Department of Climate Change, Energy, the Environment and Water

Greenhouse gas emissions accounting and reporting guidelines

Guidelines for NSW Government entities



June 2025

Acknowledgment of Country



Department of Climate Change, Energy, the Environment and Water acknowledges the traditional custodians of the land and pays respect to Elders past, present and future.

We recognise Australian Aboriginal and Torres Strait Islander peoples' unique cultural and spiritual relationships to place and their rich contribution to society.

Artist and designer Nikita Ridgeway from Aboriginal design agency – Boss Lady Creative Designs, created the People and Community symbol.

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Greenhouse gas emissions accounting and reporting guidelines

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Contents

1	About this Guide	6
1.1	How to navigate and use this document	7
1.2	GHG accounting and reporting principles	9
1.3	Governance	10
1.3.1	GHG emissions accounting and reporting	10
1.3.2	Approval to use additional or alternative accounting methodologies	10
2	Terms and definitions	12
3	Guidance	17
3.1	Step 1 – Establish entity boundary	19
3.1.1	Operational control	19
3.2	Step 2 – Determine operational boundary	21
3.2.1	Identify emissions sources and removals	
3.2.2	Categorise emissions scopes	
3.2.3	Determine scope emissions for accounting and reporting	
3.3	Step 3 – Consider relevance	29
3.4	Step 4 – Calculate GHG emissions	30
3.4.1	Collect activity data and set up GHG inventory	30
3.4.2	Source emission factors	34
3.4.3	Quantify emissions	36
3.6	Step 5 – Report emissions	42
3.7	Step 6 – Monitor and review	43

Greenhouse gas emissions accounting and reporting guidelines

Tracking of emissions	43
Continual improvement of greenhouse gas inventory	44
Annual reporting	44
Future updates to this Guide	44
	Tracking of emissions Continual improvement of greenhouse gas inventory Annual reporting Future updates to this Guide

Tables

Table 1 Terms and definitions	.12
Table 2 General guidance on scopes for energy use in leased building assets with submeteri	ing
capturing tenancy and base building energy use separately	25
Table 3 General guidance on scopes for whole building energy use in leased assets with no	
submetering to record tenancy and base building energy use separately	25
Table 4 Relevant emissions	29
Table 5 Emission sources and potential data sources	.32
Table 6 Emissions factor hierarchy	35
Table 7 IPCC AR6 100-year time horizon Global Warming Potential values	36
Table 8 Indirect location-based scope 2 emission factors from consumption of purchased or	
acquired electricity	38

Figures

Figure 1 GHG accounting and reporting principles	10
Figure 2 Overview of guidance steps	17
Figure 3 Scope 1, 2 and 3 emissions (adapted from GHG Protocol – A Corporate Accounting	g
and Reporting Standard)	22
Figure 4 Approach for when an entity has data gaps	33

Appendices

Appendix A – Scope 1 and 2 emission sources

Appendix B – Reporting template

Greenhouse gas emissions accounting and reporting guidelines

Appendix C – Estimation methodologies

- Appendix D Optional market-based scope 2 emissions
- Appendix E Comparison of reporting requirements

1 About this Guide

The Greenhouse gas emissions accounting and reporting guidelines (the Guide) provides a methodology for NSW Government entities to measure and report their scope 1 and 2 greenhouse gas (GHG) emissions. This will support entities to meet their reporting obligations and progress towards emission reduction targets for NSW Government operations.

The NSW Government is committed to achieving net zero emissions by 2050 and making NSW more resilient to a changing climate, as legislated in the *Climate Change (Net Zero Future) Act 2023*. The Net Zero Government Operations Policy has been developed to enhance transparency and drive climate action. This policy supports the reduction in emissions across NSW Government operations and supports progress towards NSW's emission reduction targets. Accurate accounting and reporting of GHG emissions are critical for tracking progress towards net zero commitments under *The Climate Change (Net Zero Future) Act 2023*.

Under TPG23-10 NSW Treasury Policy and Guidelines – Annual Reporting Requirements¹, Government Sector Finance (GSF) agencies are required to include climate-related financial disclosures within annual reports. Entities specified as Phase 1 entities are required to make these disclosure statements from FY2024-25. The TPG24-33 Reporting framework for first year climate-related financial disclosures² states that entities must disclose absolute gross scope 1 and (location-based) scope 2 GHG emissions generated during the reporting period. This disclosure of climate-related risks and opportunities provides transparency to the community and industry and drives climate action. The Net Zero Government Operations Policy sets out 24 required actions and targets for general government agencies to reduce their operational GHG emissions and achieve other sustainability outcomes.

This Guide provides a GHG accounting methodology and reporting approach for NSW Government entities to comply with TPG24-33 Reporting framework for first year climate-related financial disclosures and the Net Zero Government Operations Policy (Actions 1, 2, and 24). For agencies reporting under Net Zero Government Operations Policy, the term "entity" used throughout this guide can be interchangeable with "agency".

The Guide recognises the range of services provided by NSW Government entities, and the variance in the emission reporting boundaries and emission sources. The Guide aims to provide

Greenhouse gas emissions accounting and reporting guidelines

¹ NSW Treasury (2023), <u>NSW Treasury Policy and Guidelines – Annual Reporting Requirements</u> <u>TPG23-10</u>, NSW Government, accessed 12 November 2024.

² NSW Treasury (2024), <u>Reporting framework for first year climate-related financial disclosures</u>, NSW Government, accessed 12 November 2024.

general guidance that can be applied across all entities. It also includes specific examples and guidance for common challenges relating to GHG accounting and reporting. The Guide provides some flexibility for existing reporting obligations, e.g. under the National Greenhouse and Energy Reporting (NGER) Scheme, and the unique emission sources of some NSW Government entities.

This first version of the Guide covers scope 1 and 2 emissions. Future updates may expand the Guide to include scope 3 emissions to meet future policy requirements.

1.1 How to navigate and use this document

The structure of this Guide is as follows:

- Chapter 1: Overview of the context and purpose of this guidance document.
- Chapter 2: Key terms and their definitions used in the Guide.
- Chapter 3: Mandatory steps to measure and report scope 1 and scope 2 GHG emissions.
- Appendix A: Potentially relevant scope 1 and scope 2 emission sources.
- Appendix B: Reporting template for GHG emission reporting.
- Appendix C: Estimating emissions when activity data is unavailable.
- Appendix D: Optional market-based method to calculate scope 2 emissions.
- Appendix E: TPG24-33 and Net Zero Government Operations Policy comparative requirements.

This Guide has been developed to broadly align with the GHG Protocol Corporate Accounting and Reporting Standard³. All NSW Government entities must follow the steps outlined in this Guide to support consistent accounting and reporting.

NSW Government entities that currently report under the NGER Scheme can use their annual NGERS estimates for scope 1 and 2 emissions and report these in line with the reporting template in Appendix B. All entities can either use this template or reproduce this template in an alternative format, such as Excel, however, this must include all content included within the template. These entities must still undertake the steps in the Guide to identify, measure, and report any additional emission sources not required to be quantified under NGERS.

If an entity has unique emission sources that are not adequately covered by the calculation methodology provided in Step 4 of this Guide, they may choose to adopt and disclose an

³ WRI & WBCSD (2004), <u>The Greenhouse Gas Protocol : A Corporate Accounting and Reporting</u> Standard, World Resources Institute, accessed 12 November 2024

Greenhouse gas emissions accounting and reporting guidelines

alternative or additional methodology which is more appropriate for their entity's operations. Entities looking to adopt alternative methodologies are encouraged to seek guidance from the Department of Climate Change, Energy, the Environment and Water (DCCEEW), the requirements of which are outlined in Section 1.3.2.

1.2 GHG accounting and reporting principles

The following accounting and reporting principles have been adopted from the GHG Protocol Corporate Accounting and Reporting Standard³ and underpin the methodology presented in this Guide. These principles provide the foundations for preparing accurate, transparent, and consistent GHG inventories. These should be considered during each step of the process.

Relevance

Entities should select an inventory boundary that reflects the full spectrum of activities and associated emissions, ensuring that the GHG data supports informed decision-making. When establishing this boundary, entities should consider their entity's structure, operational activities, the sources of their emissions, and the geographic locations of their operations, so that the resulting inventory accurately represents their emissions profile.

Completeness

Entities should include all material emission sources and activities within their inventory boundary, ensuring a comprehensive and robust account of their emissions. This involves identifying all direct and indirect Scope 1 and 2 emissions, accounting for all significant emission sources, estimating emission sources where data is not readily available and transparently documenting any exclusions or data limitations. Entities should aim to address any gaps and estimates over time.



Consistency

Entities should maintain consistent accounting practices, boundaries, calculation methods, and data sources within their inventory, enabling meaningful comparisons of emissions performance over time. Adjustments to methodologies or boundary definitions should be documented and justified to preserve the integrity of trend analyses and support reliable performance benchmarking.



Transparency

Entities should clearly disclose and explain the methodologies, assumptions, data sources, and calculation tools used to develop their GHG inventories, providing sufficient detail to enable others to evaluate and replicate their results. Transparent documentation and reporting create credibility, enables verification, and aids stakeholder understanding of the context and reliability of the emissions data presented.



Accuracy

Entities should aim to quantify their GHG emissions as accurately as possible, minimising uncertainties and ensuring that estimates are neither systematically over nor understated. By using robust data sources, credible emission factors, and sound measurement techniques, entities improve the confidence in the data.

Figure 1 GHG accounting and reporting principles

1.3 Governance

1.3.1 GHG emissions accounting and reporting

Accountable authorities are responsible for annual reporting, including climate-related financial disclosures. These disclosures include GHG emissions reporting. Chief Financial Officers, sustainability, risk, procurement, and corporate service functions are all expected to play a role in climate-related financial disclosures.

It is the individual entity's responsibility to collate, review and verify emissions data. Agencies and divisions within entities should work together to ensure that annual emissions data is complete and accurate. This includes reviewing and updating the GHG inventory annually to align with this Guide, as well as improving the accuracy of inventory data.

1.3.2 Approval to use additional or alternative accounting methodologies

The Guide provides a GHG calculation methodology in Step 4. This methodology is intended to cover most operations and emission sources from NSW Government entities. If an entity has

unique emission sources not adequately covered by this Guide, it may choose to adopt and disclose an alternative or additional methodology that is more appropriate for its operations.

Entities seeking to adopt alternative methodologies are encouraged to seek guidance from the Department of Climate Change, Energy, the Environment and Water (DCCEEW) at government@environment.nsw.gov.au.

Advice/endorsement of an alternate methodology will consider:

- Alignment with domestic or internationally recognised GHG accounting and reporting framework or standards.
- Alignment with the accounting and reporting principles outlined in Section 1.2.
- Whether it is suitable for the NSW Government context.

2 Terms and definitions

Table 1 Terms and definitions

Term	Definition
Accountable authority	Under the Government Sector Finance Regulation 2024, an accountable authority of a GSF agency is the individual or governing body responsible for the performance and financial management of the agency. Section 2.7(2) of the GSF Act 2018 defines who the accountable authority is for each GSF agency, usually the head of the agency.
Activity data	The quantitative information about activities that generate GHG emissions or removals. It typically includes metrics such as the amount of fuel consumed, electricity used, distance travelled, or materials produced. These metrics are then combined with emission factors to calculate GHG emissions.
Behind the meter	Electricity generated and consumed within a building or asset, rather than being drawn from the electricity grid. This includes through items such as rooftop solar panels or battery storage.
Carbon credit	An emissions unit that is issued by a carbon crediting programme and represents an emission reduction or removal of GHG. Carbon credits are uniquely serialised, issued, tracked, and cancelled by means of an electronic registry.
Carbon removals	The process of extracting carbon dioxide from the atmosphere and storing it in a stable form to reduce atmospheric GHG concentrations.
Carbon offsets	Measurable and verifiable reductions in GHG emissions or carbon removals that are used to compensate for emissions occurring elsewhere. In the context of this Guide, this relates to carbon credits generated under Australian carbon credit units (ACCU) scheme.
Carbon sequestration	The uptake of CO_2 and storage of carbon in biological carbon sinks.
Climate-related financial disclosures	For a not-for-profit entity, climate-related financial disclosures are a particular form of general-purpose financial report. These disclosures provide information about the reporting entity's climate-related risks and opportunities that could reasonably affect the entity's cash flows, access to finance or cost of capital, and its ability to further its

Term	Definition
	objectives, over the short, medium or long term. This includes information about the entity's governance, strategy and risk management in relation to those risks and opportunities, and related metrics and targets. For a for-profit entity, climate-related financial disclosures are a particular form of general purpose financial report that provides information about the reporting entity's climate-related risks and opportunities that could reasonably be expected to affect the entity's cash flows, access to finance or cost of capital over the short, medium or long term, including information about the entity's governance, strategy and risk management in relation to those risks and opportunities, and related metrics and targets.
Consolidation	Aggregation of GHG emissions data from separate operations that form part of one entity or group of entities.
CO2-e (CO2 equivalent)	The universal unit of measurement to indicate the global warming potential of each GHG, expressed in terms of the global warming potential of one unit of carbon dioxide. This unit is used to evaluate releasing (or avoiding releasing) different GHG against a common basis.
Direct emissions	Emissions from sources that are controlled by the reporting entity.
Emission factor	A factor allowing GHG emissions to be estimated from a unit of available activity data and absolute GHG emissions.
Entity boundary (organisational boundary)	The boundary that determines the operations controlled by the reporting entity (organisation), using the operational control consolidation approach.
GHG Protocol	A globally recognised framework that provides standards, guidance, and tools for entities to consistently measure, manage, and report GHG emissions. It sets out best practices for identifying emissions sources, selecting appropriate accounting boundaries, and calculating and disclosing emissions across value chains. Where this Guide has adopted concepts or definitions from the GHG protocol, the term organisation has been substituted for the term entity to align with NSW Government terminology.
Global warming potential (GWP)	A factor describing the radiative forcing impact (degree of harm to the atmosphere) of one unit of a given GHG relative to one unit of CO ₂ .

