



University of Newcastle

CLIMATE ACTIVE EMISSIONS INVENTORY FOR CY2021

13 July 2022

Contents

1	EXECUTIVE SUMMARY	4
2	GLOSSARY OF TERMS AND ABBREVIATIONS	7
3	BACKGROUND INFORMATION	10
3.1	UNIVERSITY OF NEWCASTLE’S TARGETS	10
3.2	SCOPE OF WORK	10
3.3	DEFINITION OF CARBON NEUTRALITY.....	11
3.4	ABOUT CLIMATE ACTIVE	11
3.5	CARBON ACCOUNTING ‘SCOPES’	11
4	DETERMINING THE ORGANISATIONAL AND OPERATIONAL BOUNDARY	13
4.1	EMISSION SOURCES UNDER THE CLIMATE ACTIVE STANDARD.....	13
4.2	INCLUDED AND EXCLUDED EMISSION SOURCES	13
4.2.1	<i>Non-quantified emissions</i>	15
4.2.2	<i>Excluded emissions</i>	15
4.2.3	<i>Emission sources that the University is currently monitoring</i>	17
5	CLIMATE ACTIVE CARBON FOOTPRINT	18
5.1	REFRIGERANT EMISSIONS	22
5.2	LOCATION AND MARKET-BASED ACCOUNTING FOR ELECTRICITY EMISSIONS	22
5.3	CARBON NEUTRAL PRODUCTS.....	23
6	ASSUMPTIONS AND LIMITATIONS OF THE FOOTPRINT CALCULATION	24
7	EMISSIONS OVER TIME	27
8	ORGANISATIONAL CONSIDERATIONS FOR GOING CARBON NEUTRAL UNDER CLIMATE ACTIVE	29
8.1	GHG DATA MANAGEMENT AND ADMINISTRATION REQUIREMENTS	29
8.1.1	<i>A note on employee commute emissions</i>	31
8.2	RECOMMENDATIONS FOR IMPROVEMENT.....	32
9	CARBON NEUTRALITY STRATEGY VIA CARBON OFFSETS	34
9.1	CARBON OFFSET STRATEGY	34
9.2	CARBON OFFSET BANKING	37
10	COMPARISON WITH OTHER UNIVERSITIES.....	38
10.1	UNIVERSITIES’ RENEWABLES AND CARBON NEUTRAL COMMITMENTS.....	38
10.2	TIMES HIGHER EDUCATION (THE) IMPACT RANKINGS	41
APPENDIX A: ELECTRICITY EMISSIONS CALCULATION WHEN UNDERGOING THE CLIMATE ACTIVE CERTIFICATION.....		44
MARKET-BASED APPROACH		44
LOCATION-BASED APPROACH		44
APPENDIX B: EXCLUDED SCOPE 3 FACILITIES		46
APPENDIX C: CHANGES IN THE UNIVERSITY’S EMISSIONS BOUNDARY		47
APPENDIX D: STEPS TO BECOME CARBON NEUTRAL UNDER CLIMATE ACTIVE		48
1.	<i>Review operational boundary</i>	48

2. <i>Gather emissions data</i>	48
3. <i>Describe emissions reduction strategy</i>	48
4. <i>Complete the registration</i>	49
5. <i>Sign the licence agreement</i>	49
6. <i>Prepare the report</i>	49
7. <i>Third-party validation</i>	49
8. <i>Purchase offsets</i>	50
9. <i>Payment to Climate Active, certification and use of the Climate Active trademark</i>	50
APPENDIX E: SOURCE DATA HIERARCHY, NON-QUANTIFICATION, AND RELEVANCE TEST	51
DATA HIERARCHY	51
NON-QUANTIFIED EMISSION SOURCES	52
APPLYING THE RELEVANCE TEST	52
APPENDIX F: DESCRIPTION OF SCOPE 3 EMISSION CATEGORIES	53
APPENDIX G: CARBON OFFSETS	58
CARBON OFFSET APPROACHES ALLOWED UNDER CLIMATE ACTIVE	58
ALLOWABLE OFFSETS UNDER CLIMATE ACTIVE	58
<i>Co-benefits of carbon offsets</i>	59
<i>Examples of carbon offset projects</i>	59

Table of figures

Figure 1: How to become carbon neutral	4
Figure 2: Contribution of emissions sources to the University's CY2021 carbon footprint	5
Figure 3: University of Newcastle emissions trend from CY2019 to CY2021	5
Figure 4: Scope of work	10
Figure 5: Direct and indirect emissions – scopes	12
Figure 6: Organisational and operational boundary assessment	14
Figure 7: Refining the range of currently reported emission sources	17
Figure 8: Carbon footprint for CY2021 by emission source and scope	20
Figure 9: Climate Active inventory by scope	21
Figure 10: Contribution of emissions to the inventory in percentages	21
Figure 11: Emissions over time	27
Figure 12: Changes from the CY2019 to the CY2021 inventory	28
Figure 13: Carbon neutral, net zero and 100% renewables commitments by Australian universities as at March 2022	41
Figure 14: Steps to take to become carbon neutral under Climate Active	48
Figure 15: Source data hierarchy	51
Figure 16: Supply chain emissions according to the GHG Protocol	53
Figure 17: Allowable offsets under Climate Active	58

Table of tables

Table 1: Emission sources assessment summary for the University	13
Table 2: University's non-quantification test	15
Table 3: University's relevance test for excluded emission sources	16
Table 4: Emission sources currently tracked in Envizi	17
Table 5: The University's Climate Active carbon footprint for CY2021	19
Table 6: Emissions from refrigerants under the Montreal Protocol in tonnes of CO ₂ -e	22
Table 7: Market-based approach applied to the University's CY2021 electricity consumption – excluding scope 3 facilities	22
Table 8: Location-based approach – excluding scope 3 facilities	23
Table 9: Climate Active carbon footprint assumptions	24
Table 10: Source of activity data and collection requirements	29
Table 11: Recommendations for improvement of the University's data quality	32
Table 12: How offset project preferences affect the cost to go carbon neutral under Climate Active	36
Table 13: Renewable energy and carbon neutrality commitments of other universities as at Jun 2022	38
Table 14: Australian universities' ranking in the global top-100 in <i>THE Impact Rankings 2022</i>	41
Table 15: Australian universities' ranking in the global top-100 in selected <i>THE Impact Ranking</i> categories	42
Table 16: Categories of supply chain emissions	54

1 Executive summary

Addressing climate change is important for the University of Newcastle’s students, staff and partners. Guided by the Environmental Sustainability Plan 2019-2025, the University has taken significant steps to achieve the endorsed target of becoming **carbon neutral by 2025**.

In Australia, it is considered best practice to become carbon neutral under the *Climate Active Standard*. The *Climate Active Carbon Neutral Program* is managed by the Australian Government and allows organisations to get their carbon neutral status accredited and to use the highly regarded Climate Active logo in their communication material.

In 2018, the University completed its detailed Energy and Carbon Management strategy that underpinned its carbon neutral commitment, including a preliminary assessment of its Climate Active carbon footprint. In preparation for the 2025 carbon-neutral target year, the University commissioned 100% Renewables to develop a fully Climate Active-compliant emissions inventory for 2019, 2020, and 2021.

To achieve carbon neutral status, the University needs to estimate the greenhouse gas emissions generated by their activities, including but not limited to fuel, electricity use and travel. The University should aim to reduce these emissions as much as possible by changing their operations, implementing abatement measures and working with suppliers and staff to reduce upstream and downstream emissions. Any residual emissions can be eliminated by purchasing carbon offsets. Carbon offset units are certificates that are generated under rigorous national and international standards from activities that prevent, reduce or remove greenhouse gas emissions from being released into the atmosphere. When the number of offsets purchased by the University is equal to the residual emissions, the University can claim carbon neutral status.

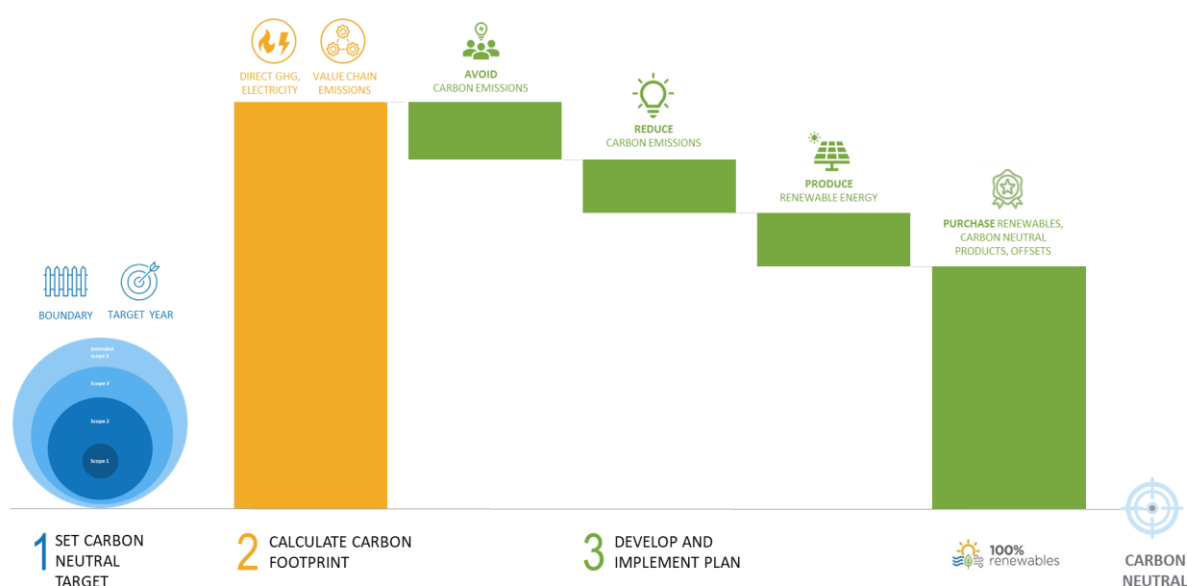


FIGURE 1: HOW TO BECOME CARBON NEUTRAL

Under Climate Active, an organisation has to take responsibility for more emissions sources within its supply chain that are deemed relevant to its operations rather than just accounting for easy-to-calculate scope 3 emission sources (such as upstream energy-related emissions, for example).

In the calendar year 2021 (CY2021), the University’s Climate Active-compliant footprint was **32,037 tonnes of greenhouse gas (GHG) emissions**. Due to the University’s 100% renewable electricity contract, the most significant emission source in CY2021 is now employee commute (12%), followed by natural gas (10%), chemicals (10%) and technical services (9%). The breakup of the University’s emissions is illustrated below.

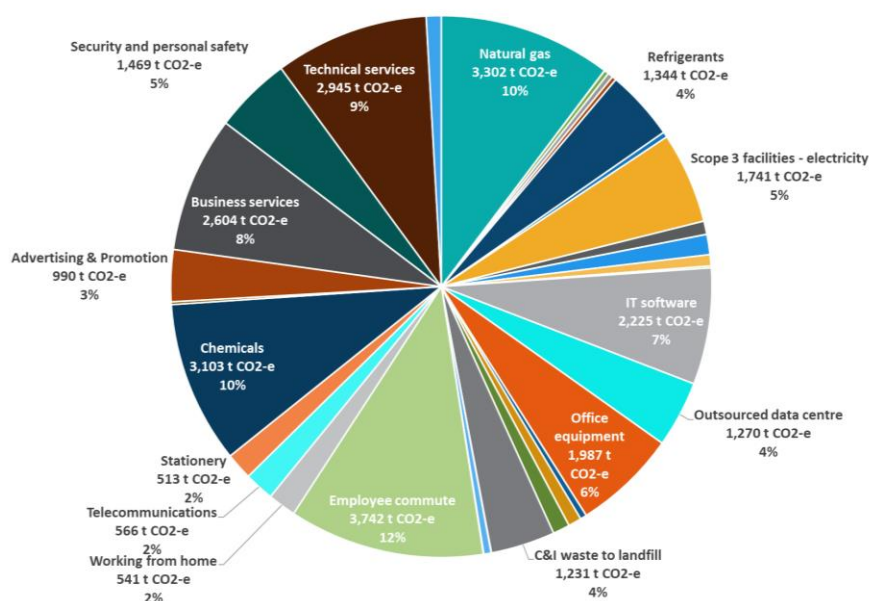


FIGURE 2: CONTRIBUTION OF EMISSIONS SOURCES TO THE UNIVERSITY’S CY2021 CARBON FOOTPRINT

The graph below shows the University’s emissions over time. Since CY2020, several factors have affected the inventory, the most significant being the 100% renewable electricity supply to large campuses, reducing scope 2 emissions to close to nil.

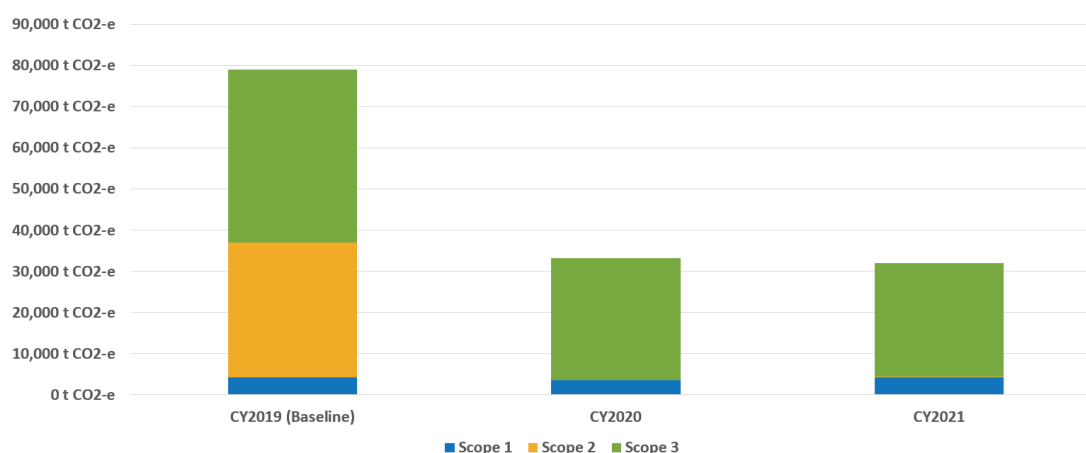


FIGURE 3: UNIVERSITY OF NEWCASTLE EMISSIONS TREND FROM CY2019 TO CY2021

While getting accredited under Climate Active has a significant reputational benefit, there are implications for costs and resourcing.

Staff time will be needed to manage Climate Active requirements, monitor adjustments to carbon management, and reporting systems will also need to be established. There will be costs, including carbon offsets, third-party verification, and Climate Active program membership fees. There are also costs associated with engaging a consultant to help develop the Climate Active inventory. In addition, from July 2023 organisations with emissions greater than 1,000 t CO₂-e will have to source at least 20% of their carbon offsets from ACCU projects.

The carbon market offers many different offset projects at a range of (market-based) costs. The University would incur costs of between \$423,776 and \$1,119,802 to become carbon neutral for CY2021 based on pricing for a range of reputable carbon offsets available as of May 2022 (noting that in a market the price of offsets is variable). These costs include Climate Active's license fee, third-party verification fees, and carbon offset costs, assuming that 20% of offset purchases are ACCUs as will be a requirement from July 2023.

