (1 - (RPP + JRPP))) + (E \times (1 - JRPP)) - (X \times 1000) + (L \times 1000)] \times RMF / 1000$$

Where:

Y is the scope 2 emissions, measured in CO₂-e tonnes.

Q is the quantity of electricity purchased or acquired from the electricity grid during the year and consumed from the operation of the facility, measured in kilowatt hours (kWh).

E is the quantity of electricity exempt from Renewable Energy Target (RET) liability, measured in kWh. This value is equivalent to the number of approved exemption certificates for emission-intensive trade-exposed (EITE) facilities reported during the year under the NGER scheme.

¹ Mckenna et al (2019) [Analysis of international residential solar PV self-consumption](#).

RPP is the RET [Renewable Power Percentage](#) for the applicable period (averaged across the adjacent calendar years). The **RPP** is calculated and published annually by the CER based on the number of RECs liable entities must surrender to meet the annual target for renewable electricity set out in the *Renewable Energy (Electricity) Act 2000* (the REE Act). The annual target increased each year until 2020 and is now constant at 33,000,000 megawatt hours (MWh) to 2030. EITE facilities are not eligible to claim the **RPP** as they have not invested in renewable generation through the RET. For this electricity exempt from RET liability (**E**), the **RPP** equals zero.

JRPP is the jurisdictional renewable power percentage for the applicable period and activity State. For reporters in a jurisdiction without a **JRPP**, the **JRPP** equals zero. It is calculated as the number of eligible RECs surrendered by or on behalf of the jurisdictional authority divided by total electricity consumption in the jurisdiction. **JRPP** is applied to **E** if the jurisdictional scheme includes EITE activities in its REC acquittal activities.

X is the number of eligible RECs voluntarily surrendered in the reporting year equivalent to MWh. For **X**, an eligible REC is a LGC, voluntarily surrendered through the REC Registry in the reporting year with evidence of surrender or GreenPower evidence of purchase. Evidence of eligible certificate retirement must be attributed to a particular party's claim, and is as follows:

- Serial numbers as recorded on the REC Registry
- A GreenPower receipt of purchase.

If more eligible RECs (**X**) are surrendered than the total required to reach zero emissions, then Y is equal to zero.

RMF is the scope 2 residual mix factor, in kilograms of CO₂-e emissions per kWh as mentioned in Part 6 of Schedule 1 of the Measurement Determination. The calculation method and a preliminary **RMF** for the 2023-24 NGER reporting year is outlined below. The **RMF** is applied to final net electricity consumption – after the removal of surrendered RECs and the adjustments from the application of the **RPP** and **JRPP**.

L is the number of eligible RECs that have been or will be issued for electricity produced on-site during the year and consumed from the operation of the facility, never passing the facility's meter to enter a grid, equivalent to MWh.

Ineligible RECs include:

- LGCs surrendered to meet a liable entity's obligations for that compliance year under the REE Act
- Small-scale technology certificates (STCs)
- Certificates administered under State and Territory schemes
- Incorrectly created or cancelled LGCs
- LGCs voluntarily surrendered with a generation year of more than 3 years prior to the end of the reporting year.

Method for calculating the Residual Mix Factor

The **RMF** will be calculated by the Department on the same annual cycle as the location-based method scope 2 emission factors and will be published within the Measurement Determination.

The calculation method is described below:

$$RMF = M / (N - (Y \times 1000))$$

Where:

RMF is the residual mix factor for the financial year, measured in kilograms of CO₂-e per MWh.

M is emissions from on-grid generation for Australia based on NGER reports for the preceding reporting year, measured in tonnes CO₂-e. Emissions associated with cogeneration facilities and those whose primary purpose for electricity is for self-use and not for the grid (for example an alumina refinery) are pro-rated based on the proportion of the amount of total generation and that which is sent to the grid, as reported under NGER.

M includes methane emissions from hydro generation dams (defined as a human-made structure built to contain and control a body of water and used to generate hydroelectricity) based on the method applied in the National Greenhouse Gas Inventory.

N is electricity generation sent out to the grid in Australia, measured in kWh, and excludes distributed small scale solar self-consumption. Generation data is from NGER reports for the preceding reporting year and Australian Energy Market Operator data for that same time period sourced through the NEMReview software package.

Y is LGC creations for generation which occurred in the same financial year as **N** and **M**, measured in MWh, and is based on data provided by the CER from the REC Registry.

