Sunshine Coast Airport

Carbon Accreditation Program

Carbon Footprint Report FY24

Prepared by:	E. Smith
Date:	February 2024

airport carbon accreditation
MAPPING I REDUCTION I OPTIMISATION I NEUTRALITY

Sunshine Coast Airport

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ORGANISATION AND EMISSION DETAILS

Organisation name	Sunshine Coast Airport Pty Ltd (SCA Pty Ltd)
Contact person(s)	Amanda Pummer Senior Environmental Advisor Sunshine Coast Airport Pty Ltd 10 Electra Lane, Marcoola QLD Phone: 0422 877 162 Email: amanda.pummer@sunshineairport.com.au
Standards this inventory has been prepared in accordance with	National Greenhouse and Energy Reporting System National Greenhouse and Energy Reporting (Measurement) Determination 2008 ISO 14064.1:2006 GHG Protocol: A Corporate Accounting and Reporting Standard ACA Application Manual Issue 12
Reporting year period	Financial Year 2023 (01 July 2023 – 30 June 2024)
Total in emissions reporting year (Scope 1, 2 & 3)	26, 969 tCO_2e
Total in emissions per passenger (Scope 1 and 2)	0.000850106 tCO_2e
Base year period (first year for which the carbon footprint has been completed)	Budget year 2011 – 2012

INTRODUCTION

The purpose of this Carbon Footprint Report (CFR) is to support our application to renew the Sunshine Coast Airport's (SCA) Level 3+ accreditation of the Airport Carbon Accreditation (ACA) Program. SCA was operated as a separate commercial business unit under local government authority, Sunshine Coast Council ("Council") until 1 December 2017. Following this, the airport operated as a private company referred to as Sunshine Coast Airport Pty Ltd. The new operator, Palisade Investment Partners, remains committed to Council's goal of maintaining carbon neutrality status with the ACA Program.

Sunshine Coast Airport is not required to report its carbon footprint under the *Clean Energy Act 2011.* Continued participation in the ACA program ensures SCA continues to seek best practice in carbon management and acts as a prompt to further pro-action by other airports in conducting sustainable business.

Figure 1: Sunshine Coast Airport

BACKGROUND

Overview of the ACA Program

The ACA program is an international scheme that was established in 2008 by 'Airports Council International Europe' (ACI Europe) to assist member airports in reducing their carbon footprint. Airports submit information required for various levels in the program to the Scheme Administrator. The process allows airports to identify their emissions sources, highlight priority areas for mitigation, manage reductions in emissions and receive international recognition for improvements in carbon and energy management.

Levels of Certification

There are 6 levels in the ACA program process, each reflecting increased intensity in carbon management. Airports may enter the program at any level (Figure 2).

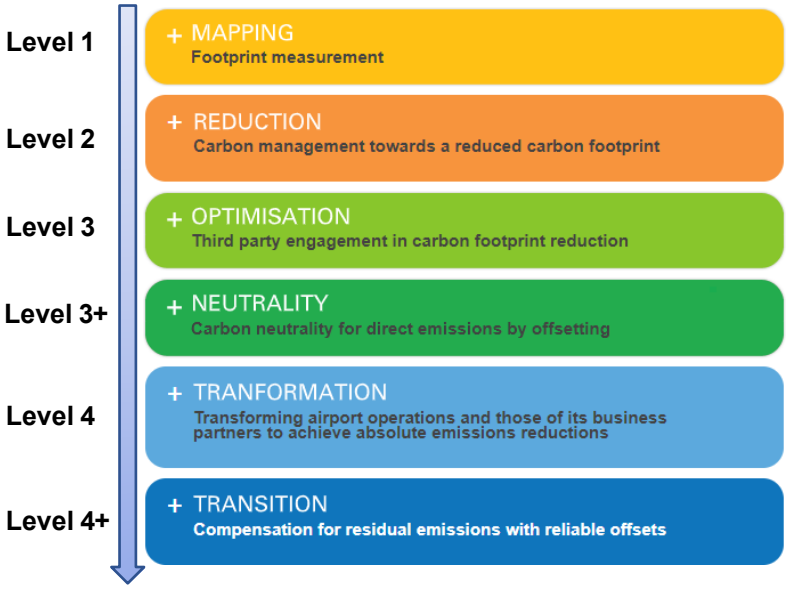


Figure 2: Steps in the Airport Carbon Accreditation program

Each level in the process has mandatory requirements including a verified carbon footprint. Should an airport remain on a particular level for more than 12 months, the verification of the carbon footprint then only needs to occur every second year.

Requirements for Level 3 Renewal

To achieve this level of accreditation, SCA must:

- Fulfil all Level 2 accreditation renewal requirements, noting that the carbon footprint should also include specific scope 3 emissions.
- Provide evidence of effective carbon management procedures including target setting; and
- Show a reduction in the carbon footprint in comparison to carbon emissions data of consecutive years.

Requirements for Level 3+ Renewal

To achieve this level of accreditation, SCA must:

- Fulfil all Level 3 accreditation renewal requirements; and
- Offset remaining Scope 1 and 2 carbon emissions to show its commitment to achieving carbon neutral operations for all direct emissions and indirect emissions over which the airport has control, using internationally recognised offsets.

BUSINESS GOALS

Business goals for this carbon footprint include:

- Managing greenhouse gas risks and identifying reduction opportunities in alignment with wider organisational policy to achieve carbon neutrality.
- Participation in a voluntary greenhouse gas program (the ACA program).
- Identify the key drivers for carbon neutrality and influence our aviation industry
- Identifying opportunities in the Level 3+ application that can be improved to achieve Level 4 and 4+ accreditation.
- Developing a Stakeholder Partnership Plan to encourage external engagement and reduction in emissions in our communities
- Achieve a reduction in emissions per passenger whilst expanding operations via our PDA development plan.

CARBON FOOTPRINT REPORTING PERIOD

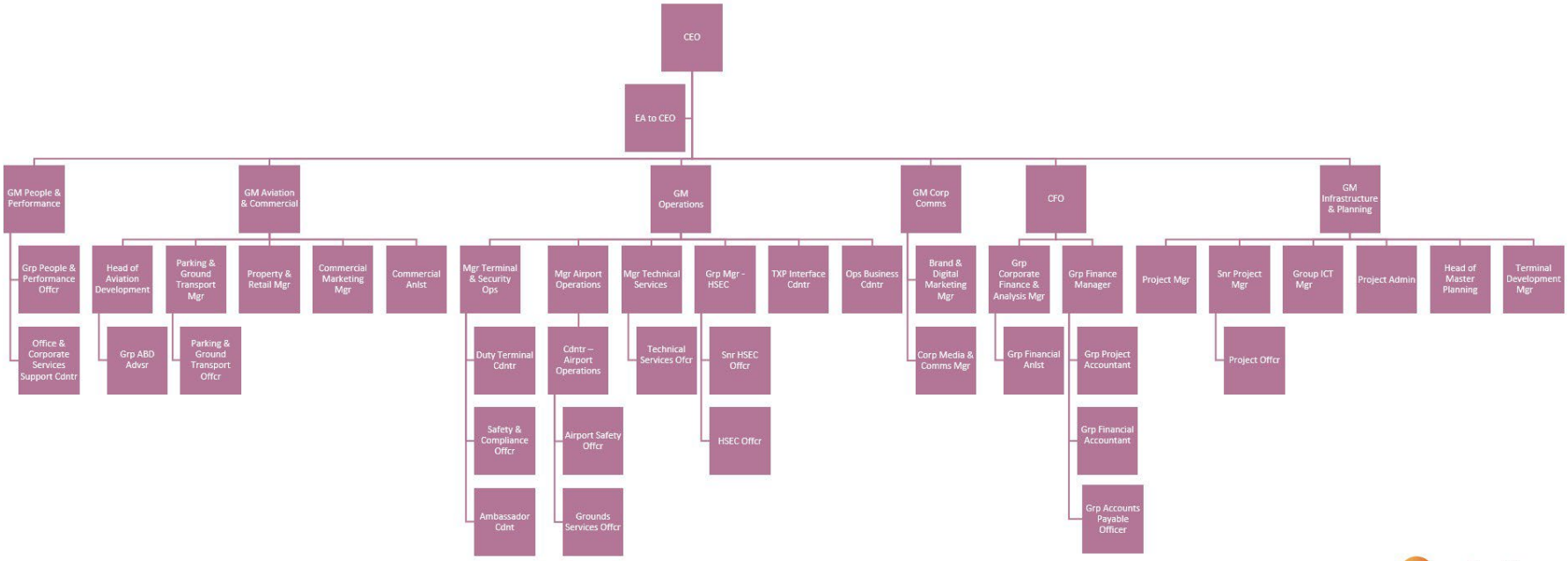
This CFR contains the Greenhouse Gas (GHG) inventory for the SCA operations between 1 July 2023 – 30 June 2024 (FY24).

ORGANISATIONAL SRUCTURE

The current organisational structure is captured in Figure 3 below.