Term	Definition
	In simpler terms GWP is a measure of how much heat a GHG traps in the atmosphere over a specific time period, relative to CO ₂ .
Greenhouse gases (GHGs)	 The seven GHGs listed in the GHG Protocol: carbon dioxide (CO₂) methane (CH₄) nitrous oxide (N₂O) hydrofluorocarbons (HFCs) perfluorocarbons (PFCs) sulphur hexafluoride (SF₆) nitrogen fluoride (NF₃) This list includes the six GHG in the Kyoto Protocol and nitrogen fluoride.
Gross GHG emissions	The total amount of GHG emissions released into the atmosphere by an entity before accounting for any removals or offsets. This includes all scope 1 and scope 2 emissions and where applicable, scope 3.
Inventory	A quantified list of an entity's GHG emission sources and associated emissions.
Indirect emissions	Emissions that are a consequence of the activities of an entity but occur at sources controlled by another government entity or private companies.
Location-based method (for scope 2 accounting)	The calculation of scope 2 GHG emissions based on the average emission factors of the local or regional electricity grid where consumption occurs. Location-based emission factors are available in Australia per state or territory, or part thereof for WA and the NT.
Machinery of government (MOG)	The entity structures, processes, and systems through which governments are arranged and operate to deliver policies, programs, and services.
Market-based method (for scope 2 accounting)	The calculation of scope 2 GHG emissions using emissions factors specific to the electricity contractually purchased by an entity.
National Greenhouse Energy and Reporting Scheme	 For the purposes of this Guide, NGER Scheme legislation refers to: The National Greenhouse and Energy Reporting Act 2007 The National Greenhouse and Energy Reporting Regulations 2008

Term	Definition	
(NGERS) legislation	The National Greenhouse and Energy Reporting (Measurement) Determination 2008.	
Net GHG emissions	The total GHG emissions released by an entity, minus carbon removals or offsets purchased.	
Net Zero Government Operations Policy (NZGO)	NSW Government policy to encourage NSW Government agencies to reduce their greenhouse gas emissions and contribute to the state's legislated emissions reductions targets.	
Operational control	Where an entity has full authority to introduce and implement its own operating policies for its facilities or operations.	
Operational boundary	The boundaries that define the direct and indirect emissions that are associated with the operations controlled by the reporting entity. This allows an entity to determine which activities cause direct and indirect emissions, and to decide which indirect emissions to include in reporting.	
Scope 1 greenhouse gas emissions	Direct GHG emissions. For example, emissions from sources that are controlled by the reporting entity.	
Scope 2 greenhouse gas emissions	Indirect GHG emissions from the generation of purchased or acquired electricity, steam, heating, or cooling consumed by the reporting entity. Purchased and acquired electricity is electricity that is purchased or brought into an entity's boundary. Scope 2 GHG emissions physically occur at the facility where electricity is generated.	
Scope 3 greenhouse gas emissions	Indirect GHG emissions other than those covered in scope 2 GHG emissions. These emissions occur in the value chain of the reporting entity and include upstream and downstream emissions.	
TPG24-33 (Reporting framework for first year climate- related financial disclosures)	NSW Government's reporting framework that sets out the minimum requirements for the first year of mandatory climate-related financial disclosures for a NSW Government entity with reporting obligations.	

Term	Definition
Undue cost or effort	As defined under TPG24-33 an assessment of what constitutes undue cost and effort depends on the entity's circumstances. This assessment requires a balanced consideration of the costs and effort required to prepare the scope 1 & 2 GHG emissions disclosure under TPG24-33's metrics and target pillar and for Action 1 of the Net Zero Government Operations Policy, and the benefits to users of the disclosure. This assessment is likely to change over time as circumstances and capability change. Relevant factors include:
	 resource constraints where the cost of investing in and operating the systems and processes needed to enable GHG emissions reporting is higher for some entities data availability where high-quality external data is less available for some parts of the disclosure specialist availability where skills or expertise are less available to some entities.

3 Guidance

This chapter outlines how NSW Government entities must measure and report their GHG emissions for climate-related disclosure reporting under TPG24-33 and the Net Zero Government Operations Policy. Following this guidance will support consistency in reporting and support the aggregation of the NSW State Government's whole-of-government operations emissions data. The aggregated GHG emissions data from all the reporting entities would represent the GHG emissions from the NSW State Government, not the entire NSW economy.



Figure 2 Overview of guidance steps

An entity's GHG emissions boundary is formed by first establishing its entity boundary (Section 3.1) and then determining the operational boundary (Section 3.2). You may consider whether the emissions are relevant and exclude any greenhouse gas sources that aren't. (Section 0).

For the emission sources included within the GHG emission boundary, the entity must then source relevant activity data and corresponding emission factors to calculate the related GHG emissions (Section 3.4). These must be reported within or alongside annual reports to meet disclosure obligations under TPG24-33 and the Net Zero Government Operations Policy (Section 3.5).

As part of the reporting cycle, entities are encouraged to monitor and review their GHG inventory to enable refinements and improvements of their GHG accounting and reporting over time (Section 3.7).

3.1 Step 1 – Establish entity boundary



Step 1 establishes how an entity should define its boundary for GHG accounting and reporting purposes

There is a wide variety of structures among the NSW Government reporting entities. Some structures may involve agencies, divisions, subsidiaries and joint ventures. The entity may also change over time due to machinery of government (MOG) changes.

The reporting entity must align its GHG reporting boundary with its climate-related disclosure reporting boundary. This will be disclosed as part of annual reporting information under TPG23-10 NSW Treasury Policy and Guidelines – Annual Reporting Requirements. TPG23-10 refers to a 'reporting GSF Agency' as being defined in the *Government Sector Finance Act 2018*.

Reporting entities must also adopt an 'operational control' approach to consolidate their GHG emissions from separate operations within their entity⁴.

3.1.1 Operational control

Under an operational control consolidation approach, an entity accounts for 100% of the GHG emissions from operations over which it has operational control. The entity does not account for GHG emissions from operations it does not control. An entity is considered to have operational control over an operation if it — or one of its subsidiaries — has the authority to introduce and implement operating policies. For example, Occupational Health and Safety Policy. It does not necessarily mean that the entity has authority to make all decisions concerning the operation without consulting other entities³.

The operational control consolidation approach is first applied at the entity level and then repeated for each lower operational level, such as subsidiaries and divisions. As part of the accounting process, GHG emissions are first allocated at the lowest operational level before being consolidated at higher entity levels.

⁴ While the GHG Protocol permits two other approaches (equity share and financial control), the operational control approach is recommended to most accurately reflect emissions for public sector organisations. Moreover, a consistent consolidation approach for all NSW Government entities reduces the risk of unaccounted or double counting of emissions that may occur when approaches are mixed.

Greenhouse gas emissions accounting and reporting guidelines

Shared operations

Where there are shared operations or joint ventures, reporting entities should liaise with each other to ensure that only one entity has operational control for that operation. This ensures the entity will be reporting 100% of its associated emissions. The other entities will exclude this operation from their GHG accounts. This approach ensures that GHG emissions from all operations are captured, without double counting. Refer to Section 3.2.2.1 for guidance on property leases and shared building occupancy.

Example 1 – Establishing a government entity boundary

A government department within a broader portfolio is preparing for its climate-related financial disclosures. The department has six divisions/agencies within it. These divisions/agencies provide a range of services, and they own, operate, and lease a variety of assets which generate GHG emissions.

The department prepares an annual report that includes these divisions and has deemed them to be within its operational control, using the definition provided above. These divisions are therefore considered within the department's entity boundary. The department should report the GHG associated with activities carried out by the divisions/agencies within its climate-related financial disclosure report.

Additional affiliated entities/agencies are within the same broader portfolio of the department. These entities/agencies prepare their own annual reports, and the department does not have operational control over their activities. Therefore, they are not within the department's entity boundary.

3.1.1.1 Machinery of Government (MOG) changes

For reporting entities under TPG24-33, when a MOG change impacts an entity's boundary during the reporting year, the entity responsible for the staff and facilities on 30 June of the reporting period must include and report all the activity data for its operation for that reporting period. The entity that has relinquished the staff or facilities must make the necessary data available to the entity required to report on them. The MOG change should be noted within the GHG reporting for both entities.

3.2 Step 2 – Determine operational boundary



Step 2 consists of identifying emissions, categorising emission scopes, and determining the scope of emissions for accounting and reporting.

Once the entity boundary has been established, the entity determines its operational boundary. Together, these will form the entity's GHG emissions boundary. Determining an operational boundary consists of identifying the potentially relevant emissions sources (Section 3.2.1), classifying them as scope 1, 2, or 3 (Section 3.2.2), and determining the scope of emissions for accounting and reporting (Section 3.2.3).

3.2.1 Identify emissions sources and removals

An entity first identifies what activities it undertakes that result in GHG emissions being produced or removed from the atmosphere. As a minimum, entities are to include activities that:

- **combust fuels**. For example, petrol in cars, natural gas in buildings, diesel in back-up generators, vegetation or crop residues in land management
- **use energy generated by others.** For example, electricity, steam, district heating and cooling
- require the use of GHG. For example, refrigerants in air conditioning systems
- **emit a GHG.** For example, waste processing in landfills or wastewater, enteric fermentation in ruminants. This could include cows or sheep, industrial processing of chemicals or production of certain materials such as cement and ammonia
- **remove carbon from the atmosphere.** For example, carbon sequestration from afforestation, reforestation or improved forest management.

Appendix A – Scope 1 and 2 emission sources provides a more extensive list of emission sources for consideration.

These emission sources align with those outlined in TPG 24-33. The above list has been refined to emission sources typically associated with NSW Government entity operations.

3.2.2 Categorise emissions scopes

After the emission sources have been identified, they must be defined as direct or indirect and categorised as scope 1, 2, or 3 emissions.

GHG emission scopes as defined by the Greenhouse Gas Protocol

Scope 1: Direct GHG emissions that occur from sources that are controlled by an entity⁵1.

Scope 2: Indirect GHG emissions from purchased or acquired electricity, steam, heating or cooling consumed by an entity. Purchased and acquired electricity is electricity that is purchased or otherwise brought into an entity's boundary. Scope 2 GHG emissions physically occur at the facility where electricity is generated.

Scope 3: Indirect GHG emissions other than those covered in scope 2 GHG emissions. These emissions occur in the value chain of an entity and include upstream and downstream emissions. Scope 3 GHG emissions include the Scope 3 categories in the Greenhouse Gas Protocol Corporate Value Chain (Scope 3) Accounting and Reporting Standard (2011).

Carbon removals: Absorption or sequestration of carbon from the atmosphere for long term storage through deliberate human activities.

For more information on the concept of GHG emissions and emission scope categories, refer to Appendix A – Scope 1 and 2 emission sources.

Figure 3 summarises key scope 1, 2 and 3 emission sources. As shown, scope 3 emissions are currently outside the scope of the Guide as these are not currently required to be reported under the Reporting framework for first year climate-related financial disclosures (TPG24-33) or the Net Zero Government Operations Policy.