Grids are the National Electricity Market (NEM), South-West Interconnected System (SWIS), Darwin, Katherine Interconnected System (DKIS) and the North-West Interconnected System (NWIS).

Preliminary factors for the 2023-24 NGER reporting year

A preliminary **RMF** of 0.81 kilograms of CO₂-e per kWh has been calculated for use in the market-based method in the 2023-24 reporting year.

Preliminary location-based factors for the 2023-24 reporting year are shown below.

Table 1 – Preliminary location-based emission factors

Location	2023-24 preliminary location-based emission factor (kg CO ₂ -e/kWh)
New South Wales and Australian Capital Territory	0.68
Victoria	0.79
Queensland	0.73
South Australia	0.25
South West Interconnected System in Western Australia	0.53
Tasmania	0.12
Northern Territory	0.54

Associated reportable information

To support the market-based method, associated amendments to the NGER Regulations would be made to require reporting of:

- The number of RECs voluntarily surrendered in the reporting year (**X**) equivalent to MWh; and
- The Jurisdictional renewable power percentage (**JRPP**).

B: Update to Method 1 used to calculate fugitive methane emissions from Queensland open cut mines

Section 3.20 of the Measurement Determination sets out the default method (Method 1) for estimating fugitive emissions of methane released during the extraction of coal from open cut mining.

Six state-based emission factors are provided, in tonnes of methane (CO₂-e) per tonne of run-of-mine coal extracted. In descending order of magnitude, these are:

- 0.061 for a mine in New South Wales,
- 0.023 for a mine in Queensland or Western Australia,
- 0.019 for a mine in Tasmania, and
- 0.0003 for a mine in South Australia or Victoria.

The majority of open cut mines in Australia are located in Queensland and New South Wales. The Method 1 factors above for Queensland and New South Wales open cut mines were derived from a

1993 CSIRO study² which measured methane fluxes in a small number of locations in the Bowen basin to calculate a Queensland methane emissions factor.

Recent spatial data on methane concentrations in air columns below the European Space Agency satellite ‘Sentinel 5p’ have been used by some researchers to make ‘top-down’ estimates of methane fluxes across Australia and around the world. Some of these analyses were targeted to a particular geographic region (e.g. the Bowen Basin, Sadavarte *et al* 2021³) while others were global (Deng *et. al* 2021⁴).

Technical challenges currently prevent such satellite data, by itself, producing reliable, ‘top-down’ emission estimates. The Department published an explanation of these technical challenges in its *Quarterly Update of Australia’s National Greenhouse Gas Inventory: March 2021*⁵. The emergence of the satellite-based methane emissions analysis of Australia did however prompt the Department to review its existing methods for the estimation of fugitive methane emissions from Queensland open cut mines.

The Department’s review identified data published through the Queensland Government’s Petroleum Exploration Dataset⁶ that was more detailed and recent than the previously used data. The previously used 1993 CSIRO study included twelve samples, compared with these new data which included approximately four thousand samples. The Queensland Government dataset includes geographical and chemical composition data relating to drilling of the petroleum wells, stratigraphic bores, and coal and mineral boreholes.

Using these data, further contextualised using information from environmental impact assessments and approvals where available, an updated emissions factor for Queensland open cut mines was derived and implemented in Australia’s National Inventory.

The updated emission factor was applied in the *Quarterly Update of Australia’s National Greenhouse Gas Inventory: June 2021*⁷ (published 30 November 2021). It was subsequently implemented in Australia’s *National Inventory Report 2020*⁸ to the United Nations Framework Convention on Climate Change (UNFCCC), submitted in May 2022. The updated emission factor was reviewed by an UNFCCC

² Williams and Saghafi (1993) [Methane emissions from coal mining – a perspective](#), Australian coal journal, vol. 41, pp. 37-42.

³ Sadavarte *et al* (2021) [Methane Emissions from Super-emitting Coal Mines in Australia quantified using TROPOMI Satellite Observations](#), Cornell University.

⁴ Deng *et al* (2021) [Comparing national greenhouse gas budgets reported in UNFCCC inventories against atmospheric inversions](#) Earth Systems Science Data (preprint).

⁵ Department of Industry, Science, Energy and Resources (2021) [Quarterly Update of Australia’s National Greenhouse Gas Inventory: March 2021](#).

⁶ Business Queensland (2022) [Queensland Petroleum Exploration Database \(QPED\)](#).