Sunshine Coast Airport

FY24 Current SCA Org Structure as of APRIL 2024



Sunshine Coast Airport

Figure 3: SCAs Organisational Structure (as of April 2024)

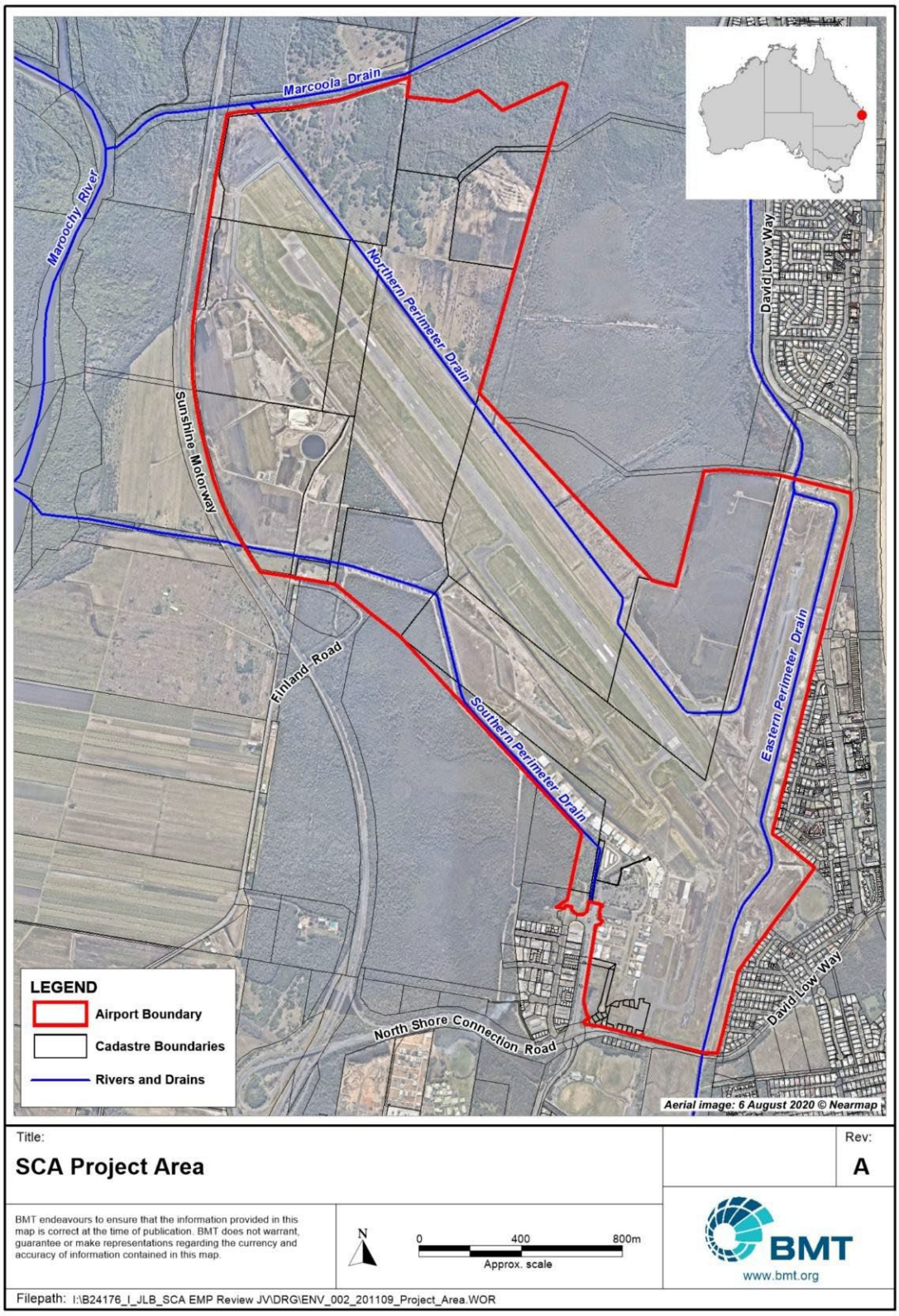


Figure 4: SCAs operational boundary

OPERATIONAL BOUNDARIES

This report covers the accounting and reporting of carbon dioxide (CO_2) as required by the ACA program. In SCAs carbon footprint, six greenhouse gases have been considered as covered in the Kyoto Protocol. These include carbon dioxide (CO_2), methane (CH_4), nitrous oxide (N_2O), sulphur hexafluoride (SF6), hydrofluorocarbons (HFCs), and perfluorocarbons (PFCs). Sunshine Coast Airport has elected to include HFC refrigerants as CO_2e towards Scope 1 emissions.

The Global Warming Potential (GWP) of a greenhouse gas is an index of the combined effect representing the differing times greenhouse gases remain in the atmosphere and their relative effectiveness in absorbing outgoing infrared radiation. The GWP of each of the six Kyoto GHGs is provided in Table 1.

Greenhouse Gas	Chemical Formula	Global Warming Potential
Carbon dioxide	CO2	1
Methane	CH4	28
Nitrous oxide	N2O	265
Hydrofluorocarbons	HFCs	116 – 12,400
Perfluorocarbons	PFCs	6,630- 11,100
Sulphur hexafluoride	SF6	23,500

Table 1: Global Warming Potential of Kyoto Greenhouse Gases (AR5)

The ACA program requires calculation of all Scope 1 and Scope 2 and defined Scope 3 emissions. Carbon dioxide (CO_2) is the only mandatory greenhouse gas required for reporting under the ACA program. Level 3+ of the ACA program requires the purchase of offsets of Scope 1 and Scope 2 emissions and Scope 3 emissions attributable for business travel. Airports may voluntarily report other greenhouse gases, and this is regarded as exercising 'best practice.'

Facilities within SCAs organisational boundary for Scope 1 and Scope 2 are shown in Table 2 and within the appendices. Scope 3 emissions (indirect) are those that SCA can influence through effective partnerships and guide by best practice reductions. A summary list of Scope 3 emissions is provided in Table 3.

Level 3+ renewals with ACA require all direct (Scope 1), indirect (Scope 2) and other indirect emissions from third parties (Scope 3) caused by SCA operations or third-party activities for the facilities be included in this CFR as defined in Tables 2 and 3.

Emissions	Equipment	Responsible Department	Comments
Scope 1 – Direct Emissions			
Stationary sources	Three generators	Sunshine Coast Airport Operations Team	Refer to Appendix B for a description.
	Two mowers	Sunshine Coast Airport Operations Team	Vehicles that are not registered for on road use are classed as stationary sources. Refer to Appendix B for a description.
Mobile (transport) sources	Six fleet vehicles	Sunshine Coast Airport Operations Team Servicing of vehicles is outsourced to various mechanical businesses according to the make of the vehicle	Refer to Appendix C for a description of the vehicles.
	One tractor (mower)	Operation of tractor (mower) – Sunshine Coast Airport Operations Team	This mower is registered for on road use and is therefore classed as a mobile source. Refer to Appendix C for a description of the vehicles.
Refrigerant leakage	Four (4) R407c, Nineteen (19) R410a, Nine (9) R32 and One (1) R22 Refrigerants.	Sunshine Coast Airport Operations Team. The systems are maintained by CV Services. Cold Room is leased through Kleer.	Refer to Appendix D for description.

Emissions	Equipment	Responsible Department	Comments
Scope 2 – Energy Indirect Emissions			
Purchased electricity	Buildings and facilities owned, operated, and occupied by SCA include various spaces within the airport terminal, the public car park, the runway, taxi ways, aprons, visual aids, internal access roads, a maintenance shed, vacant (serviced) land and vacant buildings. Refer to Appendix E.	SCAs Sunshine Coast Airport Team are responsible for procuring electricity contracts for Sunshine Coast Airport. Sunshine Coast Airport Operations Team are responsible for electricity sub meters for tenants. The Aviation and Commercial Team are responsible for invoicing Sunshine Coast Airport tenants for electricity usage. Sunshine Coast Airport's Aviation and Commercial Team are also responsible for managing tenants' leases. Sunshine Coast Airport's Operations Team are responsible for the maintenance of the runways, taxi ways, aprons, and internal access roads. Sunshine Coast Airport Infrastructure & Planning team are responsible for capital works, including building works, new infrastructure and asset renewal projects.	Tenants occupy the remaining facilities and purchased electricity is on-sold to the tenants via meter reading and invoicing. A list of tenants and corresponding meters is provided in Appendix F.

Table 2: SCAs Carbon Footprint Scope 1 and Scope 2 emissions

Emissions	Equipment	Responsible Department (GUIDE)	Responsible Department (INFLUENCE)	Ownership	Measured in carbon inventory?
Scope 3 – Indirect Emissions					
Aircraft	The ground movement of aircraft as well as aircraft engine start-ups to idle (run ups), engine, reverse thrust, taxiing, APU and PCA.	Sunshine Coast Airport Operations Team can guide third parties.	Movement and actions of aircraft before and after being on the ground (LTO cycle – approach, landing, take off, climb and cruise).	Sunshine Coast Airport Operations Team can influence aircraft operators.	Measured
Stationary Sources	Firefighting exercises and flares currently in the control of another party offsite.	Airservices Australia	Tenants LPG, grease, and combustion of other oil product.	Sunshine Coast Airport Aviation and Commercial Team and Operations Team can influence the contactors, tenants and other third parties.	Tenants LPG, grease, and combustion of other oils products – only combustion of oil products is measured as the others (LPG and grease) consumption is small and considered immaterial.

Emissions	Equipment	Responsible Department (GUIDE)	Responsible Department (INFLUENCE)	Ownership	Measured in carbon inventory?
			Paper used in Sunshine Coast Airport administration.	Sunshine Coast Airport Corporate Administration procures stationery. All teams are responsible	No due to calculated emissions totalling less than 0.1% total inventory
Mobile Sources	Staff travel in their own vehicles (commutes). 3rd party owned vehicles. Passenger surface access.	Sunshine Coast Airport's Aviation and Commercial Team can guide third party owned vehicles (e.g., rental car tenants).	Sunshine Coast Airport staff business travel.	Sunshine Coast Airport's CEO and Sunshine Coast Airport Operations Team influence staff business travel and travel in airport vehicles for business purposes	Staff travel, passenger surface access and staff business travel are all measured.
Process emissions	Disposal and management of airport waste within the airport boundary.	Sunshine Coast Airport's Operations Team can guide passengers, third parties and airport staff to avoid, re use or recycle waste within the airport boundary.	On site waste management and water waste management currently in the control of other parties (i.e., tenants). Management of waste from the airport in landfills (off site).	Sunshine Coast Council's Sustainability and Environment Policy Branch and Waste and Resource Management Branch (within the Infrastructure Services Department) can influence emissions from airport waste in landfills as well as waste collection services. Sunshine Coast Airport's Aviation and Commercial Team can influence disposal of waste and water waste management through the Environmental Guidelines for tenants which encourage recycling and reuse.	Waste is measured.

