IMPORTANT NOTE & DISCLAIMER

The National Carbon Offset Standard for Events (Event Standard) is a voluntary standard to manage greenhouse gas emissions and to achieve carbon neutrality. It provides best-practice guidance on how to measure, reduce, offset, report and audit emissions that occur as a result of an event’s activities.

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VERSION: This version of the National Carbon Offset Standard for Events is effective from 1 November 2017.
CONTENTS

1. Overview and key principles ........................................................................................................ 1
   1.1 Introduction ............................................................................................................................... 1
   1.2 Development of the Event Standard ......................................................................................... 2
   1.3 Core principles ......................................................................................................................... 3
       1.3.1 Carbon accounting principles .............................................................................................. 3
       1.3.2 Offsets integrity principles .................................................................................................. 3
   1.4 Using the Event Standard ......................................................................................................... 5
       1.4.1 Making carbon neutral claims ............................................................................................. 5
       1.4.2 Carbon neutral certification ................................................................................................ 6
       1.4.3 Use of the certification trade mark ....................................................................................... 6

2. Requirements of the Event Standard .......................................................................................... 7
   2.1 Context for the requirements ................................................................................................... 7
   2.2 Achieving and maintaining carbon neutrality .......................................................................... 8
   2.3 MEASURE: Prepare carbon account ........................................................................................ 8
       2.3.1 Step 1: Establish the emissions boundary .......................................................................... 9
       2.3.2 Step 2: Catalogue emissions sources within the boundary .............................................. 11
       2.3.3 Step 3: Collect data on identified emissions sources ........................................................... 13
       2.3.4 Step 4: Calculate the pre-event carbon account ................................................................. 14
       2.3.5 Step 5: Calculate post-event carbon account (large events only) ..................................... 16
   2.4 REDUCE: Reduce emissions where possible ......................................................................... 17
       2.4.1 Emissions reduction activities ............................................................................................. 17
   2.5 OFFSET: Cancel eligible offset units ....................................................................................... 17
       2.5.1 Eligible offset units ............................................................................................................. 17
       2.5.2 Proof of cancellation of offset units .................................................................................... 18
   2.6 REPORT: Prepare public reports .............................................................................................. 18
       2.6.1 Pre-event reporting ............................................................................................................. 19
       2.6.2 Post-event reporting (large events only) ............................................................................ 19
   2.7 AUDIT: Independent audit ....................................................................................................... 19
3. Certification against the Event Standard.................................................................21
   3.1 Application for certification...............................................................................21
      3.1.1 Pre-event carbon account........................................................................21
      3.1.2 Pre-event public report............................................................................22
   3.2 Obligations........................................................................................................22
      3.2.1 Agreement with obligations.....................................................................22
      3.2.2 Obligations for certification.................................................................22
   3.3 Licence to use the certification trade mark.........................................................23
      3.3.1 Licence agreement..................................................................................23
      3.3.2 Permission to use the certification trade mark....................................23
      3.3.3 Completion of obligations....................................................................24
   3.4 Other administrative arrangements...................................................................24
      3.4.1 Timing of offset unit cancellation.........................................................24
      3.4.2 Review of decisions..............................................................................25
      3.4.3 Confidentiality......................................................................................25

4. References.............................................................................................................26
   4.1 References that form the basis of the Event Standard....................................26
   4.2 All references..................................................................................................27

5. Glossary...................................................................................................................29

Appendix A: Eligible offset units.............................................................................35
   Eligible offset units..............................................................................................35

Appendix B: Carbon accounting requirements and guidance...............................36
   1. Calculations for typical emissions sources......................................................37
      1.1 Transport....................................................................................................37
         1.1.1 Emissions sources.............................................................................37
         1.1.2 Collecting activity data....................................................................39
         1.1.3 Emission factors...............................................................................40
         1.1.4 Emissions calculation........................................................................40
         1.1.5 Worked example ............................................................................42
      1.2 Stationary energy: co- and tri generation..................................................43
         1.2.1 Emissions sources.............................................................................43
         1.2.2 Collecting activity data....................................................................44
         1.2.3 Emission factors...............................................................................44
         1.2.4 Emissions calculation........................................................................44
         1.2.5 Worked example ............................................................................47
### 13. Water supply

1.3.1. Emissions sources
1.3.2. Collecting activity data
1.3.3. Emission factors
1.3.4. Emissions calculation
1.3.5. Worked example

#### 14. Wastewater

1.4.1. Emissions sources
1.4.2. Collecting activity data
1.4.3. Emission factors
1.4.4. Emissions calculation
1.4.5. Worked example

#### 15. Waste

1.5.1. Emissions sources
1.5.2. Collecting activity data
1.5.3. Emission factors
1.5.4. Emissions calculation
1.5.5. Worked example

#### 16. Other emissions sources

<table>
<thead>
<tr>
<th>Section</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.3. Water supply</td>
<td>49</td>
</tr>
<tr>
<td>1.3.1. Emissions sources</td>
<td>49</td>
</tr>
<tr>
<td>1.3.2. Collecting activity data</td>
<td>49</td>
</tr>
<tr>
<td>1.3.3. Emission factors</td>
<td>50</td>
</tr>
<tr>
<td>1.3.4. Emissions calculation</td>
<td>50</td>
</tr>
<tr>
<td>1.3.5. Worked example</td>
<td>51</td>
</tr>
<tr>
<td>1.4. Wastewater</td>
<td>51</td>
</tr>
<tr>
<td>1.4.1. Emissions sources</td>
<td>51</td>
</tr>
<tr>
<td>1.4.2. Collecting activity data</td>
<td>52</td>
</tr>
<tr>
<td>1.4.3. Emission factors</td>
<td>53</td>
</tr>
<tr>
<td>1.4.4. Emissions calculation</td>
<td>53</td>
</tr>
<tr>
<td>1.4.5. Worked example</td>
<td>53</td>
</tr>
<tr>
<td>1.5. Waste</td>
<td>54</td>
</tr>
<tr>
<td>1.5.1. Emissions sources</td>
<td>54</td>
</tr>
<tr>
<td>1.5.2. Collecting activity data</td>
<td>54</td>
</tr>
<tr>
<td>1.5.3. Emission factors</td>
<td>55</td>
</tr>
<tr>
<td>1.5.4. Emissions calculation</td>
<td>55</td>
</tr>
<tr>
<td>1.5.5. Worked example</td>
<td>57</td>
</tr>
<tr>
<td>1.6. Other emissions sources</td>
<td>58</td>
</tr>
<tr>
<td>2. Accounting for renewable energy and energy efficiency schemes</td>
<td>58</td>
</tr>
<tr>
<td>2.1. Context</td>
<td>58</td>
</tr>
<tr>
<td>2.2. Treatment</td>
<td>58</td>
</tr>
<tr>
<td>2.3. Worked examples</td>
<td>60</td>
</tr>
<tr>
<td>2.3.1. Onsite generation (LGCs)</td>
<td>61</td>
</tr>
<tr>
<td>2.3.2. Onsite generation (STCs)</td>
<td>61</td>
</tr>
<tr>
<td>2.3.3. GreenPower</td>
<td>62</td>
</tr>
<tr>
<td>2.3.4. Emissions Reduction Fund</td>
<td>63</td>
</tr>
<tr>
<td>3. Recommended practices and tools</td>
<td>63</td>
</tr>
<tr>
<td>3.1. Additional guidance for preparing a carbon account</td>
<td>63</td>
</tr>
<tr>
<td>3.1.1. Data collection</td>
<td>63</td>
</tr>
<tr>
<td>3.1.2. Carbon account calculation</td>
<td>66</td>
</tr>
<tr>
<td>3.1.3. Methodology and emission factor hierarchy for products and services</td>
<td>67</td>
</tr>
<tr>
<td>3.1.4. Validity period of emission factors</td>
<td>67</td>
</tr>
<tr>
<td>3.2. Additional guidance for reporting on emissions reductions</td>
<td>68</td>
</tr>
<tr>
<td>3.3. Additional guidance for incorporating NGER data in a carbon account</td>
<td>69</td>
</tr>
</tbody>
</table>
1. OVERVIEW AND KEY PRINCIPLES

1.1 Introduction

Businesses and other organisations are managing their greenhouse gas emissions to position themselves for growth and competitiveness in a lower-emissions future. Businesses are also choosing to go one step further and demonstrate leadership and corporate responsibility by becoming carbon neutral.

Carbon neutral means reducing emissions where possible and compensating for the remainder by investing in carbon offset projects to achieve zero carbon emissions (Figure 1). In working towards carbon neutrality, event managers can achieve cost savings from improved energy productivity or other operational efficiencies, and build their capacity for emissions management.

The National Carbon Offset Standard for Events (Event Standard) is a voluntary standard to manage greenhouse gas emissions and to achieve carbon neutrality. It provides best-practice guidance on how to measure, reduce, offset and report emissions that occur as a result of an event’s activities.

The Event Standard has been designed to accommodate a wide variety of events in Australia. From large-scale festivals with many thousands of participants to small community events, the standard can be used to achieve carbon neutrality and showcase climate leadership.

The Event Standard can be used in a number of ways. It can be used to better understand and manage carbon emissions, to credibly claim carbon neutrality and to seek carbon neutral certification.

For events certified by the Australian Government, the Carbon Neutral Certification Trade Mark (the certification trade mark) is available for use. It provides a legitimate stamp of approval that an event has met all the requirements of the Event Standard and provides opportunities to demonstrate climate commitments to stakeholders. Certification against the standard is provided through the Australian Government’s Carbon Neutral Program, also described in this document (Section 3).
1.2 Development of the Event Standard

The National Carbon Offset Standard and the Carbon Neutral Program were launched by the Australian Government in 2010. Since then, they have provided a credible framework for managing emissions and achieving carbon neutrality. The National Carbon Offset Standard and the Carbon Neutral Program were first designed for organisations, products and services.

In 2017, the National Carbon Offset Standard was expanded to include buildings and precincts. In light of the increasing number of carbon neutral categories covered by the National Carbon Offset Standard, separate, stand-alone documents have been created for each of these categories (Box 1). This allows for streamlined and tailored guidance to be provided to meet the needs of different users.

Box 1: Categories of the National Carbon Offset Standard

The Event Standard complements the broader family of National Carbon Offset Standard categories. A separate document is available for each category of the standard.

› National Carbon Offset Standard for Organisations
› National Carbon Offset Standard for Products & Services
› National Carbon Offset Standard for Buildings
› National Carbon Offset Standard for Precincts

When considering carbon neutral certification, please contact the Department early to confirm the appropriate choice of certification category.

The Department retains the right to determine the certification category for an application.
1.3 Core principles

The Event Standard is based on international standards and tailored to the Australian context. The Australian and international standards that form the basis for the Event Standard are listed in Section 4: References.

The requirements of the Event Standard (Section 2) are underpinned by carbon accounting and offsets integrity principles.

1.3.1 Carbon accounting principles

The following principles are considered best practice when calculating a carbon account. The carbon account of an event must be calculated according to these principles if seeking to claim carbon neutrality against the Event Standard.

- **Relevance**: ensure the greenhouse gas inventory of an event appropriately reflects the greenhouse gas emissions attributable to that event and serves the decision-making needs of users - both internal and external.

- **Completeness**: account for and report all greenhouse gas emissions sources and activities within the defined boundary of the event. Disclose and justify all exclusions.

- **Consistency**: use consistent methodologies to allow for meaningful comparisons of greenhouse gas emissions over time. Transparently document any changes to the data, boundary, methods or any other relevant factors in the time series.

- **Transparency**: compile, analyse and document greenhouse gas information clearly and coherently so that auditors and the public may evaluate its credibility. Disclose any relevant assumptions and make appropriate references to the calculation methodologies and data sources used.

- **Accuracy**: ensure the quantification of greenhouse gas emissions is unbiased (not systematically over or under actual emissions) and uncertainties are reduced as far as practicable. Achieve sufficient accuracy to enable users to make decisions with reasonable assurance as to the integrity of the reported information. Where uncertainty is high, use conservative values and assumptions.

These principles are based on those outlined in the *GHG Protocol – Corporate Standard* (WBCSD and WRI, 2004) and international standards, including the AS ISO 14064 and ISO 14040 series (references in Section 4).

1.3.2 Offsets integrity principles

Event organisers can use offset units to support their emissions management activities. For example, event organisers seeking to organise a carbon neutral event can use eligible offset units to compensate for emissions that cannot be reduced through energy efficiency, the procurement of renewable energy or supply chain management.

The purchase of offset units supports projects that reduce or remove emissions from the atmosphere, such as through reforestation, renewable energy or energy efficiency. Many of these projects also deliver other environmental, social and economic benefits; for example, improved water quality, increased biodiversity and increased Indigenous employment. Event organisers may seek offset projects that provide these benefits to align with the event’s purpose, message or their own corporate values.
The projects and offset units are verified by independent auditors through internationally recognised standards. These standards ensure the projects are implemented, run and managed properly and the credits they generate represent real and actual emission sequestered or avoided.

One offset unit is issued for each tonne of emissions avoided or removed from the atmosphere.

The Department reviews the credibility of publicly available offset units. Only offset units that have met the integrity principles below are eligible for use in a carbon neutral claim against the Event Standard.

The integrity principles are based on the offsets integrity framework for Australian Carbon Credit Units (ACCUs) as set out in the Carbon Credits (Carbon Farming Initiative) Act 2011. The offsets integrity principles ensure that any unit used to offset emissions as part of a carbon neutral claim under the Event Standard represents a genuine and credible emissions reduction.

For a unit to be eligible for use under the Event Standard it must meet the following requirements:

- **Additional**: it must result in emissions reductions that are unlikely to occur in the ordinary course of events, including due to any existing commitment or target publicly agreed by the entity responsible for issuing the units. It must represent abatement that has not been double counted.

- **Permanent**: it must represent permanent reductions in greenhouse gas emissions. In the case of sinks, this requires that the carbon stored is sequestered and will not be released into the atmosphere for a period of 100 years. Where a period of less than 100 years is applied to sequestration units, an appropriate discount must be applied.

- **Measurable**: methods used to quantify the amount of emissions reductions generated must be supported by clear and convincing evidence.

- **Transparent**: consumers and other interested stakeholders must have access to information about the offset project that generated the abatement, including the applied methodology and project monitoring arrangements.

- **Address leakage**: the system responsible for generating the offset unit must provide deductions for any material increases in emissions elsewhere which nullify or reduce the abatement that would otherwise be represented by the offset unit.

- **Independently audited**: the circumstances responsible for the generation of the unit must be verified by an independent, appropriately qualified third party and not found to be in contradiction with these integrity principles.

- **Registered**: the offset unit must be listed and tracked in a publicly transparent registry.

The Department uses a decision framework based on the offsets integrity principles to determine the eligibility of offset units under the Event Standard. A list of offset units that have met the integrity principles and are eligible for use under the standard is provided in Appendix A: Eligible offset units.

Appendix A may be updated as new information or different offset units become available. This may result in the addition of new offset units or the removal of existing ones.
1.4 Using the Event Standard

The Event Standard is a voluntary standard and can be used in a number of ways. Firstly, it can be used to better understand and manage the greenhouse gas emissions that occur as a result of the delivery of an event. This can be achieved by following the best-practice guidance provided in Section 2 on a range of topics, including how to measure, reduce, offset, report and audit emissions. Secondly, it can be used as a framework to credibly claim carbon neutrality by following all of the requirements outlined in Section 2. Thirdly, it can be used as a pathway to be certified as carbon neutral by the Australian Government. This can be done by following the steps provided in Section 3 of the standard.

1.4.1 Making carbon neutral claims

When making a carbon neutral claim against the Event Standard (Box 2), the responsible entity must be mindful of its obligations under Australian Consumer Law. Australian Consumer Law applies to all forms of marketing, including claims on packaging, labelling and in advertising and promotions across all media (print, television, radio and internet).

Consumers are entitled to rely on any carbon neutral claim made in reference to the Event Standard and expect these claims to be truthful. The responsible entity must ensure any claim made regarding compliance with the standard is accurate and appropriately substantiated.

**Box 2: Carbon neutral claims against the Event Standard**

Where the Event Standard is being used as the basis for a claim of carbon neutrality, the user must fully disclose and provide transparency as to the actions behind the carbon neutral claim. This allows the public to develop an informed opinion on the validity of the claim. The requirements detailed in Sections 2.2–2.7 must be followed, regardless of whether or not the claim is certified.

Certification of carbon neutral claims can be sought through the Australian Government’s Carbon Neutral Program as described in Section 3.

**Important:**

› The certification trade mark can only be used when certification has been granted by the Department.
1.4.2 Carbon neutral certification

Carbon neutral certification against the Event Standard can be sought through the Australian Government’s Carbon Neutral Program by applying to the Department (Section 3). Australian Government certification allows for the use of the certification trade mark, which can be used to showcase the event’s carbon neutrality.

Event organisers considering carbon neutral certification should contact the Department early to confirm the appropriate choice of certification category (event, organisation, product & service, building, precinct). The Department retains the right to determine the certification category for an application.

1.4.3 Use of the certification trade mark

The Australian Government has registered the Carbon Neutral Certification Trade Mark (the certification trade mark) with the Australian Competition and Consumer Commission, which can be used under licence to show an event complies with the Event Standard.

The certification trade mark is only available to entities that are certified by the Australian Government and have executed a Certification Trade Mark Licence (licence agreement) with the Department.