⁷ DCCEEW (2021) [Quarterly Update of Australia’s National Greenhouse Gas Inventory: June 2021](#).

⁸ DCCEEW (2022) [National Inventory Report 2020](#).

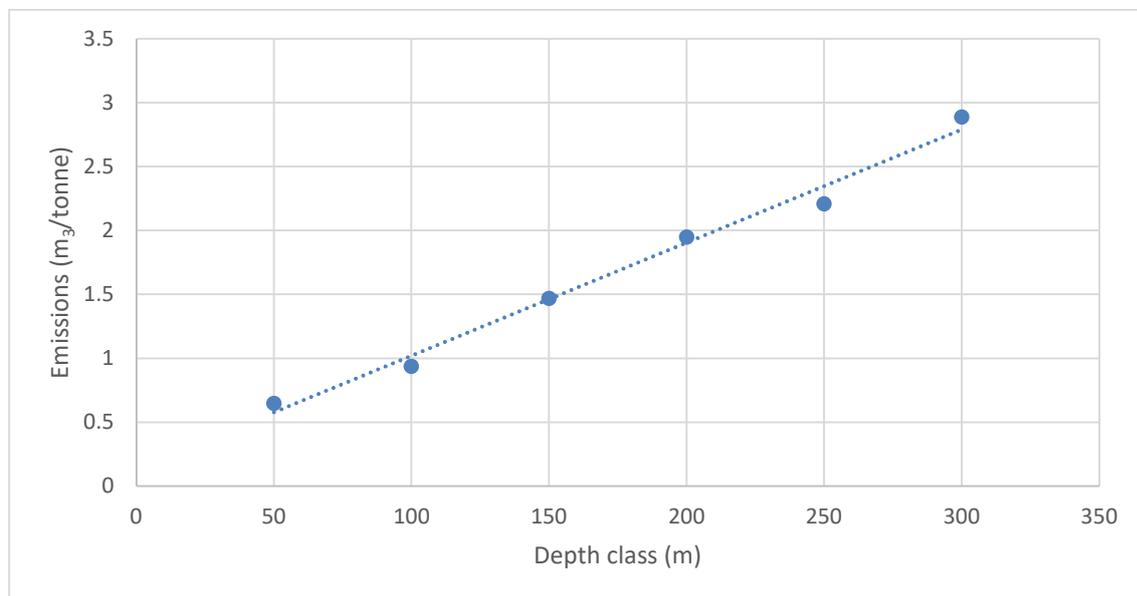
expert inventory team in September 2022 as part of the annual review of that Report. The expert team raised no concerns with the new emissions factor.

The updated emission factor was derived by:

- Processing the petroleum dataset to exclude gas content data outside of active coal mine fields,
- Aggregating drillhole observations into 50 metre depth classes by average and median values, and
- Assuming all gas contained within the coal seam will be released upon the coal's extraction.

As outlined in Figure 1, the analysed data shows a linear relationship between the methane content of the strata and the depth class at which the measurement was taken (Figure 1).

Figure 2 – Methane content by depth class



Data sourced from the Queensland Petroleum Exploration Database (QPED) (Business Queensland, 2022) and environmental impact reports, analysed and graphed by DCCEEW (2022).

A review of coal mining environmental and planning documents was conducted to determine common operating depths of Queensland open cut mines. These depths were combined with the average methane content analysis presented above, resulting in a revised emission factor of 1.65 m³ of methane per tonne of run-of-mine coal produced. This converts to 0.031 tonnes CO₂-e per tonne of run-of-mine coal extracted. Updating this factor will not impact reporters using Method 2 or 3, nor will it impact reporters outside of Queensland.

The Department considers the updated emission factor more appropriate than the factor taken from the 1993 CSIRO study because the petroleum dataset underpinning it has greater geographic coverage and a much larger number of observations. Incorporation of these new data reduce uncertainty, and reduce biases caused by natural variability across drillholes, coal seams, and drilling depths.

At present, the only new geological and composition data the Department has identified to improve fugitive emissions reporting under this source category applies to Queensland. The Department will investigate opportunities to apply this improved method to emissions factors for other jurisdictions where sufficient geological data is available.

In addition to Method 1, two other methods are also available for estimating fugitive methane emissions released during the extraction of coal from open cut mining:

- Method 2: involves estimating the total gas contained by gas bearing strata, modelled, sampled and analysed in accordance with the Australian Coal Industry's Research Program (ACARP) guidelines and relevant Australian Standards.
- Method 3: is the same as Method 2, but with an increased expectation on standards used. Specifically, AS 2617—1996 *Sampling from coal seams or an equivalent standard*, and AS 2519—1993 *Guide to the technical evaluation of higher rank coal deposits or an equivalent standard*.