Emissions	Equipment	Responsible Department (GUIDE)	Responsible Department (INFLUENCE)	Ownership	Measured in carbon inventory?
Infrastructure	Grid power and fuel purchased and used by suppliers, couriers / delivery services, taxis, rental cars etc.	Grid power and fuel consumed by suppliers, couriers / delivery services, taxis, rental cars etc. can be guided Sunshine Coast Airport's Business and Commercial.	Grid power and fuel consumed by airport tenants and Sunshine Coast Airport. Installations / renovations / upgrades by sub- contractors.	Grid power and fuel consumed by airport tenants and Sunshine Coast Airport can be influenced by Sunshine Coast Airport's Aviation and Commercial Team. Installations / renovations / upgrades can be influenced by Sunshine Coast Airport Infrastructure & Planning team, Operations Team eg. Solar roof top installation Terminal due May 2025.	Grid power is measured.

Table 3: SCAs Carbon Footprint Scope 3 emissions

EMISSION SOURCES

Scope 1 Emissions

Scope 1 emissions include:

- Combustion of fuel for SCAs leased and owned vehicles.
- Combustion of fuel for SCAs stationary operations which includes generators, mowers, and a registered tractor; and
- Leakage of refrigerants from SCAs air-conditioning and refrigerator equipment.

Scope 2 Emissions

Scope 2 emissions include:

- Emissions generated from the use of purchased electricity for SCA facilities within the operational boundary of the carbon footprint shown in Figure 4 and Table 2.

Scope 3 Emissions

The ACA Application Manual (Issue 12) requires that measurement of Scope 3 emissions must occur. These emission sources include:

- The LTO cycle as defined by the ICAO Airport Quality Guidance Manual (Doc No. 9889).
- On stand engine running (start-up – shut down) and auxiliary power units (APU).
- Surface (passenger and airport company staff) access.
- Airport staff business travel (flights, taxi is and hire vehicles).
- Ground support equipment (GSE) including ground power units and ground running operations (including testing and ground running, use of fixed ground power and pre-conditioned air).
- Energy used by tenants.
- Transmission and distribution (electricity) losses; and
- Waste (generated by tenants, passengers, and the airport) to landfill.

EMISSION EXCLUSIONS

Other than those described in Table 2, there are no other Scope 1 emissions such as boilers, furnaces, turbines, heaters, incinerators, engines, firefighting exercises, flares, or process emissions. These are all Scope 3 emissions in the case of SCA. LPG use is only by one tenant (Scope 3) and this usage is negligible. It has therefore been excluded from this footprint.

The use of greases and combustion of other oil-based products by SCA is also negligible as the servicing of SCA's vehicles and equipment is conducted by a third party for a small number of vehicles and equipment offsite (refer to Appendix B and C for a list of vehicles and equipment).

Emissions from fire-fighting exercises and flares are not measured as these exercises are contracted by a third party and attended by staff from a third party who supply the service to multiple airports. The exercises occur outside of SCA's geographic boundary. Paper use has been measured in 2024, however the calculation is less than 0.1% of total GHG inventory and therefore not included as negligible. We will continue to measure paper and work on increasing the % of eco-accredited paper used (recyclable and made from recycled paper as well as prioritise carbon neutral suppliers) even though not included.

METHODOLOGY

This CFR has been undertaken in accordance with the following requirements:

- *AS ISO 14064.1—2018: Greenhouse gases Part 1: Specification with guidance at the organisation level for quantification and reporting of greenhouse gas emissions and removals.*
- *National Greenhouse and Energy Reporting (Measurement) Determination 2008.*
- *Methods of Calculating Total Equivalent Warming Impact (TEWI) 2012.*
- *Greenhouse Gas Protocol Technical Guidance for Calculating Scope 3 Emissions Version 1.0 2013; and*
- *Airport Air Quality Manual, Document 9889 2020.*
- This CFR has been compiled by Evelyn Smith (HSEC Officer) – evelyn.smith@sunshine.coastairport.com.au and reviewed by Amanda Pummer (Senior Environmental Advisor).

- Figure 5 below illustrates the data management process and quality control practices undertaken by SCA.

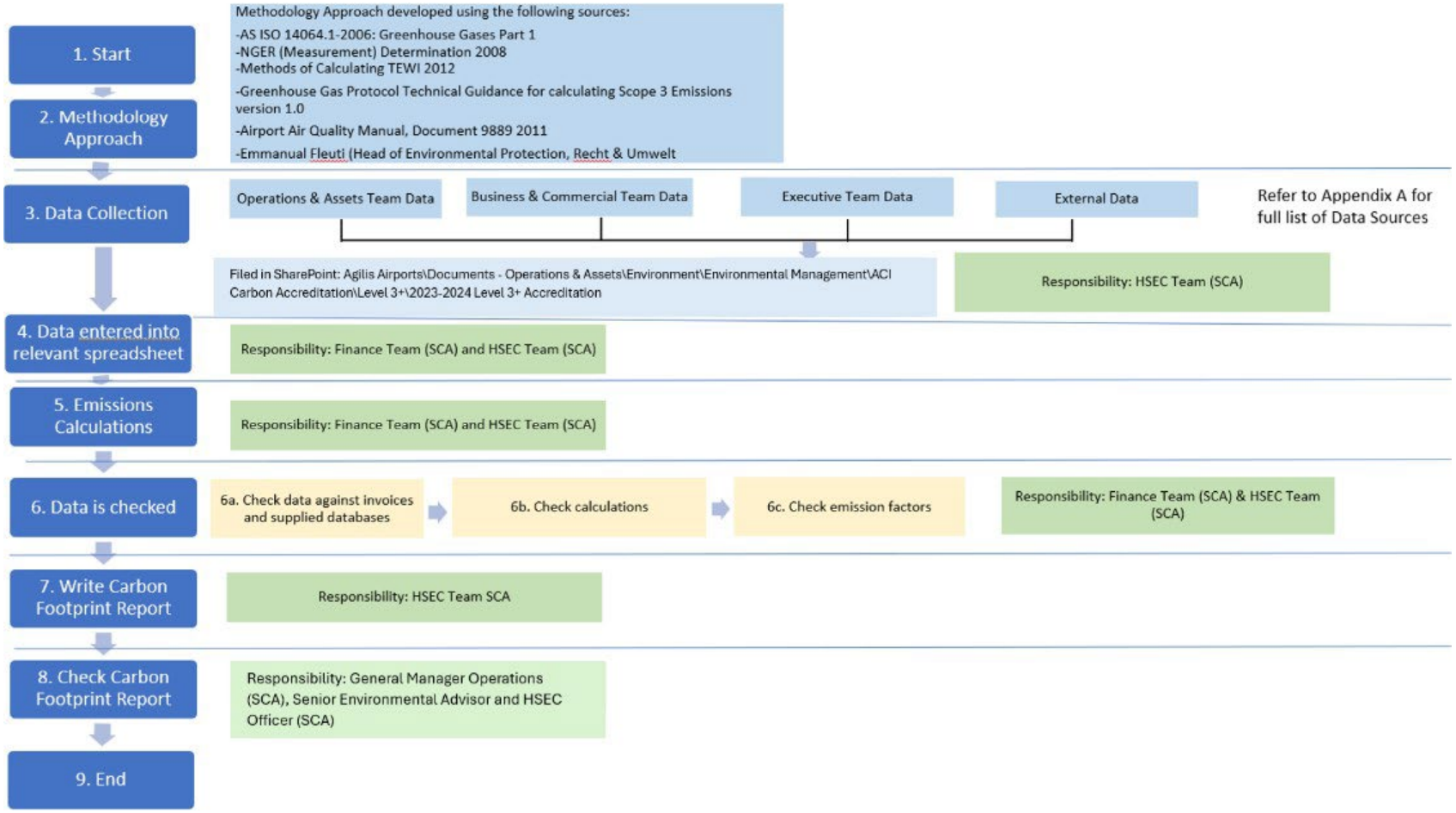


Figure 5: Data Management Process and Quality Assurance process utilised at the SCA

SCOPE 1 EMISSIONS CALCULATION

Scope 1 emissions attributable to the SCA were calculated using Method 1 as defined in the *National Greenhouse and Energy Reporting (Measurement) Determination, 2008*.

Fuel for SCA vehicle use (transport)

SCA transport fleet is comprised of a few vehicles that consume diesel as a fuel source, including one tractor. There are no LPG or ULP vehicles in the fleet. The activity data for each of the SCA vehicles were obtained from the monthly British Petroleum (BP) Plus Fleet Control Reports and Bulk Diesel usage records and invoices.

Emissions were calculated using the following formula:

$$E_{ij} = \frac{Q_i \times EC_i \times EF_{ijoxec}}{1\,000}$$

Where:

- ***Eij*** is the emissions of gas type (j), carbon dioxide, methane, or nitrous oxide, from fuel type (i) (CO2-e tonnes).
- ***Qi*** is the quantity of fuel type (i) (kilolitres) combusted for transport energy purposes
- ***Eci*** is the energy content factor of fuel type (i) (gigajoules per kilolitre) used for transport energy purposes — see Table 4.
- ***Efijoxec*** is the emission factor for each gas type (j) (which includes the effect of an oxidation factor) for fuel type (i) (kilograms CO2-e per gigajoule) used for transport energy purposes – see Table 4.

Emission Factors

Table 4 below shows the relevant emission factors for carbon emissions (Scope 1).