2 Glossary of terms and abbreviations

Term	Definition
Activity data	Source data from an emissions generating activity, such as fuel usage and electricity consumption, used to determine greenhouse gas emissions through multiplication by an Emissions Factor.
Australian Government Department of Industry, Science, Energy and Resources	The Department assesses claims of carbon neutrality and provides certified organisations, products, services or events with access to the Climate Active certification trademark. The certification trademark can be used for promoting products or services to consumers, showcasing an organisation's action to address climate change or for other marketing purposes.
Australian Carbon Credit Unit (ACCU)	An emissions unit issued under the Carbon Credits (Carbon Farming Initiative) Act 2011.
Annex 1 countries	Defined in the International Climate Change Convention as those countries taking on emissions reduction obligations: Australia; Austria; Belgium; Belarus; Bulgaria; Canada; Croatia; Czech Republic; Denmark; Estonia; Finland; France; Germany; Greece; Hungary; Iceland; Ireland; Italy; Japan; Latvia; Liechtenstein; Lithuania; Luxembourg; Monaco; Netherlands; New Zealand; Norway; Poland; Portugal; Romania; Russian Federation; Slovakia; Slovenia; Spain; Sweden; Switzerland; Ukraine; United Kingdom; USA.
Baseline	A hypothetical scenario for what GHG emissions, removals or storage would have been in the absence of greenhouse gas (GHG) project activities.
Boundaries	GHG accounting and reporting boundaries can have several dimensions, i.e. organisational, operational, geographic, business unit, and target boundaries. The inventory boundary determines which emissions are accounted for and reported.
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 referred to as a carbon footprint or emissions inventory.
Carbon dioxide equivalent (CO₂-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 Program	Businesses that wish to have their carbon neutral status certified and recognised need to participate in the Carbon Neutral Program, administered by the Department of Industry, Science, Energy and Resources.
Carbon sink	A natural or man-made reservoir, such as a forest, that stores carbon.
Certified Emissions Reductions (CERs)	A unit of emission reduction generated by a CDM project. CERs are tradable commodities that can be used by Annex 1 countries to meet their commitments under the Kyoto Protocol.
Clean Development Mechanism (CDM)	A mechanism established by Article 12 of the Kyoto Protocol for project-based emission reduction activities in developing countries.
Climate Active Carbon Neutral Standard	A standard for making carbon neutral claims which sets rules for measuring, reducing, validating and reporting emissions. The standard is available for organisations, products and services, buildings, precincts and events. It is administered by the Department of Industry, Science, Energy and Resources.
Direct GHG emissions	Emissions from sources that are owned or controlled by the reporting company.
ECF	Energy Content Factor
Emission factor (EF)	Emissions Factors refer to numeric values that specify the kilograms of CO ₂ -e emissions per unit of activity.

Term	Definition
Eligible offset unit	An offset unit that has been deemed to meet the Climate Active Carbon Neutral Standard's offsets integrity principles.
Embedded/embodied/cradle-to-gate emissions	Cradle-to-gate emissions include all emissions that occur in the life cycle of purchased products, up to the point of receipt by the reporting company (excluding emissions from sources that are owned or controlled by the reporting company).
Emissions	The release of GHG into the atmosphere.
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.
Emission Reduction Unit (ERU)	A unit of emission reduction generated by a Joint Implementation (JI) project. ERUs are tradable commodities which can be used by Annex 1 countries to help them meet their commitment under the Kyoto Protocol.
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®	A voluntary government-accredited program that enables an electricity provider to purchase renewable energy on a buyer's behalf. GreenPower® guarantees that the renewable electricity from energy suppliers meets stringent environmental standards and is additional to Australia's Renewable Energy Target.
Gold Standard	A standard and logo certification mark program for non-governmental emission reductions projects in the Clean Development Mechanism (CDM), the Voluntary Carbon Market and other climate and development interventions.
Indirect GHG emissions	Emissions that are a consequence of the operations of the reporting company, but occur at sources owned or controlled by another company.
Inventory	A quantified list of an organisation's GHG emissions and sources.
Kyoto Protocol	The Kyoto Protocol operationalises the United Nations Framework Convention on Climate Change by committing industrialised countries to limit and reduce greenhouse gases (GHG) emissions in accordance with agreed individual targets.
National Carbon Offset Standard	The previous name of the Climate Active Carbon Neutral Certification Standard.
National Greenhouse and Energy Reporting System (NGER)	Introduced in 2007 to require large emitting organisations to report their scope 1 and scope 2 greenhouse gas emissions and energy consumption and production. More info here .
Offsetting	The activity of cancelling offset units.
Offset unit	Represents reductions of GHG or removals of GHG 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.
Operation	A generic term used to denote any kind of business, irrespective of its organisational, governance, or legal structures. An operation can be a facility, subsidiary, affiliated company or other form of joint venture.
Outsourcing	The contracting-out of activities to other businesses.
Public Disclosure Summary	A report or document prepared by the submitting organisation and submitted to the Department to be certified as carbon neutral under the Climate Active standard and eligible to use the certification trademark.
REDD+	Reducing emissions from deforestation and forest degradation. These carbon offset projects encourage developing countries to reduce emissions and enhance removals of greenhouse gases through a variety of forest management options.
Relevance	Ensuring that the carbon account of a subject appropriately reflects the emissions of that subject and meets the expectations of users and stakeholders.

Term	Definition
Relevance test	Qualitative test for determining whether certain emissions sources are or are not considered relevant.
Removal Units (RMUs)	An emission unit issued by a Kyoto Protocol country on the basis of land use, land-use change and forestry activities under article 3.3 or 3.4 of the Kyoto Protocol.
Reporting	Presenting data to internal management and external users such as regulators, shareholders, the general public or specific stakeholder groups.
Scope	The categorising of emissions sources into direct and indirect sources. See individual definitions for scope 1, scope 2, and scope 3 emissions.
Scope 1 emissions	The release of GHG into the atmosphere is a direct result of activities occurring within a responsible entity's control (or geographic boundary).
Scope 2 emissions	The release of GHG 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 are emitted as a consequence of a responsible entity's activities but emitted outside the responsible entity's control (or geographic boundary).
Sequestration	The removal of atmospheric carbon dioxide, either through biological processes (e.g. photosynthesis in plants and trees) or geological processes (e.g. storage of carbon dioxide in underground reservoirs).
True-up	The calculation to determine if additional eligible offset units must be purchased after the measurement of a post-event carbon account.
Uplift factor	A factor 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.
Verification	An independent assessment of the reliability (considering completeness and accuracy) of a GHG inventory.
Verified Carbon Standard (VCS)	Verra or VCS, formerly the Voluntary Carbon Standard, is a standard for certifying carbon emissions reductions. VCS is administered by Verra, a not-for-profit.
Verified Carbon Units (VCUs)	An emission unit issued by the Verified Carbon Standard (VCS). Each VCU represents a reduction or removal of 1 t CO ₂ -e achieved by a project.
Vintage	Refers to the date of issuance of an offset unit.
Voluntary Emissions Reductions (VERs)	An emission unit issued by the Gold Standard. VERs are a reduction in GHG from a project that is independently audited (i.e., verified) against a third-party certification standard. Each verified emission reduction represents 1 t CO ₂ -e.

3 Background information

3.1 University of Newcastle's targets

Addressing climate change is important for University of Newcastle's students, staff and partners. Guided by the Environmental Sustainability Plan 2019-2025, the University of Newcastle (UON) has set a target of becoming **carbon neutral by 2025**. This includes a detailed Energy and Carbon Management Strategy, and as of 1 January 2020, the University has been powered by 100% renewable electricity across their Newcastle City, Callaghan and Ourimbah Campuses. Furthermore, several significant energy reduction and renewable energy initiatives have now been implemented across the University.

3.2 Scope of work

University of Newcastle commissioned 100% Renewables to develop an operational carbon footprint which includes scope 3 emission sources to cover the period from 1 January 2021 to 31 December 2021 (CY2021).

The scope of work for this project is as described and illustrated below.



FIGURE 4: SCOPE OF WORK

- Conduct a kick-off meeting to discuss the project requirements.
- Review the Climate Active-compliant emissions boundary, which includes
 - re-assessing quantified, non-quantified and excluded emission sources.
- Develop a Climate Active-compliant carbon footprint for CY2021.
- Deliver a short report to prepare for Climate Active certification
 - Provide advice on systems and protocols to capture activity data for future reporting
 - Provide advice on the expected cost of carbon offsets

3.3 Definition of carbon neutrality

Carbon neutral means reducing emissions where possible and compensating for the remainder by investing in carbon offset projects to achieve net-zero overall emissions. Offsets are generated from an activity that prevents, reduces or removes greenhouse gas emissions from being released into the atmosphere.

3.4 About Climate Active

Climate Active used to be called the ‘National Carbon Offset Standard’, or NCOS. The National Carbon Offset Standard and Carbon Neutral Program were launched by the Australian Government in 2010 to provide a credible framework for managing emissions and achieving carbon neutrality. Initially, the Standard was designed for organisations, products and services and was expanded to events, buildings and precincts in 2017.

The Climate Active Carbon Neutral Standard for Organisations (Organisation Standard) is a voluntary standard to manage greenhouse gas emissions and achieve carbon neutrality. It provides best-practice guidance on how to measure, reduce, offset, validate and report emissions that occur as a result of the operations of an organisation.

Further information is available at www.climateactive.org.au.

3.5 Carbon accounting ‘scopes’

To help differentiate between different emissions sources, emissions are classified into the following scopes according to the GHG Protocol – Corporate Standard:

- Scope 1 emissions include all direct greenhouse gas emissions from sources that are within the organisation’s control 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 organisation’s control boundary but used within the organisation).
- Scope 3 emissions are all indirect emissions that occur as a result of the activities of the organisation but occur from sources outside the organisation’s control boundary.

These emissions scopes are illustrated below.

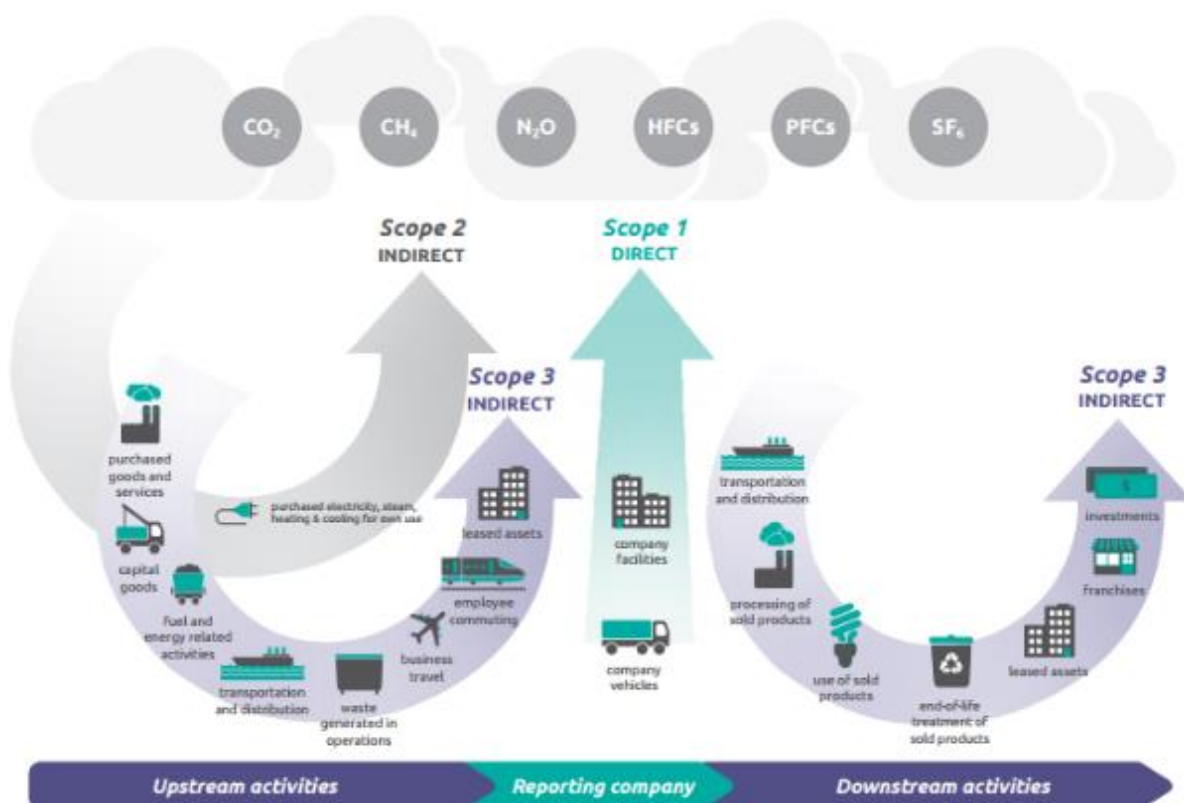


FIGURE 5: DIRECT AND INDIRECT EMISSIONS – SCOPES

4 Determining the organisational and operational 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 which of the identified sources are to be included or excluded.

University of Newcastle is wholly owned and operated by one legal entity, and the organisational boundary encompasses assets under the ownership or operational control of the University and facilities with the University's presence (scope 3 facilities).

Under the Climate Active Standard, it is recommended to follow the **operational control approach** for consolidating GHG emissions throughout the organisation. This makes sure that emission sources that can be directly affected through carbon management strategies can be categorised as scope 1 or 2 and that those GHG emission sources over which there is limited control can be categorised as scope 3.

4.1 Emission sources under the Climate Active Standard

Under Climate Active, organisations must include scope 1 and 2 as well as relevant scope 3 emission sources in their boundary. In consultation with the University of Newcastle team, the following emissions sources were assessed and included.

1. All stationary energy and fuels used in buildings, machinery or vehicles that are in the entity's control (e.g. natural gas, fuels used in generators or vehicles).
2. All electricity consumed by buildings, machinery or vehicles in the entity's control (this includes servers or other machines off-site if the associated emissions are likely to be large relative to items 1-2).
3. All other emissions which are within the control approach or able to be influenced by the entity seeking certification must be assessed for relevance. This includes emissions outside the control approach of the organisation.

Broad categories of scope 3 emissions sources that need to be considered are as follows:

- | | |
|---|---|
| 1. Purchased goods and services | 8. Upstream leased assets |
| 2. Capital goods | 9. Downstream transportation and distribution |
| 3. Fuel- and energy-related activities (not included in Scope 1 or Scope 2) | 10. Processing of sold products |
| 4. Upstream transportation and distribution | 11. Use of sold products |
| 5. Waste generated in operations | 12. End-of-life treatment of sold products |
| 6. Business travel | 13. Downstream leased assets |
| 7. Employee commuting | 14. Franchises |
| | 15. Investments |

4.2 Included and excluded emission sources

In consultation with the University of Newcastle team, based on the scope 3 categories in section 4.1, the relevance of the emissions source, and the availability of activity data and emission factors, emission sources as shown in Table 1 will most likely be included when the University seeks certification under Climate Active. Please note that this inventory boundary has to be confirmed once the University goes through the certification process.