The certification trade mark can only be used in direct relationship with the category of certification. For example, an organisation hosting a certified event cannot use the certification trade mark on its own promotional materials or in any way that suggests the certified claim of carbon neutrality applies to the organisation, host or event organiser (unless the organisation is itself certified against the National Carbon Offset Standard for Organisations).
2. REQUIREMENTS OF THE EVENT STANDARD

2.1 Context for the requirements

The requirements of the Event Standard are written from the perspective of a reader who is seeking to achieve carbon neutrality. Where an event chooses to claim carbon neutrality against the standard, it must be applied consistently and fully.

Throughout this document, the term ‘must’ is used to signify what is required to make a carbon neutral claim in accordance with the Event Standard. The terms ‘can’ or ‘may’ are used where an event organiser can apply its own discretion and choose from several options, all of which are acceptable under the standard. The term ‘should’ is used to indicate a recommendation by the standard, in line with best practice.

The responsible entity is the person or organisation that has taken responsibility for making a carbon neutral claim or seeking carbon neutral certification. The responsible entity should be clearly identified and must be able to meet the requirements of the Event Standard, including carbon accounting, reporting and purchasing of eligible offset units as required to make the carbon neutral claim.

The Event Standard can be applied to make a carbon neutral claim for small events or large events.

When using the Event Standard, the responsible entity must determine if the event is categorised as a small or large event. The category of event will determine requirements for measurement of the carbon account, public reporting and independent audit.

1. Small event:
   › Less than 1,000 attendees; or
   › Less than 2,000 attendees and an event duration of one day or less.

2. Large event:
   › Greater than 2,000 attendees; or
   › Greater than 1,000 attendees and an event duration greater than one day.

The Event Standard only covers greenhouse gas emissions. Other environmental impacts of the event do not need to be assessed for the purpose of meeting the requirements of the standard.
2.2 Achieving and maintaining carbon neutrality

To achieve and maintain a valid and credible carbon neutral claim against the Event Standard, the responsible entity must:

› **Measure:** Prepare a carbon account (Section 2.3).
› **Reduce:** Reduce emissions where possible (Section 2.4).
› **Offset:** Cancel eligible offset units to compensate for remaining emissions (Section 2.5).
› **Report:** Report publicly (Section 2.6).
› **Audit:** For large events, arrange for an independent audit of the post-event carbon account and public report (Section 2.7).

![Figure 2: The activities for carbon neutral claims](image)

A key element of a carbon neutral claim for an event is the confidence of attendees, vendors and other stakeholders in the validity of the claim. The requirements of the Event Standard have been designed to provide these stakeholders with transparent information on the actions taken to achieve carbon neutral status.

Sections 2.3–2.7 describe the requirements of the Event Standard and provide guidance on how to meet those requirements to achieve carbon neutrality. Certification against the Event Standard can be sought through the Carbon Neutral Program (Section 3).

2.3 **MEASURE: Prepare carbon account**

The requirements for preparing a carbon account depend on whether the event is deemed a small or large event (Section 2.1).

For both small and large events, the responsible entity may choose to prepare its own carbon account, or may engage a consultant to prepare the carbon account or to provide technical advice.

**Small event**

For a small event, the responsible entity must prepare a carbon account prior to the event (pre-event carbon account).

The pre-event carbon account is used to estimate the expected emissions of the upcoming event. A conservative approach must be taken when preparing the pre-event carbon account. The preparation of the pre-event carbon account involves the following steps:

**Step 1:** Establish the emissions boundary.
**Step 2:** Catalogue emissions sources within the boundary.
**Step 3:** Collect data on identified emissions sources.
**Step 4:** Calculate the pre-event carbon account.
Large event

For a large event, the responsible entity must prepare a carbon account prior to the event (pre-event carbon account) and after the event (post-event carbon account).

For preparing the carbon account for a large event, Step 5: Calculate post-event carbon account (large events only) needs to be undertaken in addition to Steps 1–4.

2.3.1 Step 1: Establish the emissions boundary

Defining the emissions boundary is the first step in the carbon accounting process. The emissions boundary refers to the coverage and extent of the carbon account. The boundary is established using a set of criteria to identify emissions sources and decide which of the identified sources are to be included or excluded. Refer to Figure 3 for examples of typical inclusions within an emission boundary.

Defining the emissions boundary is the first step in the carbon accounting process. The boundary refers to the coverage and extent of the carbon account. This includes emissions sources that are part of the event organisation boundary as well as emissions sources outside the event organisation boundary which occur as a consequence of the event (scope 3) and are considered relevant. The criteria of materiality can be applied to exclude emissions sources that would not be cost effective to measure relative to their significance to the carbon account.

Achieving carbon neutrality for an event may require agreement across a range of stakeholders (organisers, vendors, sponsors, facilities owners/managers). The treatment of some associated emissions may vary subject to the nature of the event.

The event’s emissions boundary must be transparently documented and disclosed, along with the reasoning for choosing the boundary. Where significant exclusions are made, they must be clearly stated, and the reasons for and implications of the exclusions must be justified. A disclosure statement, including reason and justification for any exclusions, must be published as part of the public report/s (Section 2.6).

Event organisation boundary

The event organisation boundary sets the basis for determining what are considered direct emissions and indirect emissions. See Section 2.3.2 for more information on scopes of emissions.

The event organisation boundary is established from the perspective of the event organiser. Therefore, references below to the different control approaches refer to the event organiser’s ability to direct financial and operating policies. Where the responsible entity is not the same entity as the event organiser (e.g. the responsible entity is the event sponsor), the responsible entity will need to work with the event organiser to prepare the event organisation boundary.

The event organisation boundary can be established using one of two control approaches. A control approach requires an event organiser to account for the greenhouse gas emissions from event activities over which it has control. This can be based on either:

- financial control, whereby the event organiser reports 100 per cent of activities over which it has ‘the ability to direct the financial and operating policies of the latter with a view to gaining economic benefits from its activities’ (GHG Protocol –Corporate Standard (WBCSD and WRI, 2004)); or
- operational control, whereby the event organiser reports 100 per cent of the activities over which it has ‘the full authority to introduce and implement its operating policies’ (GHG Protocol – Corporate Standard (WBCSD and WRI, 2004)).
Relevance

For many types of events, a large proportion of the emissions may come from sources that are outside the direct control of the event organiser, but nonetheless occur as a consequence of the event taking place.

The criterion of relevance, as adapted from the GHG Protocol – Corporate Standard (WBCSD and WRI, 2004), is about ensuring the carbon account appropriately reflects the emissions of the event and meets the expectations of consumers and stakeholders.

Emissions sources considered to be relevant, whether or not they fall within the event organisation boundary, must be included in the emissions boundary (subject to materiality).

The Event Standard deems certain emissions sources to be relevant.

Emissions deemed to be relevant

The following emissions sources are deemed to be relevant to all events:

- All scope 1 emissions (direct emissions).
- All scope 2 emissions (emissions from the generation of electricity, heat, cooling and steam purchased by the event).
- Scope 3 emissions from electricity consumption and fuel use (indirect emissions from the extraction, production and transport of fuel burned at generation and the indirect emissions attributable to the electricity lost in delivery in the transmission and distribution network).
- Scope 3 emissions from waste, attendee travel and accommodation, presenter/performer travel and accommodation, catering, base building services (if applicable), promotional material, event onsite energy use and event onsite water use.

All other scope 3 emissions sources must be assessed for relevance in accordance with the relevance test, including:

- Emissions from staff commuting, postage and freight, pre-event planning and preparation, cleaning services, IT services (e.g. data centres) and telecommunication services.

Relevance test

Emissions sources are relevant when any two of the following conditions are met (adapted from the GHG Protocol – Corporate Standard (WBCSD and WRI, 2004)):

- the scope 3 emissions from a particular source are likely to be large relative to the event’s scope 1 and scope 2 emissions
- the scope 3 emissions from a particular source contribute to the responsible entity or event organiser’s greenhouse gas risk exposure
- the scope 3 emissions from a particular source are deemed relevant by key stakeholders
- the responsible entity or event organiser has the potential to influence the reduction of scope 3 emissions from a particular source
- the scope 3 emissions are from outsourced activities that were previously undertaken within the event organisation boundary or from outsourced activities that are typically undertaken within the boundary for comparable events.
Materiality

An emissions source that constitutes 1 per cent or more of the total carbon account is considered to be material under the Event Standard.

If a relevant emissions source is estimated to be material, it must be included within the emissions boundary, unless justification can be provided to demonstrate that such quantification would not be technically feasible, practicable or cost effective relative to its significance.

Emissions sources that are relevant but estimated to constitute less than 1 per cent of the total carbon account can be excluded from the emissions boundary.

In applying the 1 per cent materiality threshold, the total amount of emissions to be excluded must not exceed 5 per cent of the total carbon account.

To estimate materiality of these emissions sources, tools based on input-output analysis can be useful.

Responsible entities are encouraged to include, measure and report as many emissions sources as possible, regardless of an emissions source’s materiality. Data for emissions sources that are deemed as immaterial (contributing less than 1 per cent to the carbon account) may still be included in the carbon account. The following methods can be used if primary data cannot be sourced:

- taking an initial measurement as a basis for projecting emissions for future years of that source; or
- estimating and projecting an emissions source (e.g. using input-output analysis tools or approximation through extrapolation. See Appendix B Section 3.1.3)

Where a scope 3 emissions source is determined to be relevant and estimated to be material, but accurate data is not yet available, a conservative approach must be taken to estimate the emissions source. This includes estimates for activities where accurate data is not available prior to the event’s delivery.

2.3.2 Step 2: Catalogue emissions sources within the boundary

Once the emissions boundary has been established, the responsible entity must catalogue all emissions sources within the boundary as well as emissions sources that have been excluded from the boundary. When cataloguing an emissions source, the responsible entity must detail the type of greenhouse gas emissions and the scope of the emissions. Emissions sources are usually catalogued in the same document used for recording data and calculating the carbon account (see Appendix B Section 3).

Types of greenhouse gas emissions

The carbon account must include emissions of carbon dioxide (CO$_2$), methane (CH$_4$), nitrous oxide (N$_2$O), hydrofluorocarbons (HFCs), perfluorocarbons (PFCs), sulphur hexafluoride (SF$_6$) and nitrogen trifluoride (NF$_3$).
Scopes of emissions

To help delineate direct and indirect emissions sources, emissions included within the emissions boundary must be classified into the following scopes, (adapted from the GHG Protocol – Corporate (WBCSD and WRI, 2004)):

- Scope 1 emissions include all direct greenhouse gas emissions from sources that are within the event’s emissions boundary. These could be emissions from fuel use, refrigerants and on-site electricity generation.
- Scope 2 emissions include purchased electricity, heat, cooling and steam (i.e. energy produced outside the boundaries of the event but used for the event’s activities).
- Scope 3 emissions are all indirect emissions that occur as a result of the activities of the event, but occur from sources not owned or controlled by the responsible entity or event organisers.

Figure 3: Typical examples of scope 1, scope 2 and scope 3 inclusions in an emissions boundary

Disclosing excluded emissions sources

Emissions sources within the emissions boundary that are excluded on the basis of the materiality threshold, relevance or materiality (including not being technically feasible, practical or cost effective relative to significance) as well as emissions sources that stakeholders may expect to be included, must be disclosed and justified.

A disclosure statement must be published as part of the public report. The statement should include the justification for the exclusion of the emissions sources.
Sensitive emissions

Sensitive emissions are emissions from activities that are susceptible to material changes between preparation of the pre-event carbon account and the delivery of the event. Examples of sensitive emissions sources may include food and beverage, waste and electricity. These activities may be considered sensitive if variations such as event attendee numbers or event location can materially affect the emissions associated with these activities.

A disclosure statement for sensitive emissions must be included as part of the pre-event public report (Section 2.6.1). It must include an explanation of why certain emissions are identified as sensitive, how variation in the activity may affect the pre-event carbon account and how a conservative approach has been taken to ensure actual overall event emissions will not be higher than the amount predicted in the pre-event carbon account.

Uplift factors can be a useful way to manage risks associated with sensitive emissions and may be applied to the activity data to ensure that a conservative approach to estimating emissions is taken prior to the event’s delivery. The uplift factor may vary depending on the emissions source, the method for collecting data on the emissions source and the approach taken by the responsible entity.

2.3.3 Step 3: Collect data on identified emissions sources

Once the responsible entity has established the emissions boundary and catalogued the emissions sources, it must identify the type of data available for different emissions sources, bearing in mind the emissions calculations that it will need to undertake (Section 2.3.4).

When considering calculating the emissions from identified sources, best endeavours must be used to meet the carbon accounting principles of relevance, completeness, consistency, transparency and accuracy (Section 1.3.1).

Actual measured data should be used whenever possible, with conservative estimates used only where data is unavailable. For example, operational energy data should be obtained from energy meters such as electricity and gas meters (from utility bills).

For the pre-event carbon account, activities that will occur during the delivery of the event may not have actual measured data available. In circumstances where measured data is not available, a conservative approach must be used. Assumptions used to estimate activity data should be based on data collected from a previous or similar event.

For large events, a methodology for collecting sensitive emissions activity data from the event must be developed. The collected data is to be used in the post-event carbon account calculated after the event.

Appendix B Section 3.1.1 provides further guidance on data collection.

Data management and record keeping

The responsible entity must ensure appropriate systems are put in place to monitor and record the greenhouse gas emissions within the emissions boundary.

The quality of data is key to the integrity of a carbon account. Quality control practices must be in place when collecting data to ensure a high level of data quality.

The data required to create a carbon account, and the processes for establishing and maintaining those records, must be identified to ensure that the greenhouse gas emissions attributable to the subject of the carbon neutral claim, and any changes in these emissions, are recorded in a timely manner.
In line with the carbon accounting principle of completeness and accuracy (Section 1.3.1), all data collection procedures should be fully documented to ensure appropriate controls are in place and auditable. These procedures should reference the data collection and storage system, including:

- data collection, report format, reporting frequency, and length of time records are archived
- data transmission, storage, and backup procedures and strategies for identifying and coping with lost or poor-quality data
- entities responsible for measurement and data collection procedures
- all quality control procedures to be implemented for measurement and data collection procedures (e.g. central data control, site audits, calibration, site technician reminders, maintenance procedures, service sheets).

The responsible entity must ensure the existence, quality and retention of documentation in order to enable the creation of an audit trail of how the carbon account was created. Records must be kept for seven years after the end of the carbon neutral period. For responsible entities seeking certification under the Event Standard, records must be kept for the period of time specified in the licence agreement.

Recommended records include but are not limited to:

- a list of all emissions sources monitored
- the data used for calculation of greenhouse gas emissions for each source, categorised by process and fuel or material type
- documentary evidence relating to calculations (e.g. receipts, invoices and details of payment methods)
- documentation of the methods used for greenhouse gas emissions and energy estimations
- documents justifying selection of the monitoring methods chosen
- documentation of the collection process for data for an activity and its sources
- records supporting business decisions.

A data management plan may be developed to ensure the collection of high-quality carbon account data and the improvement of data collection procedures. A data management plan or quality management system is also useful in providing transparency when the carbon account is audited.

Appendix B Section 3.1.1 provides examples of recommended practices and tools for data management.

### 2.3.4 Step 4: Calculate the pre-event carbon account

The responsible entity must calculate greenhouse gas emissions attributable to the event using the data collected (Section 2.3.3) in conjunction with appropriate emission factors (preference should be given to emission factors published by government entities).

The carbon account should be set out to allow for easy interpretation. Emissions sources within the boundary should be grouped according to scope. The calculation methods and the emission factors used must be disclosed clearly and completely.

The use of renewable energy or carbon neutral certified activities must be recorded in the carbon account even if the emissions will be equal to zero (further details below).

Both small and large events are required to calculate a pre-event carbon account. The pre-event carbon account must inform the quantity of eligible offset units cancelled prior to the event in order to make a carbon neutral claim. Certain information gathered to prepare the pre-event carbon account is required to be published in the pre-event public report.
For small events, the effect of sensitive emissions on the pre-event carbon account must be considered. A conservative approach to the estimation of sensitive activities must be used in the carbon account and this may result in the cancellation of additional eligible offset units.

Appendix B Section 3.1 provides examples and templates for calculating a carbon account.

**Emission factors**

The responsible entity must use credible and reliable emission factors when determining the carbon account. Where a factor is available in the *National Greenhouse Accounts Factors* (NGA Factors, Department of the Environment and Energy, 2017) that is applicable to the entity’s circumstances, this factor must be used (unless as otherwise provided for by this standard or its associated guidance material).

The current version of the NGA is available on the Department’s website at [www.environment.gov.au](http://www.environment.gov.au). This includes factors for scope 1 and 2 emissions and scope 3 emission factors for waste; wastewater; solid, liquid and gaseous fuels; and electricity.

Further guidance on scope 3 factors that are not available in the NGA is provided in Appendix B Section 1.

Factors used must either be the most up to date available at the time of preparing the carbon account or align with the relevant time period during which the emissions occurred (e.g. a 2015 emission factor should be used to calculate 2015 emissions).

**Treatment of renewable energy**

The carbon account must include used or generated renewable energy even when considered as zero emissions.

The requirements when accounting for renewable energy and energy efficiency schemes under the Event Standard are explained in Appendix B Section 2. This includes the rules that apply to renewable energy generated and used onsite.