Fuel Combusted	Energy Content Factor (GJ/KL)	Emission Factor Kg CO_2-e /GJ (Relevant oxidation factors incorporated)
		CO_2
Diesel	38.6	69.9

Table 4: Energy Content Factor and Emissions Factors for Scope 1 transport fuel use

Assumptions

- All fuel for SCAs vehicle fleet is purchased from BP or via the bulk diesel dispenser onsite; and
- Vehicle leasing and procurement arrangements are such that all vehicles in SCAs fleet are manufactured post-2004

Fuel for SCA generator (stationary)

Sunshine Coast Airport's diesel 500 KVA generator is used for back up electricity purposes. The Airport also has a 200KVA and 300KVA emergency generator and two mowers. Therefore, according to the *National Greenhouse and Energy Reporting (Measurement) Determination 2008* they are considered stationary sources. Emissions were calculated using the following formula:

$$E_{ij} = \frac{Q_i \times EC_i \times EF_{ijoxec}}{1\,000}$$

Where:

- ***Eij*** is the emissions of gas type (j), carbon dioxide, methane, or nitrous oxide, from fuel type (i) (CO2-e tonnes).
- ***Qi*** is the quantity of fuel type (i) (kilolitres) combusted for transport energy purposes
- ***Eci*** is the energy content factor of fuel type (i) (gigajoules per kilolitre) used for transport energy purposes — see Table 4.
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Emission Factors

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		CO_2
Diesel	38.6	69.9

Table 5: Energy Content Factor and Emissions Factors for Scope 1 transport fuel use

Assumptions

Note: Generator run hours are from February 2024 to February 2025, as generator log can only be extracted for 14 months.

The 500 KVA generator (diesel) has a capacity of 500 litres (l). This amount of fuel will last approximately 8 hours (hr.). The generator is fitted with an hour meter to measure the time it is run. The hour meter shown on the generator at the beginning of the reporting period and at the end was used to determine the total run time. The technical specifications for the generator state that the fuel efficiency for this generator is 62.5 L/hr at 100% load. As the generator is not always run at a 100% load rate, it has been reduced to an average of 80%, resulting in a 50 L/hr fuel usage. This generator was run for a total of 12 hours from February 2024- February 2025.

The 200 KVA generator (diesel) was installed in February 2013 as a back-up generator for offices. It has a capacity of 1000 litres. The technical specifications state that its fuel efficiency at 100% load is 50 L/hr. It is also assumed that this generator is operated at 80% (40 L/hr) capacity. It is

estimated that the 200 KVA generator was run for approximately 4 hours and 9 minutes from February 2024- February 2025.

The 300 KVA Atlas Copco generator (diesel) was installed in 2020 in the airport lighting room. The generator was run for a total of 44 hours and 10 minutes from February 2024- February 2025. The QIS 330 has 330kVa of power and 47L/h (75% load) fuel consumption. This generator was run for longer than previous years due to emergency works associated with project Aerospace 1B.

Refrigerant Leakage Emissions Calculations

Sunshine Coast Airport has a multitude of air-conditioning systems which includes ducted and standalone units. There are also domestic refrigerators and freezers in staff kitchens and facilities.

The stock of refrigerant type and capacity for the air conditioning systems was determined by the records kept by SCAs air-conditioning contractors. The contractors for all the air-conditioning systems – packaged and split systems are CV Services.

The emissions from refrigerant leakage were calculated using the following formula:

$$E_{jk} = Stock_{jk} \times L_{jk}$$

Where:

- ***Ejk*** is the emissions of HFC, summed over each equipment type (tonnes of CO2-equivalent).
- ***Stockjk*** is the stock of HFC contained in equipment, by equipment type (tonnes of CO2-e); and
- ***Ljk*** is the default leakage rates by equipment type.

The default annual leakage of 0.09 (i.e. 9%) for Chillers (upper % for air-conditioning applications) and a default annual leakage of 0.02 (i.e. 2%) for domestic-type refrigerators and freezers (self- contained refrigeration systems) were used in the calculation of refrigerant loss in accordance with Table 1, Page 8 of the Methods of Calculating Total Equivalent Warming Impact (TEWI) 2012.

The CO2e of each refrigerant was calculated by multiplying the refrigerant capacity of the system by the Global Warming Potential (GWP) of each of the stated refrigerant types. The GWP for each refrigerant type was obtained from Table 2, page 8 of the *Methods of Calculating Total Equivalent Warming Impact* (TEWI, 2012) as shown in Table 6.

Refrigerant Type	Global Warming Potential
HCFC- 22 (R22)	1760
HFC-32 (R32)	677
HFC- 134a	1300
R410A	1924
R401A	1129.92

R407C	1624

Table 6: Global Warming Potential of Refrigerants (AR5)

Uncertainty Analysis

An uncertainty analysis of Sunshine Coast Airport's Scope 1 emissions was undertaken in accordance with the *National Greenhouse and Energy Reporting (Measurement) Determination 2008.*

The following formula was used to assess the uncertainty of estimates of scope 1 emissions that are estimated using method 1 for a source:

$$D = \pm\sqrt{A^2 + B^2 + C^2}$$

Where:

- D = aggregated percentage uncertainty for the emission source
- A = the uncertainty associated with the emission factor for the source expressed as a percentage
- B = the uncertainty associated with the energy content factor for the source
- C = the uncertainty associated with the activity data for the source expressed as a percentage utilising the measurement Criterion for that source.
- The total percentage uncertainty for Sunshine Coast Airport Scope 1 emissions was assessed using the following formula:

$$U_{total} = \frac{\pm\sqrt{(F_1 \times G_1)^2 + (F_2 \times G_2)^2 + \ldots + (F_n \times G_n)^2}}{G_1 + G_2 + \ldots + G_n}$$

Where:

- **Utotal** = the percentage uncertainty for the total emissions for Sunshine Coast Airport
- **F1-Fn** = the percentage uncertainties associated with each emission estimate for the Sunshine Coast Airport
- **G1 – Gn** are the estimated emissions from each of the facilities under the operational control of Sunshine Coast Airport

SCOPE 2 EMISSIONS CALCULATION

Electricity Consumption

The activity data for energy consumption for SCA was sourced from the electricity providers electricity bills (Table 7).

NMI	Facility/Site	Energy Provider	Frequency
QB120854210	Airport West	Origin Energy	Monthly
QB18027391	Airport Terminal		Monthly
QB123175861	Airport East		Monthly
QB31203538070	Airport North		Monthly

Table 7: SCAs Electricity Providers

Estimates were calculated by:

- Determining the average kWh per day used during the known billing period.
- Applying the average daily kWh for the billing period use to the days that fall within the budget year for that billing period.
- Subtracting the average kWh usage within the period for the days that fall outside of the financial period; and
- Determining the correct kWh for the budget year (total kWh – extra kWh)
- Indirect emissions from the consumption of purchased electricity were calculated using the following formula:

$$Y = Q \times \frac{EF_{Qld}}{1\,000}$$

Where:

- ***Y*** is the scope 2 emissions measured in CO_2e tonnes.
- ***Q*** is the quantity of electricity purchased (kilowatt hours)
- ***EFQld is*** the scope 2 emission factor, for Queensland (kg CO_2e per kilowatt hour). From Part 5 of the *NGER Determination (Australian Government, 2024)* the current (FY24) Scope 2 emissions factor for purchased electricity in Queensland is 0.71 kg CO_2e/kWh.

SCOPE 3 EMISSIONS CALCULATION

The following sections detail the methodologies used to calculate the Scope 3 emissions required by the ACA program. Emissions were calculated using the relevant Energy Content Factors and Emission Factors listed in Schedule from the *National Greenhouse Accounts factors 2024* (Australian Government, 2024).

Fuel Combusted	Energy Content Factor (GJ/KL)	Emission Factor Kg CO_2-e /GJ (relevant oxidation factors incorporated)
		CO_2
Diesel	38.6	69.9
Gasoline (other than for use as fuel in an aircraft)	34.2	67.4
Kerosene for use as fuel in aircraft	36.8	69.6
Gasoline for use as fuel in aircraft	33.1	67.0
Liquefied petroleum gas	25.7	60.2

Table 8: Energy Content Factors and Emissions Factors for Scope 3 transport fuel use

Emissions associated with transport and distribution of Fuel

Transmission and distribution losses from SCAs stationery and transport fuel use was calculated using the following formula from the GHG Protocol:

$$\sum \text{(fuel consumed (e.g., kWh)} \times \text{upstream fuel emission factor (kg CO2 e)/kWh))}$$

Where:

- Upstream fuel emission factor = life cycle emission factor – combustion emission factor.

An emission factor of 3.6 Kg CO_2e/GJ was applied to calculate the liquid fuels used in transport and stationery.

Emissions Associated with Aircraft Landing and Take-off Cycle

The Airport Carbon and Emissions Reporting Tool (ACERT) was used to calculate emissions associated with the landing and take-off (LTO) cycle of aircraft.

The option of using 'detailed aircraft data' (step 7.1 in ACERT) was selected and used to calculate emissions for LTO using the ACERT spreadsheet. This has provided an approach that is a combination of the 'advanced' and 'simple' approach as outlined in the 'Airport Air Quality Manual' (ICAO, 2020). Refer to Table 9 below. Note that in using this approach, the engines chosen are representative and not a weighted average and ACERT only considers CO_2 and no other greenhouse gasses.

Aircraft movements were extracted from the Finance Departments Passenger Database. Data was extracted for the reporting period which allowed for aircraft types to be filtered, counted, and entered the ACERT spreadsheet.