TABLE 1: EMISSION SOURCES ASSESSMENT SUMMARY FOR THE UNIVERSITY

Emission source	Relevant	Quantified	Scope 1	Scope 2	Scope 3
Natural gas	Yes	Yes	✓	-	✓
Diesel – stationary	Yes	Yes	✓	-	✓
Diesel – fleet	Yes	Yes	✓	-	✓
Petrol – fleet	Yes	Yes	✓	-	✓
Ethanol – fleet	Yes	Yes	✓	-	✓
Diesel – shuttle bus	Yes	Yes	✓	-	✓
Refrigerants	Yes	Yes	✓	-	-
Electricity	Yes	Yes	-	✓	✓
Scope 3 facilities – electricity	Yes	Yes	-	-	✓
Water	Yes	Yes	-	-	✓
Paper	Yes	Yes	-	-	✓
Paper (carbon neutral)	Yes	Yes	-	-	✓
Outsourced printing	Yes	Yes	-	-	✓
IT equipment	Yes	Yes	-	-	✓
IT equipment lease	Yes	Yes	-	-	✓
IT software	Yes	Yes	-	-	✓
Outsourced data centre	Yes	Yes	-	-	✓
Office equipment	Yes	Yes	-	-	✓
Office furniture	Yes	Yes	-	-	✓
Food, catering, and beverages	Yes	Yes	-	-	✓
Postage and couriers	Yes	Yes	-	-	✓
Waste (Commercial & industrial)	Yes	Yes	-	-	✓
Waste (Construction & demolition)	Yes	Yes	-	-	✓
Green waste	Yes	Yes	-	-	✓
Air travel	Yes	Yes	-	-	✓
Business accommodation	Yes	Yes	-	-	✓
Employee commute	Yes	Yes	-	-	✓
Working from home	Yes	Yes	-	-	✓
Telecommunications	Yes	Yes	-	-	✓
Stationery	Yes	Yes	-	-	✓
Chemicals	Yes	Yes	-	-	✓
Equipment hire	Yes	Yes	-	-	✓
Advertising	Yes	Yes	-	-	✓
Business services	Yes	Yes	-	-	✓
Technical services	Yes	Yes	-	-	✓
Security & personal safety	Yes	Yes	-	-	✓
Legal fees	Yes	Yes	-	-	✓
Hire cars	Yes	No	-	-	✓

Emission source	Relevant	Quantified	Scope 1	Scope 2	Scope 3
International offices	No	N/A	-	-	-
Other regional offices	No	N/A	-	-	-
Other scope 3 offices	No	N/A	-	-	-
Scope 3 facilities – natural gas	No	N/A	-	-	-
Subscription & periodicals	No	N/A	-	-	-
Taxis and ride share	No	N/A	-	-	-
Cleaning	No	N/A	-	-	-
Acetylene	No	N/A	-	-	-
Capital investment	No	N/A	-	-	-
Investments	No	N/A	-	-	-
Construction of uni buildings	No	N/A	-	-	-

The list in the table above is repeated in the graphic below. The figure also shows the list of campuses/facilities that are included in the boundary.

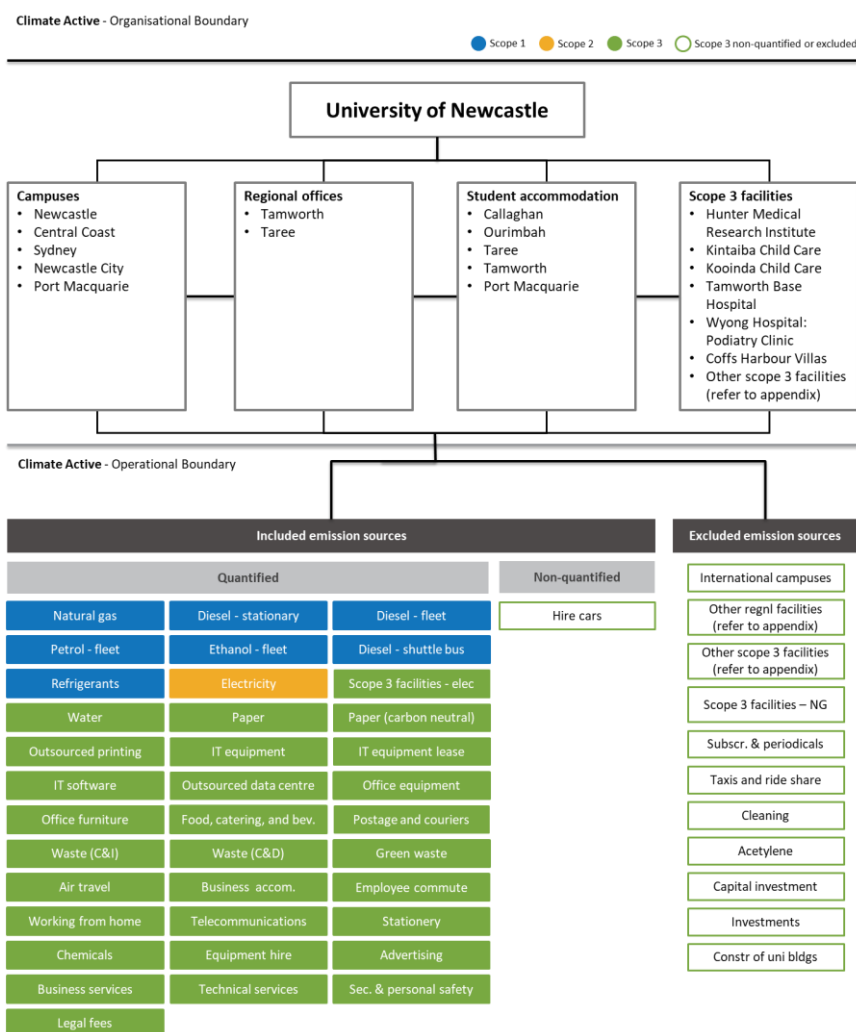


FIGURE 6: ORGANISATIONAL AND OPERATIONAL BOUNDARY ASSESSMENT

4.2.1 Non-quantified emissions

Under Climate Active, emission sources are either *quantified, not quantified, or excluded*. A relevant emissions source can be non-quantified for any of the reasons shown in the table below. The only emissions source that is currently non-quantified is ‘Hire cars’, as it is considered immaterial to the carbon footprint. Future revisions of the emissions inventory may evaluate this emission source and quantify it.

TABLE 2: UNIVERSITY’S NON-QUANTIFICATION TEST

Non-quantified emission sources	<i>Immaterial <1% for individual items and no more than 5% collectively</i>	<i>Quantification is not cost-effective relative to the size of the emission but uplift applied.</i>	<i>Data unavailable but uplift applied. A data management plan must be put in place to provide data within 5 years.</i>	<i>Initial emissions are non-quantified but repairs and replacements quantified</i>
Hire cars	Yes	No	No	No

4.2.2 Excluded emissions

As discussed in Section 4.2, the ‘relevance test’ under Climate Active states that if less than two of the five relevance criteria are met, an emissions source can be excluded from the boundary. The table below shows the emissions sources that were deemed irrelevant and therefore categorised as ‘excluded’ emissions in the operational boundary.

TABLE 3: UNIVERSITY'S RELEVANCE TEST FOR EXCLUDED EMISSION SOURCES

Emission Source	Scope	RELEVANCE TEST: Y/N				
		The emissions from a particular source are likely to be large relative to the organisation's electricity, stationary energy and fuel emissions.	The emissions from a particular source contribute to the organisation's greenhouse gas risk exposure.	Key stakeholders deem the emissions from a particular source as relevant.	The responsible entity has the potential to influence the reduction of emissions from a particular source.	The emissions are from outsourced activities previously undertaken within the organisation's boundary, or from outsourced activities typically undertaken within the boundary for comparable organisations.
International offices	3	N	N	N	Y	N
Other scope 3 facilities where UoN is not responsible for power	3	N	N	N	N	N
Other scope 3 facilities where the tenant is responsible for power	3	N	N	N	N	N
Scope 3 facilities - natural gas	3	N	N	N	Y	N
Taxis and ride share	3	N	N	N	N	N
Cleaning	3	N	N	N	N	N
Acetylene	3	N	N	N	N	N
Subscription & periodicals	3	Y	N	N	N	N
Capital investments	3	N	N	N	Y	N
Investments	3	N	N	N	Y	N
Construction of uni bldgs	3	N	N	N	Y	N

4.2.3 Emission sources that the University is currently monitoring

Currently, the University tracks stationary and transport energy consumption in Envizi under scopes 1 and 2, such as electricity and natural gas. Currently reported emission sources encompass upstream emissions (scope 3) for fuel extraction and transport, as well as transportation and distribution losses for electricity consumption. Envizi also records water consumption, but not the associated scope 3 GHG emissions.

TABLE 4: EMISSION SOURCES CURRENTLY TRACKED IN ENVIZI

Scope 1	Scope 2	Scope 3
Natural gas	Electricity incl. solar generation	Water (only the consumption is tracked, not the associated GHG)

In addition to the emission sources tracked in Envizi, the University also tracks the following emission sources for reporting to the Tertiary Education Facilities Management Association (TEFMA).

- Air travel
- Fleet vehicles
- Shuttle bus
- Stationary – Diesel
- Waste
- Green waste

Figure 7 shows emission sources currently tracked in Envizi, as well as emission sources that need to be evaluated under a Climate Active boundary. The Climate Active carbon footprint casts a wider net regarding emission sources than what is currently reported. Under Climate Active, an organisation has to go beyond prominent and easy to calculate scope 3 emission sources and take responsibility for many more emissions. Most of these emission sources come from the supply chain, but they also include emissions from waste generated from the University's operations.

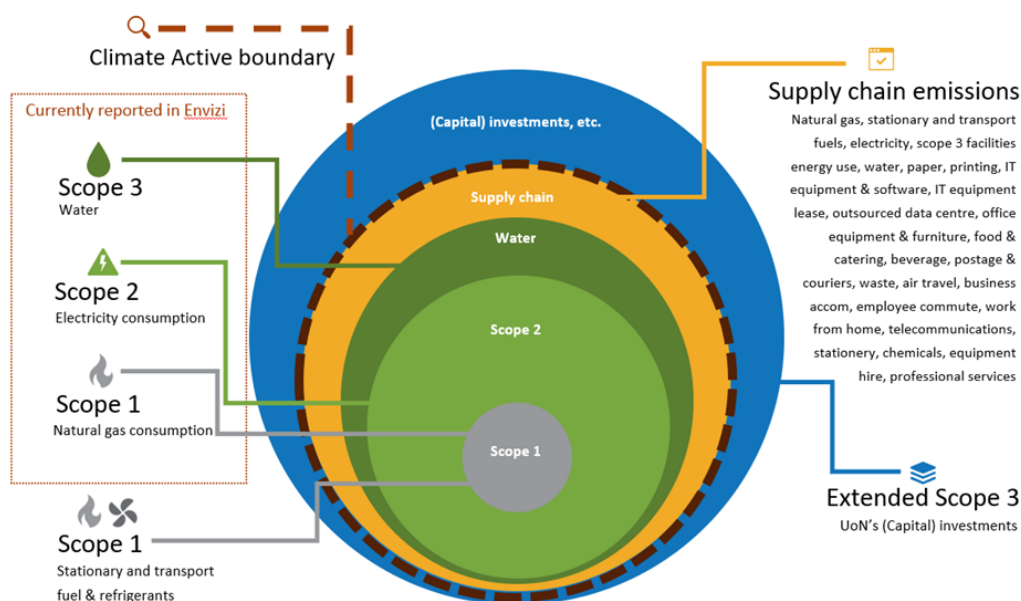


FIGURE 7: REFINING THE RANGE OF CURRENTLY REPORTED EMISSION SOURCES

5 Climate Active Carbon footprint

This inventory has been prepared based on the Climate Active Standard and was developed in accordance with the general principles of:

- The Greenhouse Gas Protocol, A Corporate Accounting and Reporting Standard developed by the World Business Council for Sustainable Development (GHG Protocol);
- GHG Protocol: Corporate Value Chain (Scope 3) Accounting and Reporting Standard.

This inventory measures greenhouse gases in carbon dioxide equivalence (CO₂-e) and includes all seven greenhouse gases covered by the Kyoto Protocol – carbon dioxide (CO₂), methane (CH₄), nitrous oxide (N₂O), perfluorocarbons (PFCs), hydrofluorocarbons (HFCs), sulphur hexafluoride (SF₆), nitrogen trifluoride (NF₃), as well as hydrochlorofluorocarbons (HCFCs) covered by the Montreal Protocol (where applicable).

In CY2021, the University's Climate Active-compliant footprint was **32,037 tonnes of greenhouse gas (GHG) emissions**. The most significant emission source is employee commute (12%), followed by natural gas (10%), chemicals (10%) and technical services (9%). The breakup of the University's emissions is illustrated below.

It is noted that the University opted to switch the refrigerant emissions methodology from the annual leakage methodology to the top-up methodology in CY2021. The annual leakage method estimates the emissions from the annual leakage rate of refrigerants in a HVAC system, while the top-up methodology estimates the emissions of refrigerants that were recharged in the reporting period. Both methods are acceptable under Climate Active. The former provides relatively constant emissions year-on-year, while the latter will fluctuate if there are more or less top-ups in a reporting period.

The reduction in employee commute emissions from 'working from home' was accounted for under the 'employee commute' emissions. It comprises the covid lockdown from the end of June to October and the working from home arrangement throughout the year. The associated increase in home energy use was accounted for under 'working from home' emissions.

The table below shows the University's emissions inventory. The carbon inventory is also shown graphically in Figure 8.

TABLE 5: THE UNIVERSITY'S CLIMATE ACTIVE CARBON FOOTPRINT FOR CY2021

	Emission source	Activity data	Unit	Scope 1	Scope 2	Scope 3	Total t CO ₂ -e	%
	Natural gas	51,087	GJ	2,633 t CO ₂ -e		669 t CO ₂ -e	3,302 t CO ₂ -e	10.31%
	Stationary - Diesel	2	kL	5 t CO ₂ -e		0.2 t CO ₂ -e	5 t CO ₂ -e	0.02%
	Fleet - Diesel	30	kL	82 t CO ₂ -e		4.2 t CO ₂ -e	86 t CO ₂ -e	0.27%
	Fleet - Petrol	41	kL	95 t CO ₂ -e		5.0 t CO ₂ -e	100 t CO ₂ -e	0.31%
	Fleet - Ethanol	3	kL	0 t CO ₂ -e		0.2 t CO ₂ -e	0 t CO ₂ -e	0.00%
	Shuttle bus - Diesel	29	kL	79 t CO ₂ -e		4.0 t CO ₂ -e	83 t CO ₂ -e	0.26%
	Refrigerants	753	kg	1,344 t CO ₂ -e			1,344 t CO ₂ -e	4.20%
	Electricity	33,856,930	kWh		93 t CO ₂ -e	10 t CO ₂ -e	103 t CO ₂ -e	0.32%
	Scope 3 facilities - electricity	2,148,900	kWh			1,741 t CO ₂ -e	1,741 t CO ₂ -e	5.43%
	Potable water	179,476	kL			255 t CO ₂ -e	255 t CO ₂ -e	0.80%
	Paper	3,451	\$			1 t CO ₂ -e	1 t CO ₂ -e	0.00%
	Paper (carbon neutral)	343,409				0 t CO ₂ -e	0 t CO ₂ -e	0.00%
	Outsourced printing	1,493,154	\$			385 t CO ₂ -e	385 t CO ₂ -e	1.20%
	IT equipment	1,574,720	\$			214 t CO ₂ -e	214 t CO ₂ -e	0.67%
	IT equipment lease	4,488,290	\$			37 t CO ₂ -e	37 t CO ₂ -e	0.12%
	IT software	16,041,203	\$			2,225 t CO ₂ -e	2,225 t CO ₂ -e	6.94%
	Outsourced data centre	9,159,433	\$			1,270 t CO ₂ -e	1,270 t CO ₂ -e	3.97%
	Office equipment	7,383,640	\$			1,987 t CO ₂ -e	1,987 t CO ₂ -e	6.20%
	Office furniture	699,610	\$			123 t CO ₂ -e	123 t CO ₂ -e	0.38%
	Food and catering	714,835	\$			253 t CO ₂ -e	253 t CO ₂ -e	0.79%
	Postage and couriers	899,040	\$			325 t CO ₂ -e	325 t CO ₂ -e	1.01%
	C&I waste to landfill	947	t			1,231 t CO ₂ -e	1,231 t CO ₂ -e	3.84%
	C&D waste to landfill	38	t			8 t CO ₂ -e	8 t CO ₂ -e	0.02%
	Green waste	-	t			0 t CO ₂ -e	0 t CO ₂ -e	0.00%
	Air travel	680,518	pax.km			138 t CO ₂ -e	138 t CO ₂ -e	0.43%
	Business accommodation	336	nights			9 t CO ₂ -e	9 t CO ₂ -e	0.03%
	Employee commute	3,742	tCO ₂ e			3,742 t CO ₂ -e	3,742 t CO ₂ -e	11.68%
	Working from home	541	tCO ₂ e			541 t CO ₂ -e	541 t CO ₂ -e	1.69%
	Telecommunications	3,639,099	\$			566 t CO ₂ -e	566 t CO ₂ -e	1.77%
	Stationery	1,989,992	\$			513 t CO ₂ -e	513 t CO ₂ -e	1.60%
	Chemicals	4,519,687	\$			3,103 t CO ₂ -e	3,103 t CO ₂ -e	9.69%
	Equipment hire	221,269	\$			53 t CO ₂ -e	53 t CO ₂ -e	0.17%
	Advertising & Promotion	8,244,426	\$			990 t CO ₂ -e	990 t CO ₂ -e	3.09%
	Business services	27,764,113	\$			2,604 t CO ₂ -e	2,604 t CO ₂ -e	8.13%
	Security and personal safety	6,335,024	\$			1,469 t CO ₂ -e	1,469 t CO ₂ -e	4.59%
	Technical services	18,047,684	\$			2,945 t CO ₂ -e	2,945 t CO ₂ -e	9.19%
	Legal services	2,217,198	\$			287 t CO ₂ -e	287 t CO ₂ -e	0.90%
	TOTAL:			4,236 t CO₂-e	93 t CO₂-e	27,708 t CO₂-e	32,037 t CO₂-e	100%