**Accounting for carbon neutral supply chains**

If the event’s carbon account includes an activity, product or venue in its supply chain that has been certified as carbon neutral against any of the other categories of the National Carbon Offset Standard (see Box 1), the activity or product is considered to contribute zero emissions to the event’s carbon account. This is because the emissions of the activity or product have already been accounted for and offset.

A carbon neutral activity, product or venue in the event’s supply chain could include:

- use of products and services (e.g. retail electricity) certified against the *National Carbon Offset Standard for Products & Services*; or
- use of a venue certified against the *National Carbon Offset Standard for Buildings* or the *National Carbon Offset Standard for Precincts*, respectively.

The use of the activity, product or venue must still be reported (in the form of activity data) to ensure transparency and completeness of the carbon account. The activity data should be recorded as having an emission factor of zero.
For example, if carbon neutral retail electricity is used, the carbon account for the event would record the amount of electricity used with an associated emission factor of zero. Therefore, the calculated emissions from the use of this electricity would also be zero.

An activity or product that claims to be carbon neutral but is not certified against any of the National Carbon Offset Standard categories is not considered to have a zero emissions impact for an event’s carbon account.

2.3.5 Step 5: Calculate post-event carbon account (large events only)

The post-event carbon account must be prepared within four months of the event’s delivery. Certain information gathered to prepare the post-event carbon account is required to be published in the post-event public report.

The responsible entity for a large event must re-calculate the carbon account after the event’s delivery using actual measured data collected from the event for activities identified as sensitive in the pre-event public report (section 2.3.2). If the post-event carbon account exceeds the pre-event carbon account, a quantity of additional eligible offset units, equal to or greater than the difference in carbon accounts, is required to be cancelled.

The preparation of a post-event carbon account involves the following processes:

- Identify any changes in the emissions boundary and sources from the pre-event account.
- Collect data from emissions sources and calculate the post-event carbon account.

Identify changes in emissions boundary and sources from the pre-event carbon account

The emissions boundary and sources established in the pre-event account must be reviewed against the post-event carbon account. This is to ensure the post-event boundary includes activities and emissions sources that may have changed after the submission of the pre-event carbon account.

The emissions boundary and the identification and collection of data for new emissions sources must be completed in accordance with the requirements of Section 2.3.1.

Changes from the pre-event carbon account must be disclosed in the post-event public report (Section 2.6.2). The disclosure must identify and explain the change.

Collect data on emissions sources and calculate the post-event carbon account

For emissions sources identified as sensitive in the pre-event carbon account, a methodology for collecting data from the delivery of the event is required. This data must be used in the calculation of the post-event carbon account. If the responsible entity is not able to collect activity data on sensitive emissions sources from the event, it must include a justification and updated methodology for calculation in the post-event carbon account.

For newly identified emissions sources, actual measured data should be used whenever possible, with conservative estimates used only where data is unavailable.

Data collected for the post-event carbon account must be maintained in accordance with the requirements of Section 2.3.3.

After the data is collected, the post-event carbon account must be calculated using updated activity data.
2.4 REDUCE: Reduce emissions where possible

2.4.1 Emissions reduction activities

Maintaining a comprehensive carbon account can help an event organiser to better understand the sources of greenhouse gas emissions and to identify the most cost-effective opportunities for reducing emissions for future events.

The Event Standard requires that emissions reduction activities are undertaken where possible, before compensating for emissions through the purchase and cancellation of eligible offset units (Section 2.5).

Since emissions reduction activities will reduce the carbon account of the event, these will have implications for the quantity of offsets that need to be purchased to achieve carbon neutrality.

Disclosing emissions reduction initiatives and reporting on achievements contributes to transparency and is in line with carbon management best practices.

Emissions reductions may be achieved in many ways, including by:

- increasing energy efficiency (e.g. by using energy efficient lighting and appliances)
- process changes/improvements (e.g. improved waste management processes)
- substituting products or inputs with those that are less emissions intensive or carbon neutral
- changing practices to replace emissions intensive activities with those that generate fewer emissions (e.g. replacing business-related flights with teleconferencing, and switching off lighting and air conditioning when not in use).

Entities seeking to become carbon neutral for multiple or recurring events should develop and maintain an emissions reduction strategy. The emissions reduction strategy should identify the emissions reduction measures to be undertaken and the quantity of emissions expected to be reduced over a specified timeframe, where this can be quantified.

2.5 OFFSET: Cancel eligible offset units

Any remaining emissions must be compensated through cancelling (also known as retiring) an equivalent number of eligible offset units.

The responsible entity for the event must adopt an upfront offsetting approach. The number of offsets cancelled must be equal to or greater than the pre-event carbon account. For large events, offsetting in advance must be followed by a true-up process after the event to ensure that sufficient eligible offset units have been cancelled to cover the event (further details at Section 3.4.1).

2.5.1 Eligible offset units

Offset units eligible for use as part of a carbon neutral claim against the Event Standard are listed in Appendix A. Only these units can be used as part of a carbon neutral claim under the standard.

These units have met the offset integrity principles of the Event Standard (Section 1.3.2). Appendix A may be updated as new information or offset units become available. This may result in the addition of new eligible offset units or the removal of existing ones.

The purchase of eligible offset units supports projects that reduce or remove emissions from the atmosphere. Many carbon offset projects deliver positive outcomes in addition to emissions
reductions. The responsible entity may choose to purchase units from projects that align with corporate goals or values, those that deliver specific social or environmental outcomes, and/or those that support particular Sustainable Development Goals.

Before choosing to use any units for offsetting purposes, the responsible entity should undertake its own due diligence assessment of the originating projects and underpinning methodologies, as well as consult the Department’s website (www.environment.gov.au/climate-change/government/carbon-neutral) for any updates to the eligibility of offset units.

2.5.2 Proof of cancellation of offset units

Eligible offset units must be cancelled via a publicly available registry. The cancellation should be clearly attributed to the carbon neutral claim and the event or responsible entity making the claim. The cancellation and attribution of eligible offset units is important to prevent resale or double counting of offset units.

Proof of the cancellation of eligible offset units, including the name of the registry in which the units were cancelled and the serial numbers of the units, must be provided in the public report (Section 2.6). Attributing units to the particular carbon neutral claim should be done via a note within the registry explaining that the units have been ‘cancelled on behalf of Event XYZ to meet its carbon neutral claim against the National Carbon Offset Standard for FY2017-18’.

There are several independently managed registers for offset units, as well as those set up by suppliers and the administrators of the various offset standards. Units may be purchased and cancelled by the responsible entity or by a consultant or carbon service provider.

Eligible offset units may be purchased and cancelled for immediate use or they may be banked for use against a future carbon neutral claim. Early purchase and/or cancellation of units allow the responsible entity to choose the timing of purchase to meet its needs and to obtain a particular type of offset when it is available.

2.6 REPORT: Prepare public reports

A report must be made publicly available to communicate progress on emissions reduction activities and offsetting as part of a carbon neutral claim. Reporting keeps the public and other interested parties informed in an open and transparent manner and communicates achievements in managing emissions.

The level of detail and explanation required in a public report must ensure the reader has a clear understanding of what has been done to achieve carbon neutrality in terms of determining the carbon account, the actions to reduce absolute emissions or emissions intensity over time and offsetting of remaining emissions.

The public report should be signed off by senior management (e.g. the appropriate business unit leader or chief executive officer) and must be published on the responsible entity’s website.

The public report can be in the format of a Public Disclosure Summary (template is available from the Department’s website at www.environment.gov.au/climate-change/government/carbon-neutral) or another document more suitable for communication with event stakeholders.

For events that are certified against the Event Standard through the Carbon Neutral Program (Section 3), the public report will be automatically published on the Department’s website when certification has been granted.
2.6.1 Pre-event reporting

Small and large events are required to prepare a public report prior to the event. The pre-event public report must include the following:

› the total gross and net projected greenhouse gas emissions of the event
› disclosure of emissions sources excluded from the emissions boundary (especially from activities that stakeholders would expect to be included)
› disclosure of sensitive emissions sources
› a summary of the emissions reduction activities planned for the event
› records to prove that sufficient eligible offset units have been cancelled to offset the event’s emissions (e.g. the name of the registry in which the units were cancelled and the project type and serial numbers of the relevant units).

2.6.2 Post-event reporting (large events only)

Large events are also required to prepare a public report after the event. The post-event public report must include:

› the total gross and net greenhouse gas emissions of the event
› the difference between the pre-event emissions and the post-event emissions of the event
› changes to the emissions sources, methodologies, data quality and boundaries since the preparation of the pre-event public report
› details of the quantity and type of eligible offset units cancelled and records to prove that sufficient eligible offset units have been cancelled to offset any negative difference between the pre-event estimation of emissions and the post-event calculation of emissions (if required).

2.7 AUDIT: Independent audit

A considered and transparent audit model provides confidence in carbon neutral reporting. Independent auditing validates the accuracy and completeness of carbon calculations, including the appropriateness of emissions boundaries, methodologies and factors.

Small events are not required to be audited, although the carbon account for a small event may still be subject to scrutiny via the publication of the public report.

For large events, carbon account calculations, emissions reductions and offsetting activities must be reported and independently audited. A large event under the Event Standard must be subject to an independent audit after the event. The audit report should identify any issues or discrepancies in the carbon account measurement, public report, emissions reduction claims and/or offsetting arrangements against the requirements of the Event Standard. The independent auditor’s report and/or assurance statement should be made publicly available.

The audit must include assessment of the adequacy and appropriateness of the emissions boundary setting, emissions methodologies and emission factors.

As appropriate to the carbon account, the auditor may need reasonable access to:

› facilities, equipment and personnel required for the operations within the event’s emissions boundary
› records, including monitoring records, utility bills, attendance records, vendor records, internal audit and management review records, customer complaints and statistics related to the activities within the emissions boundary
› any additional reporting or information source used to develop the carbon account.
If the auditor identifies any Corrective Action Requests (CARs) and/or Observations in the course of the audit, they must provide these to the responsible entity. The responsible entity should be provided with the opportunity to resolve these prior to the closure of the audit activity. The auditor may wish to contact the Department to discuss any issues or interpretations concerning the Event Standard.

The responsible entity making a carbon neutral claim is responsible for maintaining appropriate records for auditing and bearing the associated costs.

Audit standards that should be applied are:

- ASAE 3000 Assurance Engagements other than Audits or Reviews of Historical Financial Information; or
- ISO 14064-3: Greenhouse gas specification with guidance for the validation and verification of greenhouse gas assertions.

If another auditing standard is to be applied, the auditor must confirm that it is as rigorous as those specified above.

The auditor must provide an assurance statement confirming whether the carbon account and other information relevant to the carbon neutral claim are presented fairly in accordance with the requirements of the Event Standard. The minimum level of assurance provided by the statement must be limited assurance for all scopes of emissions.

At the conclusion of the audit, the auditor must also provide the responsible entity with a list of any outstanding Corrective Action Requests and Observations. This can assist the responsible entity to improve its data gathering and management practices over time, where appropriate, and may also be published by the responsible entity alongside the auditor’s report and/or assurance statement to provide further transparency to the carbon neutral claim.

An audit of a carbon neutral claim under the Event Standard must be undertaken by a suitably qualified auditor. Suitably qualified auditors are individuals or bodies that are:

- included on the Register of Greenhouse and Energy Auditors, as established under section 75A of the National Greenhouse and Energy Reporting Act 2007 (NGER Act) and maintained by the Clean Energy Regulator; or
- accredited to the international standard ISO 14065:2013 or recognised international standards based on ISO 14040.

Where specialist skills are required that are not possessed by the auditor, the necessary skills can be provided by an independent expert. Such experts must be independent and cannot have been involved in the development of the carbon account that is the subject of the audit.

The responsible entity must keep records that are adequate to enable the independent auditor to ascertain whether activities have been conducted in accordance with requirements under this standard. This includes information that can be used to verify the relevance, completeness, consistency, transparency and accuracy of reported data during an external audit. Record keeping requirements are outlined in Section 2.3.3.

Records can be kept in electronic or paper form. Records should be stored in a format that is accessible to external auditors if required.
3. CERTIFICATION AGAINST THE EVENT STANDARD

Carbon neutral certification against the Event Standard can be sought through the Australian Government’s Carbon Neutral Program. Certification is available for small and large events (as per Section 2.1). Certification may also be sought for recurring, multiple and suites of events.

Responsible entities considering applying for carbon neutral certification should contact the Department (carbonneutral@environment.gov.au) early in the process to discuss the suitability of the Event Standard for their circumstances.

Certification may be granted by the Department upon:

› the Department’s approval of an application for carbon neutral certification against the requirements of the Event Standard (Section 3.1)
› the responsible entity agreeing to the obligations for certification (Section 3.2) and the terms and conditions of the licence to use the certification trade mark, by entering into a licence agreement with the Department (Section 3.3).

The Department will make a decision on the certification of the event and will advise the responsible entity of the decision in writing. If certification is granted, the responsible entity will receive a notice of certification.

Details of the certification, including the public report, will be placed on the Department’s website.

3.1 Application for certification

Applications for carbon neutral certification can be made by contacting the Department. The Department will provide guidance on how to apply. Applications must include:

1. a pre-event carbon account (Section 3.1.1)
2. a pre-event public report (Section 3.1.2).

Templates for the pre-event carbon account and public report are available on the Department’s website at (www.environment.gov.au/climate-change/government/carbon-neutral). Other formats for the annual carbon account and public report can also be used.

If an application is unsuccessful, the Department will provide an explanation of the reasons why.

3.1.1 Pre-event carbon account

The responsible entity seeking carbon neutral certification must have all relevant data or have determined methods for collecting data and must be able to calculate an event’s pre-event carbon account (as per Section 2.3.4).
The pre-event carbon account must demonstrate an understanding of what must be included in the event’s carbon account, and for large events, what activity data must be collected from the delivery of the event.

The requirements for collecting activity data and calculating the carbon account are described in Section 2.3.3 and Section 2.3.4.

Appendix B Section 3.1 provides examples and templates for calculating a carbon account.

3.1.2 Pre-event public report

Transparency of information is important for maintaining consumer confidence in carbon neutral claims. A responsible entity seeking certification of an event through the Carbon Neutral Program must prepare a public report as described in Section 2.6.1 as part of the application for carbon neutral certification.

Note that for a large event, the responsible entity must also prepare a post-event public report within four months of the delivery of the event.

3.2 Obligations

3.2.1 Agreement with obligations

The Department will only grant certification after the responsible entity has agreed to the obligations for certification, as contained in the licence agreement (Section 3.3.1). The licence agreement also specifies the reporting period for large events, the licence fees and the dates by which these obligations are due.

Once executed, the licence agreement legally binds the responsible entity to the obligations for certification for the agreed duration of the certification (Section 3.3.1).

3.2.2 Obligations for certification

The Event Standard requires measuring, reducing, offsetting and reporting of emissions to be completed for the event, and for large events, an independent audit must also be undertaken (Section 2). Completion of obligations for certification against the standard is based on these requirements.

The licence agreement specifies the reporting period and the dates by which obligations are due.

Obligations for small event certifications

1. Payment of the licence fee. The licence fee must be paid prior to the event.


The Department may require a certified carbon neutral event to complete a post-event report and/or obtain an independent audit if circumstances change significantly. Examples of a significant change may include an increase in event attendance or change in event duration or event location.
Obligations for large event certifications

1. **Payment of the licence fee** prior to the event. The licence fee must be paid prior to the event. Information on fees is available from the Department or via the Department’s website at www.environment.gov.au/climate-change/government/carbon-neutral.

2. **Submission of a post-event carbon account.** The carbon account must include:
   - a detailed inventory of the emissions generated from the certified event (as per Section 2.3)
   - any changes to the carbon account calculation compared to the pre-event carbon account
   - assumptions or limitations relating to how the carbon account has been calculated
   - details of any activities leading to emissions reductions achieved during the certified event’s delivery.

3. **Submission and publication of a post-event public report.** In addition to the requirements of Section 2.6, the post-event public report must include:
   - a summary of how the carbon neutral certification has been marketed and communicated, including the use of the certification trade mark.

4. **Independent auditing** of the post-event carbon account and public report (as per Section 2.7). The independent audit must be arranged and paid for by the responsible entity. The audit report and list of any outstanding Corrective Action requests and/or Observations must be submitted to the Department as part of the certification obligations. The Department may request clarification or further information to assist with the evaluation.

The post-event carbon account, public report and the independent audit must be submitted within four months of the event.

Templates for the post-event carbon account and public report are available on the Department’s website at www.environment.gov.au/climate-change/government/carbon-neutral. Other formats can also be used.

### 3.3 Licence to use the certification trade mark

#### 3.3.1 Licence agreement

The licence agreement is an agreement between the responsible entity and the Department that stipulates the obligations for certification and the terms and conditions for the use of the certification trade mark.

The licence agreement legally binds the responsible entity to the agreed terms for the timeframe specified in the agreement and provides the responsible entity with a licence to use the certification trade mark subject to achieving and maintaining certification.

To be granted certification and licence to use the certification trade mark, the responsible entity must execute the licence agreement.

A copy of the licence agreement can be requested from the Department at any time.

#### 3.3.2 Permission to use the certification trade mark

If certification is granted, the responsible entity will be sent a notice of certification by the Department.
Once the notice of certification has been issued, the carbon neutral certification and permission to use the certification trade mark are valid continually for the time specified in the licence agreement, subject to all obligations being met (Section 3.2).