Key parameters	Simple approach		Advanced approach		Sophisticated approach
Fleet (aircraft/engine combinations)	Identification of aircraft group types (e.g. all B737 or all A319/320/321)		Identification of aircraft and representative engine types (e.g. all A320 with 50% V2525 and 50% CFM56-5B5P)		Actual aircraft type/subtype and engine combinations (by tail number and engine UID or similar)
Movements	Number of aircraft movements by aircraft type (according to look-up table), as defined in "fleet"		Number of aircraft movements by aircraft-engine combinations as defined in "fleet"		Number of aircraft movements by aircraft tail number
Emissions calculation	Option A UNFCC look-up table (no calculation)	Option B Spreadsheet calculation	Performance-based calculation, potentially reflecting additional parameters like forward speed, altitude, ambient conditions (model-dependent)		Performance-based with actual engine data (P3/T3) and including ambient conditions
Thrust levels	Option A N/A	Option B Rated thrust	Option A Average airport and/or aircraft-group-specific reduced thrust rate	Option B Performance model calculated rated reduced thrust	Actual thrust provided by the air carrier
TIM		Option B ICAO certification LTO	Option A Modified times in mode (airport-specific average or actual for one or several modes)	Option B Performance model calculated TIM	Movement-based actual values for all modes
Fuel flow		Option B ICAO certification data bank values	Option A Derived from ICAO EEDB with thrust-to-fuel flow conversion model	Option B Derived from ICAO EEDB with performance model	Refined values using actual performance and operational data derived from the air carrier
EI	Option A UNFCC LTO emissions mass by aircraft type	Option B ICAO certification data bank values	Option A Derived from ICAO EEDB and thrust level through BFFM2 curve-fitting method	Option B Derived from ICAO EEDB through BFFM2 curve-fitting method	Refined values using actual performance and operational data derived from the air carrier
Start-up emissions	Not considered		Consider including — see 6.53 to 6.59		Consider including — see 6.53 to 6.59
Engine deterioration	Do not consider — see 6.44 to 6.52		Do not consider — see 6.44 to 6.52		Do not consider — see 6.44 to 6.52

Table 9: Approach to calculating emissions associated with aircraft LTO (highlighted)

The formula used to calculate emissions in the ACERT spreadsheet is from the 'Airport Air Quality Manual Doc 9889' and described below (Figure 6). The emissions associated with the taxi mode were calculated using the same formula, however the time in mode (TIM) was individualised.

Emissions calculation methodology for NO_x, CO, and HC (Source: Airport Air Quality Manual Doc 9889)

Identification of the aircraft type will enable the determination of the number of engines and the appropriate engine models. In turn, the engine model will determine the proper EI to calculate aircraft emissions.

6.16 To determine the NO_x, CO or HC emissions for a unique aircraft/engine combination, the following formula may be used. This method is repeated for each aircraft/engine type representing each TIM to establish a complete aircraft emissions inventory.

$$E_{ij} = \Sigma (TIM_{jk} * 60) * (FF_{jk}) * (Ei_{ijk}) * (Ne_j) \quad \text{Eq. A1-3}$$

where:

E_{ij} = total emissions of pollutant i (e.g., NO_x, CO, or HC), in grams, produced by aircraft type j for one LTO cycle.

Ei_{ijk} = emission index for pollutant i (e.g., NO_x, CO, or HC), in grams per pollutant per kilogram of fuel (g/kg of fuel), in mode k (e.g., take-off, climb-out, idle and approach) for each engine used on aircraft type j.

FF_{jk} = fuel flow for mode k (e.g., take-off, climb-out, idle and approach), in kilograms per second (kg/s), for each engine used on aircraft type j.

TIM_{jk} = time-in-mode for mode k (e.g., idle, approach, climb-out and take-off), in minutes, for aircraft type j.

Ne_j = number of engines used on aircraft type j.

If the actual measured TIM for one or more of the operating modes exists and is used, then the different flight phases must be calculated separately and the total emissions for each species have to be summed to give the total emissions for each aircraft/engine type.

ICAO does not have emissions certification standards for SO_x. However, SO_x emissions are a function of the quantity of sulphur in the fuel. The U.S. EPA conducted a survey of sulphur content for commercial aviation jet fuel, which resulted in a U.S. average of 1 gram per 1 000 grams of fuel consumed (EI SO_x = 1 g/kg of fuel). This average should not be relied upon where validated data are needed, but can be used to perform an emissions inventory of SO_x emissions using the following equation:

$$E_k = \Sigma (TIM_k * 60) * (Er_k) * (Ne_k) \quad \text{Eq. A1-4}$$

where:

E_k = total emissions of SO_x, in grams, produced by aircraft type k for one LTO cycle;

Ne_k = number of engines used on aircraft type k.

$Er_k = 1 * (FF_k)$;

where:

Er_k = emission rate of total SO_x in units of grams of SO_x emitted per second per operational mode for aircraft k.

FF_k = the reported fuel flow by mode in kilograms per second (kg/s) per operational mode for each engine used on aircraft type k.

ICAO does not have emissions certification standards for PM emissions. However, CAEP has developed and approved the use of an interim First Order Approximation (FOA) method to estimate total PM emissions from certified aircraft engines. At the time of publication of this document, FOA, version 3, was the most up to date and is provided in Attachment D to this appendix. FOA3.0 provides expressions of volatile PM from fuel organics and sulphur content, as well as a relationship between SN and non-volatile PM mass. CAEP is committed to continually updating the interim FOA methodology as data and scientific advancements become available, until such time as it can be replaced by fully validated and verified measurement data. The FOA methodology is to be used for emissions inventory purposes only within the vicinity of airports. The FOA methodology should not be relied upon where accurate, validated data are required.

Figure 6: Formula for calculating aircraft LTO

General Aviation Aircraft Movements and Assumptions

The Australian Airports Movement Summary (FY24) report developed by Air Services Australia) was accessed to determine the total number of movements for general aviation and helicopters at Sunshine Coast Airport.

Although the total number of movements and the individual aircraft types were known, the available data did not provide the number of movements for each aircraft type. Therefore, the assumption was made that the most common general aviation aircraft type (Cessna 172) accounted for all general aviation aircraft movements and the most common helicopter type was Bell206B accounted for all helicopter movements.

Note: Helicopter movements at Sunshine Coast Airport are mostly training circuits that remain under 3,000 feet. As a result, only emissions associated with the take-off, approach, idle and climb have been calculated. The assumption has been made that even though the helicopters remain under 3,000 feet, once they have ceased climbing, they are cruising. Cruising emissions are not required to be accounted for according to the Airport Carbon Accreditation Guidance Document Version `10 September 2016.

Emissions associated with Auxiliary Power Units (APU)

Commercial aircraft operating at SCA in FY24 that are equipped with an APU include the Airbus 320, Airbus 321, Airbus 320/321neo, Boeing 737 (600-900), Boeing 717/738, 737 Max8 Boeing and SAAB 340, which utilise Jet A-1 fuel (kerosene for use as fuel in an aircraft). The Fokker 70/100 aircraft is a turboprop model that does not have an APU, therefore has been excluded. FY24 SCA Traffic and Passenger Database spreadsheet was also utilised to calculate the APU. Data for the average APU operation time (minutes) for each aircraft type was collected from Airport Operations Coordinator who advised the following APU usage per turn (taxi in/taxi out) for each aircraft type:

- Airbus 320 (Jetstar): assume 35 minutes
- Airbus 321 and 321neo (32Q) (Jetstar): 45 minutes
- Airbus 320neo (32N) (Air NZ): 60 mins
- Airbus 321neo (32Q) (Air NZ): 45 mins
- Boeing 737 (600-900) (Virgin): 40 minutes
- Boeing 717/ 738 (Qantas): 40 minutes
- SAAB 340 (Link Airways): 20 minutes
- 737 Max8 Boeing (Bonza): 50 minutes

Total APU operation was calculated using the following formula:

Total APU operation time (minutes) = Average APU time Type A X LTO cycles Type A

Where:

- **Average APU time** Type A = Average APU duration time (minutes) for aircraft type A and corresponding airline
- **LTO cycles**Type A = Number of LTO cycles for aircraft type A and corresponding airline

- Fuel burn rate (kg/min) for each aircraft was sourced from Airport Air Quality Manual Doc 9889, (Table 10). Sunshine Coast Airport commercial aircraft fall under the Short Haul category which burns 80 kilograms of fuel per 45 minutes (1.78kg per minute). Total fuel in kilograms was calculated based on total APU operation time (minutes) and the fuel burn rate.

Aircraft group	Short-haul[9]	Long-haul
Duration of APU operation	45 min	75 min
Fuel burn	80 kg	300 kg
NO_x emissions	700 g	2400 g
HC emissions	30 g	160 g
CO emissions	310 g	210 g
PM_{10} emissions	25 g	40 g

Table 10: Values representative of APU emissions for each aircraft operation

Total fuel (kilograms) = Total APU operation time (minutes) Type A X Fuel Burn rate (1.78kg/min)

Where:

- **Fuel burn rate** = 1.78kg of Jet A1 fuel (Kerosene for use as fuel in an aircraft) per minute

Total fuel in kilograms was then converted to total fuel in litres by accounting for density of Jet A1 fuel.

Total Jet A1 (kerosene) fuel (L) = Total fuel (kg) ÷ Average density Jet A1 fuel (g/cm3)

- **Average Density Jet A1 fuel =** 0.8075g/cm^3

Emissions were calculated using the formula from the National Greenhouse and Energy Reporting (Measurement) Determination 2008:

$$E_{ij} = \frac{Q_i \times EC_i \times EF_{ijoxec}}{1\,000}$$

Where:

- ***Eij*** is the emissions of gas type (j), carbon dioxide, methane, or nitrous oxide, from fuel type (i) (CO2-e tonnes)
- ***Qi*** is the quantity of fuel type (i) (kilolitres) combusted for transport energy purposes
- ***Eci*** is the energy content factor of fuel type (i) (gigajoules per) used for transport energy purposes – see Table 8
- ***Efijoxec*** is the emission factor for each gas type (j) (which includes the effect of an oxidation factor) for fuel type (i) (kilograms CO2-e per gigajoule) used for transport energy purposes. See Table 8.