⁵ The GHG Protocol uses 'owned or controlled' in its definitions of direct and indirect emissions, reflecting that it offers a choice for organisations to adopt either an equity share or a (financial or operational) control consolidation approach. This Guide prescribes the use of the operational control approach for NSW government entities to ensure consistency and allow whole-of-government aggregation. Therefore, 'owned or' has been consistently omitted from the definitions in this Guide to avoid confusion.

Greenhouse gas emissions accounting and reporting guidelines





Figure 3 Scope 1, 2 and 3 emissions (adapted from GHG Protocol – A Corporate Accounting and Reporting Standard)³

3.2.2.1 Leased property assets

Government entities may be involved in one of the following leasing arrangements:

- Leasing a property, such as an office, from another NSW government entity or a third party as a tenant.
- Leasing a property they own to other government entities or to private tenants for commercial or residential purposes.
- Hold a headlease for a tenancy, which it then subleases to one or more entities or private tenants.

Determining whether the emissions associated with the buildings' energy use is scope 1, 2, or 3 will depend on who is deemed to have operational control over the building. The following simplified guidance assists entities in typical situations.

Buildings may have energy submeters installed that measure a subset of building equipment. A common instance in commercial properties is to have submeters that record energy use of the equipment in each tenancy, which the respective tenants operate. This could include lighting, IT equipment, appliances and tenant A/C units. With a whole building meter and/or metering capturing the remainder of the building energy ('base building'), energy use of the building can be divided into tenant energy use and landlord energy use. As a tenant, receiving an electricity invoice with consumption for your tenancy indicates there is submetering in place.

GHGs from the energy use that is in an entity's control is scope 1 or 2. In buildings without energy submetering, the energy use cannot be divided and the associated GHG are considered scope 1 & 2 for the entity operating the asset.

The proposed guidance below first considers whether there is energy submetering in place that distinguishes between tenant and landlord energy use, before determining operational control. Some entities such as Property and Development NSW, acts as an intermediary, with a head lease which it subleases to other entities or private tenants. In these instances, the entity must consider the GHG emissions from both the tenant and the base building energy as Scope 3, whether sub-metered or not.

Scope 3 emissions do not have to be monitored or reported in the first year of climate related disclosures under TPG24-33 or the Net Zero Government Operations Policy.

Separate submetering of base building (landlord) and tenant energy use

If the tenant energy use is separately metered, then this energy use is considered a scope 1 (for fossil fuel combustion) and scope 2 (electricity) emission for the tenant. It is considered a scope 3 emission for the landlord.

Any base building energy is considered a scope 1 and 2 emission for the landlord. It is considered a scope 3 emission for the tenant entity.

Energy use	Tenant	Landlord	Headlease owner (if relevant)
Tenancy energy	Scope 1 & 2	Scope 3	Scope 3
Base building energy	Scope 3	Scope 1 & 2	Scope 3

 Table 2 General guidance on scopes for energy use in leased building assets with submetering capturing tenancy and base building energy use separately

Whole building energy use (no submetering)

If there is no submetering of tenant energy, for example, only whole building energy is metered, then the GHG from this whole building energy use is only considered to be scope 1 and 2 for the tenant entity if it leases the entire building and controls the building systems and operations. If not, it is considered a scope 3 emission for the leasing entity, and a scope 1 and 2 emission for the landlord.

Operational control	Tenant	Landlord	Headlease owner (if relevant)
Tenant operates entire asset	Scope 1 & 2	Scope 3	Scope 3
The landlord operates asset	Scope 3	Scope 1 & 2	Scope 3

Table 3 General guidance on scopes for whole building energy use in leased assets with no submetering to record tenancy and base building energy use separately.

Example 1 - Submetering tenancy and base building energy

An entity leases a tenancy within a building from a landlord. There is submetering that allows separate measurement of tenant and landlord energy use.

The tenant (lessee) sets the operating hours of its tenancy and controls the building systems, such as lighting. In this instance, the tenant is considered to have operational control over the tenancy. The GHG emissions associated with the tenancy's energy use would be the tenant's scope 1 & 2 emissions. For the landlord (lessor), these are considered downstream indirect emissions in the value chain (scope 3).

The landlord (lessor) is considered to have operational control over the equipment metered by the base building (landlord) submeters, and includes the GHG associated with its energy use in its GHG inventory as scope 1 & 2. This would be a scope 3 (upstream leased asset) emission for the leasing tenant entity.

Example 2 – No submetering of tenant and base building energy

An entity subleases a tenancy in a building from Property & Development NSW (PDNSW), which has a head lease with the private sector landlord. There is no submetering of tenant and base building energy. The landlord sets the operating hours and controls of the building systems such as the main air-conditioning system, the lifts, and the lighting in common areas.

The landlord is considered to have operational control over the building, including the whole building energy use in its GHG inventory as a scope 1 & 2 emissions.

PDNSW includes all of the building's energy use in its GHG inventory as a downstream scope 3 emission.

The entity leasing the tenancy includes the whole building energy in its GHG inventory as an upstream scope 3 emission.

Example 3 – Entity (tenant) leases and operates entire asset. No submetering

An entity leases a whole building from Property and Development NSW (PDNSW). The entity operates the facility, including setting the operating hours and controls of the building systems, such as the air conditioning system. There is no submetering that allows separate measurement of tenant and landlord energy use, only whole building energy use data is available. PDNSW has a maintenance contractor to maintain the air-conditioning units and domestic hot water heat pumps.

In this instance, the tenant entity (lessee) is considered to have operational control over the building's operations. Therefore, the emissions associated with the whole building energy use are included in the entity's scope 1 & 2 GHG emissions inventory.

PDNSW includes GHG from the whole building energy use in its GHG inventory as a scope 3 emission and includes the fugitive emissions from the building services equipment's refrigerant leakage in scope 1.

Example 4 – Entity (landlord) leases entire asset to tenants. No base building energy.

An entity leases homes to residential tenants. The tenants have full operational control over their respective homes. There are no common areas or common building services equipment, however, the entity is responsible for maintaining the air-conditioning units for all tenants.

The residential tenants are considered to have operational control over the buildings' operations, and therefore, the emissions associated with the homes' energy use are scope 3 for the entity (lessor). Fugitive emissions from the refrigerants in the air-conditioning systems are scope 1 for the entity, as they are responsible for their maintenance. If the tenant installed and maintained the air-conditioning system, this would be the tenants' scope 1 emissions.

Fugitive refrigerant emissions

Fugitive emissions from refrigerants leaking from building services equipment, such as airconditioning units, chillers, and heat pumps, are considered scope 1 emissions for the entity responsible for their maintenance.

Shared occupancy

Where an entity shares a location with other tenants and does not have submetering that allows division of its resource usage (electricity, natural gas, diesel), the resource use can be divided based on the entity's relative size. The proportion can best be determined using the respective floor area, also known as the Net Lettable Area (NLA). The same apportioning method should be used for all entities sharing that location.

Example 1 – Co-sharing

Two entities share a tenancy floor of 1,000 m² Net Lettable Area, with Entity A leasing 600 m² and Entity B leasing 400 m². The tenancy's electricity use for the whole floor for the reporting year is 30,000 kWh.

Entity A includes 18,000 kWh in its GHG inventory for the year ($60\% \times 30,000$ kWh), while Entity B includes 12,000 kWh (40%).

3.2.2.2 Fleet

Entities must account for the GHG emissions of all the vehicles they operate as part of their operations. There is no distinction in scopes categorisation depending on whether the vehicle is owned or leased by an entity, as the entity is deemed to have operational control over the vehicle in both cases. These fleet emissions are scope 1 emissions. If an entity leases out vehicles, the emissions associated with its energy use are considered a scope 3 downstream emission for them as the lessor.

It is noted that per the current GHG Protocol guidance, the electricity used for electric vehicle (EV) charging is considered a scope 2 emission for an entity if it is providing it as a free service to others. Refer to the examples below.⁶

Emissions from vehicles not operated by the entity are considered scope 3 (indirect) emissions for an entity and therefore do not need to be reported for Net Zero Government Operations Policy or TPG24-33 Reporting framework for first year climate-related financial disclosures. These scope 3 emissions include business travel, employee commuting, transportation and the distribution of purchased or sold goods.

⁶ WRI & WBCSD (2019), <u>Scope 2 Frequently Asked Questions</u>, World Resources Institution, accessed 12 November 2024.

Example 1 - Charging of electric vehicle (EV)

Entity A operates an (owned or leased) electric vehicle, which it charges at a cost at various EV charging stations. The GHG emissions from the electricity are considered scope 2 for Entity A. It is considered scope 3 for the entities that sell the electricity to Entity A.

Example 2 - Electric vehicle charging offered as a free service

Entity A is the landlord of a property that offers electric vehicle charging as a free service to its tenants, either through dedicated EV charging stations or general power outlets. The electricity is purchased and used by the landlord for services it provides to its tenants. This is considered scope 2 for Entity A.

3.2.3 Determine scope emissions for accounting and reporting

For the first year of climate-related financial disclosures under TPG24-33 and reporting on Action 1 of the Net Zero Government Operations Policy, the GHG accounting and reporting is limited to scope 1 and 2. Entities must include all direct emissions and purchased electricity emissions from operations they control.

Under the Net Zero Government Operations Policy, by 30 June 2027 agencies must identify their biggest scope 3 emissions sources and actions to address them. Entities with mature GHG data collection systems may choose to begin identifying, collating data, and reporting on significant scope 3 emission sources now. This will help entities further understand indirect emissions associated with their value chain, particularly where they have a level of control or ability to influence and reduce these emissions. Typical scope 3 emissions sources include employee travel, waste treatment and disposal, or assets operated by third party entities.

3.3 Step 3 – Consider relevance



Step 3 outlines how to identify relevant emissions to ensure that GHG accounting appropriately reflects all significant emissions associated with an entity's operations.

Table 4 outlines emission sources that this Guide considers relevant to NSW Government entities and that therefore must be quantified and reported by all entities as a minimum. All other scope 1 and 2 emission sources identified under Step 2 that are within the entity's operational boundary would also be considered relevant emission sources. Refer to Section 3.1.1 for a definition of operational control. Relevance consideration is mostly applicable to scope 3 emission sources, and further guidance on how to consider relevance for scope 3 emission sources will be provided in future updates of the Guide.

Where data is unavailable, entities must provide an estimate or report the emission sources as non-quantifiable (refer to Section 3.4.1.2).

Scope 1	Scope 2
Fuel used in buildings under an entity's control. For example, natural gas or fuels used in generators. Fuel use in vehicles, equipment and machinery under an entity's control. For example, petrol, diesel and Liquefied	All electricity consumed by buildings, equipment, machinery, or vehicles under the entity's control. This includes off-site usage.
petroleum gas (LPG).	

Table 4 Relevant emissions

3.4 Step 4 – Calculate GHG emissions



Step 4 includes collecting activity data and setting up a GHG inventory, sourcing emissions factors, and quantifying emissions.

The general calculation formula for GHG emissions is:

GHG emissions = activity data × emissions factor × GWP

Note:

- The unit in which the activity is expressed can be freely chosen but it may need to be converted to match the unit for its corresponding emissions factor.
- The global warming potential (GWP) is specific to the GHG and normalises the impact in terms of 'equivalent' CO2 emissions (CO₂-e). Where there are multiple GHGs, the calculated GHGs are to be added in CO2 equivalent.
- The emissions factor may already combine the impacts for all GHG, in which case the formula simplifies to:

GHG (tCO₂-e) = activity data (unit) × emissions factor (tCO₂-e/unit)

3.4.1 Collect activity data and set up GHG inventory

For the emission sources deemed relevant, the first step in calculating the associated GHG emissions is to collate the activity data for the reporting period. Potential sources of emissions are discussed in Section 0. Emission source activity data must be as complete, consistent and accurate as possible for the reporting period. If there are data gaps, entities must follow the guidance in Section 3.4.1.2.

Entities must establish a GHG inventory to collate, analyse, track and manage its GHG emissions over time. A GHG inventory is a quantified list of an entity's GHG emission sources and associated emissions. A typical inventory could be a calculation sheet.

Principles for a robust GHG inventory:

- Has clearly defined emissions sources and its scope, with the data source of the associated activity data recorded in the correct unit of measurement for analysis.
- Includes relevant and up-to-date emission factors detailing the date and the source from which the factors were adopted from.

- Includes methodologies and calculations for estimated emission sources.
- Is transparent and easy to follow to allow for checks, reviews and verifications of data.
- Includes sufficient information to allow modifications to the GHG inventory boundary. For example, noting that the exclusion of an agency's emissions is due to machineryof-government changes.
- Has a reporting section that summarises emissions for reporting in line with relevant reporting requirement. For example, the Reporting Template for GHG emissions in Appendix B Reporting template.
- Allows for comparison to previous years to identify anomalies or data gaps.