C: Updates to Method 1 for the estimation of methane emissions released from landfills (other than from flaring of methane).

Section 5.4 of the Measurement Determination provides a default method (Method 1) to estimate emissions of methane released from landfills (other than from flaring of methane).

Under the current Method 1, if the quantity of methane collected⁹ amounts to more than 75% of the quantity of modelled methane generated from the landfill during the year, emissions must be estimated based on the quantity of methane captured, multiplied by the inverse of the collection efficiency (1/0.75). In other words, there is a 75% threshold for collection efficiency based on the theoretical maximum collection efficiency expected at a landfill. Where reported capture exceeds this threshold, it is considered that the modelled generation is not accurate and emissions are instead derived from the reported capture.

The Department proposes to amend Section 5.4 of the Measurement Determination to replace the 75% collection efficiency threshold with the collection efficiency calculation currently available in Section 5.15(4) under Method 2.

The proposed amendment will allow landfill operators to estimate collection efficiencies in accordance with Section 5.15C, using either:

- the area of the landfill with active gas collection and cover material used, permitting a collection efficiency of up to 95%, or

⁹ Methane collection refers to the total quantity of methane in landfill gas either captured for combustion, flared from the landfill, or transferred out of the landfill.

- a default efficiency limit of 75% for areas of the landfill with active gas collection.

The Department welcomes submissions of detailed evidence to support the review of Section 5.15C. In particular, the Department is seeking feedback on whether the categorisation of cover types in Section 5.15C accurately reflects industry capping practices and/or improvements to capping technologies and associated capture thresholds.

Under current NGER provisions, landfill operators also have the option to report under Method 2, which enables the derivation of higher collection efficiencies based on site survey. To date, no landfill operators have opted to use Method 2.

Under the proposed amendment the ability to derive higher collection efficiencies, currently available under Method 2, will be available under Method 1. However, the ability to include specific information on waste mix types at the landfill by defining sub-facility zones, currently available under Method 2, will not be made available under Method 1.

The proposed amendment allows NGER reports to better reflect site-specific operational circumstances and increases the collection efficiency threshold under Method 1. In doing so, the proposed amendment also recognises the advancements that have been made in collection efficiency at landfills since the introduction of the existing Method 1.

D: Renewable paraffinic diesel and renewable paraffinic kerosene

The Department proposes to create two new NGER Scheme fuel types:

- *renewable paraffinic diesel* (RPD) and
- *renewable paraffinic kerosene* (RPK).

RPD and RPK are biomass-derived hydrocarbon fuels with nearly identical chemical and physical properties to their conventional petroleum-derived equivalents (*diesel oil* and *kerosene for use as fuel in an aircraft*, respectively). RPD is also commonly referred to as ‘renewable diesel’, while RPK falls within a class of fuels commonly referred to as ‘sustainable aviation fuel’.

A variety of pathways have been developed to produce RPD and RPK, the most common being hydrotreatment of biomass oil and fat feedstocks. Other production pathways include gasification of biomass for use in Fischer-Tropsch synthesis, and fermentation of biomass to produce alcohols for conversion via the alcohol-to-jet pathway¹⁰.

RPD is suitable for use as a ‘drop-in’ equivalent to diesel oil – it can be used without blending limit or constraint in existing diesel infrastructure and equipment, including as a neat fuel. RPK is suitable for use in existing aviation infrastructure, equipment and aircraft, and is currently approved for blending

¹⁰Enea and Deloitte for ARENA (2021) [Australia’s Bioenergy Roadmap](#).

at proportions up to 50% with conventional aviation turbine fuel depending on the production pathway¹¹.

Under the draft amendments RPD and RPK have the same technical parameters as their respective petroleum-derived equivalents, except both RPD and RPK are assigned a zero carbon dioxide emission factor (see Schedule 1 Items 22, 24, 26 and 27). This approach is consistent with other biogenic fuel types, and reflects the fact that their combustion releases carbon which was absorbed by their biogenic source materials from the atmosphere during their life. Assigning RPD and RPK Method 1 default energy content factors identical to their petroleum-derived equivalents is a conservative approach in the absence of definitive evidence to support the use of a different default value. In practice, because of their lower density, RPD and RPK fuels may have a slightly lower volume-based energy content than their petroleum-derived equivalents. As such, NGER reporters have the option to estimate their own energy content factor for RPD and RPK by sampling and analysing the fuel they consume in accordance with the standards prescribed in the draft amendments (see Schedule 1 Item 4 and 6).