Emissions Associated with Staff and Passenger Surface Access

Staff Surface Access

As highlighted in Section 8.3, staff surface access refers to those airport staff directly employed by the SCA. Data relevant to staff surface access was obtained directly from the SCA staff survey which collected suburb, vehicle make and model and the fuel type of each staff member. The total kilometres travelled by each staff member to and from SCA for the reporting period were estimated using Google Maps. The total fuel consumption was calculated based on the total kilometres travelled, and the fuel efficiency for that type of vehicle as determined using the Australian government's Green Vehicle Guide.

$$\text{Total fuel consumed by SCA staff private vehicles (L)} = \text{Total Kms}_{\text{car type}} \times \text{fuel efficiency}_{\text{car type}}$$

Where:

- **Total Kms car type** = Total Kms travelled by staff member (to and from Sunshine Coast Airport), estimated using Google Maps and the total working days per year for each staff member.
- **Fuel efficiency car type** = Average fuel efficiency (L/100km) of each type of car/vehicle

Emissions were calculated using the following formula.

$$E_{ij} = \frac{Q_i \times EC_i \times EF_{ijoxec}}{1\,000}$$

Where:

- ***Eij*** is the emissions of gas type (j), carbon dioxide, methane, or nitrous oxide, from fuel type (i) (CO_2-e tonnes).
- ***Qi*** is the quantity of fuel type (i) (kilolitres) combusted for transport energy purposes
- ***Eci*** is the energy content factor of fuel type (i) (gigajoules per) used for transport energy purposes – see Table 8
- ***Efijoxec*** is the emission factor for each gas type (j) (which includes the effect of an oxidation factor) for fuel type (i) (kilograms CO_2-e per gigajoule) used for transport energy purposes. See Table 8

Passenger Surface Access

SCA had a total of 1,889,334 passengers during FY24. Data for passenger travel was gathered from Scope 3 Passenger Survey conducted by Bindi McGrath Marketing in May 2024 (FY24) where 402 people (821 within travel party) were surveyed. The survey results provided:

- Locations where visitors and locals travelled from (ground travel) to arrive at Sunshine Coast Airport.

- Mode of transport used by passengers to arrive at Sunshine Coast Airport.
- Number of people in each surveyed passenger's travelling party (i.e., Providing the number of passengers captured by the survey).

In addition, data for ground transport in Queensland 2020 was gathered from the *Survey of Motor Vehicle Use, Australia* conducted by the Australian Bureau of Statistics.

Total km travelled by surveyed passengers were calculated by determining the number of surveyed passengers travelling from each postcode in the Sunshine Coast region and estimating the distance of a round trip from each location to Sunshine Coast Airport using Google Maps.

$$\text{Total km's (surveyed passengers)} = \sum \text{round trip distance}_{\text{Location A, B, C...}} X \text{ No. surveyed passengers}_{\text{Location A, B, C...}}$$

Where:

- **Round trip distance Location** A, B, C. = Total Kms travelled in round trip by one passenger (Location A, B, C etc. to and from Sunshine Coast Airport). Distance (km) estimated using Google Maps.
- **No. surveyed passengers Location** A, B, C. = The number of surveyed passengers from each location namely A, B, C and so on.

Using the total km travelled by all surveyed passengers, the distance travelled by those passengers for each mode of transport could be calculated as below:

$$\text{Distance travelled}_{\text{Mode of Transport}}(km) = \%\ \text{surveyed pax}_{\text{Mode of Transport}} X\ \text{Total km's (surveyed passengers)}$$

Total litres of fuel used for passenger travel by surveyed passengers were calculated using the following methodologies for each mode of transport.

Assumptions:

Passenger surveys were conducted in FY24 (9th- 13th of May 2024).

The ABS Survey of Motor Vehicle Use is conducted bi-annually. FY20 ABS survey data (latest report available) was utilised for this reporting period.

Private Vehicle

Data from the ABS Survey of Motor Vehicle Use (Australia) Table 5 Total Fuel Consumption by State (QLD) provided the percentage of passenger cars using each fuel type. This data indicated that less than 2% of total fuel consumption of passenger cars used LPG/CNG/Dual fuel/Hybrid and other, however more recent research shows Qld has 6% registration of private vehicles using EV. This will continue to be monitored for data calculations in 2025. For the purposes of calculating emissions, this proportion was categorised as LPG. Distance travelled by private vehicles, for each fuel type, could then be calculated as follows:

$$\text{Total km's for Private Vehicle}_{\text{Fuel Type}} = \%\ \text{Passenger cars}_{\text{Fuel Type}}\ X\ \text{Total Km's travelled by all Private Vehicles (km)}$$

Total litres used by surveyed passengers travelling by private vehicle (for each fuel type) were calculated using the average fuel efficiency (L/100km) data provided by the ABS survey – Table 6 Average Rate of Fuel Consumption by State.

$$\text{Total L used by survey passengers}_{\text{Fuel Type}} = \frac{\text{Total Kms for Private Vehicle}_{\text{Fuel Type}} \times \text{Fuel Efficiency}_{\text{Fuel Type}}}{100}$$

Where

- **Total kms for Private Vehicle** Fuel Type = Distance travelled by private vehicle for each fuel type (ULP, Diesel or LPG)
- **Fuel efficiency** Fuel Type = The average fuel consumption for passenger cars in Queensland for each fuel type (L/100km)

Shuttle Bus

This category includes those passengers travelling to and from the SCA via shuttle bus, courtesy bus, or coach. Data on fleet details including make, model and fuel type was collected from the two main shuttle bus providers at the SCA:

- Henrys' Airporter
- Con-X-ion Airport Transfers

It was assumed that Henry's Airporter and Con-X-ion Airport Transfers represent equal half of shuttle bus transport at Sunshine Coast Airport. Total kms for each vehicle type and corresponding fuel type were calculated as follows:

$$\text{Total kms for Shuttle Bus}_{\text{Vehicle Type}} = \%\ \text{Fleet}_{\text{Vehicle Type}} \times \text{Total Kms travelled by Shuttle Bus}$$

Total litres used by surveyed passengers travelling by shuttle bus were calculated using the fuel efficiency (L/100km) data provided by several sources:

- Australian government's Green Vehicle Guide
- Australia Buses & 4wd Hire Service
- ABS Survey of Motor Vehicle Use (Australia) – Table 6 Average Rate of Fuel Consumption by State (Bus category)

$$\text{Total L used by surveyed passengers}_{\text{Bus Model}} = \frac{\text{Total Kms for Shuttle Bus}_{\text{Model}} \times \text{Fuel efficiency}_{\text{Bus Model}}}{100}$$

Where

- **Total kms for Shuttle Bus** Model = Distance travelled by shuttle bus for each bus make/model

- **Fuel efficiency** Bus Model = The average fuel consumption for each bus make/model (L/100km)

Taxi

The data for taxi vehicle types was collected in the 2024 Passenger Survey. For this observational survey, the make, model, and fuel type were recorded for each Suncoast Cabs taxi that arrived at SCA. From this taxi count and the number of vehicle types recorded, the total kilometres travelled by taxis for each vehicle type were calculated as follows:

$$\text{Total km's for Taxis}_{\text{Vehicle Type}} = \%\ \text{Fleet}_{\text{Vehicle Type}}\ X\ \text{Total Km's travelled by Taxis}$$

Where

- **% Fleet**Vehicle Type = % of all taxis entering SCA representing each vehicle type (and corresponding fuel type) during observational survey
- **Total Kms travelled by Taxis** = Total distance travelled by taxis for surveyed passengers only
- Total litres used by surveyed passengers travelling by taxi (for each vehicle type and corresponding fuel type) were calculated using the fuel efficiency (L/100km) data provided by the Australian government's Green Vehicle Guide.

$$\text{Total L used by surveyed passenger}_{\text{Vehicle Type}} = \frac{\text{Total Kms for Taxis}_{\text{Vehicle Type}}\ X\ \text{Fuel efficiency}_{\text{Vehicle Type}}}{100}$$

Where

- **Total kms for Taxis** Vehicle Type = Distance travelled by Taxis for each vehicle type (and corresponding fuel type)
- **Fuel efficiency** Vehicle Type = The average fuel consumption for each vehicle type (and corresponding fuel type)

Hire Car

Data for fleet details of the hire car companies operating at the SCA were collected from

- Avis Australia
- Budget Company website
- Hertz Company website

- Europcar Company website
- Thrifty Company website
- SIXT
- Bargain

From the data collected, the average percentage of hire cars using ULP, and diesel fuel was calculated. Distance travelled by hire cars, for each fuel type, could then be calculated as follows:

$$\text{Total kms for Hire Cars}_{\text{Fuel Type}} = \%\ \text{Hire Car Fleet}_{\text{Fuel Type}} \times \text{Total Kms travelled by all Hire Cars}$$

Total litres used by surveyed passengers travelling by hire car (for each fuel type) were calculated using the average fuel efficiency (L/100km) data provided by the Australian government's Green Vehicle Guide, for each fuel type.

$$\text{Total L used by surveyed passenger}_{\text{Fuel Type}} = \text{Total Kms for Hire Cars}_{\text{Fuel Type}} \times \text{Fuel Efficiency}_{\text{Fuel Type}}$$

Where

- **Total kms for Hire Cars Fuel Type** = Distance travelled by hire cars for each fuel type (ULP or Diesel)
- **Fuel efficiency**$_{\text{Fuel Type}}$ = The average fuel consumption for all hire car company fleets for each fuel type (L/100km)

Public Bus

Data for the type of buses used by SunBus (Translink) was collected through an observational survey at Sunshine Coast Airport where the registration numbers were recorded for four buses travelling on Route #622 which is the only bus route that stops at Sunshine Coast Airport. With the registration numbers, the vehicle makes, and model were found using the Australian Bus Fleet List1 and further details regarding fuel type from each manufacturer's website.