The licence agreement for an event usually covers a one-year period. If the responsible entity wishes to continue using the certification trade mark after the end of the period specified in the licence agreement, it must agree to a new licence with the Department.

Use of the certification trade mark must be in accordance with the User Guide for the Carbon Neutral Certification Trade Mark (User Guide). The User Guide has been approved by the Australian Competition and Consumer Commission. Use of the certification trade mark in accordance with the User Guide minimises risks of challenges in relation to the carbon neutral claim.


Digital versions of the certification trade mark are provided by the Department to the responsible entity upon issuance of the notice of certification.

### 3.3.3 Completion of obligations

The Department will review and monitor reporting and offsetting obligations (Section 3.2.2) and evaluate whether the requirements of the Event Standard have been met. For a large event, after the reporting documents have been accepted by the Department, a notice of completion will be issued.

Certification and trade mark use may be suspended or terminated by the Department if the obligations contained in the licence agreement are not met. There will be the opportunity to rectify any issues before such action is taken.

### 3.4 Other administrative arrangements

#### 3.4.1 Timing of offset unit cancellation

The responsible entity must offset upfront with a sufficient quantity of eligible offset units equal to or greater than the pre-event carbon account.

The responsible entity seeking carbon neutral certification is not required to proceed with the purchase and cancellation of eligible offset units until after the application has been accepted by the Department.

Once the application documents have been accepted by the Department, evidence must be provided to the Department with details of the eligible offset units that have been cancelled to support the carbon neutral claim for the event. These units must be cancelled prior to the event to support the carbon neutral claim.
For large events, a true-up is performed after the event to ensure that a sufficient quantity of units has been cancelled.

- After the event, the responsible entity must calculate the difference between the post-event carbon account for the event and the number of eligible offset units cancelled prior to the event.

- If more eligible offset units have already been cancelled than needed to acquit the carbon neutral claim for the event, the excess may be carried over to be used against other carbon neutral claims. If the post-event carbon account is greater than the number of units already cancelled, additional units will need to be purchased and cancelled to meet this discrepancy. This process is known as ‘true-up.’

Information on the pre-event cancellation of eligible offset units must be included in the pre-event public report. Information on the true-up process must be included in the post-event public report.


### 3.4.2 Review of decisions

If the responsible entity disagrees with a decision of the Department (either in relation to a certification decision or the granting and use of the certification trade mark) it may request an internal review of the decision.

See the Department’s service charter for details on the internal review processes. The charter can be found at www.environment.gov.au.

If the responsible entity is dissatisfied with the way in which the Department handles a complaint, it may wish to complain to the Commonwealth Ombudsman. The Ombudsman will usually decline to investigate a complaint unless the matter has been raised directly with the Department first. Details of how to make a complaint to the Commonwealth Ombudsman can be found at www.ombudsman.gov.au.

### 3.4.3 Confidentiality

Information that is provided to the Department that is confidential will not be disclosed to any third party without the responsible entity’s permission, except under limited circumstances that are required for the administration of the Carbon Neutral Program and set out in the licence agreement, or if required by law. This does not apply to the public reports, which are public documents.

Information is regarded as confidential if it is information that:

- is inherently confidential and not in the public domain: and

- the responsible entity notifies the Department is to be treated in confidence: and

- is not in the possession or knowledge of the Department independently of its disclosure by the responsible entity.

Confidentiality conditions are detailed further in the licence agreement. If there are any concerns about disclosure of confidential information, please discuss this with the Department.
4. REFERENCES

4.1 References that form the basis of the Event Standard

The following existing Australian and international standards and Australian legislation provide the basis for the Event Standard. These documents also provide further detailed information on how to develop a carbon account. For all references see Section 4.2.

- Australian Standard (AS) ISO 14064 series, including:
- International Standard ISO 14040 series, including:
  - Other international standards that are based on the ISO 14040 series, including PAS 2050:2011
  - Specification for the assessment of the life cycle greenhouse gas emissions of goods and services
- ISO 14065:2013 – Greenhouse gases – Requirements for greenhouse gas validation and verification bodies for use in accreditation of other forms of recognition
- The British Standards Institution’s (BSI) Specifications, including:
  - BSI’s PAS 2060:2014 – Specification for the demonstration of carbon neutrality
- The Greenhouse Gas (GHG) Protocol standards, including:
  - The GHG Protocol for Project Accounting (2005)
  - GHG Protocol – Corporate Value Chain (Scope 3) Accounting and Reporting Standard (2011)
- The National Greenhouse and Energy Reporting Act 2007 (NGER Act) and supporting legislation and documentation, including:
  - National Greenhouse and Energy Reporting Regulations 2008
  - National Greenhouse and Energy Reporting (Audit) Determination 2009
  - National Greenhouse and Energy Reporting Technical Guidelines
  - National Greenhouse Accounts Factors

All standards and legislation are subject to revision. Responsible entities must use the most recent version or editions of any listed standards, guidance material or legislation.
4.2 All references


5. GLOSSARY

**Activity data**
Source data that quantifies an emissions-generating activity, such as fuel usage and electricity consumption, and that can be used to determine greenhouse gas emissions.

**Additionality**
A requirement that a project or activity results in carbon abatement that is unlikely to occur in the ordinary course of events in the absence of the project or activity, including due to any existing commitment or target publicly agreed by the entity responsible for issuing the units. Abatement must not be double counted under another system.

**Australian Carbon Credit Unit (ACCU)**
An emissions unit issued under the Carbon Credits (Carbon Farming Initiative) Act 2011.

**Cancellation**
Transfer of a unit to a cancellation account so that it may not be used for any further purpose. Also known in some schemes as ‘retirement’.

**Carbon account**
A measure of the carbon dioxide equivalent emissions attributable to an activity. A carbon account can relate to the emissions of an individual, household, organisation, product, service, event, building or precinct. This can also be known as a carbon footprint or emissions inventory.

**Carbon dioxide equivalence (CO\(_2\)-e)**
A standard measure that takes account of the global warming potential of different greenhouse gases and expresses the effect in a common unit.

**Carbon neutral**
A situation where the net emissions associated with an activity are equal to zero because emissions have been reduced and offset units cancelled to fully account for all emissions.

**Carbon Neutral Certification Trade Mark (certification trade mark)**
The National Carbon Offset Standard Certification Trade Mark. IP Australia Reference Number 1369520.

**Carbon Neutral Program (or the Australian Government’s Carbon Neutral Program)**
The program by which an organisation, product & service, building, precinct or event can be certified as carbon neutral against the National Carbon Offset Standards.

**Carbon sink**
A natural or man-made reservoir, such as a forest, that stores carbon.

**Certification trade mark**
see Carbon Neutral Certification Trade Mark.

**Certified Emission Reduction (CER)**
A Kyoto Protocol unit corresponding to one metric tonne of carbon dioxide equivalent emissions, and issued for verified emissions reductions or removals achieved by a project approved under the Clean Development Mechanism (CDM). CDM projects undertaking afforestation and reforestation activities are issued temporary (tCERs) and long term units (lCERs), which expire and must be replaced after a specified period.
Clean Development Mechanism (CDM)
A carbon offset mechanism established under Article 12 of the Kyoto Protocol. Countries with emissions targets under the Kyoto Protocol can meet their obligations using credits from greenhouse gas abatement projects established under Article 12 in countries that are party to the Protocol but do not have an emission target.

Conservative approach
An approach that reduces the risk of emissions being underestimated in the carbon account.

Department (the)
Australian Government Department of the Environment and Energy.

Eligible offset unit
An offset unit that has been deemed to meet the National Carbon Offset Standard’s offsets integrity principles, and is listed in Appendix A to this standard.

Emission factor
A factor that specifies the kilograms of CO$_2$-e emissions per unit of activity.

Emissions abatement or carbon abatement
Either the removal of one or more greenhouse gases from the atmosphere or the avoidance of emissions of one or more greenhouse gases.

Event
A planned and organised occasion.

Event organisation boundary
The basis for determining what can be considered direct and indirect emissions associated with an event’s emissions sources, from the perspective of the event organiser. See Section 3.2.1 for further details.

Event organiser
The entity that assumes control of the event’s planning and organisation.

Event Standard
see National Carbon Offset Standard for Events.

Facility
(a) For any organisation already reporting under the NGER Act, an activity or a series of activities (including ancillary activities) that involves the production of greenhouse gas emissions, the production of energy or the consumption of energy, and that forms a single undertaking or enterprise and meets the requirements of the National Greenhouse and Energy Reporting (NGER) Regulations.

(b) For any organisation not currently reporting under the NGER Act, any building or land together with any machinery, plant, appliance, equipment, implement, tool or other item used in connection with any activity carried out at the facility, and includes an offshore facility. The facility may be located on a single site or on adjacent or contiguous sites owned or operated by the same person.

Financial control
One of the control approaches described in the GHG Protocol – Corporate Standard (WBCSD and WRI, 2004) for setting an organisational boundary. This approach can be adapted for use in determining an event organisation boundary. See Section 2.3.1 for further details.

Greenhouse gases (GHG)
The atmospheric gases responsible for causing global warming and climate change. The Kyoto Protocol lists six greenhouse gases – carbon dioxide (CO$_2$), methane (CH$_4$), nitrous oxide (N$_2$O), hydrofluorocarbons (HFCs), perfluorocarbons (PFCs) and sulphur hexafluoride (SF$_6$) – with the addition of nitrogen trifluoride (NF$_3$) from the beginning of the protocol’s second commitment period.

GreenPower-eligible LGC
An LGC produced by a GreenPower-accredited generator and sold through a GreenPower product.

GreenPower product
Any product or service that enables customers to voluntarily contribute financially to renewable energy generation from GreenPower Generators, and has been accredited under the National GreenPower Accreditation Program.
**GreenPower provider**
An electricity supplier or decoupled provider offering an accredited GreenPower product.

**Input-output analysis**
A method of estimating carbon emissions using aggregate economic and emissions data which are categorised into different industry sectors. The analysis takes into account the economic flows between these sectors, and is usually presented in input-out tables (or databases) as an emissions intensity per dollar of economic activity (or business spending) in any given industry sector.

**Kyoto Protocol**
An international treaty that was created under the United Nations Framework Convention on Climate Change (UNFCCC) in 1997 and entered into force in 2005. The Kyoto Protocol sets binding targets for the reduction of greenhouse gas emissions by developed countries and countries in transition.

**Kyoto unit**
Emissions units created under the Kyoto Protocol. Kyoto units include Assigned Amount Units (AAUs), Certified Emission Reductions (CERs, including tCERs and ICERs), Emission Reduction Units (ERUs) and Removal Units (RMUs).

**Large event**
An event with more than 2,000 attendees, or more than one thousand attendees and an event duration greater than one day. See Section 2.1 for further details.

**Licence agreement**
An agreement in place between the responsible entity and the Department which contains terms and conditions for the use of the certification trade mark. The responsible entity must agree to and comply with the obligations and rules contained in the licence agreement in order to use the certification trade mark.

**Limited assurance**
A level of assurance defined in the National Greenhouse and Energy Reporting (Audit) Determination 2009 whereby the auditor finds that there is no evidence to suggest that a report is not accurate. This is a lower level of assurance than ‘reasonable assurance’. It is distinguishable from a reasonable level assurance in that there is less emphasis on detailed testing of greenhouse gas data and information supplied to support the greenhouse gas assertion.

**Material**
The status of an emissions source when it constitutes 1 per cent or more of the total carbon account. Refer to Section 2.3.1 for further details.

**Material discrepancy**
An error (e.g. from an oversight, omission, or miscalculation) that results in the reported quantity being significantly different to the true value to an extent that will influence performance or decisions. This definition is taken from the GHG Protocol – Corporate Standard (WBCSD and WRI, 2004).

**Materiality**
Material.

**National Carbon Offset Standard**
A standard for making carbon neutral claims; maintained by Australian Government Department of the Environment and Energy; sets rules for measuring, reducing, offsetting and reporting emissions. The standard is available for:

- Organisations: National Carbon Offset Standard for Organisations
- Products and Services: National Carbon Offset Standard for Products & Services
- Buildings: National Carbon Offset Standard for Buildings
- Precincts: National Carbon Offset Standard for Precincts
- Events: National Carbon Offset Standard for Events
National Carbon Offset Standard for Events (Event Standard)
A standard for making carbon neutral claims in relation to an event. The Event Standard is maintained by the Australian Government Department of the Environment and Energy. It sets the rules for measuring, reducing, offsetting and reporting emissions as required to make a carbon neutral claim for an event.

National Greenhouse and Energy Reporting (NGER) Scheme
The national reporting framework for information related to greenhouse gas emissions, energy production and use by corporations operating in Australia. The framework is established under Commonwealth legislation, which makes registration and reporting mandatory for corporations whose greenhouse gas emissions or energy production or use meet certain thresholds.

NGER Act

Notice of Certification
A formal letter of acknowledgement from the Department to the responsible entity informing it that its application for certification through the Carbon Neutral Program has been successful.

Notice of Completion
A formal letter of acknowledgement from the Department to the responsible entity informing it that its obligations for certification through the Carbon Neutral Program have been met.

Offsetting
The activity of cancelling offset units.

Offset unit
Represents reductions of greenhouse gases or removals of greenhouse gases from the atmosphere by sinks, relative to a business-as-usual baseline. Offset units are tradeable and can be used to negate (or offset) all or part of another entity’s emissions.

Operational control
One of the control approaches described in the GHG Protocol – Corporate Standard (WBCSD and WRI, 2004) for setting an organisational boundary. This approach can be adapted for use in determining an event organisation boundary. See Section 2.3.1 for further details.

Organisation
A company, corporation, firm, enterprise, authority or institution, or a combination thereof, incorporated or not, public or private, that has its own functions and administration. This may also include an organisation that shares functions and/or administration with another organisation.

Permanence
A requirement that offset units represent reductions in emissions or an increase in carbon sequestration that is permanently maintained and is not re-released into the atmosphere.

Precinct
A precinct or district is a discernible area ‘more than a building and less than a city’ and is primarily defined by its geographic boundaries, which, at a minimum, must incorporate public infrastructure beyond a single building.

Product
Physical goods produced for sale.

Reasonable assurance
A level of assurance defined in the National Greenhouse and Energy Reporting (Audit) Determination 2009 that the report is accurate in all material respects. The auditor provides a high, but not absolute, level of assurance that the responsible party’s greenhouse gas assertion is materially correct.

Relevance
Concept adapted from the GHG Protocol – Corporate Standard (WBCSD and WRI, 2004) for ensuring the carbon account of a subject appropriately reflects the emissions of that subject and meets the expectations of users and stakeholders. See Section 2.3.1 for further details.
**Relevance test**
Qualitative test for determining whether certain emissions sources are or are not considered relevant. See Section 2.3.1 for further details.

**Removal Unit (RMU)**
A unit created under the Kyoto Protocol corresponding to one metric tonne of carbon dioxide equivalent emissions sequestered and issued for removals of carbon dioxide from the atmosphere by eligible land use, land-use change and forestry activities.

**Responsible entity**
The organisation or person (with appropriate delegation to sign on behalf of the event) that has taken responsibility for making a carbon neutral claim or seeking carbon neutral certification.

**Scope**
The categorising of emissions sources into direct and indirect sources. Refer to the individual definitions for scope 1 emissions, scope 2 emissions and scope 3 emissions. See Section 2.3.2 for further details.

**Scope 1 emissions**
The release of greenhouse gases into the atmosphere as a direct result of activities occurring within a responsible entity’s control (or geographic boundary).

**Scope 2 emissions**
The release of greenhouse gases into the atmosphere from the consumption of electricity, heating, cooling or steam that is generated outside of a responsible entity’s control (or geographic boundary).

**Scope 3 emissions**
Greenhouse gases emitted as a consequence of a responsible entity’s activities but emitted outside the responsible entity’s control (or geographic boundary).

**Sensitive emissions**
Emissions that are sensitive to material change throughout the delivery of an event. See Section 2.3.2 for further details.

**Sequestration**
The removal of atmospheric carbon dioxide, either through biological processes (for e.g. photosynthesis in plants and trees) or geological processes (e.g. storage of carbon dioxide in underground reservoirs).

**Service**
A type of economic activity that is intangible, is not stored and does not result in ownership.

**Sink**
See definition for carbon sink.

**Sustainable Development Goals**
Refers to the 17 goals that form part of the United Nations’ 2030 Agenda for Sustainable Development.

**Small event**
An event with less than 1,000 attendees, or less than 2,000 attendees and an event duration of one day or less. See Section 2.1 for further details.

**True-up**
The calculation to determine if additional eligible offset units must be purchased after the measurement of the post-event carbon account.

**Uplift factor**
A factor that is used to increase the estimated emissions from an activity, usually by a risk-adjusted proportion or percentage, and mitigate the risk of emissions being underestimated in the carbon account.

Sets out the rules that govern how and when the certification trade mark can be used.
**Verified Carbon Unit (VCU)**
A unit corresponding to one metric tonne of carbon dioxide equivalent emissions reduced or avoided, as certified and issued under the Verified Carbon Standard.

**Verified Emissions Reduction (VER)**
A unit corresponding to one metric tonne of carbon dioxide equivalent emissions reduced or avoided, as certified and issued under the Gold Standard, a global standard for projects that deliver carbon abatement and other social and environmental benefits.