The Department welcomes submissions of detailed evidence to support the development of default energy content factors and emission factors (methane and nitrous oxide) for RPD and RPK.

The addition of the new RPD and RPK fuel types will allow reporting of consumption of pure quantities of these fuels or blends of RPD and RPK with their petroleum-derived equivalents¹², and for NGER reports to reflect the associated reduction in emissions.

The following definitions will be added through associated amendments to the NGER Regulations:

biodiesel means a biofuel¹³ that:

- (a) is produced by esterification of oil derived from biomass; and
- (b) consists mainly of esters; and
- (c) is suitable for use as a substitute for diesel oil.

renewable paraffinic diesel means a biofuel that:

- (a) is produced by hydrotreatment, gasification, pyrolysis or other chemical, biochemical and thermochemical pathways; and
- (b) consists mainly of alkane hydrocarbons; and
- (c) is suitable for use as a substitute for diesel oil.

Note: Renewable paraffinic diesel is not biodiesel.

¹¹ ASTM D7566-22a: Standard Specification for Aviation Turbine Fuel Containing Synthesized Hydrocarbons.

¹² See Part 2.6 of the Measurement Determination for provisions on reporting consumption of a blend of fossil and biogenic carbon fuels.

¹³ *Biofuel* is defined in NGER Regulation 1.03 as a liquid fuel derived or recovered from biomass.

renewable paraffinic kerosene means a biofuel that:

- (a) is produced by hydrotreatment, gasification, pyrolysis or other chemical, biochemical and thermochemical pathways; and
- (b) consists mainly of alkane hydrocarbons; and
- (c) is suitable for use as a substitute for kerosene for use as fuel in an aircraft.

Biodiesel is an existing NGER Scheme fuel type, but is not currently defined in regulation 1.03 of the NGER Regulations. While both are substitutes for diesel oil, RPD and biodiesel are not the same fuel type. They are produced via different pathways and are chemically distinct final products (RPD consists mainly of alkane hydrocarbons; biodiesel consists mainly of esters). Unlike RPD which is considered a fully compatible ‘drop-in’ substitute for diesel oil, biodiesel is considered a ‘blend-in’ substitute as it is generally only used in a blend with diesel oil or RPD up to 20% biodiesel, not as a neat fuel. The draft amendments make no changes to the existing technical parameters for biodiesel in the Measurement Determination.

E: Other amendments

Waterborne transport

Sections 2.20 and 2.41 of the Measurement Determination set out Method 1 for estimating emissions from the combustion of gaseous and liquid fuels for stationary and transport energy purposes.

Schedule 1, items 2 and 3 of the draft amendments make a clarifying amendment to the definition of **transport energy purposes** set out in subsections 2.20(2) and 2.41(2) of the Measurement Determination. Paragraph (c) of the definition of transport energy purposes is changed from ‘(c) marine navigation;’ to ‘(c) waterborne transport;’ to clarify that transport energy purposes is intended to cover all forms of water-borne transport, not just transport at sea.

The terminology ‘waterborne transport’ is consistent with the terminology used to describe this emissions source category in [guidelines](#) published by the Intergovernmental Panel on Climate Change.

Light and heavy duty vehicles

Division 4.1 of Schedule 1 of the Measurement Determination specifies separate energy content factors and emission factors for compressed natural gas that has reverted to standard conditions and liquefied natural gas depending on whether those fuels are used in light duty vehicles or heavy duty vehicles.

Schedule 1, item 1 of the draft amendments inserts definitions of the terms **light duty vehicle**, **heavy duty vehicle** and **gross vehicle mass**. These definitions are inserted to clarify the types of vehicles to which specific light and heavy duty vehicle energy content and emission factors apply.

The definitions inserted by the draft amendments are consistent with the classifications and definitions used by the [Bureau of Infrastructure, Transport and Regional Economics](#), the [Australian Bureau of Statistics](#) and under [Heavy Vehicle National Law](#).

The phrase ‘tare weight’ in the definition of gross vehicle mass is sometimes referred to as ‘unladen weight’.