Total litres used by surveyed passengers travelling by public bus were calculated using the fuel efficiency (L/100km) data provided by the ABS survey – Table 6 Average Rate of Fuel Consumption by State.

$$\text{Total Litres used by surveyed passengers} = [\text{Total Km's for Public Bus} \div 100] \times \text{Fuel efficiency}$$

Where

- **Total kms for Public Bus =** Distance travelled by public bus for surveyed passengers
- **Fuel efficiency** = The average fuel consumption (L/100km) for buses in Queensland (using diesel fuel)

Once total litres used by surveyed passengers were calculated for each mode of transport considering each fuel type, this figure was extrapolated to account for the 1,889,334 passengers travelling in FY24. Firstly, litres used per passenger (including their travelling party) were calculated:

$$\textit{Litres per passenger surveyed (inc. travelling party)} = \frac{\textit{Total Litres (surveyed passengers) Mode of Transport, Fuel Type}}{\textit{No. pax surveyed (inc. travelling party) Mode of Transport, Fuel}}$$

Where

- **Total litres (surveyed passengers)** Mode of Transport, Fuel type= Total litres used by surveyed passengers for each mode of transport and corresponding fuel type
- **No. pax surveyed (inc. travelling party)** Mode of Transport, Fuel type= The total number of passengers captured by the survey (including those people travelling with surveyed passengers)

Secondly, the total litres used by all passengers calculated using the L per passenger figure and the estimated number of passengers to use each mode of transport (and corresponding fuel type):

$$\textit{Total Litres (FY)} = \sum (\%\ \textit{surveyed pax}_{\textit{Mode of Transport}} \times 1{,}021{,}765\ \textit{total pax}) \times \%\ \textit{surveyed pax}_{\textit{Fuel type}} \times \textit{L per passenger surveyed (inc. travelling party)}$$

Where

- **% Surveyed pax**Mode of Transport = % of surveyed passengers for each mode of transport
- **% Surveyed pax**Fuel Type = % of surveyed passengers for each fuel type (for each mode of transport)

  Transport Options | Sunshine Coast Airport

  Finally, using the Total Litres of ULP, Diesel and LPG, emissions were calculated using the formula from the *National Greenhouse and Energy Reporting (Measurement) Determination 2008*:

$$E_{ij} = \frac{Q_i \times EC_i \times EF_{ijconst}}{1\,000}$$

Where

- ***Eij*** is the emissions of gas type (j), carbon dioxide, methane, or nitrous oxide, from fuel type (i) (CO_2-e tonnes).
- ***Qi*** is the quantity of fuel type (i) (kilolitres) combusted for transport energy purposes

- ***Eci*** is the energy content factor of fuel type (i) (gigajoules per) used for transport energy purposes – see Table 8
- ***Efijoxec*** is the emission factor for each gas type (j) (which includes the effect of an oxidation factor) for fuel type (i) (kilograms CO2-e per gigajoule) used for transport energy purposes — see Table 8

Emissions associated with SCA Business Travel

Air Flights

Sunshine Coast Airport utilises interstate and international flights for business travel. The flight data was obtained from a report provided by Sunshine Coast Airport's Finance Department.

Emissions were estimated for each one-way trip utilising the International Civil Aviation Organisation (ICAO) carbon calculator:

ICAO Carbon Emissions Calculator

The following gives a general description of the methodology used by the ICAO carbon calculator:

> *"The ICAO methodology employs a distance-based approach to estimate an individual's aviation emissions using data currently available on a range of aircraft types. To implement this methodology, ICAO uses the best publicly available data regarding fuel consumption, and it is committed to continuously monitor and seek improvements in the data used, to obtain better emissions estimation." - (ICAO, 2024)*

A flowchart of the calculation procedure used by the ICAO Carbon Calculator is depicted in Figure 7.

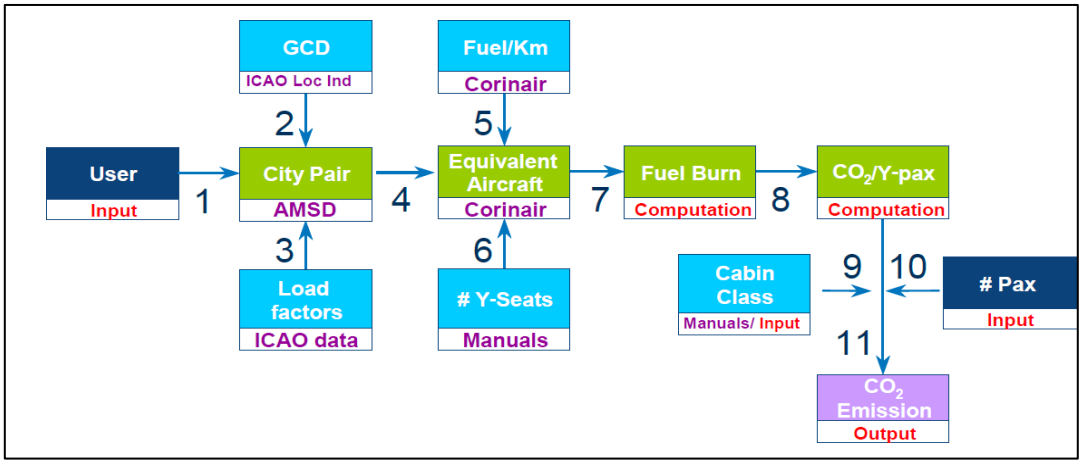


Figure 7: ICAO Carbon Emissions Calculator procedure

Hire Cars

Sunshine Coast Airport utilises the services of Avis Rent a Car for business travel. Activity data for SCA hire cars was obtained from a report from Sunshine Coast Airport's Accountant in addition to invoices provided by Avis for the budget year. The Avis invoices provided the number of kilometres travelled on each hire occasion based on the start and finish odometer reading and the type of car hired. The total fuel consumption was calculated based on the fuel efficiency for that type of car as determined using the Australian government's Green Vehicle Guide.

Total fuel consumed by SCA hire cars (L) = Total Km's $_{car\ type}$ X fuel efficiency $_{car\ type}$

Where:

- Total Kms car type = Total Km's travelled for each car type
- Fuel efficiency car type = Average fuel efficiency of each type of car

Emissions were calculated using the following formula:

$$E_{ij} = \frac{Q_i \times EC_i \times EF_{ijoxec}}{1\,000}$$

Where:

- ***Eij*** is the emissions of gas type (j), carbon dioxide, methane, or nitrous oxide, from fuel type (i) (CO_2-e tonnes).
- ***Qi*** is the quantity of fuel type (i) (kilolitres) combusted for transport energy purposes
- ***Eci*** is the energy content factor of fuel type (i) (gigajoules per) used for transport energy purposes – see Table 8
- ***Efijoxec*** is the emission factor for each gas type (j) (which includes the effect of an oxidation factor) for fuel type (i) (kilograms CO_2-e per gigajoule) used for transport energy purposes – see Table 8

Assumptions

Data extracted from Mileage Reports extracted by Corporate Traveller for FY24 and emailed to the HSEC Team. It also noted that EV continues to be a higher percentage of hire cars registrations and this will be evaluated as an inclusion in FY25.

Taxi Travel

Sunshine Coast Airport utilises various taxi companies for SCAs associated intrastate, interstate, and international business taxi travel. Activity data for SCA Airport taxi travel in the budget year was obtained from a report provided by SCAs Accountant. This report provided the total cost of the fare. The total number of kilometres travelled for each journey was estimated by:

Km's travelled = (Total fare – GST) – Flag fall tariff)/tariff per km

Flag fall tariffs and tariffs per km were obtained from the respective State Policies and websites for the various cab companies shown in Table 11 below.

Taxi Company	Flag fall Tariff	Tariff per km	Reference
AERIAL CAPITAL GROUP LTD (ACT)	5.00	2.06	Taxi fares and service areas (Department of Transport and Main Roads) (tmr.qld.gov.au)
AUCKLAND NZ CO-OP TAXIS	3.21	2.72	http://www.numbeo.com/taxi-fare/city_result.jsp?country=New+Zealand&city=Wellington&displayCurrency=AUD
BLACK & WHITE CABS BRISBANE	2.90	2.06	Get Fare – Black & White Cabs (blackandwhitecabs.com.au)
BLACK CAB VIC	4.20	1.62	Fares | Commercial Passenger Vehicles Victoria (cpv.vic.gov.au)
BLUE TAXI COMPANY	4.4	1.54	Darwin Taxi Fare Rates – Taxi Fare Calculator Australia http://www.taxifare.com.au/rates/australia/darwin/
CORPORATE CABS NZ	3.21	2.72	http://www.numbeo.com/taxi-fare/city_result.jsp?country=New+Zealand&city=Wellington&displayCurrency=AUD
EFTPOS YELLOW CABS QLD	2.90	2.17	Brisbane Taxi Fare Rates – Taxi Fare Calculator Australia
GM CABS	3.50	2.14	Fares – GM Cabs (131001.com.au)

Taxi Company	Flag fall Tariff	Tariff per km	Reference
SILVER TOP TAXI SERVICE	4.20	1.62	Fare Info – Silver Top Taxi
TAXIS COMBINED	3.6	2.19	Become a Taxi Driver | NSW Taxi Council | Australia
UBER MELBOURNE	2.35	1.15	Melbourne: A Guide for Getting Around in the City | Uber

Table 11 Flag falls and Tariffs for taxis used for SCA business travel

The total fuel consumption was calculated based on the average fuel efficiency rate of a typical taxi (i.e., Ford Falcon).

Total fuel consumed by SCA = Total Km's X average fuel consumption (L/100km) (ford falcon)

Emissions were calculated using the following formula:

$$E_{ij} = \frac{Q_i \times EC_i \times EF_{ijoxec}}{1\,000}$$

Where

- ***Eij*** is the emissions of gas type (j), carbon dioxide, methane, or nitrous oxide, from fuel type (i) (CO_2-e tonnes).
- ***Qi*** is the quantity of fuel type (i) (kilolitres) combusted for transport energy purposes
- ***Eci*** is the energy content factor of fuel type (i) (gigajoules per kilolitre) used for transport energy purposes – see Table 8
- ***Efijoxec*** is the emission factor for each gas type (j) (which includes the effect of an oxidation factor) for fuel type (i) (kilograms CO_2-e per gigajoule) used for transport energy purposes – see Table 8.