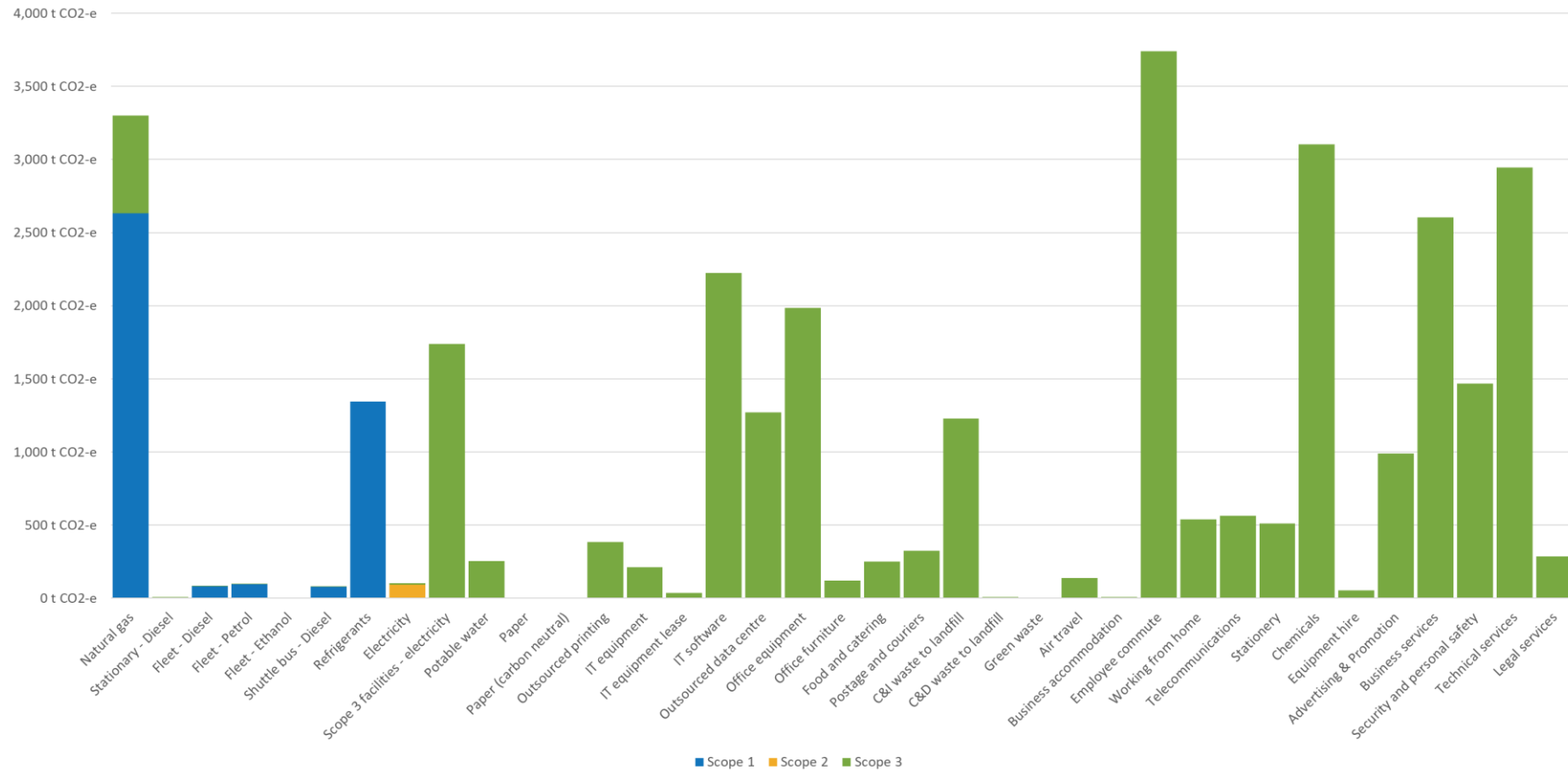


FIGURE 8: CARBON FOOTPRINT FOR CY2021 BY EMISSION SOURCE AND SCOPE

Scope 3 emissions (87%) make up the biggest proportion of the University's Climate Active carbon footprint, such as emissions from employee commute, followed by scope 1 (13%) and scope 2 (0%).

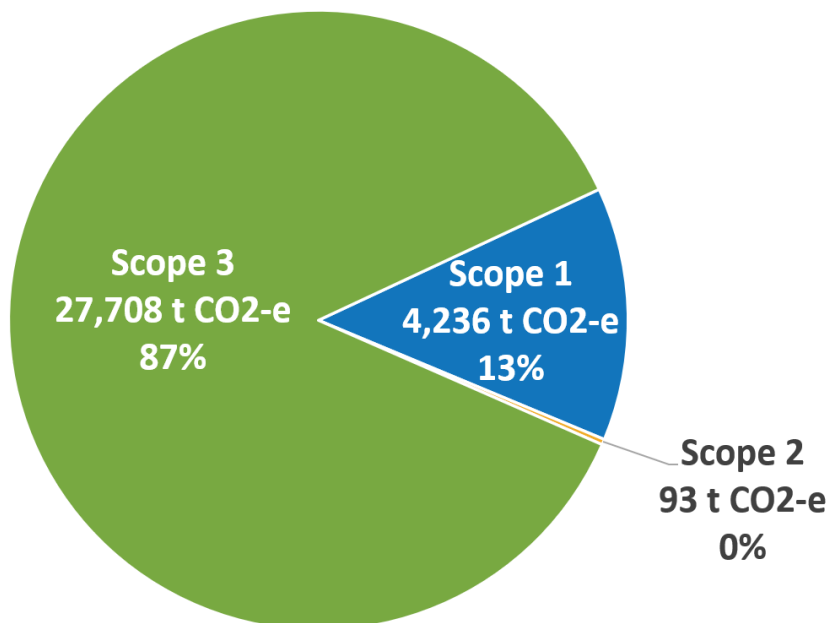


FIGURE 9: CLIMATE ACTIVE INVENTORY BY SCOPE

Figure 10 shows the contribution of emission sources to the inventory.

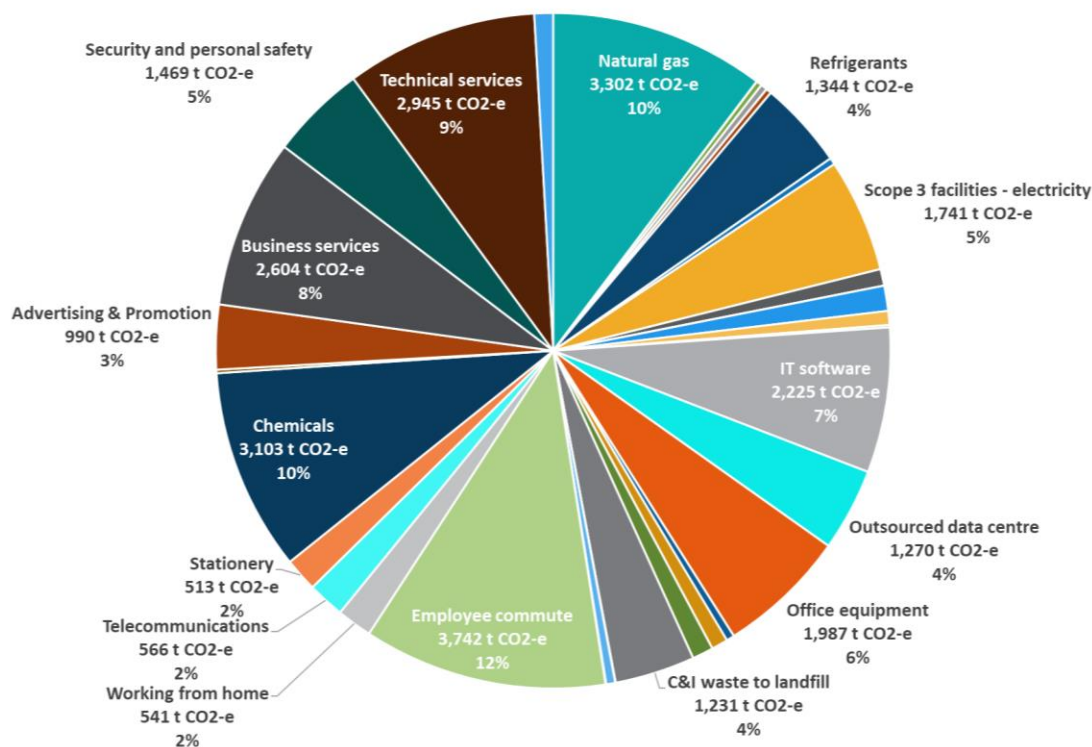


FIGURE 10: CONTRIBUTION OF EMISSIONS TO THE INVENTORY IN PERCENTAGES

5.1 Refrigerant emissions

Refrigerants that fall under the Montreal Protocol, such as R22, are not included in a Climate Active carbon inventory. Notwithstanding this, it is recommended to note these emissions to give context when old HVAC units are replaced with new units that utilise refrigerants under the Kyoto Protocol, as the associated emissions from these will then be included in the Climate Active-compliant carbon inventory. As mentioned above, the University opted to switch the methodology. In CY2021, there were no recorded top-ups of Montreal refrigerants.

TABLE 6: EMISSIONS FROM REFRIGERANTS UNDER THE MONTREAL PROTOCOL IN TONNES OF CO₂-E

Emission source	Activity data	Unit	Scope 1	Scope 2	Scope 3	Total t CO ₂ -e
 Refrigerants - Montreal	-	kg	0 t CO ₂ -e			0 t CO ₂ -e

5.2 Location and market-based accounting for electricity emissions

Climate Active has two methods for calculating electricity-related emissions: market-based and location-based. The market-based method reflects the emissions intensity of different electricity products, markets and choices. In contrast, the location-based method reflects the average emissions intensity of the electricity grid in the state in which energy consumption occurs. The tables below show the resulting emissions from electricity consumption using these two approaches. Please note that for simplicity, the tables below show the electricity emissions for the accounts that the University has operational control over only. When the University undergoes the Climate Active certification, the University should also include electricity emissions calculation from the Scope 3 facilities in the tables. Please refer to Appendix A: Electricity emissions calculation when undergoing the Climate Active certification for the complete electricity emissions table.

TABLE 7: MARKET-BASED APPROACH APPLIED TO THE UNIVERSITY'S CY2021 ELECTRICITY CONSUMPTION – EXCLUDING SCOPE 3 FACILITIES

Market-Based Approach	Activity Data (kWh)	Emissions (kgCO ₂ e)	Renewable Percentage of total
Behind the meter consumption of electricity generated	596,845	0	2%
Total non-grid electricity	596,845	0	2%
LGC Purchased and retired (kWh) (including PPAs & Precinct LGCs)	27,473,000	0	80%
GreenPower	0	0	0%
Jurisdictional renewables (LGCs retired)	0	0	0%
Jurisdictional renewables (LRET) (applied to ACT grid electricity)	0	0	0%
Large Scale Renewable Energy Target (applied to grid electricity only)	6,277,075	0	18%
Residual Electricity	106,855	106,252	0%
Total grid electricity	33,856,930	106,252	98%
Total Electricity Consumed (grid + non grid)	34,453,775	106,252	100%
Electricity renewables	34,346,919	0	
Residual Electricity	106,855	106,252	
Exported on-site generated electricity	4,144	-3,025	

Emissions (kgCO ₂ e)	103,227
Total renewables (grid and non-grid)	99.69%
Mandatory	18.22%
Voluntary	79.74%
Behind the meter	1.73%
Residual Electricity Emission Footprint (TCO₂e)	103
<i>Figures may not sum due to rounding. Renewable percentage can be above 100%</i>	

In the market-based approach shown above, 'Electricity renewables' takes into account the renewable energy target, retired LGCs, PPAs, purchased GreenPower® and consumed solar energy. 'Residual electricity' is the net of the remaining grid electricity and electricity renewables, and 'Exported on-site generated electricity' is an additional electricity reduction measure.

TABLE 8: LOCATION-BASED APPROACH – EXCLUDING SCOPE 3 FACILITIES

Location-Based Approach	Activity Data (kWh)	Scope 2 Emissions (kgCO ₂ e)	Scope 3 Emissions (kgCO ₂ e)
NSW	33,856,930	26,408,405	2,369,985
Grid electricity (scope 2 and 3)	33,856,930	26,408,405	2,369,985
NSW	596,845	0	0
Non-grid electricity (Behind the meter)	596,845	0	0
Total Electricity Consumed	34,453,775	26,408,405	2,369,985
Emission Footprint (TCO₂e)	28,778		
<i>Scope 2 Emissions (TCO₂e)</i>	26,408		
<i>Scope 3 Emissions (TCO₂e)</i>	2,370		

In the location-based approach shown in Table 8, 'Grid electricity' fully accounts for the University's grid electricity consumption, accounted for at NSW's electricity grid emissions factor, while 'Non-grid electricity' accounts for consumed behind-the-meter solar energy only.

The carbon inventory shown in Table 5 **used the market-based approach to calculate electricity emissions in CY2021.**

5.3 Carbon neutral products

In CY2021, more than half of the University's paper purchases were carbon neutral. Please note that for future Climate Active certification, the exact brand of the paper has to be investigated and whether it is Climate Active-certified.

6 Assumptions and limitations of the footprint calculation

A series of assumptions were made to complete the Climate Active carbon footprint. The table below explains where these assumptions were made.