Wet weight

Division 5.2.2 of Part 5.5 specifies that a quantity of waste should be measured in tonnes of wet weight.

Schedule 1, item 1 of the draft amendments inserts a definition of the term **wet weight**, to provide clarity on how volumes of waste incinerated are to be quantified.

The definition inserted by the draft amendment is consistent with that of ‘weight of wet waste’ used in the [2006 IPCC Guidelines](#).

F: Detailed notes on proposed amendments

The following notes explain the operation of proposed amendments set out in the *National Greenhouse and Energy Reporting (Measurement) Amendment (2023 Update) Determination 2023 Exposure Draft* published with this consultation paper.

Section / item	Description
1 Name	States the name of the 2023 Measurement Determination update instrument.
2 Commencement	Provides that amendments would commence on 1 July 2023.
3 Authority	States that the instrument is made under section 10(3) of the NGER Act.
4 Schedules	A formal clause which allows the Schedule to amend the Measurement Determination.
Schedule 1 - Amendments	
[1] Section 1.8	<p>Inserts definitions of fuel types <i>biodiesel</i>, <i>renewable paraffinic diesel</i> and <i>renewable paraffinic kerosene</i> consistent with definitions proposed to be inserted in the <i>National Greenhouse and Energy Reporting Regulations 2008</i>.</p> <p>Inserts definitions of <i>gross vehicle mass</i>, <i>heavy duty vehicle</i>, <i>light duty vehicle</i> and <i>wet weight</i>.</p>
[2] Subsection 2.20(2) (paragraph (c) of the definition of <i>transport energy purposes</i>)	Repeals the former paragraph (c) of the definition of <i>transport energy purposes</i> '(c) marine navigation' and substitutes it with a new paragraph '(c) water-borne transport'.
[3] Subsection 2.41(2) (paragraph (c) of the definition of <i>transport energy purposes</i>)	Repeals the former paragraph (c) of the definition of <i>transport energy purposes</i> '(c) marine navigation' and substitutes it with a new paragraph '(c) water-borne transport'.
[4] Subsection 2.45(1) (after table item 20)	Prescribes standards for analysing samples of <i>renewable paraffinic diesel</i> and <i>renewable paraffinic kerosene</i> for the purpose of reporting emissions using Method 2 for

Section / item	Description
	combustion of liquid fuels. Prescribed standards are as for diesel oil and kerosene for use as fuel in an aircraft.
[5] Subsection 2.45(1) (table item 22)	Repeals the former table item 22 and substitutes a new table item 22 that accounts for the newly inserted table items 20A and 20B.
[6] Subsection 2.47(3) (after table item 20)	Prescribes standards for sampling <i>renewable paraffinic diesel</i> and <i>renewable paraffinic kerosene</i> for the purpose of reporting emissions using Method 3 for combustion of liquid fuels. Prescribed standards are as for diesel oil and kerosene for use as fuel in an aircraft.
[7] Subsection 2.47(3) (table item 22)	Repeals the former table item 22 and substitutes a new table item 22 that accounts for the newly inserted table items 20A and 20B.
[8] Subparagraph 2.67A(b)(ii)	Editorial correction.
[9] Section 3.20 (paragraph (c) of the definition of EF _j)	Updates the Method 1 emissions factor applicable to Queensland when estimating fugitive methane emissions released during the extraction of coal from open cut mining.
[10] Subsection 3.54(2)	Editorial correction.
[11] Subparagraph 3.88N(1)(c)(ii)	Editorial correction.
[12] Section 3.88 (the section 3.88 inserted by item 62 of Schedule 1 to the <i>National Greenhouse and Energy Reporting (Measurement) Amendment Determination 2010 (No. 1)</i>)	Editorial correction.
[13] Sections 4.85 and 4.89	Legacy correction. Repeals Method 1 for estimating emissions of tetrafluoromethane and hexafluoroethane in aluminium production. These methods are redundant as they are not available be used to estimate emissions of these gases from aluminium production (see subsections 4.84(1) and 4.88(1) of the Measurement Determination).