**Vintage**
Refers to the date of issuance of an offset unit.
Eligible offset units

As of 1 November 2018, all units must have a vintage year later than 2012.

The following offset units are eligible under the National Carbon Offset Standard:

- Australian Carbon Credit Units (ACCUs) issued by the Clean Energy Regulator in accordance with the framework established by the Carbon Credits (Carbon Farming Initiative) Act 2011.
- Certified Emissions Reductions (CERs) issued as per the rules of the Kyoto Protocol from Clean Development Mechanism projects, with the exception of:
  - long-term (lCERs) and temporary (tCERs); and
  - CERs from nuclear projects, the destruction of trifluoromethane, the destruction of nitrous oxide from adipic acid plants or from large-scale hydro-electric projects not consistent with criteria adopted by the EU (based on the World Commission on Dams guidelines).
- Removal Units (RMUs) issued by a Kyoto Protocol country on the basis of land use, land-use change and forestry activities under Article 3.3 or Article 3.4 of the Kyoto Protocol.
- Verified Emissions Reductions (VERs) issued by the Gold Standard.
  - Abatement recognised by the Gold Standard may be subject to the possibility of double counting; for example, where the abatement occurs in a host country or region that is affected by international or national emissions trading, cap and trade or carbon tax mechanisms. Please see the Gold Standard’s Double Counting Guideline for full details.
  - Where the additionality of a VER is ensured through the cancellation of an Eligible Cancellation Unit (as defined by the Gold Standard), that VER is only eligible for use under the National Carbon Offset Standard where the applicable Eligible Cancellation Unit would also have been eligible under the National Carbon Offset Standard.
- Verified Carbon Units (VCUs) issued by the Verified Carbon Standard.

This list of eligible offset units will be updated as new information or new offset units become available. This may result in the addition of new offset units or the removal of existing ones.

A decision framework based on the offset integrity principles (Section 1.3.1) is used to determine the eligibility of new offset units and to review the eligibility of existing units.
This document (Appendix B) provides information on common emissions sources and the treatment of renewable energy use when preparing a carbon account under one of the categories of the National Carbon Offset Standard.

The National Carbon Offset Standard is available for organisations, products & services, buildings, precincts and events:

- National Carbon Offset Standard for Organisations
- National Carbon Offset Standard for Products & Services
- National Carbon Offset Standard for Buildings
- National Carbon Offset Standard for Precincts
- National Carbon Offset Standard for Events.

Appendix B should be read in conjunction with the category of the National Carbon Offset Standard relevant to the carbon neutral claim being made.

References in this appendix to sections, made in the form 'Section XY', mean the sections in any category of the National Carbon Offset Standard. References in this appendix to other sections within the appendix itself are made in the form 'Appendix B: Section XY'.

The information contained in this appendix is not intended to be a comprehensive guide and may be more relevant to particular categories of the National Carbon Offset Standard than others. Some additional guidance on scope 3 emissions sources and emission factors is available in Guidance on Scope 3 Calculations at [www.environment.gov.au/climate-change/government/carbon-neutral](http://www.environment.gov.au/climate-change/government/carbon-neutral).

Some of the information in this document is likely to change over time as practices evolve and improved estimation techniques become available. The Department will use its best endeavour to update the information.

For more information, please refer to the carbon neutral website at [www.environment.gov.au/climate-change/government/carbon-neutral](http://www.environment.gov.au/climate-change/government/carbon-neutral) or contact the Department:

- via email to carbonneutral@environment.gov.au; or
- phone 1800 057 590 and ask to talk to the Carbon Neutral Team.
1. Calculations for typical emissions sources

1.1. Transport

Transport vehicles and mobile equipment or machinery generate greenhouse gas emissions either directly by combusting fuel or indirectly by consuming grid-delivered electricity.

This section has been written with reference to the Global Protocol for Community-Scale Greenhouse Gas Emissions Inventories (WRI and ICLEI, 2014).

1.1.1. Emissions sources

The relevance and completeness principles (Section 1.3.1) apply to the identification of the transport activities falling within the emissions boundary.

Any mode of transport may be relevant. Different modes of transportation link back to specific sources of emissions, mostly fuels and grid-distributed electricity (for public transport). Modes of transport may include:

- **on-road transportation**: fuel- and electricity-powered automobiles (e.g. cars, trucks, taxis, buses)
- **railway**: trams, urban railway subway systems, regional (inter-city) commuter rail transport, national rail system
- **marine navigation**: domestic inter-city vessels, international water-borne vessels, sightseeing ferries
- **air travel**: domestic inter-city flights, international flights, helicopters
- **off-road transportation**: airport ground support equipment, agricultural tractors, forklifts.

Emissions by scope

**Under the control approach:**

Scope 1 emissions arise from the consumption of transport fuels in vehicles and machinery directly controlled by the responsible entity or affiliated entities.

Scope 2 emissions arise from the use of electricity from the grid for vehicles and machinery either directly controlled by the responsible entity or directly operating within the geographic boundary of the certification category (where applicable).

When a transport service or activity is outsourced to, purchased from or leased from a third party then it falls under scope 3 emissions.

**Under the geographic boundary approach (buildings and precincts):**

Scope 1 emissions arise from the combustion of transport fuels in vehicles and machinery occurring within the geographic boundary of the certification category.

Scope 2 emissions arise from the use of electricity from the grid for vehicles and machinery operating within the geographic boundary of the certification category.

Scope 3 emissions arise from either the combustion of transport fuels or the use of electricity from the grid for vehicles and machinery operating outside the geographic boundary of the certification category but are induced by activities within the geographic boundary.
For geographic boundaries, the induced activity method as outlined in the *Global Protocol for Community-Scale Greenhouse Gas Emissions Inventories* (WRI and ICLEI, 2014) may be used. To reflect the responsibility shared by different geographic areas inducing these trips, and to avoid double counting of transportation emissions, responsible entities can allocate emissions by reporting 50 per cent of transboundary trips and excluding pass-through trips.

**Upstream scope 3 emissions:**
Scope 1 and scope 2 emissions will also have an additional component of upstream scope 3 emissions, which are the indirect emissions from the extraction, production and transport of fuel burned at generation, and the indirect emissions attributable to the electricity lost in delivery in the transmission and distribution network.

Upstream scope 3 emissions are required to be included when calculating emissions for scope 1 and scope 2.

**Examples of transport activities**
These examples are provided to illustrate potential transport activities that should be included. They are not intended to be exhaustive.

For an organisation, examples of transport activities include:

- fleet operation (scope 1 or scope 2 and scope 3), including the reimbursement of private vehicle use to employees
- transport of goods and products manufactured by the organisation (scope 1 or 2 or 3)
- transport service purchased from a third party: flights, taxi and train trips (scope 3)
- employee commuting (scope 3).

For a product or service, examples of transport activities include:

- fleet operation (scope 1 and/or 3) for the distribution of product or supply of materials
- transport service purchased from a third party: freight (scope 3).

For a precinct, examples of transport activities include:

- intra-precinct public transport (scope 1 or 2 and 2 and 3)
- transport induced by precinct maintenance or management activities (scope 1 and 2, or possibly 3)
- transport generated by the activities of the tenants/occupants of the precinct (scope 3)
- transport from the portion of transboundary journeys occurring outside the precinct (scope 3). See *Global Protocol for Community-Scale Greenhouse Gas Emissions Inventories* (WRI and ICLEI, 2014) for examples of the types of typical transboundary journeys.

For a building, examples of transport activities include:

- transport induced by building maintenance or management activities (scope 1 or 2, and 3)
- transport generated by the activities of the tenants/occupants of the building (scope 3).

For an event, examples of transport activities include:

- fleet operation (scope 1 and 2), including the reimbursement of private vehicle use to employees
- public transport to event, arranged by event organisers (scope 1 and 2)
- intra-event public transport (scope 1 and 2)
- employee and attendee transport to event: car, train, taxi and flight trips (scope 3).
1.1.2. Collecting activity data

Information and data collection will depend on the type of transport activity considered for inclusion and the mode of transport.

- For scope 1 and scope 2 emissions, it is usually possible to collect data on the units of energy (amount and type of fuel or electricity) consumed by the transport activities directly controlled.
- For scope 3 emissions, while the exact units of energy are not known, it is usually possible to estimate emissions from the distances and the mode of transport, or the split between modes of transport for an activity. It may also be possible to ask for a report from the service provider.
  - For example, when assessing commuting in a metropolitan city, an estimation of the proportion of people commuting by train, road or active transport (walking or cycling) can be obtained through specific surveys or derived from existing surveys.

In looking for appropriate data for transport such as commuting or freight or material transport, the order of preference is as follows:

1. specific (measured) data, such as fuel consumption, can be obtained through direct reporting or staff or site surveys.
2. national/state statistics
3. research papers.

Available data for travel and transport includes the following:

- Sydney Trains provides a carbon calculator for specific trips. [http://www.sydneytrains.info/about/environment/index.htm](http://www.sydneytrains.info/about/environment/index.htm)
- Qantas provides a calculator for calculating emissions between different Qantas-operated or codeshare flight routes. [https://www.qantasfutureplanet.com.au/](https://www.qantasfutureplanet.com.au/)

Note that in some cases (e.g. air travel) the transport service provider is able to provide a carbon neutral certified service or a calculation of emissions related to a specific trip (through a calculator). If such a carbon neutral service is certified against one of the categories of the National Carbon Offset Standard, then the emissions for the trip can be directly considered as zero emissions (see Section 2.3.5). For emissions calculators, the methodology must be transparent and able to be interrogated during the course of the independent audit (with the exception of calculators for transport services already certified against a category of the National Carbon Offset Standard).
1.1.3. Emission factors

For scope 1 and scope 2 emissions, the fuel’s emission factors can be directly sourced from the latest National Greenhouse Accounts (NGA) Factors (Department of the Environment and Energy, 2017).

For scope 3 emissions, the quantity of fuel consumed may not be known. It is possible to convert transport activity (e.g. distance travelled or tonne-km or passenger-km) to a quantity of fuel, from which the NGA Factors can then be applied. Emission factors for different modes of travel can also be used.

Note that wherever possible, the ‘full fuel cycle’ emission factors should be used. ‘Full fuel cycle’ emission factors incorporate the extraction, production and transportation of the transport fuel that are added to the total emissions from the combustion process. Refer to the table in the NGA Factors document for ‘Scope 3 emission factors – liquid fuels and certain petroleum based products’.

When fuel quantity data is not available, generic emission factors exist based on distance travelled and vehicle type. The emission factors come from the UK Government’s Department for Business, Energy & Industrial Strategy (Department for Business Energy & Industrial Strategy, 2017) which covers the following modes of travel:

- passenger vehicles
- business travel – air
- business travel – sea
- freighting goods
- managed assets – vehicles.

1.1.4. Emissions calculation

When the quantities of fuel (or electricity) used in transport vehicles are collected to account for scope 1 or 2 emissions, a direct emissions calculation can be done using the relevant NGA emission factor:

\[ \text{Fuel quantity (kL/yr)} \times \text{emission factor for relevant fuel (tonne CO}_2\text{-e/kL)} \]

In cases where various modes of transport can be used, the ASIF (Activity, mode Share, Intensity, Fuel factor) framework (Figure 4) can be used See Global Protocol for Community-Scale Greenhouse Gas Emissions Inventories (WRI and ICLEI, 2014).

This bottom-up approach must begin with detailed activity data in order to develop a carbon account for transport. It can be simplified, in particular by sourcing emission factors that are a mix of energy intensity for the mode of transport considered and fuel factor.

The ASIF framework for determining total emissions is as follows:

\[ \text{Emissions} = \text{Activity} \times \text{Mode Share} \times \text{Intensity} \times \text{Fuel} \]
Where:

- **Activity (A)** is measured as VKT (vehicle kilometres travelled), which reflects the number and length of trips.
- **Mode Share (S)** describes the proportion of trips taken by different transport modes (e.g. public transport, private car) and vehicle types (e.g. car, bus, truck, motorcycle). As mentioned above, the Mode Share for an activity can be measured directly, estimated through surveys undertaken directly for that purpose or estimated by reference to secondary sources (surveys undertaken for other purposes but publicly available).
- **Energy Intensity (I)** is the energy consumed per VKT. This is a function of vehicle type, characteristics (e.g. the occupancy or load factor, represented as passenger-kilometres or tonnes-kilometres) and driving conditions.
- **Fuel factor (F)** is the carbon content of the fuel, and is based on the composition of the fuel stock.

Figure 5 was adapted from Figure 7.1 in the *Global Protocol for Community-Scale Greenhouse Gas Emissions Inventories* (WRI and ICLEI, 2014) and shows how on-road transport emissions should be calculated under the standard for all categories.
1.1.5. Worked example

To estimate transport emissions from staff travel to work (scope 3) in a precinct (one specific site, 1,000 employees), company ABC organised a simple staff survey, asking staff to provide their usual mode of transport from home to work (active/car/train) and the estimated number of kilometres travelled (one way).

The staff commute is a transboundary trip, where the trip originates outside the precinct and terminates in the precinct. The portion of the trip that occurs within the precinct boundary is 70 per cent, while the portion that occurs outside the precinct boundary is 30 per cent. The induced activity method is used and the precinct reports 50 per cent of transboundary trips.

Combined with the number of employees, this provided input for the Activity (A) and Mode Share (S) in the diagram above.

The results were as follows:

- 75 per cent of employees used the train, with a one-way trip averaging 25 km
- 15 per cent of employees travelled by car, with a one-way trip averaging 40 km
- 10 per cent of employees walked or cycled (average trip irrelevant)

Assuming all the trips were for a Melbourne site, the GHG calculations are as follows (for a year):

Assumptions:

- 1,000 employees
- Metropolitan train transport emission factor: 0.150 kg CO₂-e per passenger-km (EPA Victoria)
- Car transport emission factor: 0.210 kg CO₂-e per km for a medium car (EPA Victoria)
- No car sharing takes place
- No emissions for active transport
- 45 weeks and 5 days a week work period (excluding holidays, professional trips interstate, sick leave, etc.)

Calculations:

- Number of days per employee per year: 45 x 5 = 225
- Number of commuting trips overall per year: 1,000 x 225 x 2 = 450,000
- Emissions from train commuting: 75% x 450,000 (trip number) x 25 (km) x 0.150 (emission factor)/1,000 (conversion into tonnes) = 1,266 tonnes
- Emissions from car commuting: 15% x 450,000 (trip number) x 40 (km) x 0.210 (emission factor)/1,000 (conversion into tonnes) = 567 tonnes
- Overall commuting emissions = 1,833 tonnes CO₂-e per year
- Commuting emissions induced by the precinct = 1,833 tonnes CO₂-e per year x 50% = 916 tonnes CO₂-e per year
- Scope 1 emissions = 916 tonnes CO₂-e per year x 70% = 642 tonnes CO₂-e per year
- Scope 3 emissions = 916 tonnes CO₂-e per year x 30% = 275 tonnes CO₂-e per year
1.2. Stationary energy: co- and tri-generation

1.2.1. Emissions sources

This section addresses emissions from:

- **co-generation**: emissions from production of both heat and electrical power from main activity producers for sale to the public at a single Combined Heat and Power (CHP) facility
- **tri-generation**: emissions from the simultaneous generation of electricity, heat and cooling.

In a co- or tri-generation system, multiple forms of energy (most often electricity and steam) are generated simultaneously in an integrated system from the same input fuel supply. Emissions from these systems occur from the combustion of fossil fuels such as natural gas in the plant to generate the different energy streams. The greenhouse gas emissions produced are CO$_2$, CH$_4$ and N$_2$O. The most popular type of fossil fuel used for co- or tri-generation in Australia is natural gas.

Emissions by scope

Scope 1 emissions arise from the consumption of fossil fuels in the co- or tri-generation system directly controlled by the responsible entity or affiliated entities.

Scope 2 emissions arise from the use of electricity from the grid or steam supplied to the responsible entity or affiliated entities.

Scope 1 and scope 2 emissions will also have an additional component of upstream scope 3 emissions, which are the indirect emissions from the extraction, production and transport of fuel burned at generation, and the indirect emissions attributable to the electricity lost in delivery in the transmission and distribution network.

Upstream Scope 3 emissions are required to be included when calculating emissions for scope 1 and scope 2.

Co- or tri-generation scenarios

Table 1 provides an overview of the methods used for accounting for import/export of electricity or other energy products.