TABLE 9: CLIMATE ACTIVE CARBON FOOTPRINT ASSUMPTIONS

Emission source	Assumption/limitation and justification
Natural gas	UoN provided a normalised Envizi natural gas consumption of 51,087,342 MJ.
Shuttle bus - Diesel	There is operational control over the shuttle bus servicing the Newcastle campus, which resulted in the emissions source being classified as scope 1. The amount of top-up charge was provided.
Refrigerants - Kyoto	UoN advised changing the method of accounting for refrigerant emissions from 'standard leakage rate', to the 'top up' method. The top-up method requires the actual amount of topped-up gas to estimate the emissions from the refrigerants. Previously, the refrigerant emissions were estimated using a standard leakage rate of 9% for all commercial air conditioning systems ¹ .
Electricity	UoN provided a normalised Envizi electricity consumption of 33,188,196 kWh, and the adjusted consumption used for the carbon footprint calculation is 33,856,930 kWh to align with the Red Energy advised voluntary LGCs retired.
Consumed solar	Solar consumption was based on available Envizi data. The recorded solar data in the Tamworth Education Centre (July 2021) was adjusted as the value was unrealistic. Solar consumption from the student accommodation in Port Macquarie, Manning Education Centre, and student accommodation in Taree was estimated using a solar specific yield of 1,500 kWh/kWp.
Exported solar	It was assumed that 5% of the generated solar energy in Tamworth was exported.
Scope 3 facilities - electricity	This comprises the following sites: <ol style="list-style-type: none"> 1. Kintaiba Child Care 2. Kooinda Child Care 3. Tamworth Base Hospital 4. Wyong Hospital: Podiatry Clinic 5. Hunter Medical Research Institute 6. Coffs Harbour Villas 3,4,5,8,9,10 122 Pacific Hwy The total consumption is the sum of the actual data for the Coffs Harbour Villas and the estimated data for other relevant scope 3 facilities based on gross floor area and electricity intensity.
Potable water	UoN provided a normalised Envizi water consumption of 179,476 kL.
Paper	The University advised that 30% of the account code '6133 – Course Materials' was paper-based. In CY2021, it was advised that there were no paper purchases in the account code 6133. It was also advised that 0.2% of the account code '6012 – Printing and Photocopy Services' was purchased paper.
Paper (carbon neutral)	The University advised that 19.9% of the account code '6012 – Printing and Photocopy Services' was carbon neutral paper.

¹ [National Greenhouse Accounts Factors: 2021 | Department of Industry, Science, Energy and Resources](#)

Emission source	Assumption/limitation and justification
IT equipment	<p>The University advised that 69% of account code '6711 - Hardware Maintenance and Service Agreements' and 5% of account code '6707 - Equipment - Capital (Capital Projects ONLY) >\$10,000' were IT equipment-related expenditure.</p> <p>Hardware expenses under account code '6012 – Employee reimbursements' are not included as advised by the University.</p>
IT software	<p>The University advised that 90.7% of the account code '6712 – Software Maintenance and License Fees' was IT software-related expenditure.</p> <p>Software expenses under account code '6012 – Employee reimbursements' are not included as advised by the University.</p>
Outsourced data centre	<p>The 'outsourced data centre' expenditure under the account code '6716 - IT Cloud Hosted Services and Associated Costs' was used instead of the AWS price schedule provided previously.</p>
Office equipment	<p>The University advised that 2% of the account code '6707 - Equipment - Equipment - Capital (Capital Projects ONLY) >\$10,000' and 90% of the same account code was office equipment-related expenditure.</p> <p>In CY2021, lab equipment-related expenditure is accounted for under office equipment due to lack of a more appropriate Climate Active emission factor. Should a more appropriate emission factor becomes available, lab equipment-related expenditure will be reallocated accordingly.</p>
Food, catering, and beverages (food and catering)	<p>The University advised that 16% of account code '6303 – Travel - Domestic Meals and Incidentals' fall under food and catering – related expenses. Previously, it was 10%.</p> <p>Meal expenses under account code '6012 – Employee reimbursements' was not included as advised by the University.</p>
Food, catering, and beverages (alcoholic beverages)	<p>The University advised that alcoholic beverages account for 90% of the account code '6813 – Purchases: Beverage'. Previously, it was 65%.</p>
Food, catering, and beverages (non-alcoholic beverages)	<p>The University advised that 10% of the account code '6813 – Purchases: Beverage' was non-alcoholic beverages. Previously, it was 35%</p>
Air travel	<p>A detailed line-by-line air travel data from FCM Travel Solutions was used.</p> <p>Please note that there are no Climate Active emission factors for the following flight classes:</p> <ul style="list-style-type: none"> • Premium economy, very short haul • Premium economy, short-haul • First-class, very short haul • First-class, short-haul • Business, very short haul <p>In the GHG inventory, the following flight classes were used:</p> <ul style="list-style-type: none"> • 'Flights Very short (up to 400 km)' for all very short-haul listed above • 'Economy class Flights Short (between 400 km to 3700km)' for International, Premium economy, short-haul • 'Business-class Flights Short (between 400 km to 3700km)' for International, First class, short-haul

Emission source	Assumption/limitation and justification
	Due to the ongoing pandemic, flights activity has decreased significantly.
Business accommodation (domestic)	<p>Based on the CY2019 assumption, as per the advice from Elaine from FCM Travel Solutions, the majority of domestic accommodation was booked in 3-star rating hotels. In the carbon footprint calculation, it was assumed that all accommodation took place in a 3-star hotel.</p> <p>The advised accommodation expense, 10% of the account code '6013 – Conjoint Expenses - Non-Payroll; Expenses paid to get Conjoint here to Teacher / Lecture and associated costs of their trip / stay & attend meetings as part of Committees' was not included. It was assumed that all accommodation-related expenses are covered under the business accommodation data provided by FCM Travel Solutions.</p> <p>Similar to air travel, due to the ongoing pandemic, activity data has decreased significantly.</p>
Employee commute	<p>The University advised using the 2018 employee commute emissions. It was then scaled based on FTE (extracted from annual reports published by the University).</p> <p>It is recommended that the University conducts an employee commute survey to obtain more accurate data. Please note that 100% Renewables hosts an online survey, which can be used to gather activity data from employees and contractors.</p> <p>This emission source accounted for the reduction in employee commute emissions due to working from home (assumptions are discussed below).</p>
Working from home	<p>The Climate Active WFH calculator was used to account for emissions from working from home. The calculator estimates the net emissions from the reduced employee commute emissions and the increased home energy use from people working from home. The following are the inputs used in the calculator:</p> <ul style="list-style-type: none"> • The FTE days per annum and FTE hours per week were provided by the University. • The FTE was extracted from the University's annual report. • The estimated WFH FTE days from June to October 2021 was 74 days, which is the duration of the lockdown period in NSW where all staff worked from home. • Outside the lockdown period, 40% of the working days of all staff were working from home. • A pro-rated FTE per month was calculated to account for the number of days of working from home per month.
Stationery	The University advised that 79.9% of the account code '6102 – Printing and Photocopy Services – Internal' and all of the account code '6101 – Stationery and Office Supplies' were stationery-related expenditures.
Equipment hire	The University advised that 25% of the account code '6705 - Hire and Repair of Maintenance Equipment' was equipment hire-related expenditure.
Business services	The University advised that 31% of the account code '6711 - Hardware Maintenance and Service Agreements' was a business services-related expenditure.

7 Emissions over time

This section compares the year-on-year emissions to track the performance of the University in terms of carbon emissions.

The University's carbon emissions in CY2021 remained below ~35,000 t CO₂-e, with some minor reduction from 33,118 t CO₂-e to 32,037 t CO₂-e, as shown in the graph below. This is due to the large campuses' 100% renewable electricity supply as the scope 2 emissions reduced significantly. Aside from the 100% renewable electricity supply, the pandemic has greatly affected the operations of the University, with a lockdown for around 5 months from June 2021 to October 2021. In addition, travel-related emissions were significantly reduced as well as international flights were limited due to border closure.

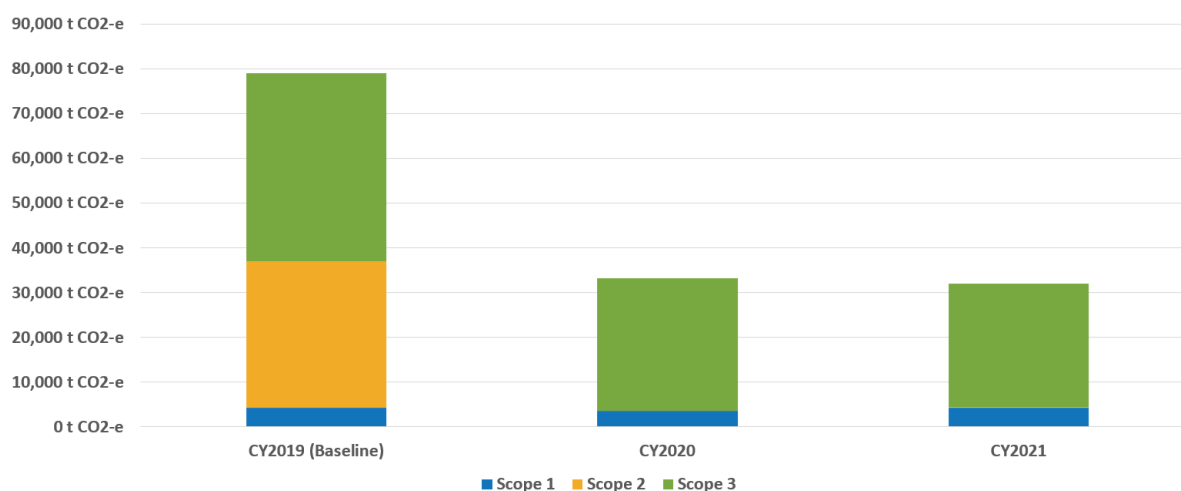


FIGURE 11: EMISSIONS OVER TIME

The waterfall graph below highlights the effect of the 100% renewable electricity supply to large campuses on the recent inventory. Other factors that affected the CY2021 inventory were aggregated in 'inventory changes'. Changes include the following:

- Pandemic
 - Working from home
 - Closure of international borders, which affected travel-related emissions such as air travel and business accommodation
 - Reduced activity data for other emission sources
- Exclusion of several emission sources that were initially included in the CY2019 inventory
- Improvement in data quality such as but not limited to updated finance coding system
- Improved green waste management process

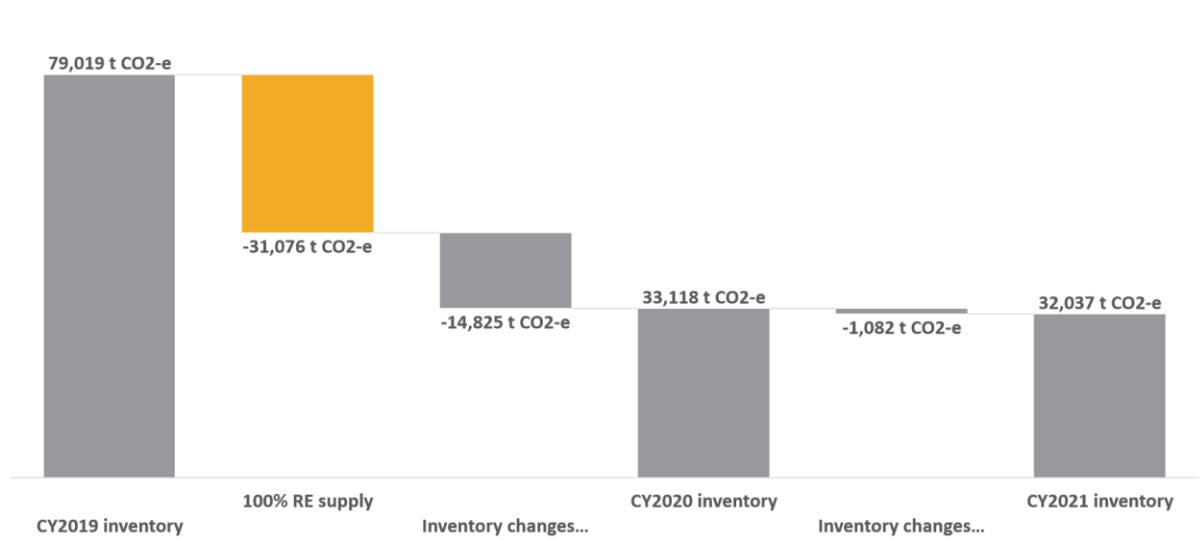


FIGURE 12: CHANGES FROM THE CY2019 TO THE CY2021 INVENTORY

8 Organisational considerations for going carbon neutral under Climate Active

8.1 GHG data management and administration requirements

The quality of data is key to the integrity of a carbon account. Climate Active recommends that quality control procedures are put in place when collecting data to ensure a high level of data quality. Records to evidence how the carbon account was created should also be kept.

The University of Newcastle should continue to document how it measures its emissions, including where the activity data comes from, how it is recorded, how any data quality improvement plans are implemented, and how any changes attributable to activities are identified and recorded. This information will be requested by the third-party auditor and the Department at the time of certification to the Climate Active Standard.

To ensure a smooth process for Climate Active accreditation, it is recommended that the University implements a system to keep track of all GHG emissions data, which is currently stored across the following reporting systems:

- Emission sources currently tracked in Envizi
- Tracking of fuel consumption of fleet vehicles and shuttle bus
- Asset register of air conditioning units (chillers, split-type and packaged units), gas used and recharge capacity
- Expenditure records from Finance software
- Cabcharge expenditure for taxi travel
- Tracking of air travel and hotel accommodation from FCM Travel Solutions
- Tracking of waste and green waste data throughout the organisation from different service providers
- Tracking of yearly FTE numbers and annual employee surveys for staff commute information

An example of how such a system could be a documented procedure that provides guidance for annual data collection is provided below.

Examples of methods that can be used are an Excel sheet or adjusting Envizi to keep track of additional emission sources. The following table lists the source of activity data and collection requirements.

TABLE 10: SOURCE OF ACTIVITY DATA AND COLLECTION REQUIREMENTS

Emission source	Source of activity data	Data collection requirement
Natural gas	Envizi	Consolidation of available data in Envizi
Stationary - Diesel	Fleet manager	Request information from the fleet manager
Fleet - Diesel	Fleet manager	Request information from the fleet manager
Fleet - Petrol	Fleet manager	Request information from the fleet manager
Fleet - Ethanol	Fleet manager	Request information from the fleet manager
Shuttle bus - Diesel	Shuttle bus operator	Request information from the contractor
Refrigerants - Kyoto	Assets department	Request information from the Assets department and/or air conditioning contractors
Electricity	Envizi	Consolidation of available data in Envizi.

Emission source	Source of activity data	Data collection requirement
Scope 3 facilities - electricity	Envizi and building operators	Consolidation of available data in Envizi and request information from building operators
Potable water	Envizi	Consolidation of available data in Envizi.
Paper	Finance department Account codes: portion of 6102, portion of 6133	Request information from the Finance department.
Paper – carbon neutral	Finance department Account code: portion of 6102	Request information from the Finance department.
Outsourced printing	Finance department Account code: 6104	Request information from the Finance department.
IT equipment	Finance department Account codes: portion of 6707, portion of 6711, 6713	Request information from the Finance department.
IT equipment lease	Finance department Account code: 6721	Request information from the Finance department.
IT software	Finance department Account codes: portion of 6712, 6714, 6715	Request information from the Finance department.
Outsourced data centre	Finance department Account code: portion of 6716	Request information from the Finance department.
Office equipment	Finance department Account codes: 6701, 6703, 6706, portion of 6707 (including lab equipment-related expenditure), 6731	Request information from the Finance department.
Office furniture	Finance department Account code: 6702	Request information from the Finance department.
Food, catering and beverages	Finance department Account codes: 6026, 6027, 6404, 6405 6814, portion of 6303, 6813	Request information from the Finance department and identify split of alcohol and non-alcohol.
Postage and couriers	Finance department Account code: 6103	Request information from the Finance department.
C&I waste to landfill	Waste service providers	Request information from waste service providers
C&D waste to landfill	Waste service providers	Request information from waste service providers
Green waste	Internal waste department	Request information from internal team
Air travel	FCM Travel solutions	Request information from FCM Travel Solutions
Business accommodation	FCM Travel solutions	Request information from FCM Travel Solutions
Employee commute	Employee survey	Conduct an employee commute survey
Working from home	Human resources department	Request WFH FTE every month from the HR department
Telecommunications	Finance department Account codes: 6611, 6612, 6613, 6614, 6615, 6704	Request information from the Finance department.
Stationery	Finance department Account codes: 6101, portion of 6102	Request information from the Finance department.