Net Zero Accelerator platform

DCCEEW have developed the Net Zero Accelerator platform that can be used by entities as a robust GHG inventory for Scope 1 and 2 emissions. The Net Zero Accelerator draws on data collated through Government Resource Efficiency Policy reporting, which will be replaced by the Net Zero Government Operations Policy. The Net Zero Accelerator will be updated to align with this Guideline and therefore can be used by entities as their GHG inventory if they do not already have one. Please contact

government@environment.nsw.gov.au for further information.

3.4.1.1 Activity data sources

Key corporate activities for some NSW Government entities may fall under a whole-ofgovernment contract, and therefore, the activity data may be sourced from the Centralised Analysis System for Performance of Energy and Resources (CASPER). This may include the following scope 1 & 2 emission sources:

- Electricity use.
- Stationary fuels such as natural gas or diesel.
- LPG consumption.
- Vehicle fuel consumption, such as diesel, petrol, lubricant, via a third-party managed by NSW Procurement.

Entities may have data from additional emission sources. There could also be instances where the whole-of-government contracts do not cover all the activities, such as when an entity owns and operates vehicles. In these situations, entities should gather the relevant data from their internal data sources, such as:

- other environmental data management platforms
- billing information from suppliers

• asset and fleet management systems, either in-house or third-party.

The data collected externally should be consolidated with CASPER data to ensure completeness and accuracy for whole-of-government reporting.

Examples of emission sources and potential sources of activity are listed in Table 5.

Emission Source	Activity data sources
Electricity	 CASPER for whole-of-government contracts Electricity retailer invoices Energy management platform Electricity meters and sub-meters Landlord data National Australian Built Environment Rating System (NABERS) rating certificates
Stationary fuels (natural gas, diesel)	 CASPER for whole-of-government contracts Natural gas retailer invoices Energy management platform Natural gas meters Bulk fuel, LPG and solid fuel supplier invoices Bulk fuel tank gauge readings or manual dipstick readings for diesel generators Landlord data NABERS rating certificates
Vehicle fuels and electricity use	 CASPER for whole-of-government contracts Fuel card providers Travel service providers Lease invoices Bulk fuel purchase invoices Fleet register Vehicle logbooks/odometer readings and average fuel consumption
Refrigerants	 Equipment surveys and standard leakage rates Purchase records Servicing records

 Table 5 Emission sources and potential data sources

3.4.1.2 Data gaps

TPG24-33 introduces the concept of proportionality, where disclosures should be proportionate to the size, prominence, and climate exposure of each entity. This takes into account the costs and benefits associated with the preparation of disclosure statements. The costs and benefits are to be reassessed over time as the entity is likely to have greater access to the data, resources, and expertise necessary to deliver more comprehensive disclosures. In the context of GHG accounting and reporting, entities should aim to report a comprehensive account of their entity's emissions and consider the concept of proportionality.

Gathering accurate or complete data for some activities is not always feasible. To avoid undue costs or efforts, entities should use the following steps outlined in Figure 4 where data collation is not practical for emission sources deemed relevant within its GHG emissions boundary.

Materiality assessment

- Use high level estimation approach of guidance to determine materiality.
- An activity may be deemed immaterial for GHG accounting under this Guide if its emissions are less than 1% of total scope 1 and 2 emissions, and the cumulative sum of immaterial activities is less than 5% (GHG Protocol & Climate Active Carbon Neutral Standard for Organisations, 2020) of scope 1 and 2 emissions.
- If an activity can quickly and confidently be deemed immaterial, its GHG emissions do not need to be reported Any emissions source deemed immaterial should be disclosed.

Prepare estimation

- If the activity is deemed material, then the entity should aim to report an estimate.
- Guidance on how to estimate the GHG emission of an activity due to lack of data (whether fully or partially) is provided in Appendix C.

Report non-quantification

- If it is not practicable, or the process would expend undue costs or efforts, to produce an adequate estimate, then it should be disclosed and noted as a 'non-quantified' emission source when emissions are reported.
- The disclosure should also summarise the steps required to improve data completion and accuracy in future reporting years.

Figure 4 Approach for when an entity has data gaps

Example – high-level calculation

An entity has calculated its emissions from electricity use and natural gas in buildings, and fossil fuels in its vehicles to be 5,000 tCO₂-e. They own and operate a small building with a diesel back-up generator is only used for annual testing. They expect the diesel use to be immaterial.

Its records show they spent \$900 on diesel for this asset. They estimate this corresponds to less than 600 litres of diesel (assuming \$1.5/L), which results in approximately 1.6tCO2-e when combusted (assuming ~2.7 kgCO₂-e per L of diesel combustion). This represents 0.03% of its total GHG footprint and can be confidently deemed immaterial. There is no need to track this **activity data** in future years, unless the diesel generator was operated as emergency power.

3.4.2 Source emission factors

To calculate the GHG emissions for each activity, the activity data must be multiplied by the corresponding emissions factors to calculate the amount of GHGs. The quantities of each GHG must then be multiplied by its Global Warming Potential (GWP) value to normalise its impact into a single unit (kg or tonnes of carbon dioxide equivalent). The scientific estimates of the GWP of the various GHGs, based on a 100-year time horizon, are published by the Intergovernmental Panel on Climate Change (IPCC) in its Assessment Reports. At the time of writing this Guide, the Sixth Assessment Report (AR6) was the latest release representing the most up-to-date estimates.

Section 3.4.2.1 provides guidance on a hierarchy of data sources for emission factors that entities must follow. Generally, the emission factors published in government or industry reports are already expressed in CO₂-equivalent (CO₂-e), and manual conversion using GWPs is not required. Where available, these emission factors must be used, even if they have been developed using GWPs from an earlier IPCC Assessment Report, for example AR5 for emission factors in National Greenhouse Accounts (NGA) Factors 2024.

However, if the emission factor is per greenhouse gas, for example, kgCH₄, its quantity must be multiplied by the latest GWP values to convert it into CO₂-e. Section 3.4.2.2 provides some key GWP values from IPCC AR6 for reference.

3.4.2.1 Emission factors data sources hierarchy

Emissions factors must be sourced in accordance with the following hierarchy. Emissions factors must be the latest available emission factors published at the time of reporting.

Publisher	Source
Australian Government	National Greenhouse Gas Account Factors ⁷ are published annually by the Australian Government's Department of Climate Change, Energy the Environment and Water. Includes emission factors for fuels, electricity, agricultural and industrial processes including refrigerant leakage.
	National Greenhouse and Energy Reporting (Measurement) Determination ⁸ is published annually by the Department of Climate Change, Energy the Environment and Water. Includes emissions factors for combustion of fuels (solid, gaseous, liquid), industrial processes, waste, and electricity.
Domestic or international industry bodies	Other alternative emission factors published by domestic or international industry bodies.

Table 6 Emissions factor hierarchy

3.4.2.2 Common global warming potential values

The GWP of the major GHGs and some of the most common refrigerants are listed in Table 7 in case the emission factors sourced in accordance with the hierarchy in Section 3.4.2.1 are not expressed in CO₂-e. Values for other GHGs and more information can be found in the GHG Protocol's IPCC Global Warming Potential Values document⁹.

Common chemical name or industrial designation	Chemical formula	GWP
Carbon dioxide	CO ₂	1
Methane – non-fossil	CH ₄	27.0
Methane – fossil	CH4	29.8
Nitrous oxide	N ₂ O	273
Nitrogen trifluoride	NF_3	17,400
Sulphur hexafluoride	SF_6	24,300

⁷ DCCEEW (2024), <u>National Greenhouse Accounts Factors</u>, Australian Government, accessed 12 November 2024.

⁸ DCCEEW (2024), <u>Federal Register of Legislation – National Greenhouse and Energy Reporting</u> (Measurement) Determination 2008, Australian Federal Government, accessed 12 November 2024.

⁹ IPCC (2024), <u>IPCC Global Warming Potential Values</u>, International Panel on Climate Change, accessed 12 November 2024.

Common chemical name or industrial designation	Chemical formula	GWP
HFC-32	CH_2F_2	771
HFC-125	CHF ₂ CF ₃	3,740
HFC-134A	CH ₂ FCF ₃	1,530

 Table 7 IPCC AR6 100-year time horizon Global Warming Potential values.

3.4.3 Quantify emissions

Once all activity data and emission factors have been collated, the associated GHG emissions for each emission source are quantified.

The formula to calculate GHG emissions when the emission factor is already expressed in units of CO_2 -equivalent:

GHG (tCO2-e) = activity data (unit) × emissions factor (tCO2-e/unit)

Example 1 – Natural gas combustion emissions

An entity operates a facility that used 900 GJ of natural gas distributed in a pipeline during the reporting period. The emission factor for natural gas combustion in stationary applications can be found in the Australian National Greenhouse Account Factors 2024 report, Table 5, and is 51.53 kgCO₂-e/GJ. The associated scope 1 emissions are calculated to be 46.38 tCO₂-e.

GHG = activity data × emissions factor = 900 GJ × 51.53 kgCO₂-e/GJ = 46,377 kgCO₂-e

Example 2 – Vehicle fuel combustion emissions

An entity leases 50 passenger vehicles and owns and operates 5 large trucks. The emissions associated with its fuel combustion are considered under the entity's operational control and are therefore included in its GHG inventory as scope 1 emissions. The 50 passenger vehicles used a total of 42,000L of diesel during the reporting year. The five trucks used a total of 125,000L of diesel.

The emission factors for diesel combustion as a transport fuel can be found in the National Greenhouse Gas Account (NGA) Factors 2024, Table 9.

EF_{car} = 70.41 kgCO₂-e/GJ

 $\text{EF}_{\text{heavy duty vehicle (Euro IV class)}} = 70.37 \ kgCO_2\text{-}e/GJ$

```
Energy content<sub>diesel</sub> = 38.6 GJ/kL
```
NGA 2024 has a combined emissions factor for diesel combustion by multiplying the three relevant greenhouse gases (CO₂, CH₄, and N₂O) by their respective GWPs from the IPCC's fifth assessment report (AR5). As the emissions factors are already converted in a CO₂-e unit, they do not have to be recalculated using the latest IPCC sixth assessment report (AR6). The latest NGA factors for the reporting period should be adopted.

Vehicle type	Diesel use (L)	Energy Content Diesel (GJ/kL)	Energy use (GJ) = diesel use (kL) x energy content (GJ/kL)	Emissions Factor (kgCO2-e/GJ)	Emissions (tCO ₂ -e) = energy use (GJ) x EF (tCO ₂ e/GJ)
Cars	42,000	38.6	1,621.2	70.41	114.1
Trucks	125,000	38.6	4,825.0	70.37	339.5
Total	167,000	38.6	6,446.2	n/a	453.7

The associated emissions are calculated in the table below.

3.4.3.1 Scope 2 electricity emissions – calculation approaches

All entities must report their electricity-related emissions using the location-based approach. If desired, entities may choose to also disclose their scope 2 electricity emissions using the market-based approach.

Location-based approach

To calculate scope 2 electricity emissions using a location-based approach, the total electricity use imported from the grid must be multiplied by the grid electricity emission factor for NSW for the reporting period.

Abbreviation	Unit	Description
GHG	tCO ₂ -e	Tonnes of CO ₂ -e scope 2 emissions determined using
		the location-based approach.
Qgrid electricity	MWh	Quantity of grid electricity procured or acquired and
		consumed.
EF2	tCO ₂ -e/MWh	The scope 2 emission factor for the state of New
	(=kgCO ₂ -e/kWh)	South Wales during the reporting year, in kilograms of
		CO ₂ -e per kilowatt hour (or tCO ₂ -e per megawatt hour),
		as per Table 8.

GHG emissions (tCO₂-e) = $Q_{grid electricity} \times EF2$

Under a location-based approach, organisations cannot claim emission reduction benefits for electricity they generate on-site, nor for renewable electricity purchased from off-site sources.

Entities must use the emissions factors published in the latest annual National Greenhouse Account Factors document applicable to their reporting period. Table **8** provides a summary of recent location-based emissions factors for NSW.

NGA provides the grid electricity emission factors per financial year, which are aligned with most entities' reporting periods. If an entity must report per calendar year, they should collate electricity use data per 6-month period and multiply each total by the emission factor for that financial year, as published in the NGA Factors reports. If only annual figures are available, entities should apply an emissions factor that is the average for the two financial years covered by the calendar year, e.g., the 2025 calendar year includes parts of the 24/25 and 25/56 financial years

Australian NGA Factors issue	2022	2023	2024
Applicable period	FY2022-23	FY2023-24	FY2024-25
NSW - Scope 2 emissions factor (kgCO ₂ -e/kWh = tCO ₂ -e/MWh)	0.73	0.68	0.66

 Table 8 Indirect location-based scope 2 emission factors from the consumption of purchased or acquired electricity

Scope 3 emissions associated with grid electricity, such as mining of the fuels, transmission and distribution losses, do not have to be reported. Only the scope 2 component of electricity generation must be accounted for in calculations.