<table>
<thead>
<tr>
<th>No.</th>
<th>Generation scenario</th>
<th>Approach</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td><strong>Self-consumption scenario:</strong> Co- or tri-generation system is located within a precinct, building or organisation, and all usable energy generated is consumed within that precinct, building or organisation.</td>
<td>Include all emissions in the carbon account as scope 1 (for fuels) and/or scope 2 (for electricity, if and where ancillary electricity is used), and scope 3 (for upstream emissions of fuels).</td>
</tr>
<tr>
<td>2</td>
<td><strong>Exported energy scenario for precincts and organisations:</strong> Co- or tri-generation system is located within a precinct or organisation’s boundaries and usable energy generated is exported outside the precinct or organisation’s boundaries.</td>
<td>Same as for Scenario 1.</td>
</tr>
<tr>
<td>No.</td>
<td>Generation scenario</td>
<td>Approach</td>
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<td>-----</td>
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</tbody>
</table>
| 3   | **Exported energy scenario for buildings:**                                         | Same as for Scenario 1, but allow the deduction from the carbon account of emissions corresponding to the energy exported to users outside the building’s boundary.
|     | Co- or tri-generation system is located within a building’s boundary, and thermal energy or electricity is exported outside the building’s boundary. |                                                                                                                                          |
| 4   | **Imported energy scenario:**                                                        | Use grid scope 2 and 3 emission factors for electricity consumption unless a strong case can be made to use a different emission factor (e.g. audited carbon accounts for the co- or tri-generation plant). 
For steam or other thermal energy (hot or chilled water, consumption), the vendor must provide a site-specific scope 2 emission factor (e.g. 400 kg CO$_2$-e/GJ).
|     | Co- or tri-generation system is located outside a precinct, building or organisation’s emissions boundaries and thermal energy and/or electricity is imported into the precinct, building or organisation’s boundaries. |                                                                                                                                              |

### 1.2.2. Collecting activity data

Data to be collected includes:

- the quantity of fuel combusted on a volume, mass or energy basis. This can come in the form of fuel receipts, purchase records or metered amounts of fuel entering the combustion system.
- fuel characteristics such as density, calorific value, heating values and moisture content.

### 1.2.3. Emission factors

The emission factors for fuel combusted and electricity consumed can be directly sourced from the latest National Greenhouse Accounts’ (NGA) publication.

### 1.2.4. Emissions calculation

**Generation scenario 1**

If the responsible entity is consuming all the usable energy generated from a co- or tri-generation system within its boundary (Generation Scenario 1 in Table 1), then GHG emissions should be calculated based on the quantity of fuel combusted and the specific emission factors given in the NGA. Emissions from this combustion are reported as scope 1 emissions. Upstream emissions for fuel combustion should also be reported as scope 3 emissions. For added transparency, reporting entities should identify the proportion of these scope 1 and 3 emissions attributable to heat/steam vs scope 2 and 3 emissions attributable to electricity production. The equation used to calculate emissions is:

$$GHG \text{ emissions of gas type} = [\text{fuel use (kL)}] \times [\text{energy content factor of fuel type (GJ/kL)}] \times [\text{emission factor for each GHG type e.g. CO}_2, \text{ CH}_4, \text{ N}_2\text{O (kg CO}_2\text{-e/GJ)}]$$

**Generation scenario 2**

In cases where a portion of the electricity and steam outputs are exported outside the boundaries of the precinct or organisation, then GHG emissions should be calculated using the same method.
as for Generation Scenario 1. This is the preferred approach as reported in the *Global Protocol for Community-Scale Greenhouse Gas Emission Inventories* (WRI and ICLEI, 2014).

**Generation scenario 3**

In cases where a portion of the electricity and steam outputs is exported outside the boundaries of the building (Generation Scenario 3 in Table 1), then it is necessary to allocate total emissions to each output stream. This is done by determining separate emission factors for the electricity and steam outputs and multiplying those emission factors by the output sold from their respective energy streams. In order to do this, the efficiency method as outlined in the GHG Protocol’s *Allocation of GHG Emissions from a CHP Plant* (WRI/WBCSD, 2006) is used. Specifically, the energy efficiency method allocates GHG emissions to energy inputs based on the relative steam and electricity generation efficiencies. This method assumes that conversion of fuel energy to steam energy is more efficient than converting fuel to electricity, and assumed efficiency values are used for both outputs.

There are six main steps for calculating emissions under Generation Scenario 3 using the efficiency method:

1. Determine the total direct emissions (ET) from fuel combustion and the total steam and electricity outputs (GJ) for the co- or tri-generation system.
2. Estimate the efficiencies of steam and electricity production. The use of source-specific efficiency factors is recommended. However, if source-specific factors are unavailable, default values can be used.
3. Conduct a check to ensure the energy balance constraints have not been violated, using the following equation:

   \[
   \text{Assumed energy input} = \frac{H}{e_H} + \frac{P}{e_P}
   \]

   Where:
   - \(H\) = steam output (energy – GJ)
   - \(e_H\) = assumed efficiency of steam production
   - \(P\) = delivered electricity production (GJ)
   - \(e_P\) = assumed efficiency of electricity generation

   The assumed energy input should be less than the total fuel energy (LHV GJ) used to fire the plant.

4. Determine the fraction of total emissions to allocate to steam and electricity production using the following equation:

   \[
   \begin{align*}
   E_H &= \left( \frac{H}{e_H} \right) \times \frac{1}{\frac{P}{e_P} + \frac{H}{e_H}} \\
   E_P &= E_T - E_H
   \end{align*}
   \]

   Where:
   - \(E_H\) = emissions allocated to steam production (tonnes CO\(_2\)-e)
   - \(H\) = steam output (energy – GJ)
   - \(e_H\) = assumed efficiency of steam production (%)
   - \(P\) = delivered electricity production (GJ)
   - \(e_P\) = assumed efficiency of electricity generation (%)

APPENDIX B: CARBON ACCOUNTING REQUIREMENTS AND GUIDANCE
\[ EP = \text{emissions allocated to electricity production (tonnes CO}_2\text{-e)} \]

\[ ET = \text{Total direct emissions of the co-generation system (determined from Step 1) (tonnes CO}_2\text{-e)} \]

5. Calculate emission rates for steam and electricity production. This is done by dividing the total emissions from steam production \( E_H \) (tonnes CO\(_2\)-e) by the total amount of steam produced \( H \) (GJ) to get an emissions rate \( \text{t CO}_2\text{-e/GJ} \). This is also done for electricity production.

6. Estimate emissions from sales. This is calculated by multiplying the total amount of electricity or steam sold/exported outside the system boundaries by the electricity emissions rate determined in Step 5. This is also done for steam production.

The worked example below shows how to use the efficiency method to allocate emissions correctly to allow the deductions of emissions relating to exported energy from the responsible entity’s carbon footprint.

It should be noted that for buildings, the NABERS co-generation calculator can be used to determine the allocation of emissions from the operation of the plant between the various output streams of energy.

**Generation scenario 4**

If the responsible entity is consuming electricity and steam imported from outside its boundaries (Generation Scenario 3 in Table 1), then GHG emissions from electricity should be calculated based on the quantity of grid-derived electricity consumed and the specific emission factors given in the NGA Factors, while GHG emissions from steam consumption should be calculated based on the quantity of steam consumed and the vendor’s steam emission factor.
1.2.5. Worked examples

This worked example is based on the Generation Scenario 2 described in Table 1

Consider the co-generation plant XYZ, which consumes 10,000 GJ (LHV) of natural gas to produce electricity and steam as shown in the table below.

<table>
<thead>
<tr>
<th>Total energy produced (GJ)</th>
<th>Total energy exported outside boundaries (GJ)</th>
<th>Steam temp. (°C)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Electricity</td>
<td>490</td>
<td>441</td>
</tr>
<tr>
<td>Steam</td>
<td>6,410</td>
<td>5,128</td>
</tr>
<tr>
<td>Total</td>
<td>6,900</td>
<td>5,569</td>
</tr>
</tbody>
</table>

The plant exports approximately 90 per cent of the electricity produced and 80 per cent of the steam produced onsite outside its boundaries. It does not allocate its GHG emissions from the co-gen plant based on the sale of energy. The plant operates at 30 per cent efficiency for electricity production and 85 per cent efficiency for steam production.

Step 1. Determine the total direct emissions from the system:

Direct emissions = Energy content of natural gas x NGA Emission Factors for natural gas

\[
\text{Direct emissions} = \frac{(GJ \times \text{CO}_2\text{-EF}) + (GJ \times \text{CH}_4\text{-EF}) + (GJ \times \text{N}_2\text{O\ EF})}{1000}
\]

\[
\text{Direct emissions} = \frac{(10,000 \text{ GJ} \times 51.4\text{kg CO}_2\text{-e GJ}) + (10,000 \text{ GJ} \times 0.1\text{kg CO}_2\text{-e GJ}) + (10,000 \text{ GJ} \times 0.03\text{kg CO}_2\text{-e GJ})}{1000}
\]

\[
\text{Direct emissions} = 515.3 \text{ t CO}_2\text{-e}
\]
This worked example is based on the Generation Scenario 3 described in Table 1

Consider the cogeneration plant XYZ, which consumes 10,000 GJ (LHV) of natural gas to produce electricity and steam as shown in the table below.

<table>
<thead>
<tr>
<th>Total energy produced (GJ)</th>
<th>Total energy exported outside boundaries (GJ)</th>
<th>Steam temp. (°C)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Electricity</td>
<td>490</td>
<td>n/a</td>
</tr>
<tr>
<td>Steam</td>
<td>6,410</td>
<td>400</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>6,900</strong></td>
<td><strong>5,569</strong></td>
</tr>
</tbody>
</table>

The plant exports approximately 90 per cent of the electricity produced and 80 per cent of the steam produced onsite outside its boundaries. It allocates its GHG emissions from the co-gen plant based on the sale of energy using the Efficiency Method. The plant operates at 30 per cent efficiency for electricity production and 85 per cent efficiency for steam production.

**Step 1. Determine the total direct emissions from the system:**

\[
\text{Direct emissions} = \text{Energy content of natural gas} \times \text{NGA Emission Factors for natural gas}
\]

\[
\text{Direct emissions} = \frac{(GJ \times \text{CO}_2 \text{EF}) + (GJ \times \text{CH}_4 \text{EF}) + (GJ \times \text{N}_2\text{O EF})}{1000}
\]

\[
\text{Direct emissions} = \frac{(10,000 \text{ GJ} \times 51.4 \text{kg CO}_2\text{-e GJ}) + (10,000 \text{ GJ} \times 0.1 \text{kg CO}_2\text{-e GJ}) + (10,000 \text{ GJ} \times 0.03 \text{kg CO}_2\text{-e GJ})}{1000}
\]

\[
\text{Direct emissions} = 515.3 \text{ t CO}_2\text{-e}
\]

**Step 2. Estimate the efficiencies of steam and electricity production:**

\(e_H = 85\%\), \(e_P = 30\%\)

**Step 3. Conduct a check to ensure the energy balance constraints have not been violated:**

\[
\text{Assumed energy input} = \frac{6410}{0.85} + \frac{490}{0.30}
\]

\[
\text{Assumed energy input} = 9175 \text{ GJ}
\]

This is ok as 9175 GJ < 10,000 GJ.
Step 4. Determine the fraction of total emissions to allocate to steam and electricity production:

\[ E_H = \left( \frac{6410}{0.85} \right) \times \frac{0.85}{0.85 + 0.30} \times 515.3 \]

\[ E_H = 423.6 \text{ t CO}_2\cdot\text{e} \]

\[ E_P = 515.3 - 423.6 = 91.7 \text{ t CO}_2\cdot\text{e} \]

1.3. Water supply

1.3.1. Emissions sources

This section describes the calculation of emissions associated with the consumption of reticulated water.

Emissions arise from processes such as the extraction, storage, treatment and distribution of freshwater through the reticulated system: services typically provided by a water authority or corporation. While there are a range of emissions sources associated with these treatments and processes, they can typically be captured under the carbon account of the water authority or corporation and summarised into a single emission factor.

The water consumed within a building or precinct, in the manufacture of a product or associated with the activities of an organisation typically carries these embodied scope 3 emissions.

Note that water supply and wastewater are treated separately in this document, but a large number of water authorities are typically responsible for both functions. The carbon accounts of these water authorities will then take into account the emissions embodied in both the supply of water as well as its treatment.

1.3.2. Collecting activity data

The key activity data to be collected is the volume of reticulated water consumed by activities or processes within the emissions boundary.

Water usage data can be measured directly (preferred option) or estimated using robust data sources. These data sources could include the average water consumption of a piece of equipment as detailed in the technical specifications for the product. Direct measurement includes:

- data logging from water meters (e.g. for a production chain for a specific product);
- the invoices from water retailers (e.g. for a building or specific site); and
- reporting from tenants, corporate sustainability managers, property managers (for precincts) or landlords (for organisations renting premises).
All water usage data obtained should be converted to a volumetric unit (e.g. kL) to which an emission factor can then be applied.

### 1.3.3. Emission factors

Some water supply authorities calculate their own emission factors (kg CO$_2$-e/kL reticulated water) and include them in their annual report or make them available on their websites. Another way to obtain this information is by requesting it directly from the authority. It is recommended that these emission factors are used when available.

Otherwise, it is recommended to use the emission factors provided in the Bureau of Meteorology’s National Performance Report 2015–16: Urban water utilities (Bureau of Meteorology, 2017), Table 2.6, to develop emission factors with the correct format (e.g. kg CO$_2$-e/kL reticulated water). These emission factors are reported as net tonnes CO$_2$-e per 1,000 connected water properties for the major urban centres across Australia and correspond to both distributed reticulated water and wastewater collection, all in one factor. Table 2.3 of the same report also provides the median annual consumption of water per household. In order to determine the kg CO$_2$-e per kL of reticulated water consumption, divide the net tonnes CO$_2$-e per 1,000 connected water properties by the median water consumption value:

\[
\text{Emission factor (kg CO}_2\text{-e per kL)} = \frac{\text{[net greenhouse gas emissions (t CO}_2\text{-e/kL) for 1,000 connected properties x 1,000}\ (*)}{1,000}\ (**)}{\text{average annual residential water supplied (kL/property)}}
\]

\(*)$ to obtain kg instead of tonnes

\(**$ to obtain a value per property rather than 1,000 properties

Other sources are also available that may allow benchmarks and comparisons:

- Melbourne Water emission factors (for water and wastewater) were used by the City of Melbourne and are reported on page 7 of the following document. [https://www.melbourne.vic.gov.au/SiteCollectionDocuments/climate-neutral-water-saving-schemes.pdf](https://www.melbourne.vic.gov.au/SiteCollectionDocuments/climate-neutral-water-saving-schemes.pdf)

The two sources listed above provide emission factors that take into account emissions from both water supply and wastewater treatment. Other references may use separate emissions from the supply of water and the treatment of wastewater. Separated emission factors for supply and wastewater may be more appropriate if a user’s water is supplied and treated by different water companies (or treated onsite).

### 1.3.4. Emissions calculation

The use of the following formula allows for the estimation of emissions associated with the use of reticulated water (in kg CO$_2$-e/year):

\[
\text{Reticulated water use (kL/yr) x water treatment & pumping emission factor (kg CO}_2\text{-e/kL)}
\]

Note that to convert the emissions in tonnes of CO$_2$-e/year, the result of the previous formula must be divided by 1,000.
1.3.5. Worked example

This example is based on a hypothetical site located in WA that uses 89,000 kL/year. Out of the amount of water consumed, 15,000 kL are collected onsite through a rain harvesting system, and the rest is supplied by a local water provider.

- Possible source of data: invoices from the water supply provider
- Activity data: 89,000 kL – 15,000 kL = 74,000 kL/year

Emission factor estimation:

- Net greenhouse gas emissions 2014–15 for Perth: 738 t CO$_2$-e/year for 1,000 connected properties
- Average annual residential water supplied (kL/property): 244

Calculation: $\frac{738}{244} \times \frac{1,000}{1,000} = 3.024 \text{ kg CO}_2\text{-e/kL}$

- Emission factor: 3.024

GHG emissions (t CO$_2$-e/year): $74,000 \times 3.024/1,000 = 224 \text{ tonnes of CO}_2\text{-e/year}$

It is recommended that the following information be kept for auditing purposes:

- invoices from the water supply company; and
- emission factors for wastewater supply and treatment, including the source of data (e.g. information directly requested from the water supplier or found on the invoice or website, and emission factors from a local authority found on an official website/report).

Note that any electricity used in pumping and treating water collected onsite will be included through site energy use collection.

1.4. Wastewater

1.4.1. Emissions sources

Greenhouse gas emissions are produced from the treatment of wastewater before returning it to the environment. Wastewater includes effluent generated by a site or organisation or during the manufacturing of a product. The emissions produced from wastewater treatment plants come from the use of energy or electricity, and from the biological or chemical activities undertaken during the treatment process.

The wastewater generated from a building or precinct, in the manufacture of a product or associated with the activities of an organisation typically carries embodied scope 3 emissions.

The range of emissions sources associated with these treatments and processes is typically captured under the carbon account of the water authority and summarised into a single emission factor, including both water supply and treatment. Where this is applicable to the user’s supply and treatment
situation, and emissions information is available from the user’s water authority, the calculation guidance in Appendix B Section 3.1 should be used instead of this section.

This section is relevant if a user’s water is supplied and treated by different water companies, or otherwise treated onsite. In some cases, for trade waste for example, when the effluent is considered unsuitable for discharge to sewer, a specialised contractor may be taking charge of the wastewater to treat it appropriately before discharge to sewer.

1.4.2. Collecting activity data

The main activity data to be collected is the quantity of wastewater generated by activities or processes within the emissions boundary.

Wastewater quantity data can be measured directly or estimated. Direct measurement includes:

- data provided on the invoices or the service provider
- measurement through a meter data logging for a specific process
- data provided by a contractor, when the wastewater needs to go through such a process (e.g. for an industrial site).

Estimations or calculations may be required in some cases; if the activity data reported corresponds to activities both within and outside the emissions boundary, it will need to be apportioned. For example:

- For an organisation sharing premises with other tenants, wastewater data for a complete building should be divided by the number of occupants and then multiplied by the number of people employed by the reporting organisation (alternatively, the floor space occupied by the organisation as a proportion of the building’s overall tenanted floor space can also be used).