Emission source	Source of activity data	Data collection requirement
Chemicals	Finance department Account codes: 6121, 6123, 6124, 6131	Request information from the Finance department.
Equipment hire	Finance department Account codes: 6532, a portion of 6705	Request information from the Finance department.
Advertising	Finance department Account codes: 6001, 6241, 6242, 6243, 6406	Request information from the Finance department.
Business services	Finance department Account codes: 6105, 6201, 6202, 6203, 6204, 6205, 6206, 6207, 6208, 6209, 6210, 6223, 6256, 6281, 6282, 6283, 6284, 6285, 6286, 6287, 6409, 6827, portion of 6711	Request information from the Finance department.
Technical services	Finance department Account codes: 6501, 6502, 6503, 6504, 6505, 6506, 6507, 6508, 6509, 6510, 6521, 6523	Request information from the Finance department.
Security and personal safety	Finance department Account codes: 6211, 6212, 6214, 6525	Request information from the Finance department.
Legal fees	Finance department Account code: 6224	Request information from the Finance department.

Due to the complexities of the calculations involved, these tasks should ideally be performed by an individual with a high standard of carbon accounting knowledge, preferably with prior Climate Active experience. It should be noted that verification fees can potentially increase if someone without Climate Active experience handles the Climate Active documentation.

8.1.1 A note on employee commute emissions

The CY2021 employee commute activity data was scaled based on CY2018 values and adjusted to the uptake of working from home during the pandemic. To improve the accuracy of data for employee commute, the University may consider conducting a survey across all its campuses for CY2022. The survey would gather data on modes of transportation used and distance travelled by employees or contractors to go to work and vice versa for the whole year. It could also collect data on working from home arrangements throughout the entire year. This will provide the University with the annual total distance in kilometres per mode of transportation. Please note that 100% Renewables hosts an online survey, which can be used to gather activity data from employees and contractors.

8.2 Recommendations for improvement

In the development of the CY 2021 carbon inventory, 100% Renewables has encountered some data quality concerns that can be improved for future reporting. The table below shows the recommendation for improvement of the University's data quality.

TABLE 11: RECOMMENDATIONS FOR IMPROVEMENT OF THE UNIVERSITY'S DATA QUALITY

Emission source	Data quality concern	Recommendation for improvement
Refrigerants – Kyoto	The top-up figures were provided for CY 2021. However no information was supplied for August 2021.	Indicate in the summary report if there were no top up amounts for months that have zero top up activity.
Electricity (solar data)	The solar data was extracted from Envizi. However, it does not provide any information about the consumed and exported values. In addition, solar PV systems for the following sites were not monitored in Envizi. <ul style="list-style-type: none"> Port Macquarie Manning Education Centre Student accomm in Taree 	The University could check with Envizi if the software can record the consumed and exported solar energy. The University could also explore other solar monitoring service providers.
Scope 3 facilities – electricity	The electricity consumption for the following sites was estimated using Gross Floor Area and kWh/sqm only. <ul style="list-style-type: none"> Kintaiba Child Care Kooinda Child Care Tamworth Base Hospital Wyong Hospital: Podiatry Cl Hunter Medical Research Inst Coffs Harbour Villas 3,4,5,8,9,10 122 Pacific Hwy 	The University could request the monthly electricity bills for these sites.
Paper	The University advised that a portion of '6133 – Course Materials' and a portion of '6012 – Printing and Photocopy Services' relate to paper expenditure.	If possible, a dedicated account code in the finance system could be introduced for all paper-related expenditure.
Paper (carbon neutral)	The University advised that a portion of '6012 – Printing and Photocopy Services' relates to paper (carbon neutral) expenditure.	If possible, a dedicated account code in the finance system could be introduced for all paper (carbon neutral)-related expenditure. The brand of the product should also be documented as Climate Active requires this in the PDS.
IT equipment	The University advised that a portion of '6711 - Hardware Maintenance and Service Agreements' and a portion of '6707 - Equipment - Capital (Capital Projects ONLY) >\$10,000' relate to IT equipment expenditure.	If possible, a dedicated account code in the finance system could be introduced for all IT equipment-related expenditure.
IT software	The University advised that a portion of '6712 – Software Maintenance and License Fees' relates to IT software expenditure.	If possible, a dedicated account code in the finance system could be introduced for all IT software-related expenditure.

Office equipment	The University advised that a portion of '6707 - Equipment - Equipment - Capital (Capital Projects ONLY) >\$10,000' relates to office equipment expenditure.	If possible, a dedicated account code in the finance system could be introduced for all office equipment-related expenditure.
Food, catering, and beverages (food and catering)	The University advised that a portion of '6303 – Travel - Domestic Meals and Incidentals' relates to food and catering expenditure.	If possible, a dedicated account code in the finance system could be introduced for all food and catering-related expenditure.
Food, catering, and beverages (alcoholic beverages)	The University advised that a portion of '6813 – Purchases: Inventory' relates to alcoholic beverages expenditure.	If possible, a dedicated account code in the finance system could be introduced for all alcoholic beverages-related expenditure.
Food, catering, and beverages (non-alcoholic beverages)	The University advised that a portion of '6813 – Purchases: Inventory' relates to non-alcoholic beverages expenditure.	If possible, a dedicated account code in the finance system could be introduced for all non-alcoholic beverages-related expenditure.
Business accommodation (domestic)	The University advised that the majority of domestic accommodation was booked in 3-star rating hotels, but there was no data provided for the breakdown by hotel star rating, so it was assumed that all domestic hotel accommodation was a 3-star rating.	The University could request a more accurate breakdown from the travel agent if the stay in other hotel star rating aside from 3-star is considered material.
Employee commute	Employee commute emissions were based on previous employee commute data and reduction due to working from home.	The University could conduct an employee commute survey.
Working from home	The University advised to assume that all FTE staff worked from home during the lockdown period in NSW. Also, the University advised to assume 40% of the staff worked from home outside the lockdown	The University could record the actual FTE staff who worked from home during the lockdown period (especially in CY2021 where NSW was in lockdown for several months). If the University would like to continue reporting 'working from home' emissions, a monitoring system could be developed to determine the staff who are working from home.
Stationery	The University advised that a portion of '6102 – Printing and Photocopy Services - Internal' relates to stationery expenditure.	If possible, a dedicated account code in the finance system could be introduced for all stationery-related expenditure.
Equipment hire	The University advised that a portion of '6705 - Hire and Repair of Maintenance Equipment' relates to equipment hire expenditure.	If possible, a dedicated account code in the finance system could be introduced for all equipment hire-related expenditure.
Business services	The University advised that a portion of '6711 - Hardware Maintenance and Service Agreements' relates to business services expenditure.	If possible, a dedicated account code in the finance system could be introduced for all business services-related expenditure.

9 Carbon neutrality strategy via carbon offsets

9.1 Carbon offset strategy

To achieve carbon neutrality, the University needs to purchase carbon offsets and match the quantity with its carbon emissions (1 carbon offset is equivalent to 1 t CO₂-e). Carbon offsets need to be retired to claim the reduction benefits.

Climate Active is the Australian Government's official carbon neutral certifying body. Getting accredited under Climate Active incurs costs, including carbon offsets, third-party verification and program membership fees. There may also be fees associated with engaging a consultant to develop the Climate Active inventory. In addition, from July 2023 organisations with emissions greater than 1,000 t CO₂-e will have to source at least 20% of their carbon offsets from ACCU projects.

The single most significant determinant of the overall cost will be the carbon offset price. As outlined above, there are several types of acceptable offsets, with prices (\$/carbon offset) varying depending on a project's location, type of activity and the accreditation standard.

The following table shows a range of current costs to obtain carbon neutral status under Climate Active, based on the full carbon footprint as calculated in this report (action to reduce the carbon footprint would lower offset purchase requirements).

Many different offsets projects are available in the market, resulting in a range of costs, which is reflected in

Table 12. The costs per offset used in estimating options 1 to 4 are based on May 2022 carbon market prices. Based on these prices, the University would most likely incur costs between \$423,776 and \$1,119,802 to become carbon neutral for CY2021, inclusive of license, third-party verification and carbon offset costs (refer to Option 4 below which includes 20% ACCUs).

In addition to financial, there will also be human resources required to manage Climate Active requirements. Adjustments to carbon management systems will also need to be made.

TABLE 12: HOW OFFSET PROJECT PREFERENCES AFFECT THE COST TO GO CARBON NEUTRAL UNDER CLIMATE ACTIVE
OPTION 1
Purchasing the cheapest offsets available

Licence Fee (ex GST)	Verification Fee (ex GST)		Carbon offset Cost (ex GST)		TOTAL ESTIMATED FEES (ex GST)	
	Min	Max	Min	Max		
\$12,335.41	\$2,200	\$25,000	\$253,092	\$1,063,628	\$267,628	\$1,100,964

OPTION 1
OPTION 2
Purchasing international offsets with social benefits

Licence Fee (ex GST)	Verification Fee (ex GST)		Carbon offset Cost (ex GST)		TOTAL ESTIMATED FEES (ex GST)	
	Min	Max	Min	Max		
\$12,335.41	\$2,200	\$25,000	\$422,306	\$728,114	\$436,841	\$753,114

OPTION 2
OPTION 3
Purchasing Australian offsets

Licence Fee (ex GST)	Verification Fee (ex GST)		Carbon offset Cost (ex GST)		TOTAL ESTIMATED FEES (ex GST)	
	Min	Max	Min	Max		
\$12,335.41	\$2,200	\$25,000	\$1,033,834	\$1,157,817	\$1,048,369	\$1,195,153

OPTION 3
OPTION 4
Purchasing 20% Australian and 80% international offsets

Carbon offset Cost (ex GST)							TOTAL ESTIMATED FEES (ex GST)	
Licence Fee (ex GST)	Verification Fee (ex GST)		Australia		International			
			Min	Max	Min	Max		
\$12,335.41	\$2,200	\$25,000	\$206,767	\$231,563	\$202,474	\$850,903	\$423,776	\$1,119,802

OPTION 4

9.2 Carbon offset banking

Climate Active allows banking of carbon offsets for up to three years from the date of retirement as long as the carbon offsets are compliant with the requirements during the time of retirement. Carbon offsets requirements are discussed in Appendix G: Carbon offsets.

Given the volatility of the carbon offset market, a good strategy could be to forward purchase carbon offsets and to bank them for future use, especially if the University has budget to buy excess carbon offsets. However, the University should be aware of the following risks involved:

- Carbon offsets prices are fluctuating and could increase or decrease in future
- There is opportunity cost of money invested in excess carbon offsets
- The University could decide not to proceed with carbon neutrality in future years

10 Comparison with other universities

10.1 Universities' renewables and carbon neutral commitments

100% Renewables collated a list of Australian universities showing their commitment to '100% renewable energy' and 'carbon neutrality' as shown in the table below.

UON is one of the leaders in the renewable energy space. Large campuses have been supplied with 100% renewable energy since 2020. The University can take the renewable energy commitment to the next level by including small campuses/facilities in its 100% renewable energy contract.

In terms of its carbon neutrality commitment, the University has a more ambitious carbon neutrality commitment compared to other universities as the aim is to achieve carbon neutrality by 2025. However, a number of universities have already achieved Climate Active carbon neutral certification (CSU, UTAS), and others are currently undergoing Climate Active certification.

TABLE 13: RENEWABLE ENERGY AND CARBON NEUTRALITY COMMITMENTS OF OTHER UNIVERSITIES AS AT JUN 2022

No	State	University	Renewable energy Commitment	Carbon neutrality commitment
1	ACT	Australian National University		Committed to reducing greenhouse gas emissions to below zero by 2030 Interim target of net-zero emissions by 2025
2	NSW	Australian Catholic University	100% renewable electricity by July 2021	Net zero emissions by 2030
3	NSW	Charles Sturt University	100% clean energy by 2030 Use 100 per cent renewable electricity from 2022	First university to obtain NCOS/Climate Active-accredited carbon neutral status in 2016
4	NSW	Macquarie University	University's total greenhouse gas emissions cut by 92 per cent, with the campus' electricity being sourced from Snowy Hydro from 1 July 2020	Aim of reducing carbon dioxide emissions by 40% by 2030
5	NSW	University of New South Wales	Expand onsite solar energy generation to 1.2 MWp by 2022 Purchase 100% renewable electricity by 2020	Reduce net emissions from building energy use to zero by 2020 Reduce total Scope 1, 2 and 3 emissions in line with a 1.5°C global warming scenario
6	NSW	University of Newcastle	Deliver 100% renewable electricity across our Newcastle and Central Coast campuses from 1 January 2020	Achieve carbon neutrality by 2025

No	State	University	Renewable energy Commitment	Carbon neutrality commitment
7	NSW	University of Sydney	100% of its electricity from renewable sources by 2025	Net zero emissions by 2030 Zero waste to landfill by 2030
8	NSW	Western Sydney University	100 per cent renewable energy by 2026	Achieve carbon neutrality by 2023 and be climate positive by 2029
9	QLD	CQ University	50 percent of its energy for its Queensland campuses sourced from renewable solar from 2021	Aim at reducing carbon emissions
10	QLD	Griffith University	50% of our campus energy will be supplied from renewable sources by 2022	45-50% emissions reduction against a 2010 baseline by 2030 Net zero emissions by 2050
11	QLD	Queensland University of Technology	Reduce energy consumption by 10% from 2017/18 levels of 0.57 GJ/m ² (GFA) by 2023 Maximise deployment of solar PV on campus by 2022	Carbon neutral by 2030 (Scope 1,2,3 emissions) Scope 1 and 2 emissions to zero by 2023
12	QLD	University of Queensland	100% renewable energy from 2020 via its own solar farm	Reduction in the university's carbon footprint
13	QLD	University of the Sunshine Coast	Large-scale solar PV and thermal storage at Sippy Downs campus	Carbon neutral by 2025
14	SA	Flinders University	Powering its campuses and facilities with 100% renewable energy from campus-based solar arrays and a local windfarm, achieving net-zero emissions from electricity from 2021	Become carbon positive
15	SA	University of Adelaide	2MW of renewable energy installed by 2020 15% reduction in Energy intensity (GJ/GFA m ²) by 2020 (2014 baseline)	Net zero emissions by 2050
16	TAS	University of Tasmania	Ensure efficacious energy management and contribute to the Tasmanian Government 2022 target to be a 100%	Carbon neutral certified since 2016 Committing to full divestment by the end of 2021