Example 1 - location-based scope 2 emissions. Financial year reporting period

An entity used 2,000 MWh for the reporting year 1 July 2023 – 30 June 2024. The National Greenhouse Accounts emissions factor for NSW for the 2023-24 financial year is 0.68 kgCO₂-e/kWh (or 0.68 tCO₂-e per MWh).

GHG = activity data × emissions factor = 2,000 MWh × 0.68 tCO₂-e/MWh = 1,360 tCO₂-e

Example 2 – location-based scope 2 emissions. Calendar year reporting period

An entity that has a mandated calendar year reporting period uses 2,000 MWh for the reporting year 1 January 2023 – 31 December 2023, of which 1,100 MWh is used between January and June 2023 and 900 MWh is used between July and December 2023. The National Greenhouse Accounts emissions factor for NSW for the 2022-23 and 2023-24

financial years are 0.73 and 0.68 kgCO₂-e/kW respectively. The location-based electricity emissions are therefore 1,415 tCO₂-e during the CY23 reporting period.

GHG = activity data × emissions factor = 1,100 MWh × 0.73 tCO₂-e/MWh + 900 MWh × 0.68 tCO₂-e/MWh = 1,415 tCO²-e

Market-based approach (optional)

Entities may also decide to report their scope 2 emissions using the market-based approach, which considers the impact of electricity procurement choices on their emissions. This method provides entities with an alternative perspective on the indirect emissions from their electricity use. This contrasts with the location-based approach, which dictates the same emission factor for all entities in NSW irrespective of whether the entity procures renewable electricity or not. Additionally, the market-based approach can incentivise the procurement of off-site renewable electricity by acknowledging its benefit in reducing overall emissions. Refer to Appendix D – Optional market-based scope 2 emissions for a methodology for this approach.

3.4.3.2 Land use, land use change, and forestry

Land use, land use change and forestry (LULUCF) activities can release GHG emissions. These activities may include deforestation, land clearing, agricultural land management practices, enteric fermentation in livestock, soil erosion, drainage and degradation of wetlands and peatlands.

The quantification of LULUCF emission sources is a complex and evolving area with several organisations developing guidance material. Entities that consider LULUCF emissions relevant and material should include these within their emissions boundary and quantify and report these where feasible. These entities must use a reputable scientific methodology developed by a domestic or international government or industry body, such as:

- National Greenhouse Gas Inventory methodologies and associated tools such as Full Carbon Accounting Model (FullCAM)¹⁰, DCCEEW
- Land Use and Land Use Change and Forestry Technical Guidance¹¹, IPPC

¹⁰ DCCEEW (2024), <u>Tracking and reporting greenhouse gas emissions</u>, Australian Federal Government, accessed 12 November 2024.

¹¹ IPCC (2003), <u>Good Practice Guidance for Land Use</u>, <u>Land-Use Change and Forestry</u>, International Panel on Climate Change, accessed 12 November 2024.

Greenhouse gas emissions accounting and reporting guidelines

- Greenhouse Gas Protocol Draft Land Sector and Removals Guidance and supporting resources¹², WRI & WBCSD
- Accounting for Natural Climate Solutions Guidance¹³, Quantis.

3.4.3.3 Carbon removals and offsets

Carbon removal refers to human-induced technologies, practices and approaches that remove and store carbon dioxide (CO₂) from the atmosphere¹⁴. Some NSW Government entities may conduct activities that remove GHG emissions from the atmosphere. The most common form of carbon removal is carbon sequestration from afforestation, reforestation or improved forest management. Other forms may include soil carbon sequestration, biochar production from organic waste residue or blue carbon sequestration through the rewetting of coastal areas or coastal revegetation.

Entities that consider carbon removal activities to be relevant and material, may choose to report these within their GHG emissions reporting. Carbon removals can only be reported if they are Australian Carbon Credit Units (ACCU) scheme accredited carbon removal projects. This means the entity must generate and retire carbon offset credits through the ACCU scheme. Entities that have purchased carbon offsets under the ACCU scheme can also report these.

Carbon offsets¹⁵ must be separately reported to gross scope 1 and scope 2 emissions as shown in Appendix B – Reporting template. Offsets can be used to calculate the total net emissions by subtracting them from the absolute gross emissions, which are the sum of all the emissions from GHG sources during the reporting period.

Net GHG emissions = Gross GHG emissions - Carbon offsets

DCCEEW will develop a Carbon Offset Policy for NSW Government agencies in 2025. NSW Treasury is also drafting sector guidance on purchasing carbon credits. When these are published, entities must align with these policy objectives. In the interim, entities that purchase and retire carbon offsets should disclose this information in their annual reporting. Entities should implement all feasible emission reductions before purchasing offsets. Carbon credits

Greenhouse gas emissions accounting and reporting guidelines

¹² WRI & WBCSD (2024), <u>Greenhouse Gas Protocol Land Sector and Removals Initiative</u>, World Resources Institute, accessed 12 November 2024.

¹³ Quantis (2019), <u>Accounting for Natural Climate Solutions</u>, BCG, accessed 12 November 2024.

¹⁴ IPCC (2022), <u>Carbon Dioxide Removal Factsheet</u>, International Panel on Climate Change, accessed 12 November 2024.

¹⁵ Carbon offsets includes carbon removal projects where carbon offset credits have been generated and retired by the entity through the ACCU scheme and carbon credits purchased through the ACCU scheme.

that can be claimed must be limited to ACCU issued by the Clean Energy Regulator. ACCU's should be purchased in the following hierarchy:

- ACCUs from projects within NSW.
- ACCUs from projects outside NSW.

ACCUs from projects within NSW should be prioritised. Price may be used as a consideration to justify the purchase of ACCUs from projects outside NSW.

3.5 Step 5 – Report emissions



Step 5 outlines the minimum reporting requirements for consistent reporting across NSW Government entities.

Scope 1 and 2 GHG emissions must be reported annually. Entities must report emissions at the consolidated entity level within their annual reports in accordance with TPG24-33 Reporting framework for first year climate-related financial disclosures and at the agency level as required under the Net Zero Government Operations Policy. GHG emissions data and associated information are to be reported in line with the reporting template provided in Appendix B – Reporting template for consistency across NSW Government entities. Entities can either use this template or reproduce this template in an alternative format, such as Excel. However, this must incorporate all content included within this template.

The TPG24-33 Reporting framework for first year climate-related financial disclosures acknowledges that the sophistication of climate-related disclosures, including GHG emissions, will evolve. This begins with a foundational level of maturity in the first year of reporting. Entities must report their GHG emissions based on the best available data at the time of reporting and disclose any limitations and planned steps, such as related timeframes. This will help improve completeness, transparency and accuracy of reporting.

GHG emissions reporting should cover at minimum:

- Qualitative information about the entity's emissions boundary, methodologies and sources of emission factors adopted. This includes disclosure of quantified and non-quantified emission sources, and any emissions excluded from the entity's boundary.
- Quantitative emissions data in metric tonnes of CO₂-e for each emission source in accordance with the breakdown provided in Appendix B – Reporting template. Scope 2 emissions must be reported using a location-based approach.
- How the entity intends to improve completeness and accuracy in the future, where relevant.
- Information on an entity's GHG emissions metrics and targets or commentary on how the entity intends to contribute to the NSW Government's net zero emissions target under the *Climate Change Act 2023*.

3.6 Step 6 – Monitor and review



Step 6 consists of the tracking, ongoing annual reporting, and monitoring of an entity's GHG emissions in the effort to continually improve the GHG inventory.

3.6.1 Tracking of emissions

Entities must track their emissions over time and document whether changes are due to:

- changes in entity or operational boundary
- inclusion of previous unquantified data
- changes in quantification or estimation methodologies or enhancement in data accuracy
- the implementation of emission reduction interventions. For example, efficiency improvements, electrification of assets, procurement of renewable energy
- economic or government changes that have resulted in reduced resource demand or emissions intensity, e.g., decarbonisation of the electricity grid, or pandemic.

In accordance with TPG24-33, entities that have established emission reduction targets must define a base year to track performance against and report progress against these targets in line with the Reporting Template in Appendix B. Agencies reporting their annual GHG emissions under the Net Zero Operations Policy must use 2018-19 as their baseline year, as outlined in the policy.

Entities that have not set emission reduction targets must disclose their efforts in contributing to NSW Government net zero emissions targets under the *Climate Change (Net Zero Future) Act 2023*, and other relevant government policies and commitments in line with the Reporting Template in Appendix B – Reporting template.

Agencies reporting against the Net Zero Operations Policy must consider their unique emissions profiles and operational considerations. Agencies must aim to achieve a reduction in scope 1 and scope 2 emissions to contribute to the following whole-of-government targets:

- 50% reduction by 2030.
- 70% reduction by 2035.
- Net zero by 2050.

3.6.2 Continual improvement of greenhouse gas inventory

GHG accounting and reporting should become increasingly sophisticated as the maturity and capability of entities develop. Entities are expected to progressively enhance their understanding of GHG emissions accounting and reporting. This should see a maturity in how entities accurately measure, monitor, report and reduce their emissions over time without undue cost or effort.

Entities should seek to continually improve the completeness, transparency and accuracy of their GHG inventory over time. Mechanisms to optimise the efficiency of data collection should be identified and implemented. Purpose-built tools such as DCCEEW's Net Zero Accelerator platform will improve GHG inventory management of scope 1 and 2 emissions for entities.

When annual reporting is complete, entities should:

- identify opportunities to gather activity data for relevant and material emission sources that were non-quantified or estimated.
- develop approaches to estimate non-quantified relevant and material emissions for future annual reporting.
- consider knowledge sharing and collaboration opportunities with entities who have similar emission sources. This will support completeness, transparency, and accuracy.

3.6.3 Annual reporting

Entities should review and update their GHG inventory annually in the lead up to annual reporting. This will help agencies:

- identify additional emission sources from new entity activities or MOG changes
- update emission factors, as required
- address any updates that may have occurred to this Guide or associated policies
- collate annual emission data
- include any additional data sets that are now available.

3.6.4 Future updates to this Guide

This Guide may be reviewed and updated periodically to enhance accounting and reporting requirements as entities' maturity increases over time. Any future good practice emissions accounting approaches will also be incorporated into updates of this Guide.

Entities may be required to report material scope 3 emissions in the future. This Guide will be updated to provide further guidance if required.

Appendix A – Scope 1 and 2 emission sources

Background information on GHG Protocol emissions categorisations (scopes)

This section provides a brief overview of the GHG Protocol's categorisation of GHG emissions. The GHG Protocol covers the greenhouse gases recognised under the UNFCC / Kyoto Protocol. Additional GHGs, such as CFC, NOx, should not be included in the GHG inventory's scopes (1,2, or 3). If they are material for an entity's GHG footprint, this should be stated in the entity's GHG reporting and these GHG should be reported separately, not within the GHG scopes.

Greenhouse gases covered by the Kyoto Protocol

- **Carbon dioxide (CO₂):** A naturally occurring gas, also a byproduct of burning fossil fuels and biomass, land-use changes and other industrial processes.
- Methane (CH₄): Emitted during the production and transport of coal, oil, and natural gas, as well as from livestock and other agricultural practices and by the decay of organic waste in municipal solid waste landfills.
- Nitrous oxide (N₂O): Emitted from agricultural and industrial activities, as well as during combustion of fossil fuels and solid waste.
- **Hydrofluorocarbons (HFCs):** Synthetic gases used in a variety of industrial applications, including refrigeration and air conditioning.
- **Perfluorocarbons (PFCs):** Synthetic gases used in industrial applications, including semiconductor manufacturing.
- Sulphur hexafluoride (SF₆): A synthetic gas used primarily in electrical transmission and distribution systems.
- Nitrogen trifluoride (NF₃): A synthetic gas used in manufacturing of electronics.

The different greenhouse gases vary in their effect on global warming. Global Warming Potential (GWP) is a measure used to compare the impact of different GHG on global warming. It quantifies the amount of heat a GHG traps in the atmosphere relative to carbon dioxide (CO₂), over a specific period, typically 20, 100, or 500 years. This allows for the expression of various GHGs in terms of CO₂ equivalents (CO₂-e), making it easier to compare their effects. For example, methane (CH₄) has a GWP of circa 28 over 100 years, meaning it is about 28 times more effective at trapping heat than CO₂. By converting all GHG emissions to CO₂-e, their contributions to climate change can be better understood and managed. This standardised approach helps in setting regulatory policies and tracking progress in the reduction of overall GHG emissions.