- For a product made on a production line in a factory that also manufactures other products, the best allocation method must be determined through analysis of the process. If it is not practical to determine, and the overall significance of the emissions is likely to be low, it is acceptable to use a conservative allocation of the whole site’s wastewater into the product’s carbon account.

- If it is not feasible to obtain the amount of wastewater produced, the activity data of the water consumed can be used as a proxy along with an estimated sewerage discharge factor, based on the analysis of the activities onsite.

If wastewater is treated onsite, the energy used in the process must be accounted for and other emissions sources (fugitive emissions) from the wastewater treatment plant must be estimated as best as possible (e.g. by using industry benchmarks).

1.4.3. Emission factors

As in the case for water supply, some wastewater treatment operators calculate specific emission factors from their processes and make them available on their website, in annual reports or on request.

If it is not possible to obtain emission factors from the provider or the operator of the wastewater treatment plant, it is recommended to look for emission factors calculated by local water or environmental authorities as a benchmark.

When the emissions boundary includes an industrial process that produces highly concentrated wastewater (e.g. distillation, refining), it is suggested that the emissions are calculated using a methodology that includes the BOD (Biological Oxygen Demand) and/or COD (Chemical Oxygen Demand).
Demand); for example, one of the methodologies under Part 5.3 or Part 5.4 of the *National Greenhouse and Energy Reporting (Measurement) Determination 2008*.

As indicated for reticulated water supply, the emission factor available sometimes covers the whole water distribution and wastewater treatment processes, in which case it is acceptable to join both calculations, on the assumption that reticulated water used is also treated by the same water company after disposal through the sewer system.

### 1.4.4. Emissions calculation

The following formulas should be used to estimate the emissions from treating wastewater.

\[
\text{Wastewater discharge (ML/yr) x } \left[ \frac{\text{wastewater treatment & pumping emission factor (kg CO}_2\text{-e/ML)/1000}}{} \right]
\]

or

\[
\text{Water use (ML/yr) x sewerage usage discharge factor (%)} \times \left[ \frac{\text{wastewater treatment & pumping emission factor (kg CO}_2\text{-e/ML)/1000}}{} \right]
\]

The sewerage usage discharge factor is the ratio of wastewater discharged to water used, based on the way water is used at a particular site. For example, water used for watering plants or in water features will not make its way to the sewerage system.

### 1.4.5. Worked example

A company located in Melbourne that has only administrative activities, discharging 110,000 kL of wastewater per year.

- Possible sources of data: invoices from the wastewater treatment provider and data collected from the property manager
- Activity data: 110,000 kL/year
- Emission factor: 0.875 kg/kL (based on Melbourne Water 2004–05 emission factor)

Greenhouse gas emissions (t CO\(_2\)-e/year): 110,000 x 0.875/1,000 = 96 tonnes of CO\(_2\)-e/year.

It is recommended that the following information be kept for auditing purposes:

- invoices with amount of wastewater treated from the wastewater company; and
- emission factors for wastewater treatment, including the source of data (e.g. information directly requested from the wastewater supplier or found on the invoice or website, and emission factors from a local authority found on an official website/report).
1.5. Waste

1.5.1. Emissions sources

The following waste management activities are likely to be the main types of waste management processes:

- disposal to landfills
- recovery for recycling
- biological treatment or composting.

Typically, all these activities occur offsite, the waste being collected and transported to the treatment site by a private operator or as part of a service provided by the municipality.

When occurring offsite, the waste management process is considered as scope 3 emissions. These should be accounted for if they are relevant and material.

If occurring onsite, energy input into the treatment process and fugitive emissions must be accounted for in the carbon account (as scope 1, 2 or 3 emissions), if they are relevant and material.

There are different methods for calculating emissions from waste management. If possible, it is recommended to use the waste-type specific method, which is based on the emissions produced by the process of disposal or treatment of each type of waste.

1.5.2. Collecting activity data

Reporting entities should identify specific waste composition and waste generation data if possible. The key activity data required to produce the most accurate emissions calculations are:

- amount of waste produced (kg, m$^3$, tonnes) (Note: the mass/volume of waste produced is generally not available to waste contractors as they do not have calibrated weighing scales to measure the waste. The charges are usually based on ‘bin lift’ or ‘bin volume’ multiplied by an industry-accepted density (kg/m$^3$), which has a large uncertainty margin); and
- breakdown of these amounts by type of waste management activity (disposed, recycled, treated, composted).

Typically, different waste management providers will deal with specific types of waste. These waste managers are usually able to provide the amount of waste collected and treated over a period, and sometimes also the emission factors for the treatment.

Should the information not be available from the contractors, the responsible entity can estimate the amount of various types of waste by undertaking waste surveys or audits throughout the year. Data from these audits can be extrapolated to provide annual waste quantities for each waste type. For a product, measurements can be taken onsite over a specific production cycle and then extrapolated appropriately.

If none of the previous methods are available, some estimates can be made, for example:

- typical amount of office waste per employee (for an organisation or a building)
- estimated food and packaging waste for an event based on sales of food and beverages
- estimated waste based on the manufacturing process for a product.
If it proves impossible to account separately for the different types of waste, it should be assumed that all the waste is going to landfill and it should be accounted for using the most conservative emission factor.

1.5.3. Emission factors

Reporting entities should find emission factors for each type of waste that is generated. As mentioned above, emission factors may be available from waste management contractors, in which case they can be used, once the rigour of the calculations has been assessed.

If this is the case, reporting entities that have estimated their own emission factors from their waste streams and waste mix should use that data.

Otherwise, NGA Factors (Department of the Environment and Energy, 2017) reported in Table 42 and Table 44 are available for various categories of waste, including a generic municipal waste emission factor that can be used as a default factor.

For waste sent to recycling or combustion (at a waste-to-energy facility), the benefits of recycling and energy recovery are attributed to the user of the recycled materials or to the waste-to-energy facility, not the producer of the waste, in line with the GHG Protocol – Scope 3 Standard (WBCSD and WRI, 2011a). For these waste streams, the emission factor should consider transport to an energy recovery or materials reclamation facility only. Default factors based on UK data can be found at [www.gov.uk/government/publications/greenhouse-gas-reporting-conversion-factors-2017](http://www.gov.uk/government/publications/greenhouse-gas-reporting-conversion-factors-2017).

1.5.4. Emissions calculation

The following formula should be used to estimate the emissions from each type of waste:

\[
\text{[Waste produced (t/year)]} \times \text{[waste emission factor (t CO}_2\text{-e/t waste)]}
\]
Overall emissions from waste are calculated as shown in Figure 6.

*Figure 6: Emissions from waste*

When an industrial process that produces waste with special characteristics is included within the emissions boundary, it is suggested that the emissions are calculated using a methodology that includes the Degradable Organic Carbon (DOC) and methane emissions from possible anaerobic reactions coming from the waste treatment activity.
1.5.5. Worked example

A higher-education facility produces a total solid waste stream of 240 tonnes. This waste comprises 180 tonnes of mixed waste disposed, 50 tonnes of paper and 10 tonnes of garden and park waste, all disposed of in the local landfill as municipal waste.

› Possible sources of activity data: invoices from providers for municipal waste and paper recycling, and the operator of the composting facility

Emission factors (from ‘Waste mix methane conversion factors’ table and ‘Waste emission factors for total waste disposed to landfill by broad waste stream category’ table in NGA Factors (Department of Environment and Energy, 2017):

› Municipal waste – 1.4 t CO₂-e/t waste
› Paper – 2.9 t CO₂-e/t waste
› Garden – 1.4 t CO₂-e/t waste

As each waste stream needs to be treated separately, greenhouse gas emissions (GHG) are calculated as follows:

GHG emissions (t CO₂-e/year) = [waste produced (t/year)] x [waste emission factor (t CO₂-e/t waste)]

Municipal waste = 180 x 1.4 = 252 tonnes CO₂-e

Paper = 50 x 2.9 = 145 tonnes CO₂-e

Garden = 10 x 1.4 = 14 tonnes CO₂-e

Total waste GHG emissions = 411 tonnes CO₂-e

Recycling: if the 50 tonnes of paper were recycled instead then a default factor of 0.02t CO₂-e/t paper (from https://www.gov.uk/government/publications/greenhouse-gas-reporting-conversion-factors-2017) would be applied to take into account only transport to the recycling facility.

It is recommended that the following information be kept for auditing purposes:

› invoices with amount of waste collected/disposed of by different providers;
› data management system from the composting facility with the amount of compost produced; and
› emission factors for waste, including the source of data (e.g. information directly requested from the provider and emission factors from a local authority found on an official website/report).
1.6. Other emissions sources

Scope 3 emissions from other typical activities or products consumed must be included in the carbon account if relevant and material (Section 2.3.1: Establish the emissions boundary).

For organisations that are preparing a carbon account for use under the National Carbon Offset Standard for Organisations, additional guidance on scope 3 emissions sources and emission factors is available in Guidance for calculating Scope 3 (www.environment.gov.au/climate-change/publications/guidance-scope-3). Some of the emissions sources and activities described may also be relevant to other carbon neutral categories, such as products and precincts.

2. Accounting for renewable energy and energy efficiency schemes

2.1. Context

The approach adopted for the treatment of renewable electricity has been developed with consideration of the mechanics of the Renewable Energy (Electricity) Act 2000, and specifically, the interaction between the Renewable Energy Target (RET), Large-scale Generation Certificates (LGCs) and Small-scale Technology Certificates (STCs).

The approach has been designed to eliminate, where possible, the risk of double counting emissions abatements. Double counting may occur if the carbon emissions reduction impact of certain actions (or pieces of equipment) can be claimed by both the generator of the reduction and a third party to whom the generator may have sold an emissions reduction certificate.

The accounting treatment described below (Section 2.2) must be applied in all carbon accounts when making a carbon neutral claim against any category of the National Carbon Offset Standard.

2.2. Treatment

A description of the different types of renewable energy certificates and their treatment under the National Carbon Offset Standard is provided in Table 2. Worked examples are provided in the next section.
Table 2. Treatment of renewable energy certificates under the National Carbon Offset Standard

<table>
<thead>
<tr>
<th>Scheme and certificates</th>
<th>Description</th>
<th>Treatment under the National Carbon Offset Standard</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Renewable Energy Target (RET)</strong>&lt;br&gt;<strong>Small-scale Renewable Energy Scheme (SRES)</strong>&lt;br&gt;<strong>Small-scale Technology Certificates (STCs)</strong></td>
<td>The Small-scale Renewable Energy Scheme creates a financial incentive for individuals and small businesses to install eligible small-scale renewable energy systems. STCs can be created following the installation of an eligible system, and are issued upfront (on a once-off basis) based on an estimation of the amount of electricity a system produces or displaces over a set time period.</td>
<td>Behind-the-meter energy usage originating from small-scale onsite generation systems can be treated as zero-emissions energy, regardless of whether any STCs have been created, sold or transferred to any other party.</td>
</tr>
<tr>
<td><strong>Renewable Energy Target (RET)</strong>&lt;br&gt;<strong>Large-scale renewable energy target (LRET)</strong>&lt;br&gt;<strong>Large-scale Generation Certificates (LGCs)</strong></td>
<td>LGCs are created based on the amount of eligible renewable electricity produced by a power generator. They can be sold or traded to the voluntary market, for example GreenPower, or to Renewable Energy Target liable entities to assist them in meeting their obligations.</td>
<td>Behind-the-meter energy usage originating from large-scale onsite generation systems that have been issued LGCs can be treated as zero-emissions energy only if the equivalent amount of LGCs are voluntarily retired by the responsible entity (or energy user). Behind-the-meter energy usage that is not matched by an equivalent amount of voluntarily retired LGCs must be accounted for in the same way as grid-based energy, and offset accordingly. LGCs do not have to be retired for energy generated by the system that is exported into the grid, as the exported energy is not being accounted as zero-emissions energy as part of the responsible entity’s carbon account.</td>
</tr>
<tr>
<td>Scheme and certificates</td>
<td>Description</td>
<td>Treatment under the National Carbon Offset Standard</td>
</tr>
<tr>
<td>-------------------------</td>
<td>-------------</td>
<td>-----------------------------------------------------</td>
</tr>
<tr>
<td><strong>Renewable Energy Target</strong>&lt;br&gt;GreenPower</td>
<td>GreenPower is a voluntary government-accredited program that enables electricity providers to purchase renewable energy on behalf of households or businesses using the same mechanism of voluntary LGC retirement, as described above.</td>
<td>The purchase of GreenPower is considered to be equivalent to the direct use of renewable energy. GreenPower uses the same mechanism of voluntary retirement of LGCs described above.</td>
</tr>
<tr>
<td><strong>The Emission Reduction Fund (ERF)</strong>&lt;br&gt;<strong>Australian Carbon Credit Units (ACCUs)</strong></td>
<td>The ERF is a voluntary scheme that aims to provide incentives for a range of organisations and individuals to adopt new practices and technologies to reduce their emissions. Participants can earn ACCUs for emissions reductions.</td>
<td>Responsible entities generating ACCUs from emissions reduction projects occurring within their boundary can claim the reduction as part of their carbon account only if the ACCUs from the projects are voluntarily retired. If the ACCUs are not retired, responsible entities are required to account for their emissions without the reductions associated with the projects (i.e. as though the projects had never occurred).</td>
</tr>
<tr>
<td></td>
<td>The ACCUs can be sold to the Commonwealth under a carbon abatement contract with the Clean Energy Regulator, or they can be sold on the voluntary market and are eligible as offset units under the National Carbon Offset Standard.</td>
<td></td>
</tr>
<tr>
<td><strong>State-based energy efficiency schemes, including the Victorian Energy Efficiency Target (VEET), the New South Wales Energy Savings Scheme (ESS) and the South Australian Retailer Energy Efficiency Scheme.</strong>&lt;br&gt;<strong>Energy Efficiency Certificates</strong></td>
<td>These energy savings schemes reduce electricity consumption by creating financial incentives for organisations to invest in energy savings projects. Energy savings are achieved by installing, improving or replacing energy savings equipment. This generates tradable white certificates.</td>
<td>Responsible entities are not required to account for state-based energy efficiency schemes. Emissions reductions resulting from activities supported by these schemes can be counted towards the carbon account regardless of whether any associated certificates have been created, sold or transferred to any other party.</td>
</tr>
</tbody>
</table>
2.3. Worked examples

Note that the following notations and assumptions have been used in the examples presented below:

1. BTMuse = Behind the meter electricity consumed
2. Grid factor (scope 2) – simplified to 1 t CO₂-e/MWh

### 2.3.1. Onsite generation (LGCs)

#### Scenario: LGCs are created and retired by the responsible entity

<table>
<thead>
<tr>
<th>Data</th>
<th>Scope 1:  40 t CO₂-e</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Scope 2:  15 MWh</td>
</tr>
<tr>
<td></td>
<td>Scope 3:  40 t CO₂-e</td>
</tr>
<tr>
<td></td>
<td>LGCs:  10</td>
</tr>
<tr>
<td></td>
<td>BTMuse:  5 MWh</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Calculation</th>
<th>Total = Scope 1 + scope 3 + [scope 2 (in MWh) + BTMuse – LGCs] x grid factor</th>
</tr>
</thead>
<tbody>
<tr>
<td>Result</td>
<td>Total = 40 t + 40 t + (15 + 5 MWh - 10 LGCs) x 1 t/MWh</td>
</tr>
<tr>
<td></td>
<td>= 80 t + 20 t</td>
</tr>
<tr>
<td></td>
<td>= 90 t</td>
</tr>
</tbody>
</table>

**Note**

Behind-the-meter use is added to the amount of electricity supplied by the grid. Any LGCs voluntarily retired by the user can then be used to ‘zero’ (or subtract) the corresponding amount of electricity (in MWh), whether it is electricity from behind the meter or electricity that is supplied by the grid.

#### Scenario: LGCs are created and sold or traded by the responsible entity

<table>
<thead>
<tr>
<th>Data</th>
<th>Scope 1:  40 t CO₂-e</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Scope 2:  15 MWh</td>
</tr>
<tr>
<td></td>
<td>Scope 3:  40 t CO₂-e</td>
</tr>
<tr>
<td></td>
<td>LGCs:  10</td>
</tr>
<tr>
<td></td>
<td>BTMuse:  5 MWh</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Calculation</th>
<th>Total = Scope 1 + scope 3 + [scope 2 (in MWh) + BTMuse] x grid factor</th>
</tr>
</thead>
<tbody>
<tr>
<td>Result</td>
<td>Total = 40 t + 40 t + (15 + 5 MWh) x 1 t/MWh</td>
</tr>
<tr>
<td></td>
<td>= 80 t + 20 t</td>
</tr>
<tr>
<td></td>
<td>= 100 t</td>
</tr>
</tbody>
</table>

**Note**

Electricity from behind-the-meter use is added on top of the electricity supplied by the grid.