Section / item	Description
[14] Subsections 5.4(2) to (5)	<p>Updates the formula under Method 1 for estimating methane released from landfills (other than from flaring of methane).</p> <p>For subsection 5.4(4), adds in a reference to subsection 3 with addition of 'and (3)'.</p>
[15] Sections 5.4A, 5.4B, 5.4C, 5.4D, 5.13, and 5.15	Replaces references to subsection 5.4(5) wherever occurring with references to subsection 5.4(4).
[16] Chapter 7	Introduces an optional, supplementary market-based method for the estimation of scope 2 emissions from purchased or acquired electricity.
[17] Subsection 8.6(1) (table item 30)	Editorial correction.
[18] Subsection 8.6(1) (after table item 50)	Prescribes the energy content uncertainty and carbon dioxide emission factor uncertainty to be used when reporting emissions from combustion of <i>renewable paraffinic kerosene</i> and <i>renewable paraffinic diesel</i> using Method 1.
[19] Subsection 8.6(1) (table item 52)	Repeals the former table item 52 and substitutes a new table item 52 that accounts for the newly inserted table items 50A and 50B.
[20] After section 9.15	Provides that amendments made by this instrument apply in relation to reporting for the financial year 2023-24 and later financial years.
[21] Part 2 of Schedule 1 (table item 17, column 2)	<p>Amends table item 17, column 2 to specify that item 17 applies to the fuel type <i>natural gas transmitted or distributed in a pipeline</i>. This amendment is consistent with previous amendments to the NGER Regulations and clarifies that this fuel type covers natural gas wherever occurring in the supply chain.</p> <p>Amendments with identical effect are made throughout the draft amendments.</p>

Section / item	Description
[22] Part 3 of Schedule 1 (after table item 50)	<p>Specifies the energy content factor and carbon dioxide, methane and nitrous oxide emission factors for the new fuel types <i>renewable paraffinic diesel</i> and <i>renewable paraffinic kerosene</i> when they are combusted for stationary energy purposes.</p> <p>The carbon dioxide emission factor is zero consistent with other biogenic fuel types; other parameters are as for <i>diesel oil</i> and <i>kerosene for use as fuel in an aircraft</i> respectively.</p>
[23] Part 3 of Schedule 1 (table item 52)	<p>Repeals the former table item 52 and substitutes a new table item 52 that accounts for the newly inserted table items 50A and 50B.</p>
[24] Division 4.1 of Schedule 1 (after table item 59)	<p>Specifies the energy content factor and carbon dioxide, methane and nitrous oxide emission factors for the new fuel types <i>renewable paraffinic diesel</i> and <i>renewable paraffinic kerosene</i> when they are combusted for transport energy purposes.</p> <p>The carbon dioxide emission factor is zero consistent with other biogenic fuel types; other parameters are as for <i>diesel oil</i> and <i>kerosene for use as fuel in an aircraft</i> respectively.</p>
[25] Division 4.1 of Part 4 of Schedule 1 (table item 61)	<p>Repeals the former table item 61 and substitutes a new table item 61 that accounts for the newly inserted table items 59A and 59B.</p>
[26] Division 4.2 of Schedule 1 (after table item 65)	<p>Specifies the energy content factor and carbon dioxide, methane and nitrous oxide emission factors for the new fuel type <i>renewable paraffinic diesel</i> when it is combusted for transport energy purposes for post-2004 vehicles.</p> <p>The carbon dioxide emission factor is zero consistent with other biogenic fuel types; other parameters are as for <i>diesel oil</i>.</p>
[27] Division 4.3 of Schedule 1 (table)	<p>Specifies the energy content factor and carbon dioxide, methane and nitrous oxide emission factors for the new fuel type <i>renewable paraffinic diesel</i> when it is combusted for transport energy purposes for certain trucks.</p> <p>The carbon dioxide emission factor is zero consistent with</p>

Section / item	Description
	other biogenic fuel types; other parameters are as for <i>diesel oil</i> for the relevant heavy vehicle design standard.
[28] Part 6 of Schedule 1	<p>Updates the emission factors for scope 2 emissions from purchased or acquired electricity using a location-based method.</p> <p>Specifies the Residual Mix Factor (RMF) for use in estimating scope 2 emissions from purchased or acquired electricity using a market-based method.</p>
[29] Part 2 of Schedule 3 (table item 17A, column 2)	See description of item [21].
[30] Part 3 of Schedule 3 (after table item 52)	Specifies the carbon content for the new fuel types <i>renewable paraffinic diesel</i> and <i>renewable paraffinic kerosene</i> , which is zero for both fuel types as for other biogenic fuel types.
[31] Amendments of listed provisions—Valves—leaker	Editorial correction.
[32] Amendments of listed provisions—Natural gas transmitted or distributed in a pipeline	See description of item [21].