To assist entities with the effective management of their GHG emissions and provide insight, the GHG Protocol has defined GHG emissions sources in three distinct 'scopes'. These scopes cover direct and indirect emissions. Direct and indirect emissions are defined as follows:

Direct: GHG emissions from sources that are controlled by an entity¹⁶. For example, fuel combusted in a boiler, furnace or vehicle under the entity's control.

Indirect: GHG emissions that are a consequence of the activities of an entity but occur at sources controlled by another government entity, private organisation or third party. For example, electricity consumed by an entity; however, the emissions occur and are in the control of the facility where the electricity is generated.

The three emission scope categories include:

Scope 1: Direct GHG emissions that occur from sources controlled by an entity.

Scope 2: Indirect GHG emissions from the generation of purchased or acquired electricity, steam, heating or cooling consumed by an entity. Purchased and acquired electricity is electricity that is purchased or otherwise brought into an entity's boundary. Scope 2 GHG emissions physically occur at the facility where electricity is generated.

Scope 3: Indirect GHG emissions other than those covered in scope 2 GHG emissions. These emissions occur in the value chain of an entity and include upstream and downstream emissions. Scope 3 GHG emissions include the Scope 3 categories in the Greenhouse Gas Protocol Corporate Value Chain (Scope 3) Accounting and Reporting Standard (2011).

Carbon removals: Absorption or sequestration of GHG from the atmosphere for long-term storage through deliberate human activities.

¹⁶ The GHG Protocol uses *'owned or controlled'* in its definitions of direct and indirect emissions, reflecting that it offers a choice for organisations to adopt either an equity share or a (financial or operational) control consolidation approach. This Guide prescribes the use of the operational control approach for NSW government entities to ensure consistency and allow whole-of-government aggregation. Therefore, *'owned or'* has been consistently omitted from the definitions in this Guide to avoid confusion.

Greenhouse gas emissions accounting and reporting guidelines

All reporting entities within the NSW Government must use the same consolidation approach, operational control. Therefore, the emissions associated with each activity will not be considered a scope 1 emission by multiple entities. Similarly, the definition of scope 2 emissions does not allow multiple entities to consider the same purchased electricity as a scope 2 emission. It is noted that one entity's scope 2 emissions will be a scope 1 emission for the entities/ organisations generating the power, however, this is not considered double counting under the GHG Protocol's Corporate Accounting and Reporting Standard.

Scope 1 emissions

The following activities are examples of potential scope 1 emission sources for your entity where it controls the operation. They are listed for consideration as part of Step 2 – Identify emissions sources and removals (Section 3.2.1).

Scope 1 emissions sources	Examples
Relevant scope 1 emissions sources	
Fuels combusted in buildings	Natural gas for space heating, domestic hot water generation, or co-generation.
	Diesel use for a back-up generator.
Fuels combusted in vehicles	Diesel, petrol, LPG, E10 in vehicles.
Other scope 1 emissions sources	
Refrigerants in air-conditioning systems in buildings	Refrigerants in air conditioning systems (chillers, split systems, VRF/VRV).
Refrigerants in air-conditioning systems in vehicles	Coolant in cars.
Fuels combusted in plant and equipment	Diesel use for cranes.
Wastewater treatment	Breaking down organic matter (methane). Removal of excess nutrients from the water (nitrous oxide).
Land use, land use change and forestry (LULUCF)	Deforestation, land clearing, agricultural land management practices, soil erosion, drainage and degradation of wetlands and peatlands.

Table A-1 Scope 1 emissions

Scope 1 emissions sources	Examples
Enteric fermentation in ruminants (likely N/A for most entities)	Livestock such as cattle and sheep (methane).
Waste processing in landfills (likely N/A)	Anaerobic decomposition of organic matter in landfills (methane). Flaring of methane in landfills (carbon dioxide).
Industrial processing of chemicals or certain materials (likely N/A)	Production of cement (carbon dioxide). Production of ammonia (carbon dioxide).
Fossil fuel mining (likely N/A)	Such as coal mining (fugitive methane emissions)

Scope 2 emissions

The following activities may be scope 2 emissions sources for an entity where it controls the operation, but the energy is generated by others. They are listed for consideration as part of Step 2 – Identify emissions sources and removals (Section 3.2.1).

Scope 2 emissions sources	Examples			
Relevant scope 2 emissions sources				
Electricity use in buildings	Grid electricity for use in active building systems, such as lighting, lifts, air-conditioning systems, ventilation. Appliances and equipment, such as computers and fridges.			
Electricity use in vehicles	Grid electricity to charge electric vehicles and hybrids with external charging, known as plug-in hybrids. Does not include electricity use from regenerative braking.			
Other scope 2 emissions sources				
District heating and cooling in buildings	District heating for buildings.			
Steam or heat in equipment	Steam sterilisation of medical devices.			

Table A-2 Scope 2 emissions

Appendix B – Greenhouse Gas Reporting Template

This Greenhouse Gas Emissions Reporting Template is designed for use by NSW Government entities to report their scope 1 and scope 2 greenhouse gas (GHG) emissions. The template is associated with the NSW Government Greenhouse Gas Emissions Accounting and Reporting Guidelines to ensure consistency and transparency in emissions reporting across all NSW Government entities. Entities must include the content of this template as part of their climate-related disclosures under the NSW Treasury Policy and Guidelines – Annual Reporting Requirements TPG24-23 as well as for reporting under Net Zero Government Operations Policy. Entities can either use this template, or reproduce this template in an alternative format, such as excel, however this must include all content included within this template. If an entity undertakes annual reporting on a calendar year basis, users of the template can replace the term financial year with calendar year.

1. Organisational information

Entity name	[Entity name]
Agencies and divisions	[Agencies and divisions included within the entities reporting boundary]
Reporting period	E.g., FY [insert Financial Year] – from 1 July [insert year] to 30 June [insert year] or Calendar Year [insert Calendar Year] – from 1 Jan [insert year] to 31 Dec [insert year]

2. Emissions boundary

List emission source categories that are included in the emissions boundary and either quantified, non-quantified, and sources that are excluded. Refer to the NSW Government Greenhouse Gas Emissions Accounting and Reporting Guidelines for definitions and further guidance. Where partial data sets for emission source categories have been adopted, provide commentary in the table below of the estimated percentage of emission source category that is quantified, estimated or non-quantified.

Included in emissions boundary	Included in emissions boundary	Excluded from boundary
Quantified	Non-quantified	Outside boundary or not relevant
 [List all quantified emission source categories e.g.: Stationary energy Vehicle fuels Electricity Refrigerants Wastewater fugitive emissions Water reservoir fugitive emissions Enteric fermentation in ruminants Other] 	[List all relevant non-quantified emission source categories]	[List any excluded emission source categories]

Justification for non-quantification or exclusions

[Provide justification for non-quantified or excluded emissions. Including materiality thresholds adopted]

3.Emission calculation methodologies/guidance and emission factors

Provide calculation methodology and source of emission factors adopted.

Calculation methodology/guidance adopted

Select relevant methodology adopted. More than one box can be selected.

- □ NSW Government Greenhouse Gas Accounting and Reporting Guidelines (GHG Protocol)
- □ National Greenhouse Gas and Energy Reporting Scheme (NGERS)
- □ Other [Description of methodology adopted]

Further commentary on the different methodologies under NGERS or the use of a combination (optional)

[Provide further commentary]

Source of emission factors

[List source of emission factors used – e.g., National Greenhouse Accounts (NGA) Factors, National Greenhouse and Energy Reporting Scheme (NGERS) etc]

4. Emissions reporting

Provide a summary of emissions by the following categories. Refer to the NSW Government Greenhouse Gas Emissions Accounting and Reporting Guidelines for guidance on the identification, measurement of emission sources.

Where entities have retired carbon offsets, these can be included in the table below and deducted from the gross emissions to inform the entities net GHG emissions.

Emissions category	Reporting period emissions (tCO ₂₋ e)				
Scope 1 emissions					
Stationary energy combustion					
Natural gas	[Emissions in tCO2e]				
Diesel	[Emissions in tCO2e]				
LPG	[Emissions in tCO2e]				
Vehicle fuels (including mobile plant and equipment)					
Diesel	[Emissions in tCO2e]				
Petrol	[Emissions in tCO2e]				
LPG	[Emissions in tCO2e]				
Other emission sources (where deemed relevant and material)					
Refrigerants (stationery and vehicles)	[Emissions in tCO2e]				
Wastewater treatment (fugitive emissions)	[Emissions in tCO2e]				
Land use, land use change and forestry (LULUCF)	[Emissions in tCO2e]				
Other (add rows as needed)	[Emissions in tCO2e]				

Emissions category	Reporting period emissions (tCO ₂ .e)
Total Scope 1 Emissions	[Emissions in tCO2e]
Scope 2 emissions (Location based)	
Purchased Electricity (e.g, assets, electric vehicles)	[Emissions in tCO2e]
Other (add rows as needed)	[Emissions in tCO2e]
Total scope 2 emissions (Location based)	[Emissions in tCO2e]
Absolute gross scope 1, Scope 2 emissions	[Emissions in tCO2e]
Carbon offsets (if applicable)	[Emissions in tCO2e]
Net total GHG emissions (Scope 1, Scope 2 less offsets)	[Emissions in tCO2e]

Commentary on emissions data and results (optional)

[Include commentary on completeness, consistency, transparency and accuracy of emissions data and results provided in the tables above such as data availability gaps, estimations methodology etc. Outline how you intend to improve completeness and accuracy in the future]

Comparison to previous years and base year

Provide breakdown of previous reporting year summary. For entities measuring and reporting emissions data for the first time in FY25 the base year will be FY25 and there will be no previous reporting period.

	Base year (FY [insert year])	Previous reporting period (FY [<i>insert</i> year])	This reporting period (FY [insert year])	Percentage change from base year to current reporting period (%)
Total scope 1	[Emissions in tCO2e]	[Emissions in tCO2e]	[Emissions in tCO2e]	[%]
Total scope 2	[Emissions in tCO2e]	[Emissions in tCO2e]	[Emissions in tCO2e]	[%]

	Base year (FY [insert year])	Previous reporting period (FY [<i>insert</i> year])	This reporting period (FY [<i>insert</i> year])	Percentage change from base year to current reporting period (%)
Absolute gross scope 1, scope 2 emissions	[Emissions in tCO2e]	[Emissions in tCO2e]	[Emissions in tCO2e]	[%]
Carbon offsets (if applicable)	[Emissions in tCO2e]	[Emissions in tCO2e]	[Emissions in tCO2e]	[%]
Net total GHG emissions (Scope 1, Scope 2 less offsets)	[Emissions in tCO2e]	[Emissions in tCO2e]	[Emissions in tCO2e]	[%]

Commentary on comparison to previous reporting period (optional)

[Include any commentary in relation to explanation of significant changes from previous reporting periods – e.g., MOG changes, improvement in accuracy/ completeness of data].

5.Optional reporting

The following section is optional for entities collating additional data and wanting to disclosure this withing their annual reporting.

1.1.1. Market-based approach

Provide a summary of emissions by the following categories when choosing to consider a market-based approach.

Indicator	Electric energy (MWh)	Emission factor	Reporting period emissions (tCO ₂ e)
Behind the meter consumption of electricity generated (optional)	[Energy in MWh]		[Emissions in tCO2e]
Total non-grid electricity	[Energy in MWh]		[Emissions in tCO2e]

Indicator	Electric energy (MWh)	Emission factor	Reporting period emissions (tCO2e)
LRET electricity	[Energy in MWh]		[Emissions in tCO2e]
LGC surrendered minus generated (net) (including GreenPower and PPAs)	[Energy in MWh]		[Emissions in tCO2e]
I-RECS ¹	[Energy in MWh]		[Emissions in tCO2e]
Residual purchased electricity	[Energy in MWh]		[Emissions in tCO2e]
Total grid electricity	[Energy in MWh]		[Emissions in tCO2e]
Total electricity (grid + non grid)	[Energy in MWh]	-	[Emissions in tCO2e]
Absolute gross total scope 1, scope 2 emissions (including all sources)	-	-	[Emissions in tCO2e]
Carbon offsets (if applicable)	-	-	[Emissions in tCO2e]
Net total GHG emissions (scope 1, scope 2 less offsets)	-	-	[Emissions in tCO2e]

1.1.2. Scope 3 emissions

Disclose any additional significant emission sources beyond emission sources defined as scope 1 & 2. Provide a summary of these emission sources in the below table.