LGCs sold or traded may not be used to ‘zero’ (or subtract) either electricity from behind the meter or electricity that is supplied by the grid. Effectively, the LGCs are not taken into account in the equation.
2.3.2. Onsite generation (STCs)

<table>
<thead>
<tr>
<th>Scenario: Irrespective of whether or not STCs are sold by the responsible entity</th>
</tr>
</thead>
<tbody>
<tr>
<td>Data</td>
</tr>
<tr>
<td>Scope 1: 40 t CO₂-e</td>
</tr>
<tr>
<td>Scope 2: 15 MWh</td>
</tr>
<tr>
<td>Scope 3: 40 t CO₂-e</td>
</tr>
<tr>
<td>STCs: 10</td>
</tr>
<tr>
<td>BTMuse: 5 MWh</td>
</tr>
<tr>
<td>Calculation</td>
</tr>
<tr>
<td>Total = Scope 1 + scope 3 + [scope 2 (in MWh) x grid factor] + BTMuse x 0</td>
</tr>
<tr>
<td>Result</td>
</tr>
<tr>
<td>Total = 40 t + 40 t + [15 x 1 t/MWh]</td>
</tr>
<tr>
<td>= 80 t + 15</td>
</tr>
<tr>
<td>= 95 t</td>
</tr>
<tr>
<td>Note</td>
</tr>
<tr>
<td>Behind-the-meter use of electricity is considered to be zero emissions.</td>
</tr>
<tr>
<td>If the responsible entity does not have an onsite renewable energy system capable of producing STCs, they cannot retire STCs from another system in order to ‘zero’ (or subtract) the emissions associated with grid-supplied electricity.</td>
</tr>
</tbody>
</table>

2.3.3. GreenPower

<table>
<thead>
<tr>
<th>Scenario: An organisation purchases 100 per cent GreenPower or voluntarily cancels GreenPower-eligible RECs equivalent to all its electricity consumption</th>
</tr>
</thead>
<tbody>
<tr>
<td>Electricity consumption</td>
</tr>
<tr>
<td>50 MWh</td>
</tr>
<tr>
<td>GreenPower-eligible RECs</td>
</tr>
<tr>
<td>100 per cent GreenPower or 50 RECs</td>
</tr>
<tr>
<td>Scope 2 electricity emissions included in carbon account</td>
</tr>
<tr>
<td>0 t CO₂-e</td>
</tr>
<tr>
<td>Note</td>
</tr>
<tr>
<td>GreenPower use is considered to be zero emissions.</td>
</tr>
</tbody>
</table>
### 2.3.4. Emissions Reduction Fund

**Scenario: An organisation generates and retires 50 ACCUs from onsite ERF activities**

<table>
<thead>
<tr>
<th>Emissions</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Scope 1 (with ERF project):</td>
<td>30 t CO₂-e</td>
</tr>
<tr>
<td>Scope 2:</td>
<td>15 t CO₂-e</td>
</tr>
<tr>
<td>Scope 3:</td>
<td>5 t CO₂-e</td>
</tr>
<tr>
<td>Total</td>
<td>= 50 t CO₂-e</td>
</tr>
</tbody>
</table>

**ACCUs**

50 ACCUs

**Total emissions**

50 t CO₂-e

**Note**

- Emissions reductions from the ERF activity may be counted if the corresponding amount of ACCUs generated by that activity has been voluntarily retired.
- The voluntary retirement of ACCUs must not be double counted as a further offset.

### Scenario: An organisation generates and sells or trades 50 ACCUs from onsite ERF activities

<table>
<thead>
<tr>
<th>Emissions</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Scope 1 (with ERF project):</td>
<td>30 t CO₂-e</td>
</tr>
<tr>
<td>Scope 2:</td>
<td>15 t CO₂-e</td>
</tr>
<tr>
<td>Scope 3:</td>
<td>5 t CO₂-e</td>
</tr>
<tr>
<td>Total</td>
<td>= 50 t CO₂-e</td>
</tr>
</tbody>
</table>

**ACCUs**

50 ACCUs

**Total emissions**

100 t CO₂-e

**Note**

- The corresponding amount of emissions represented by the ACCUs sold must be added back to the carbon account.

### 3. Recommended practices and tools

#### 3.1. Additional guidance for preparing a carbon account

Requirements for preparing a carbon account against any category of the National Carbon Offset Standard are detailed in Section 2.3. Additional guidance below relates to Step 4 (Collect data) and Step 5 (Calculate the carbon account) in Section 2.3.

#### 3.1.1. Data collection

In most cases, primary data should be collected for all relevant processes included within the defined emissions boundary. Section 2.3.4 provides a detailed description of the requirements for collecting data relevant to identified emissions sources.
Steps to preparing a carbon account:

**Step 1:** Establish the emissions boundary

**Step 2:** Identify greenhouse gas emissions sources within the boundary

**Step 3:** Set a base year

**Step 4:** Collect data on identified emissions sources

**Step 5:** Calculate the carbon account

Examples of primary data include:

- **Scope 1 emissions:** direct emissions data determined through direct monitoring, stoichiometry, mass balance or similar methods, or modelled emissions data based on purchased quantities (invoices) of commercial fuels such as natural gas, diesel, unleaded petrol and LPG.
- **Scope 2 emissions:** metered electricity or steam consumption, or data based on purchased quantities (invoices).
- **Scope 3 emissions:** invoiced contractor fuel use, employee air travel reports, invoices for the purchase of paper.

Data collection can be one of the most resource intensive steps in the development of the carbon account. In addition, the robustness of the data collection process can have a significant impact on the overall carbon account quality. Knowledge of the responsible entity’s data management systems and discussion with appropriate internal data custodians are important to ensure efficient and successful data collection.

The responsible entity should consider what methodologies and emission factors are available, and choose the type of data based on the expected accuracy of the results and the ease of calculation. Consideration should be given to whether the data would need to be converted, and if so, how many times this would need to be done, as this would likely decrease the accuracy of the carbon account.

For example, if the chosen emission factor relates to weight of product consumed but the only available data is financial data, the entity would need to find a means to convert its data from financial to weight based. This conversion could decrease the accuracy of the final figures.

Figure 7 shows an example of a simple layout for collecting and presenting data on emissions sources. This is a basic example, and most carbon account data sheets will be more detailed (it is recommended to include a field to document the origin of the data; i.e. which system it is taken from and who provided it).

**Data collection for scope 3**

Primary data is often not available for upstream or downstream processes. For further guidance on collecting data for scope 3 emissions sources, see Figure 1.1 in the *GHG Protocol – Technical Guidance for Calculating Scope 3 Emissions* (WBCSD and WRI, 2013).
### Carbon account – Data collection sheet

**General information**
- Data collection period
- Entity/Process Covered

<table>
<thead>
<tr>
<th>Scope 1 emissions</th>
<th>Units</th>
<th>Data source</th>
</tr>
</thead>
<tbody>
<tr>
<td>On-site stationary fuel use diesel</td>
<td>L</td>
<td></td>
</tr>
<tr>
<td>On-site stationary fuel use (LPG)</td>
<td>L</td>
<td></td>
</tr>
<tr>
<td>Transport unleaded (petrol) use</td>
<td>L</td>
<td></td>
</tr>
<tr>
<td>Transport fuel (diesel) use</td>
<td>L</td>
<td></td>
</tr>
<tr>
<td>Natural gas use</td>
<td>m³</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Scope 2 emissions</th>
<th>Units</th>
<th>Data source</th>
</tr>
</thead>
<tbody>
<tr>
<td>Electricity consumption</td>
<td>kWh</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Scope 3 emissions</th>
<th>Units</th>
<th>Data source</th>
</tr>
</thead>
<tbody>
<tr>
<td>Employee commuting - Car</td>
<td>km</td>
<td></td>
</tr>
<tr>
<td>Employee commuting - Bus</td>
<td>km</td>
<td></td>
</tr>
<tr>
<td>Employee commuting - Train</td>
<td>km</td>
<td></td>
</tr>
<tr>
<td>Business travel (flights)</td>
<td>km</td>
<td></td>
</tr>
<tr>
<td>Waste (organised by streams)</td>
<td>tonnes</td>
<td></td>
</tr>
<tr>
<td>Water</td>
<td>ML</td>
<td></td>
</tr>
<tr>
<td>Wastewater</td>
<td>ML</td>
<td></td>
</tr>
</tbody>
</table>

**Comments**

---

*Figure 7. Data collection sheet*

This is based on an example from a module for undertaking and interpreting greenhouse gas inventories developed by Local Government New South Wales.

**Recommended actions for data collection:**

- Explain to data providers the purpose of why the data is being collected. This gives the data providers an appreciation for the importance of the data that they are collecting and an understanding of where the priorities should be placed. Such engagement can also lead to improvements in data collection processes and paves the way for including other sources as data becomes available.
- Give data providers a data collection form or tool (a spreadsheet laid out as in Figure 6) that specifies the data required and the preferred reporting units. This collection tool should be relatively simple to fill out, and it should be designed so that data can be easily transferred to the final carbon account. The collection tool should be designed in collaboration with data providers to ensure layout and units are suitable for accurate input of data.
- Negotiate a timeline for data delivery with data providers.
- Where applicable, include data collection requirement as part of supply contracts.
3.1.2. Carbon account calculation

Calculating the greenhouse gas emissions within the emissions boundary to determine the total carbon account requires:

› the data collected on emissions sources
› appropriate emission factors
› approved methodologies.

An emissions calculation sheet should be used to assist with the emissions calculations. The sheet should be set out for easy interpretation and should group emissions according to scope.

An example of an emissions calculation sheet is shown in Figure 8. This sheet includes a cell for entering the data and a cell for the emission factor, and these two are multiplied to produce the emissions for each input in a separate cell.

A calculation sheet clearly documents the calculations undertaken to determine the total carbon account. It allows for identification of potential savings and comparison between years of the same sources.

---

**Carbon account – Emissions calculations sheet**

<table>
<thead>
<tr>
<th>Inventory period</th>
<th>Data Input</th>
<th>Emission Factor</th>
<th>Emissions factor source</th>
<th>Emissions</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Scope 1 emissions</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>On-site stationary fuel use diesel</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>On-site stationary fuel use (LPG)</td>
<td>L</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Transport unleaded (petrol) use</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Transport fuel (diesel) use</td>
<td>L</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Natural gas use</td>
<td>m³</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Scope 2 emissions</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Electricity consumption</td>
<td>kWh</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Scope 3 emissions</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Employee commuting - Car</td>
<td>km</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Employee commuting - Bus</td>
<td>km</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Employee commuting - Train</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Business travel (flights)</td>
<td></td>
<td></td>
<td></td>
<td></td>
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<td>Waste (organised by streams)</td>
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<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Water</td>
<td>ML</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Wastewater</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Figure 8: Emissions calculation sheet**

* This calculation sheet is based on a similar example in a module for undertaking and interpreting greenhouse gas inventories developed by Local Government New South Wales (Local Government New South Wales, 2010).
3.1.3. Methodology and emission factor hierarchy for products and services

When completing a carbon account under the National Carbon Offset Standard for Products & Services, there may be multiple methodologies and emissions factors for calculating emissions from the same source. In this situation, the following hierarchy of methodologies and emissions factors should be applied:

1. Latest NGA Factors or other Australian Government publications.
3. Other process-based Life Cycle Inventory (LCI) or carbon footprint data. Australian data are generally preferred above overseas data, unless the Australian data are of lesser quality or relevance. It may be possible to adjust process-based data to improve their quality and relevance (e.g. by correcting the emission factor for electricity used in a process). Any adjustments made to original data must be recorded for auditing purposes.
4. Economic Input–Output (I/O) life cycle data. The Economic Input–Output LCA method estimates GHG emissions resulting from economic activity. I/O data express emission factors as an amount of greenhouse gases emitted to produce one dollar of output from an economic sector (kg CO$_2$-e/$\text{s}i$).
5. Approximation through extrapolation. If no reliable emission factor is available for an emission source, it can be appropriate to estimate emissions by extrapolating factors from similar emission sources. For example, company ABC has identified electronic equipment as an emissions source. It has bought 15-inch laptops, but the manufacturer only reports the carbon footprint (10 kg CO$_2$-e) for a 14-inch model from the same product range. Based on respective area size of the laptops, the purchased model is 15 per cent larger than the model for which the emission factor is available. The company applies this size factor to estimate the emission factor for the purchased laptops at 10 kg CO$_2$-e x 1.15 = 11.5 kg CO$_2$-e.

6. Approximation through conservative estimates. If no reliable emission factor is available for an emissions source, it can be appropriate to estimate emissions by making conservative assumptions. For example, company ABC has identified electronic equipment as an emissions source. It has bought 15-inch laptops, but cannot find an emission factor for this or similar products. As the weight of the product is available from product specifications, the company decides to estimate the emission factor for the purchased laptops based on their weight (2 kg) and a high GHG intensity material. Assuming the laptop is constructed from aluminium (with an emission factor of 20 kg CO$_2$-e per kg), the emissions per laptop are conservatively estimated at 2 kg x 20 kg CO$_2$-e/kg = 40 kg CO$_2$-e.

The approach using conservative estimates is suitable for non-material emissions sources. If an emissions source is found to be material when applying conservative estimates, additional effort should be undertaken to improve the emissions estimate.

3.1.4. Validity period of emission factors

Emission factors used for material emissions sources should be reviewed and, where relevant, updated annually. Emission factors used for non-material emissions sources should be reviewed periodically to ensure the carbon account is in line with the latest knowledge on emissions. However, to reduce the administrative burden on responsible entities, emission factors used for non-material emissions sources may also be used for up to five years without revision.

When emission factors used for non-material emissions sources have not been updated since the previous audit, they do not have to be audited again until they are revised.
3.2. Additional guidance for reporting on emissions reductions

The National Carbon Offset Standard requires that an emissions reduction strategy is developed (Section 2.4), and that emissions reduction activities and the resulting quantity of emissions reduced are reported annually via a public report (Section 2.6).

Table 3 provides an example for reporting on emissions reduction activities. A table similar to this should be provided as part of the Public Disclosure Summary or public report at the end of the reporting period, with the status updated to ‘implemented’ and the actual emissions reductions communicated, if applicable.

Table 3. Emissions reduction measures to be implemented for the 2016 Reporting Period (1 July 2015 to 30 June 2016) – example only

<table>
<thead>
<tr>
<th>Emissions reduction activity type</th>
<th>Reduction measure</th>
<th>Emissions source and scope</th>
<th>Status</th>
<th>Expected annual GHG reduction tCO₂-e</th>
</tr>
</thead>
<tbody>
<tr>
<td>Low carbon energy installation</td>
<td>Installation of solar PV panels at offices to generate renewable electricity and reduce reliance on grid-derived electricity</td>
<td>Electricity consumption Scope 2 and 3</td>
<td>Proposed</td>
<td>300</td>
</tr>
<tr>
<td>Low carbon fuel alternatives</td>
<td>Requesting that facilities use biodiesel where feasible</td>
<td>Diesel consumption Scope 1</td>
<td>Proposed</td>
<td>120</td>
</tr>
<tr>
<td>Energy efficiency: building services</td>
<td>Implementation of various energy efficiency works across network sites including measures such as timer controls, motion sensors and fan upgrades.</td>
<td>Electricity consumption Scope 2 and 3</td>
<td>Proposed</td>
<td>270</td>
</tr>
<tr>
<td>Energy efficiency: building services</td>
<td>Tender to replace the most energy inefficient lighting luminaires to reduce energy and emissions consumption</td>
<td>Electricity consumption Scope 2 and 3</td>
<td>Installation in progress, negotiations completed and contract was executed. Three-year roll out of program covering 5,000 luminaires.</td>
<td>320</td>
</tr>
<tr>
<td>Vehicle fleet</td>
<td>A three-year program to replace 50 per cent the organisation’s fleet with hybrid and plug-in hybrid vehicles.</td>
<td>Petroleum consumption Scope 1</td>
<td>Completed in May 2016 and replacement target of 50 per cent exceeded (62 per cent)</td>
<td>190</td>
</tr>
</tbody>
</table>

Total expected emissions reduction in this reporting period 1,200

Total expected emissions reduction in future reporting periods from currently identified opportunities 780
3.3. Additional guidance for incorporating NGER data in a carbon account

In Australia, large greenhouse gas emitters are required to report their scope 1 and 2 emissions under the *National Greenhouse and Energy Reporting Act 2007* (NGER Act). When energy production and consumption and greenhouse gas emissions reported under the NGER Act already have been audited, there could be potential duplication in efforts and costs if this data needs to be audited again for the purposes of the National Carbon Offset Standard. The following guidance aims to streamline the acceptance within the National Carbon Offset Standard of greenhouse and energy data audited under the NGER Act (here referred to as ‘NGER data’).

Audited NGER data does not have to undergo an audit under the National Carbon Offset Standard when the scope of reported NGER data matches the scope of the carbon account under the standard. In this situation, the auditor can simply confirm that the data used for the standard matches the data reported to NGER. For example:

- If NGER data have been reported at facility level, then the National Carbon Offset Standard carbon account needs to cover this facility as a whole.
- If a product is manufactured at a site where other products are being manufactured as well, the NGER data at facility level first need to be attributed (split) to the relevant product(s). The rules and formulas used for attributing energy and emissions need to be audited by the auditor of the National Carbon Offset Standard carbon account.
- If a responsible entity aims to achieve carbon neutral status for its organisation, using the *National Carbon Offset Standard for Organisations*, audited NGER data can be used if they match the organisation’s boundaries.

In all other situations, when relying on data that has been reported under the NGER Act, this data will still need to be audited for the purposes of preparing a National Carbon Offset Standard carbon account.

Please contact the Department early to confirm whether NGER data needs to be audited for the purposes of meeting the requirements of the National Carbon Offset Standard. The Department retains the right to determine the applicable procedure.
CERTIFICATION AGAINST THE EVENT STANDARD