No	State	University	Renewable energy Commitment	Carbon neutrality commitment
			renewable-energy-powered State	
17	VIC	Deakin University	100% renewable electricity by 2025	Carbon neutral by 2025 Carbon negative by 2030
18	VIC	La Trobe University	The new solar panel system to generate 2.5 MW of clean, renewable electricity as well as renewable energy projects, energy efficiency improvements and waste reduction on campus.	Carbon neutral by 2029 and our regional campuses are set to become carbon neutral by 2022
19	VIC	Monash University	100% renewable energy by 2030	Net zero carbon emissions from Australian campuses by 2030
20	VIC	RMIT University	100% renewable energy from 2019	Carbon neutral organisation by 2025, covering scope 1 (direct), scope 2 (indirect) and scope 3 (upstream and downstream supply chain) emissions
21	VIC	Swinburne University of Technology	Procure 100 per cent renewable electricity from 1 July 2020.	Carbon neutral by 2025
22	VIC	University of Melbourne	Achieve zero net emissions from electricity by 2021 Reduce electricity demand by 18,350 megawatt hours per year by 2020 through on-campus energy projects.	Carbon neutral certification by 2025 and climate positive status by 2030 Achieve carbon neutrality before 2030
23	VIC	Victoria University	Procure 100% renewable electricity on 1 July 2021	Achieve Net Zero by 2025 Achieve Net Positive outcomes by 2028
24	WA	University of Western Australia	100% renewable energy by 2025	Energy carbon neutral by 2025 Carbon neutral by 2030

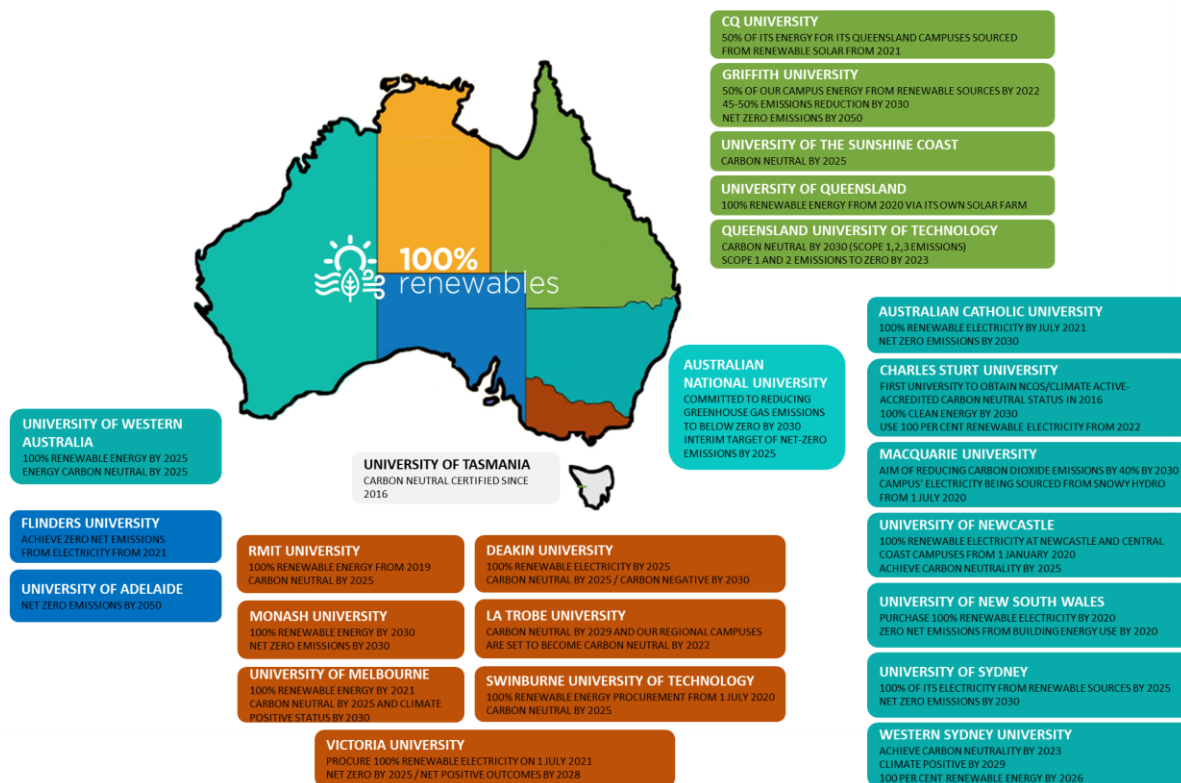


FIGURE 13: CARBON NEUTRAL, NET ZERO AND 100% RENEWABLES COMMITMENTS BY AUSTRALIAN UNIVERSITIES AS AT MARCH 2022

10.2 Times Higher Education (THE) Impact Rankings

The [Times Higher Education Impact Rankings](#) assess universities against the United Nations' Sustainable Development Goals (SDGs). In 2022, 17 Australian universities are ranked in the top 100 universities globally. [Western Sydney University](#) ranks #1 out of 1,406 universities from 106 countries and regions across the globe in the [University Impact Rankings of the Times Higher Education Impact Rankings 2022](#), scoring 99.1 out of 100 for their social, ecological and economic impact. University of Newcastle ranks #30 overall, and #6 among Australian universities.

The list of Australian institutions in the top 100 global universities for their THE Impact Ranking for 2022 is shown below.

TABLE 14: AUSTRALIAN UNIVERSITIES' RANKING IN THE GLOBAL TOP-100 IN THE IMPACT RANKINGS 2022

Rank	State	University	Score
1	NSW	Western Sydney University	99.1
15	NSW	University of Technology Sydney	95.6
19	VIC	La Trobe University	94.9
22	VIC	RMIT University	94.7
25	TAS	University of Tasmania	94.3
30	NSW	University of Newcastle	93.8
31	QLD	University of Sunshine Coast	93.6

42	VIC	Monash University	92.9
52	NSW	University of Sydney	92.2
55	NSW	University of New South Wales	91.9
57	ACT	University of Canberra	91.7
67	NSW	Charles Sturt University	90.7
70	NSW	University of Wollongong	90.4
79	NSW	Macquarie University	89.7
79	VIC	Victoria University	89.7
83	QLD	Central Queensland University	89.4
92	QLD	Griffith University	88.9

As well as the overall ranking across all Sustainable Development Goals, we have looked at the top-100 rankings of Australian universities across SDGs that are particularly relevant in terms of their response to climate change. University of Newcastle's overall #30 ranking is highly supported by its action on climate, ranking #16 for *Climate Action*, #16 for *Affordable and Clean Energy*, and #24 for *Sustainable Cities and Communities*.

TABLE 15: AUSTRALIAN UNIVERSITIES' RANKING IN THE GLOBAL TOP-100 IN SELECTED *THE IMPACT RANKING* CATEGORIES

University	Overall ranking	Impact	Affordable and Clean Energy	Sustainable Cities and Communities	Climate Action
Western Sydney University	1		=23	=15	23
University of Technology Sydney	15		14		
La Trobe University	=19			=74	=77
RMIT University	22		37	=42	=74
University of Tasmania	25		=98	=60	1
University of Newcastle	30		16	24	16
University of the Sunshine Coast	=31				22
Monash University	=42		28	=15	25
University of Sydney	52			=13	
UNSW Sydney	=55		17	=42	39
University of Canberra	57				
Charles Sturt University	=67		=98	=46	14
University of Wollongong	=70		=71	=67	
Macquarie University	=79		=93	=70	
Victoria University	=79				
Central Queensland University	=83				
Griffith University	=92			=54	

The University of Queensland		84	76	
Queensland University of Technology			=70	
James Cook University			73	
Federation University Australia			=87	
Australian National University				70
The University of Western Australia				=59

Appendix A: Electricity emissions calculation when undergoing the Climate Active certification

When undergoing the Climate Active certification, Climate Active's electricity emissions calculator should account for all electricity consumption regardless of if the University has operational control over or not. The tables below show the electricity emissions calculation of the University's facilities with operational control and scope 3 facilities that are included in the boundary.

Market-based approach

Market-Based Approach	Activity Data (kWh)	Emissions (kgCO ₂ e)	Renewable Percentage of total
Behind the meter consumption of electricity generated	596,845	0	2%
Total non-grid electricity	596,845	0	2%
LGC Purchased and retired (kWh) (including PPAs & Precinct LGCs)	27,473,000	0	75%
GreenPower	0	0	0%
Jurisdictional renewables (LGCs retired)	0	0	0%
Jurisdictional renewables (LRET) (applied to ACT grid electricity)	0	0	0%
Large Scale Renewable Energy Target (applied to grid electricity only)	6,675,481	0	18%
Residual Electricity	1,857,349	1,846,861	0%
Total grid electricity	36,005,830	1,846,861	93%
Total Electricity Consumed (grid + non grid)	36,602,674	1,846,861	95%
Electricity renewables	34,745,325	0	
Residual Electricity	1,857,349	1,846,861	
Exported on-site generated electricity	4,144	-3,025	
Emissions (kgCO ₂ e)		1,843,835	
Total renewables (grid and non-grid)	94.93%		
Mandatory	18.24%		
Voluntary	75.06%		
Behind the meter	1.63%		
Residual Electricity Emission Footprint (TCO₂e)	1,844		
<i>Figures may not sum due to rounding. Renewable percentage can be above 100%</i>			

Location-based approach

Location-Based Approach	Activity Data (kWh)	Scope 2 Emissions (kgCO ₂ e)	Scope 3 Emissions (kgCO ₂ e)
NSW	36,005,830	28,084,547	2,520,408
Grid electricity (scope 2 and 3)	36,005,830	28,084,547	2,520,408
NSW	596,845	0	0
Non-grid electricity (Behind the meter)	596,845	0	0

Total Electricity Consumed	36,602,674	28,084,547	2,520,408
Emission Footprint (TCO2e)	30,605		
<i>Scope 2 Emissions (TCO2e)</i>	28,085		
<i>Scope 3 Emissions (TCO2e)</i>	2,520		

Appendix B: Excluded scope 3 facilities

Site Code	Building Code	Building Name
CAL	RWOP	Ray Watt Pavilion
GOS	CM	Conservatorium of Music
GOS	GHCL	Gosford Hospital
GOS	GHCT	Gosford Hospital
GOS	GHN	Gosford Hospital
JHHS	JHCST	John Hunter Clinical Skills Training
JHHS	JHH	John Hunter Hospital
JHHS	RSU	Research Support Unit
MAIT	MEF	Maitland Education Facility
MATER	NM	Mater Hospital: New Med2
ORA	BH	Bloomfield Hospital - Orange
PTMAC	PMA	Pt Macquarie Block A
PTMAC	PMB	Pt Macquarie Block B
PTMAC	PMCA	Pt Macquarie Block C Annexe
PTMAC	PMD	Pt Macquarie Block D
PTMAC	PMJ	Pt Macquarie Block J
PTMAC	PMKK	Pt Macquarie Block KK
WALL	WHBB	Wallsend Hospital: Booth Building

Appendix C: Changes in the University's emissions boundary

In this reporting period, the following changes were applied to the University's emissions sources, as a result of further refinement of the emissions boundary.

- **'Scope 3 facilities – natural gas'** – re-classified to 'excluded' emission sources based on the new relevance test results
- **'Paper (carbon neutral)'** – introduced in the emissions boundary as the University advised that carbon neutral paper was purchased in this reporting period.
- **'Taxis and Ride share'** - re-classified to 'excluded' emission sources based on the new relevance test results
- **'Working from home'** – introduced in the emissions boundary due to the effect of the pandemic.
- **'Cleaning'** - re-classified to 'excluded' emission sources based on the new relevance test results
- **Ethanol – fleet** – addition of emissions from ethanol consumption
- **Waste (construction & demolition)** – addition of emissions from construction & demolition waste

Appendix D: Steps to become carbon neutral under Climate Active

The following diagram shows the steps that the University needs to take to become certified under Climate Active. Each of these steps needs to be completed annually.



FIGURE 14: STEPS TO TAKE TO BECOME CARBON NEUTRAL UNDER CLIMATE ACTIVE

Under Climate Active, the University has the following responsibilities:

- Sign Licence Agreement
- Pay annual fee
- Engage auditor/verifier
- Complete report or provide all data to Registered Consultant (please note that 100% Renewables is a Registered Consultant)
- Purchase offsets
- Sign PDS and submit report
- Submit web profile
- Use trademark correctly

The following sections go into the details of each individual step.

1. Review operational boundary

At the time the University seeks carbon neutral certification, the organisational and operational boundary needs to be re-evaluated and updated if changes have occurred.

2. Gather emissions data

Collate your emissions data as outlined in Section 8.1 and renewable energy used or generated.

3. Describe emissions reduction strategy

Describe the University's emissions reduction strategy. It should be compliant with the latest Climate Active requirements.

4. Complete the registration

Email climate.active@industry.gov.au to request a registration form. Submit your completed registration form to climate.active@industry.gov.au. A *Registered Consultant*² can help with the application. A list of Registered Consultants is available [here](#). Please note that 100% Renewables is a Registered Consultant.

Allow up to four weeks for the Climate Active team to process your registration.

5. Sign the licence agreement

Once the Climate Active team has approved your registration, they will send you a copy of the Licence Agreement to sign. You can view the [Licence Agreement](#) on their website.

6. Prepare the report

A Registered Consultant can help to prepare the carbon account, which is recommended if you do not have in-house expertise in carbon accounting.

Climate Active provides several spreadsheets which contains several hundred common emission sources and helps estimate activity data for some emission sources. Carbon inventories should use the provided emission factors in the spreadsheet whenever a relevant and suitably accurate emission factor is available.

7. Third-party validation

Independent third-party validation ensures the accuracy and completeness of carbon calculations, including the appropriateness of emissions boundaries, methodologies and calculations.

The first review (of the base year) must include an assessment of the adequacy and appropriateness of the emissions boundary setting, emissions methodologies and emission factors.

Under Climate Active, the University is a *large organisation*. As such, the University needs to undertake a Type 2 third-party validation and a technical assessment.

Type 2 validations can be prepared by:

- A Registered Greenhouse and Energy Auditor (register available at www.cleanenergyregulator.gov.au/Infohub/Audits/register-of-auditors); or
- An auditor accredited to the international standard ISO 14065:2013.

If the University prepares its own carbon account, then the University will need to engage a Registered Consultant to conduct a *Technical Assessment* and engage a qualified person to complete a *source data verification*. If a Registered Consultant prepared the account, there only needs to be a Type 2 third-party validation (*independent data audit*) which must not be performed by the same person that prepared the carbon account.

² Please note that several staff members at 100% Renewables are ‘registered consultants’ and that 100% Renewables can help you with completing the registration.

8. Purchase offsets

After successful validation, carbon offsets need to be purchased. You will need to purchase carbon offset units either to offset the base year or forward offset the first year of certification. 100% Renewables can help you with your carbon offset strategy.

You will also need to complete and sign a Public Disclosure Statement. Please note that 100% Renewables can populate the PDS on your behalf.

You will then need to submit the carbon account, third party validation and Public Disclosure Statement (including proof of offsets) to the Climate Active team. Allow up to six weeks for the Climate Active team to undertake your initial assessment.

9. Payment to Climate Active, certification and use of the Climate Active trademark

On receiving your initial reports, the Climate Active team will issue you an invoice for your certification fees. Fees are due within 30 days of receiving the invoice. Once the report has been approved, the University will receive a notice of initial certification. Once the University has received this, it can use the certification trademark in accordance with the Licence Agreement.