Emissions category	Unit	Reporting period emissions	Previous reporting period emissions
[insert]	tCO ₂ e	[Emissions in tCO2e]	[Emissions in tCO2e]
[insert]	tCO ₂ e	[Emissions in tCO2e]	[Emissions in tCO2e]
[insert]	tCO ₂ e	[Emissions in tCO2e]	[Emissions in tCO2e]
[insert]	tCO ₂ e	[Emissions in tCO2e]	[Emissions in tCO2e]
Gross total emissions	tCO ₂ e	[Emissions in tCO2e]	[Emissions in tCO2e]

¹ For pre-purchased existing contracts only

Reason for inclusion

[Outline reason for inclusion e.g., significant emission source which can be influenced by the entity]

1.1.3. Carbon offsets

Disclose retired or purchased eligible carbon credits obtained during the reporting period. Provide a summary in the below table.

Nature or technology based	Carbon reduction or removal	Unit	Reporting period quantity	Percentage of total offsets
e.g. nature-based	e.g. removal	tCO ₂ e	[Offsets in tCO2e]	[%]

Notes on use of carbon offsets

[Outline reason for use of carbon offsets e.g., to meet entity net emissions targets set by the entity]

6.GHG emissions metrics and targets

The following sections correspond to additional commentary required for GHG metrics and targets outlined in TPG24-33 Reporting framework for first year climate-related financial disclosures. The corresponding MT from TPG24-33 is noted in the heading of each table.

1.1.4. Entities with GHG emission metrics and targets

Entities that have developed additional GHG metrics provide the following information

GHG metrics – MT5

[a. How the metric is defined.]

[b. Whether the metric is an absolute measure, a measure expressed in relation to another metric or qualitative measure, such as a red, amber, green (RAG) status.]

[c. Whether the metric is validated by a third party and if so which party.]

[d. The method used to calculate the metric and the inputs to the calculation, including the limitations of the method used and the significant assumptions made.]

Entities with GHG targets provide the following information.

GHG targets – MT6 (a-h) & MT9 (i-l)

[Provide the following details:

[a. The metric used to set the target and to monitor progress towards reaching the target.]

[b. The objective of the target (mitigation, adaptation, or conformance with science-based initiatives).]

[c. The specific quantitative or qualitative target the entity has set or is required to meet.]

[d. The part of the entity to which the target applies (for example, whether the target applies to the entity in its entirety or only a part of the entity, such as a specific business unit or specific geographical region).]

[e. The period over which the target applies.]

[f. The base period from which progress is measured.]

[g. Any milestones and interim targets.]

[h. If the target is quantitative, whether it is an absolute target or an intensity target.]

[i. Which GHGs are covered by the target.]

[j. Whether scope 1 or scope 2 GHG emissions are covered by the target.]

[k. Whether the target is a gross GHG emissions target. If the entity discloses a net GHG emissions target, the entity is also required to separately disclose its associated gross GHG emissions target.]

[l. How the latest international agreement on climate change, including jurisdictional commitments that arise from that agreement, has informed the target.]

Approach to setting, reviewing and monitoring progress – MT7

[Provide the following details:

[a. Whether the target and methodology for setting the target has been validated by a third party.]

- [b. The entity's processes for reviewing the target.]
- [c. The metrics used to monitor progress towards reaching the target.]
- [d. Any revisions to the target and an explanation for those revisions.]

Performance against GHG targets – MT8

[Provide details about performance against each GHG target and an analysis of trends or changes in the entity's performance.]

Planned use of carbon offsets – MT9 cont.

[Outline planned use of carbon offsets to meet GHG emissions targets including:].

[a. the extent to which, and how, achieving any net GHG emissions target relies on the use of carbon credits.]

[b. which third-party scheme(s) will verify or certify the carbon credits.]

[c. the type of carbon credit, including whether the underlying offset will be nature-based or based on technological carbon removals, and whether the underlying offset is achieved through carbon reduction or removal.]

[d. any other factors necessary for users of general-purpose financial reports to understand the credibility and integrity of the carbon credits the entity plans to use (for example, assumptions regarding the permanence of the carbon offset).

1.1.5. Entities without GHG emissions targets

Entities who have not established GHG emissions targets provide the following information

Efforts to contribute to contributing to NSW Government's net zero emissions target under the *Climate Change Act 2023*

[Outline efforts in contributing to NSW Government's net zero emission targets under the Climate Change Act 2023].

Appendix C – Estimation methodologies

This appendix provides guidance on producing estimates where full activity data is unavailable. It first covers the general principles. It then outlines the approaches to follow when developing an estimate where either partial or no activity data is available.

The purpose of estimated emissions is to support completeness when activity data is not available. The estimates should aim to be as accurate as possible, support decision making, and allow for comparison over time. The guidance below intends to assist in meeting these objectives. Where data has been estimated, an acknowledgement of this should be disclosed in the reporting. For partial data gaps, the notes should state what percentage of that emissions source has been estimated.

Estimating emissions from partial activity data

The missing activity data can either be partially incomplete or the data may not exist.

Partial activity data gaps may be temporal, for example, electricity data use is missing for some months in the reporting period. They can also be spatial, for example, electricity use data may be missing for some assets within the entity boundary.

Temporal:

- If the activity use does not vary significantly seasonally, an estimate may be extrapolated from periods of the year where data was available.
- If the activity use has significant seasonal variation, such as air-conditioning electricity use, then an estimate may be made from the same period in a previous reporting year if the operation has not materially changed. If unavailable, then an adjustment factor may be used to account for seasonal variation on an estimate extrapolated from data in the same reporting period.

Spatial:

- If there are comparable activities for that emissions source within the GHG inventory with available activity data, the data may be extrapolated from these activities.
- If no comparable activities with activity data are present in the GHG inventory, an estimate may be produced using industry average data.

Example 1 - missing periods with consistent use

The electricity use for external lighting is missing for the last quarter of the reporting year. It is on average 840kWh per month and consistently between 800 to 900 kWh/month for the months with data available. The estimated electricity use for the last quarter is 840kWh/month x 3 months = 2,520kWh for the last quarter. 25% of the emissions are therefore estimated.

Example 2 – missing periods with variable use

The gas use for the domestic hot water units is missing for June. There were no system changes since last year, so the gas use for June in the preceding reporting year is the most appropriate to use due to the seasonal variability of hot water demand. If this is not available, then the gas use could be interpolated based on the usage in May and in July of the reporting year. For example, if the usage was 40 GJ in May and 48 GJ in July, then the June usage may be estimated as 44 GJ.

Example 3 – missing usage for source with comparable activities

The electricity use is known for $20,000m^2$ of Net Lettable Area of office space and totals 2,000 MWh per year. For one office of $160m^2$ NLA the electricity use is unknown. Its annual electricity use may be estimated using the intensity for the other offices. Emissions intensity for office space = 2,000 MWh p.a. / 20,000 m² = 0.1 MWh/m² p.a. Estimated emissions for office space with missing data = $160 m^2 \times 0.1 MWh/m^2$ p.a. = 16 MWh p.a. The estimate is approximately 0.8% of the emissions for this source.

Example 4 – missing usage for source without comparable activities

The entity operates two laboratories for which no data is available. The energy use intensity for this building type will be significantly different from its other operated building assets for which the entity has data. Therefore, the energy use intensity should be gathered from industry average data sources.

Estimating emissions when no data exists

Where there is no data available for a particular emissions source in the GHG inventory, an estimate may be established from industry average data (benchmark) and an appropriate calculation methodology.

Examples – refrigerants

Two examples are provided to estimate emissions for fugitive emissions from refrigerants (HFC gases) in vehicles and in building services equipment. For entities that use equipment with refrigerants, the Greenhouse Gas Protocol stipulates:

• the use of a sales-based approach, if servicing equipment

• lifecycle stage approach, if servicing is contracted out, to calculate the related fugitive emissions¹⁷.

Entities may estimate these emissions based on leakage rates – during assembly, operation, and disposal – to screen the materiality of this emission source.

For the below examples, it is assumed that entities do not have access to refrigerant charge (kg) purchase and service records. Instead, entities can estimate the fugitive emissions using estimated activity data using the refrigerant charge and assumed annual leakage rates, multiplied by corresponding GWP.

tCO2-e = (refrigerant charge (kg) × annual leakage rate (%) × GWP (kgCO2-e/kg refrigerant) 1,000

Relevant methodologies and default assumptions may be sourced from a variety of reputable industry literature or government standards, including AIRAH (Australian Institute for Refrigeration and Heating), NGA Factors, NGER Scheme, and Climate Active. These standards include a method limited to operational (annual) leakage as this is the predominant lifecycle for leakage.

Example 1 - refrigerant fugitive emissions in vehicles

The entity leases 50 passenger cars and 5 trucks, over which it has operational control. No data is collated on refrigerant (coolants), either in new vehicles or top up during vehicle maintenance. Due to the absence of reliable data, the fugitive emissions may be estimated using typical refrigerants and leakage rates.

Calculation formula:

GHG = <u>charge × leakage rate × GWP</u> 1,000

Where:

GHG is the emissions measured in tonnes of CO_2 -e.

Charge is the amount of refrigerant gas (kg) contained in the vehicle.

Leakage rate is the percentage of total charge leaked from the air-conditioning equipment each year.

GWP is the global warming potential of the gas.

An estimate is established using the following assumptions:

¹⁷ WRI & WBCSD (2005), <u>Calculating HFC and PFC Emissions from the Manufacturing, Installation,</u> <u>Operation and Disposal of Refrigeration & Air-Conditioning Equipment</u>, World Resources Institute, accessed 12 November 2024.

Greenhouse gas emissions accounting and reporting guidelines

- Leakage rates: 6.7% for light vehicles A/C and 10.8% for heavy vehicles A/C¹⁸.
- Refrigerant: R134A (GWP: 1,530 per IPCC AR6) as the default refrigerant for vehicles sold in Australia. In other jurisdictions, HFO-1234yf (GWP: 0.501) is the new default for vehicle A/C, which would lower associated emissions by factor 3054 (=0.03%); however, this should not be assumed for vehicles in Australia unless the refrigerant is known due to low domestic uptake to date¹⁹.
- Light vehicles: 50 x 0.75 kg (R134A) x 6.7% x 1,530 / 1,000 = 3.84 tCO₂-e (or 77 kgCO₂-e per light vehicle per year).
- Heavy vehicles: 5 x 3.5 kg (R134A) x 10.8% x 1,530 / 1000 = 2.89 tCO₂-e (or 578 kgCO₂-e per heavy vehicle per year).

Example 2 – refrigerants in buildings services equipment

An entity operates two buildings for its staff. Building A has a Net Lettable Area of 10,000m² and a known chiller cooling capacity of 1,100 kW but the refrigerant type and charge are unknown. Building B is 200m² NLA and there is no known information about the air-conditioning equipment (type, cooling capacity, refrigerant type, charge). Both buildings have gas-based space heating and domestic hot water equipment, which do not use refrigerants in operation. Calculation formula:

GHG = <u>charge × leakage rate × GWP</u> 1,000

Building A:

- **Refrigerant charge:** 385 kg estimate based on a typical value of 0.35 kg/kW cooling capacity assumed for large chillers²⁰.
- Leakage rate: 7% typical annual leak rate adopted from AIRAH Best Practice Guidelines - Methods of Calculating Total Equivalent Warming Impact (TEWI) 2012, Table 1 Annual Leak rates by equipment class/application for chillers²¹.
- Refrigerant: HFC-410A assumed for the building's air-conditioning systems.²²

- ²¹ AIRAH (2012), <u>Method of calculating Total Equivalent Warming Impact</u>, The Australian Institute of Refrigeration, Air Conditioning and Heating, accessed 12 November 2024.
- ²² DCCEEW (2023), <u>Cold Hard Facts 2022 Appendix A: Methodology Taxonomy, data and</u> <u>assumptions</u>, Australian Federal Government, accessed 12 November 2024.

¹⁸ DCCEEW (2024), <u>Australian National Greenhouse Accounts Factors</u>, Australian Federal Government, accessed 12 November 2024.

¹⁹ DCCEEW (2023), <u>Cold Hard Facts 2022 Appendix A: Methodology – Taxonomy, data and assumptions</u>, Australian Federal Government, accessed 12 November 2024.

²⁰ UNEP (2015), Fact Sheet 10: Water chillers for air-conditioning, United Nations Environment Programme, accessed 12 November 2024.