Appendix E: Source data hierarchy, non-quantification, and relevance test

Data hierarchy

Under the Climate Active Standard, the following hierarchy applies to activity data in order of preference:

1. Actual data
2. Actual data from the previous year
3. Modelled data:
 - a. Extrapolated data: partial year data or a representative sample from a group of buildings/vendors or survey data that is extrapolated to a full data set.
 - b. Projected data: where data is expensive or difficult to collect, actual data may be collected once every few years and adjusted for inflation/staff numbers or other relevant factors to estimate the current year's data.
 - c. Data conversion: converting data from one type to another through known conversion units, e.g. to estimate kilograms of paper, you may only have expenditure data for paper. By determining the average price of a carton of paper, you could also find the number of paper sheets in a carton and the grams per square metre (gsm) therefore the total weight of paper purchased.
4. Estimated data: online calculators or general statistics. Where specific data is unavailable, an estimate may be made using ABS statistics or other relevant industry-standard statistics. This is the basis for the calculators in the Climate Active spreadsheet.
5. Uplift factor: where accurate estimates are unable to be obtained, data may be non-quantified. For non-quantified emission sources, a best guess must be made to generate an uplift amount (kg CO₂-e) or percentage increase of the carbon account.



FIGURE 15: SOURCE DATA HIERARCHY

Non-quantified emission sources

Under Climate Active, emission sources are either *quantified*, *not quantified*, or *excluded*. Emission sources should be quantified whenever possible, with conservative estimates used only where data is unavailable, and non-quantification used only when estimations are not practical. An emission source can be ‘*non-quantified*’ in the carbon inventory under the following scenarios:

1. Immateriality (i.e. <1% for individual items and no more than 5% collectively)
2. Quantification is not cost-effective relative to the size of the emissions. In this case, an uplift factor³ must be used.
3. Unavailable data; in this case, a data management plan must be put in place to provide data within five years, and an uplift factor⁴ included.
4. Initial emissions are non-quantified but repairs and replacements quantified

While the University does not need to measure everything, it needs to account for all material emissions. Uplift factors are required for points 2 and 3 above.

Applying the relevance test

Emission sources are considered relevant to an organisation if at least two of the following criteria are met:

- The emissions from a particular source are likely to be large relative to the organisation’s electricity, stationary energy and fuel emissions.
- The emissions from a particular source contribute to the organisation’s greenhouse gas risk exposure.
- Key stakeholders deem the emissions from a particular source are relevant.
- The responsible entity has the potential to influence the reduction of emissions from a particular source.
- The emissions are from outsourced activities previously undertaken within the organisation’s boundary, or from outsourced activities typically undertaken within the boundary for comparable organisations.

³ An uplift factor is an upwards adjustment to the total carbon inventory to account for relevant emissions which can’t be reasonably quantified or estimated.

⁴ *ibid*

Appendix F: Description of scope 3 emission categories

As per the GHG Protocol⁵, there are 15 categories of scope 3 emission sources (also called supply chain emissions), as shown in the graphic below. These categories are further detailed in Table 16.

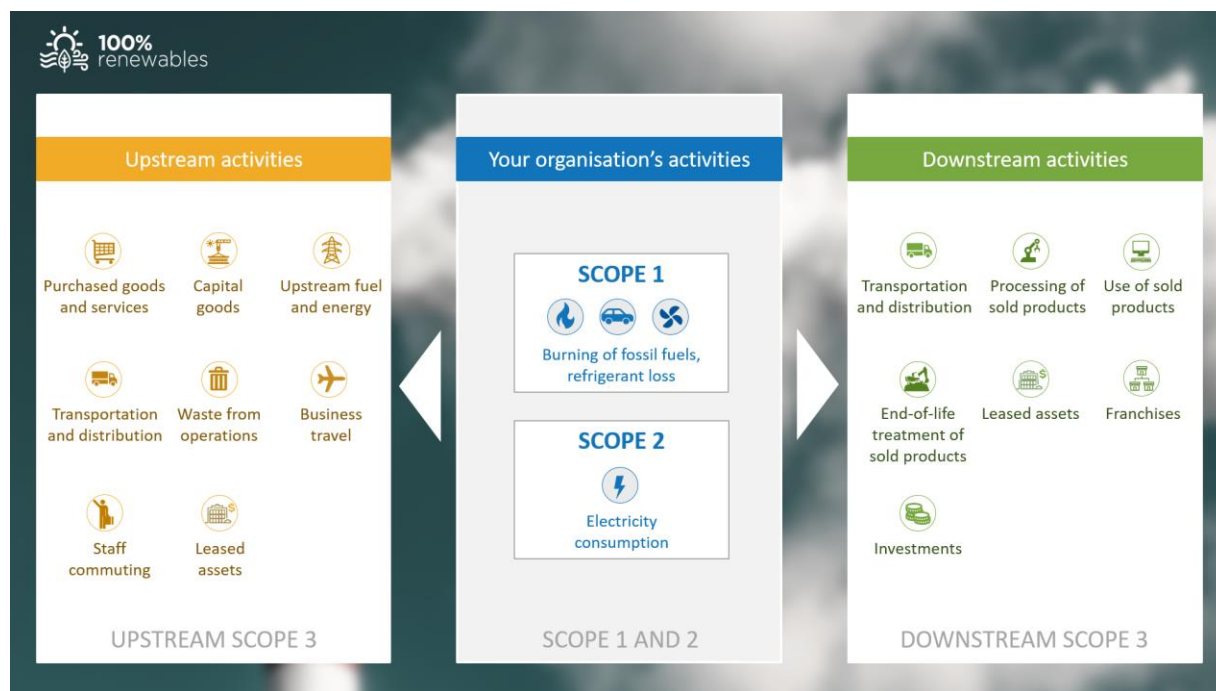


FIGURE 16: SUPPLY CHAIN EMISSIONS ACCORDING TO THE GHG PROTOCOL

⁵ GHG Protocol: Technical Guidance for Calculating Scope 3 Emissions

TABLE 16: CATEGORIES OF SUPPLY CHAIN EMISSIONS

#	Category name	Category description	Minimum boundary
1	Purchased goods and services	Extraction, production, and transportation of goods and services purchased or acquired by the reporting company in the reporting year, not otherwise included in Category 2	All upstream (cradle-to-gate) emissions of purchased goods and services
2	Capital goods	Extraction, production, and transportation of capital goods purchased or acquired by the reporting company in the reporting year	All upstream (cradle-to-gate) emissions of purchased capital goods
3	Fuel- and energy-related activities (not included in scope 1 or scope 2)	<p>Extraction, production, and transportation of fuels and energy purchased or acquired by the reporting company in the reporting year, not already accounted for in scope 1 or scope 2, including:</p> <ul style="list-style-type: none"> a. Upstream emissions of purchased fuels (extraction, production, and transportation of fuels consumed by the reporting company) b. Upstream emissions of purchased electricity (extraction, production, and transportation of fuels consumed in the generation of electricity, steam, heating, and cooling consumed by the reporting company) c. Transmission and distribution (T&D) losses (generation of electricity, steam, heating and cooling that is consumed (i.e., lost) in a T&D system) – reported by end user d. Generation of purchased electricity that is sold to end users (generation of electricity, steam, heating, and cooling that is purchased by the reporting company and sold to end 	<ul style="list-style-type: none"> a) For upstream emissions of purchased fuels: All upstream (cradle-to-gate) emissions of purchased fuels (from raw material extraction up to the point of, but excluding combustion) b) For upstream emissions of purchased electricity: All upstream (cradle-to-gate) emissions of purchased fuels (from raw material extraction up to the point of, but excluding, combustion by a power generator) c) For T&D losses: All upstream (cradle-to-gate) emissions of energy consumed in a T&D system, including emissions from combustion d) For generation of purchased electricity that is sold to end users: Emissions from the generation of purchased energy

#	Category name	Category description	Minimum boundary
		users) – reported by utility company or energy retailer only	
4	Upstream transportation and distribution	Transportation and distribution of products purchased by the reporting company in the reporting year between a company's tier 1 suppliers and its own operations (in vehicles and facilities not owned or controlled by the reporting company) Transportation and distribution services purchased by the reporting company in the reporting year, including inbound logistics, outbound logistics (e.g., of sold products), and transportation and distribution between a company's own facilities (in vehicles and facilities not owned or controlled by the reporting company)	The scope 1 and scope 2 emissions of transportation and distribution providers that occur during use of vehicles and facilities (e.g., from energy use) <i>Optional:</i> The life cycle emissions associated with manufacturing vehicles, facilities, or infrastructure
5	Waste generated in operations	Disposal and treatment of waste generated in the reporting company's operations in the reporting year (in facilities not owned or controlled by the reporting company)	The scope 1 and scope 2 emissions of waste management suppliers that occur during disposal or treatment <i>Optional:</i> Emissions from transportation of waste
6	Business travel	Transportation of employees for business-related activities during the reporting year (in vehicles not owned or operated by the reporting company)	The scope 1 and scope 2 emissions of transportation carriers that occur during use of vehicles (e.g., from energy use) <i>Optional:</i> The life cycle emissions associated with manufacturing vehicles or infrastructure
7	Employee commuting	Transportation of employees between their homes and their worksites during the reporting year (in vehicles not owned or operated by the reporting company)	The scope 1 and scope 2 emissions of employees and transportation providers that occur during use of vehicles (e.g., from energy use) <i>Optional:</i> Emissions from employee teleworking

#	Category name	Category description	Minimum boundary
8	Upstream leased assets	Operation of assets leased by the reporting company (lessee) in the reporting year and not included in scope 1 and scope 2 – reported by lessee	The scope 1 and scope 2 emissions of lessors that occur during the reporting company's operation of leased assets (e.g., from energy use) <i>Optional:</i> The life cycle emissions associated with manufacturing or constructing leased assets
9	Downstream transportation and distribution	Transportation and distribution of products sold by the reporting company in the reporting year between the reporting company's operations and the end consumer (if not paid for by the reporting company), including retail and storage (in vehicles and facilities not owned or controlled by the reporting company)	The scope 1 and scope 2 emissions of transportation providers, distributors, and retailers that occur during use of vehicles and facilities (e.g., from energy use) <i>Optional:</i> The life cycle emissions associated with manufacturing vehicles, facilities, or infrastructure
10	Processing of sold products	Processing of intermediate products sold in the reporting year by downstream companies (e.g., manufacturers)	The scope 1 and scope 2 emissions of downstream companies that occur during processing (e.g., from energy use)
11	Use of sold products	End use of goods and services sold by the reporting company in the reporting year	The direct use-phase emissions of sold products over their expected lifetime (i.e., the scope 1 and scope 2 emissions of end users that occur from the use of: products that directly consume energy (fuels or electricity) during use; fuels and feedstocks; and GHGs and products that contain or form GHGs that are emitted during use) <i>Optional:</i> The indirect use-phase emissions of sold products over their expected lifetime (i.e., emissions from the use of products that indirectly consume energy (fuels or electricity) during use)

#	Category name	Category description	Minimum boundary
12	End-of-life treatment of sold products	Waste disposal and treatment of products sold by the reporting company (in the reporting year) at the end of their life	The scope 1 and scope 2 emissions of waste management companies that occur during disposal or treatment of sold products
13	Downstream leased assets	Operation of assets owned by the reporting company (lessor) and leased to other entities in the reporting year, not included in scope 1 and scope 2 – reported by lessor	The scope 1 and scope 2 emissions of lessees that occur during operation of leased assets (e.g., from energy use). <i>Optional:</i> The life cycle emissions associated with manufacturing or constructing leased assets
14	Franchises	Operation of franchises in the reporting year, not included in scope 1 and scope 2 – reported by franchisor	The scope 1 and scope 2 emissions of franchisees that occur during operation of franchises (e.g., from energy use) <i>Optional:</i> The life cycle emissions associated with manufacturing or constructing franchises
15	Investments	Operation of investments (including equity and debt investments and project finance) in the reporting year, not included in scope 1 or scope 2	Required: <ul style="list-style-type: none"> • Equity investments • Debt investments with known use of proceeds • Project finance Optional: <ul style="list-style-type: none"> • Managed investments and client services • Debt investments without known use of proceeds • Other investments or financial services

Appendix G: Carbon offsets

Carbon offset approaches allowed under Climate Active

Two approaches to offsetting are allowed under the Climate Active Organisation Standard:

1. **Forward offsetting:** this involves estimating emissions for the coming reporting year and cancelling that number of eligible offset units at the start of the year. This must be followed by an annual true-up process to ensure that the number of cancelled eligible offset units is at least equal to actual emissions.
2. **Offsetting in arrears:** this involves cancelling offset units for the claim period after it has finished.

Allowable offsets under Climate Active

Under Climate Active, only high-quality carbon offsets are allowed for reaching carbon neutrality, as shown in Figure 17.

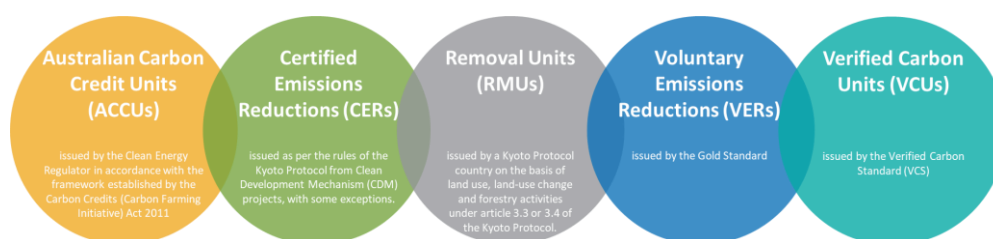


FIGURE 17: ALLOWABLE OFFSETS UNDER CLIMATE ACTIVE

Accepted offsets are:

- 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 which has now been amended to establish the Emissions Reduction Fund (ERF).
- Certified Emissions Reductions (CERs) issued as per the rules of the Kyoto Protocol from Clean Development Mechanism (**CDM**) projects, with some exceptions.
- 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 3.4 of the Kyoto Protocol.
- Voluntary Emissions Reductions (VERs) issued by the **Gold Standard**.
- Verified Carbon Units (VCUs) issued by the **Verified Carbon Standard (VCS)**.

All offset units used in a carbon-neutral claim must:

- Meet eligibility and vintage requirements as per Appendix A of the Climate Active Standard (e.g. vintage year greater than 2012)
- Be cancelled at or before the time of the claim
- Be clearly attributed and recorded in a public registry
- Be reported transparently in a public document.

Co-benefits of carbon offsets

Carbon offsets may come with beneficial non-carbon outcomes, such as positive outcomes for biodiversity, water or air quality or UN Sustainable Development Goals. These benefits are also known as co-benefits, or additional benefits, and may influence the University's carbon offset purchase strategy. Offsets with co-benefits are a great way to align an organisation's values with the carbon offset purchase, and the additional positive outcomes can be described as part of the public report.

Examples of carbon offset projects⁶

VCS: 150 MW Grid Connected Wind Power Based Electricity Generation Project in Gujarat, India:

Project description:

150 MW wind farm with 100 turbines generating approximately over 348 GWh per year

Price: ~\$16.20

VCS: Hebei Haixing 49.5MW Wind Farm Project in Hebei, China:

Project description:

49.5 MW wind farm with 33 turbines generating over 114 GWh per year. Improves local electricity supply, generates local employment and improves local air quality

Price: ~\$16.10

VCS with social benefits: Siam Cement Group Biomass to Energy Project in Thailand:

Project description:

By shifting to renewable biomass instead of fossil fuels, 5 Thai cement manufacturing plants can substantially reduce their carbon emissions - leading to environmental and socio-economic benefits for surrounding communities.

Price: ~\$17.91

VCS-REDD with social benefits: Genneia Wind Project in Argentina:

Project description:

By installing 71 wind turbines across the plains of Argentina, this project reduces fossil fuel-based power and cuts harmful greenhouse gas emissions. It sends sustainable energy to the Argentinian national grid and accelerates the global transition to a low carbon-future.

Price: ~\$21.9

⁶ Please note that in the examples provided, prices for offsets were at the time of purchase and may not reflect current or future carbon offset market prices



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