Greenhouse gas emissions accounting and reporting guidelines

• **GWP**: 1,924 for HFC-410A per NGA 2024, which is derived from the IPCC AR5²³. Note, HFC-410A is not explicitly listed in the IPCC Assessment Reports – it is a blend of 50% HFC-32 and 50% HFC-125 and its GWP could be calculated as the average of their respective GWPs. The calculated GWP for HFC-410 according to IPCC AR6 would be 2,256. However, given the GWP is available in the NGA report, the value listed there (1,924) should be adopted per the approach outlined in Section 3.4.2 and the emission factors data sources hierarchy outlined in Section 3.4.2.1.

Building A refrigerant emissions: 51.9 tCO₂-e = 385 kg (R410A) x 7% x 1,924 / 1000

Building B:

- Cooling capacity: 22 kW estimated using data from Building A, which has 0.11kW per m² (1,100kW x 200 m² / 10,000 m²).
- Refrigerant charge: 11 kg estimate based on a typical value of 0.50 kg/kW for small A/C equipment²⁴
- Leakage rate: 4% typical annual leak rate adopted from AIRAH Best Practice Guidelines - Methods of Calculating Total Equivalent Warming Impact (TEWI) 2012, Table 1 Annual Leak rates by equipment class/application²⁵ for split systems (A/C type assumed based on smaller size of the building).
- Refrigerant type: R410A (GWP 1,924) most common refrigerant for split systems in Australia²⁶.

Building B refrigerant emissions: 0.8 tCO_2 -e = 11 kg (R410A) x 4% x 1,924 / 1000

It is noted that an alternative assumption may be equally valid, e.g.

NGER Scheme specifies the 9% annual leakage rate for building services A/C equipment (which corresponds with the upper rather than typical range value in AIRAH guidance). Other R134A (GWP 1,530) or R32 (GWP 771) are increasingly common in newer A/C equipment.²⁷

- ²⁵ AIRAH (2012), <u>Method of calculating Total Equivalent Warming Impact</u>, The Australian Institute of Refrigeration, Air Conditioning and Heating, accessed 12 November 2024.
- ²⁶ DCCEEW (2023), <u>Cold Hard Facts 2022 Appendix A: Methodology Taxonomy, data and assumptions</u>, Australian Federal Government, accessed 12 November 2024.
- ²⁷ DCCEEW (2023), <u>Cold Hard Facts 2022 Appendix A: Methodology Taxonomy, data and assumptions</u>, Australian Federal Government, accessed 12 November 2024.

Greenhouse gas emissions accounting and reporting guidelines

²³ IPCC (2024), <u>IPCC Global Warming Potential Values</u>, International Panel on Climate Change, accessed 12 November 2024.

²⁴ UNEP (2015), <u>Fact Sheet 9: Large air-conditioning (air to air</u>), United Nations Environment Programme, accessed 12 November 2024.

Appendix D – Optional market-based scope 2 emissions

If an entity chooses to also report on scope 2 emissions using the market-based approach, they should be calculated using the following simplified formula²⁸ adapted from the Australian National Greenhouse Accounts Factors 2024^{Errorl Bookmark not defined}.

GHG = (Q X (1 - RPP) - (REC_{surrendered} - REC_{onsite})) x RMF2

With the following parameters for the reporting period:

Table D-1 Market based scope 2 definitions

Abbreviation	Unit	Description
GHG	tCO₂-e	Tonnes of CO ₂ -e scope 2 emissions determined using the market- based approach.
Q	MWh	Quantity of grid electricity procured or acquired and consumed.
RPP	%	The Renewable Power Percentage under the Large-scale Renewable Energy Target (LRET) for the applicable period as published by the Clean Energy Regulator, averaged across the previous and current calendar years. For example, calendar years 2022 and 2023 are used for the calculation of the financial year 2023 RPP.
REC _{surrendered}	# (MWh)	The number of eligible Renewable Energy Certificates voluntarily surrendered in the reporting year equivalent to megawatt hours – either by the entity directly or through GreenPower ²⁹ .
REC _{onsite}	# (MWh)	The number of eligible Renewable Energy Certificates that have been or will be issued for electricity produced on-site during the year equivalent to megawatt hours.

- ²⁸ Entities which have grid electricity use from operations that are exempt from the Large-scale Renewable Energy Target (LRET) or are located in the ACT (which has a Jurisdictional Power Purchase \neq 0%) should refer to the Australian NGA Factor 2024 report for the full formula.
- ²⁹ GreenPower has proposed changes which are to take effect from 1 July 2025 (FY26) where the RPP will be captured in the GreenPower percentage to simplify carbon accounting and reporting. This change will impact the LGCs required and the calculation methodology.

Abbreviation	Unit	Description
RMF2	kgCO ₂ -	The national scope 2 Residual Mix Factor, in kilograms of CO_2 -e
	e/kWh	emissions per kilowatt hour (= tonnes of CO2-e per MWh) as
	= tCO ₂ -	published in the National Greenhouse Account Factors.
	e/MWh	

Per NGA and NGER, an eligible Renewable Energy Certificates is:

- a Large-scale Generation Certificate (LGC) that is voluntarily surrendered through the Renewable Energy Certificate Registry in the reporting year with a generation date of less than 36 months prior to the end of the reporting year; or
- a purchase of GreenPower electricity from an accredited GreenPower Provider.

The RPP shall be sourced from the Clean Energy Regulator³⁰. **Table D-2** provides a summary of recent values for calendar years, and calculated average for financial years.

Period by CER	RPP by CER	Financial year period	Calculated RPP
CY 2022	18.64	FY 2022-23	18.72
CY 2023	18.96	FY 2023-24	18.80
CY 2024	18.48	FY 2024-25	N/A (CY 2025 RPP tbc)

Table D-2 Annual Renewable Power Percentages as published by the Clean Energy Regulator

The RMF shall be sourced from NGA Factors. Table D-3 provides a summary of recent values.

 Table D-3 Indirect market-based scope 2 emission factors from consumption of purchased or acquired electricity

Period	RMF scope 2 (kgCO ₂ -e/kWh)
FY2022-23	Not available
FY2023-24	0.81
FY2024-25	0.81

For reporting purposes, entities should calculate and report optional market-based scope 2 emissions using the following tabular structure. The listed formulas should be used to determine the electricity use per procurement type.

³⁰ Clean Energy Regulator (2024), <u>Renewable power percentage</u>, Australian Federal Government, accessed 25 November 2024.

Greenhouse gas emissions accounting and reporting guidelines

#	Procurement type	Electric energy (MWh)	Emissions Factor (tCO2-e / MWh)	Scope 2 emissions (tCO ₂ -e)
А	LRET Electricity ³¹	Q × RPP	0	0
В	LGC surrendered (net)	LGCs surrendered (including through GreenPower) minus LGCs generated	0	0
С	I-RECs purchased (for pre-existing contracts only) ³²	I-RECs surrendered	0	0
D	Residual Electricity	Q minus sum of A, B and C	RMF	D x RMF
Q	All	Total Grid Electricity Use	-	Sum of the above, e.g., D x RMF

 Table D-4 Market-based scope 2 emissions calculation and reporting table for the total grid electricity use (Q) by

 the entity

Example – market-based scope 2 emissions

An entity used 2,000 MWh of electricity for the reporting year 1 July 2023 – 30 June 2024. It has a 6% GreenPower contract covering all its electricity contracts, which corresponds to 120 MWh and thus 120 LGCs. Furthermore, it surrendered 300 LGCs and generated 100 LGCs during this period. The RPP is 18.80%, and the scope 2 RMF is 0.81 kgCO₂-e/kWh as per tables D-2 and D-3.

GHG = (2,000 MWh × (1 - 18.80%) - (120 MWh + 300 MWh - 100 MWh)) × 081 tCO²-e/MWh

The market-based electricity emissions are therefore 1,056 tCO₂-e during the FY24 reporting period.

The entity would report its scope 2 emissions in the following format.

Greenhouse gas emissions accounting and reporting guidelines

³¹ GreenPower (2024), <u>Proposed change to GreenPower Renewable Electricity Program Rules</u>, GreenPower, accessed 12 November 2024.

³² I-RECs (International Renewable Energy Certificates) are digital certificates issued by the International Tracking Standard Foundation which certify the environmental attributes of electricity generated from renewable energy sources. They can be used alternatively to the certificates mentioned in rows A to C [i.e. LRET Electricity, GreenPower, net LGCs surrendered] as long as their purchase is based on contracts entered into before the issuance of these guidelines and are from Australian-based renewable generation sources.

#	Procurement Type	Electric energy (MWh)	Emissions factor (tCO ₂ - e / MWh)	Scope 2 emissions (tCO ₂ -e)
A	LRET Electricity*	376 MWh = 2,000 x 18.80%	0	0
В	LGC surrendered (net)	320 MWh = 6%*2000 + 300 – 100	0	0
С	Residual Electricity	1,304 MWh = 2,000 – 696	0.81	1,056 tCO ₂ -e
Q	All	2,000 MWh	n/a	1,056 tCO ₂ -e

Appendix E – Comparison of reporting requirements

The following table summarises some of the key reporting requirements under:

- TPG24-33 Reporting framework for first year climate-related financial disclosures
- Net Zero Government Operations Policy

 Table E-1 Comparison of reporting requirements

GHG reporting requirement	TPG24-33 reporting framework for first year climate-related financial disclosures	Net Zero Government Operations Policy	Coverage in GHG accounting and reporting Guideline
Reporting organisation	Per annual reporting under TPG23- 10, by Reporting GSF Agency. Referred to as entities under this Guide.	General government agencies with 100 or more staff. Voluntary for smaller agencies.	The Guide is intended to allow adoption by all NSW government entities with reporting requirements. ('reporting entity'). For agencies reporting under Net Zero Government Operations Policy, the term entity used throughout this Guide can be interchangeable with agency.
Consolidation approach for entity boundary	No guidance or requirements.	No guidance or requirements.	This Guide recommends operational control to determine the entity boundary due to the nature of government operations, alignment with NGER Scheme and to reduce risk of duplicated reporting of GHG.

GHG reporting requirement	TPG24-33 reporting framework for first year climate-related financial disclosures	Net Zero Government Operations Policy	Coverage in GHG accounting and reporting Guideline
Operational boundary (scope 1, 2, 3)	Scope 1 & 2 to be disclosed No requirements for scope 3.	Scope 1 & 2 to be disclosed Scope 3 by 30 June 2027.	Methodology in the Guide currently covers scope 1 & 2 emissions. Further guidance for scope 3 likely to be prepared prior to scope 3 reporting requirements
Reporting period	Annually Financial Years (mostly) – commencing FY25.	Annually Financial Years – commencing FY25.	Reporting template allows either financial year or calendar year reporting.
Baseline	No guidance or requirements.	Financial Year 2018-19.	No guidance on baseline in the Guide. Reporting template enables entities and agencies to communicate GHG reductions against a baseline year.
GHG reduction targets	No guidance or requirements on targets to achieve. Entities that have developed metrics, must elaborate on the metric and progress towards reaching the target.	Agencies should aim to contribute to the whole-of- government scope 1 & 2 GHG reductions targets: • 50% reduction by 2030 • 70% reduction by 2035 • Net zero by 2050.	No targets in the Guide. Reporting template enables entities and agencies to communicate GHG reductions achieved against a baseline year, and an opportunity to disclose progress against any other targets.

GHG reporting requirement	TPG24-33 reporting framework for first year climate-related financial disclosures	Net Zero Government Operations Policy	Coverage in GHG accounting and reporting Guideline
Scope 2 calculation methodology	Location-based approach Optionally, market-based approach.	No guidance or requirements.	Methodology provided for both location- based approach and optional additional market-based approach.
Carbon offset policy	No guidance or requirements on the use of carbon offsets. If used, relevant information must be disclosed (extent, verification, type, factors relating to credibility and integrity)	To be developed by DCCEEW by December 2025. Policy will consider whether, and how, agencies should purchase carbon offsets; the types of carbon offsets that are eligible; and the regulatory, reputational and financial risks associated with offsets.	Guidance includes a section on the use and accounting approach for carbon offsets. This aligns with NSW Government's current principles in relation to the use of carbon offsets.
Relevance & materiality of GHG emissions accounting and reporting	Materiality described for climate- related information generally (not GHG emissions specific). Comprehensiveness of disclosures to be proportionate to the size, prominence, and climate exposure of each entity, avoiding undue costs or efforts.	No guidance or requirements	Guidance provided to support determine whether emission sources are 'relevant' (should be considered for quantification) and 'material' (should be quantified or estimated). Materiality is linked to the concept of proportionality introduced in TPG24-33.



For more information

DCCEEW has a dedicated team of specialists to support agencies with implementing and reporting on this policy.

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