Emissions associated with Ground Service Equipment

In the FY24 ground service equipment was managed by Swissport Ground Handling Services and Oceania Ground Handling Services. Data on the type of Ground Service Equipment used at SCA and estimates of fuel (volumes) used for the FY24 period were provided by Swissport and Oceania via email correspondence.

Emissions were calculated using the following formula:

$$E_{ij} = \frac{Q_i \times EC_i \times EF_{ijoxec}}{1\,000}$$

Where:

- ***Eij*** is the emissions of gas type (j), carbon dioxide, methane, or nitrous oxide, from fuel type(i) (CO_2-e tonnes).
- ***Qi*** is the quantity of fuel type (i) (kilolitres) combusted for transport energy purposes
- ***Eci*** is the energy content factor of fuel type (i) (gigajoules per kilolitre) used for transport energy purposes – see Table 8
- ***Efijoxec*** is the emission factor for each gas type (j) (which includes the effect of an oxidation factor) for fuel type (i) (kilograms CO_2-e per gigajoule) used for transport energy purposes — see Table 8

Emissions associated with tenant electricity

Indirect emissions from the consumption of tenancy purchased electricity were calculated using the formula from the National Greenhouse and Energy Reporting (Measurement) Determination 2008.

$$Y = Q \times \frac{EF_{Qld}}{1\,000}$$

Where:

- **Y** is the Scope 3 emissions measured in CO_2e tonnes.
- **Q** is the quantity of electricity purchased (kilowatt hours).
- $\mathbf{EF}_{Qld}$ is the Scope 3 emission factor, for Queensland (kg CO_2e per kilowatt hour). The current Scope 2 emissions factor for purchased electricity in Queensland is 0.71 kg CO_2e/kWh

Electricity usage: Tenants are billed separately monthly by Sunshine Coast Airport via individual sub-meter readings.

Emissions associated with transmission and distribution losses

Transmission and Distribution Losses from purchased electricity for both SCA and tenants was calculated using the following formula from Greenhouse Gas Protocol Technical Guidance for Calculating Scope 3 Emissions:

$$tCO_2e = \Sigma\ (electricity\ consumed\ (kWh) \times emission\ factor\ scope\ 3\ ((kg\ CO_2e)/kWh)/1000$$

Emissions associated with waste to landfill

Waste generated by SCA, tenants and passengers were accounted for in this inventory. The approach used is described as the 'waste-type-specific-method' from the Greenhouse Gas Protocol Technical Guidance.

Waste data collection

To gather data about the volume (%) of waste in each waste stream a waste assessment at the airport was conducted internally by SCA in FY24. The assessment focused on the estimation (%) of the rates of waste generation and the waste stream composition from airport sites to assist in

providing waste stream data for SCAs Carbon Accreditation Program and the planning for environmental improvements and other sustainability outcomes.

The following SCA facilities were assessed:

- Administration Building
- Airport terminal including offices, tenants, and airlines

Total tonnes for both sites (admin and terminal) FY24	2.03	2030	0.001074		
Category of waste	% of total waste volume	Tonnes	Emission's Factor (Conversion	tonnes CO2e	
Food	28.11%	29.90	2.1	62.790	
Paper & Cardboard	43.11%	45.92	3.3	151.523	
~~green & garden waste~~	~~4.11%~~	~~4.26~~	~~1.6~~	~~6.822~~	Note: green waste is all stored onsite, mulched and chipped to be reused for landscaping purposes.
Wood	0.11%	0.00	0.7	0.000	
Sludge	1.11%	1.04	0.4	0.416	
Textiles	3.11%	3.12	2	6.240	
~~Nappies~~	~~2.11%~~	~~2.08~~	~~2~~	~~4.160~~	Note: nappy segregation service no longer exists/ Trident Services invoices no longer itemised.
Rubber & Leather	2.11%	2.08	3.3	6.864	
Inert Waste	16.11%	17.06	0	0.000	
TOTAL	100%	105.46		227.833	

TOTAL tCO_2e FROM AIRPORT WASTE =	227.83

Figure 8: Waste generated by SCA passengers FY24- based on August 2024 Waste Report

Nappy Waste

Nappy segregation service no longer exists. Tax invoices are no longer itemised. Trident Services Australia performs waste servicing at SCA.

Trident Services Australia

E: accountsreceivable@tridentservices.com.au

P: 07 3395 6311

A: 69 Southgate Avenue, Cannon Hill, QLD 4170

Green & Inert Waste

Inert Waste was provided from the SCA Landscaping contractor who records all green and inert waste taken to the Landfill. This is captured under the 'Green Waste' tab in the FY24 Waste Audit Calcs Spreadsheet. Note: As of Jan-19 green waste was stored onsite to be mulched and reused for landscaping purposes.

Tonnes taken to landfill

The bin servicing schedule was obtained for the airport sites (administration building and terminal) from Sunshine Coast Council's Waste and Resource Management Branch. The Council officer responsible is:

Waste and Resources Management | Sunshine Coast Council

Phone: 54757272

Sunshine Coast Council owns and operates all landfills in the region, the organisation is responsible for recording this data. The data includes tonnes of waste collected from Sunshine Coast Airport by waste collection contractors.

SCA August 2024 Waste Report

The sites assessed included the following Sunshine Coast Airport facilities:

- Administration Building including Sunshine Coast Destination Ltd
- Airport terminal including offices and tenants

Prior to undertaking the assessments at each of the sites, the base services at each site were determined. These are presented in Table 12.

Airport Site	General Waste			Recycling Service Waste		
	Bin size	No. Bins	Collection frequency / Day	Bin size	No. Bins	Collection frequency / Day
Administration building	240 ltr	4	Friday weekly	240 ltr	4	Friday Fortnightly
Terminal	3m^3	4	Tuesday, Thursday, Saturday, and Sunday weekly	3m^3	2	Monday, Wednesday, and Friday weekly

Table 12 Site services included in the reassessment

The rate of waste generation was determined by examining the amount of waste generated in a known period. This was determined by a combination of two processes:

- Visual inspections
- Segregation assessments

Samples from each of the above waste streams were examined either visually or via segregation (or both) processes on the nominated assessment dates (15th, 19th and 22nd of August 2024), to determine the overall waste characteristics at each site.

The visual inspection processes determined the total volume of waste generated in known period. The segregation assessments determined the mass for the observed volumes. As a result, an average rate of generation per day was calculated in litres and kilograms by stream and site.

The waste stream composition was determined through the segregation assessment of materials. The segregation assessment generated information on the composition of the waste stream by manually segregating the wastes into predetermined segregation categories and determining the mass of each of the category elements. The original volume of each of the segregation samples was also recorded to assist in the determination of the rate of waste generation.

Throughout each assessment, the waste streams were maintained separately. The primary solid waste streams observed in the assessment are:

1. General Waste or waste to landfill
2. Recycling Waste

These two primary waste streams were further broken down into material types in the assessment (Figure 8 below). These waste streams were used for the assignment aligned with those outlined in the National Greenhouse and Energy Reporting (Measurement) Determination 2008 except for 'BO3 other putrescible'. Consequently, the volume of waste for 'other putrescible' in SCAs waste assessment was combined with food (Table 13) for the purpose of emission calculations.

Waste types	Default DOC proportion	Conversion factor CO_2-e (t=tonnes)
	A	B
Food	0.15	t × 2.1
Paper and cardboard	0.4	t × 3.3
Garden and green	0.2	t × 1.6
Wood	0.43	t × 0.7
Textiles	0.24	t × 2.0
Sludge	0.05	t × 0.4
Nappies	0.24	t × 2.0
Rubber and leather	0.39	t × 3.3
Inert waste (including concrete/metal/plastics/glass)	0	t × 0
Alternative waste treatment residues	0.08	t × 0.7

Note: Source: National Greenhouse and Energy Reporting (Measurement) Determination 2008. The proportions represent the quantity of DOC of the various waste types in the mix that may be available for conversion to methane. If waste is measured by volume and not by weight, conversion factors are available in Appendix 2.

Table 13: Waste streams and conversion factors

The waste assessment provided the % of each waste stream (general waste) for the time that the assessment was conducted at both the Airport Terminal and Administration buildings (which includes airport generated waste, passenger waste and tenant waste).

Emissions Calculations FY24

The following table summarises the CO2 and CO2*e* emissions produced by SCA within the FY24 reporting period.

			ENERGY & EMISSION FACTORS						FY24	
Emission Scope and Source	Unit	FY24	Energy Content Factor	Energy Content U	Emissions Factor FY	Emissions Factor Ur	Annual Leakage Rate	GWP	FY24 tCO2e	% of Total Inventory
Scope 1 Direct Emissions										
Diesel for Sunshine Coast Airport Mobile Vehicles	Litres	16,111.2	38.60	GJ/Kl	69.90	Kg CO2e / GJ	NA	NA	43.47	0.16%
Diesel for Sunshine Coast Airport generator 500 KVA & 200 KVA (stationary)	Litres	690.7	38.60	GJ/Kl	69.90	Kg CO2e / GJ	NA	NA	1.86	0.01%
Diesel for Sunshine Coast Airport Stationary Vehicles	Litres	1,710.9	38.60	GJ/Kl	69.90	Kg CO2e / GJ	NA	NA	4.62	0.02%
Refrigerants leakage for air conditioning systems of R410A	Kg	264.295	NA	NA	NA	NA	0.09	1924	45.77	0.17%
Refigerant leakage for air conditioning systems of R407C	Kg	99.6	NA	NA	NA	NA	0.09	1624	14.56	0.05%
Refrigerants leakage for domestic refigerators and freezers HFC-134a	Kg	0	NA	NA	NA	NA	0.02	1300	0.00	0.00%
Refrigerant leakage for airconditioning systems of R32	Kg	11.065	NA	NA	NA	NA	0.09	677	0.67	0.00%
TOTAL SCOPE 1									110.95	0.41%
Scope 2 Indirect Emissions										
NGER Compilation 14 date: 1/7/2022										
Total purchased electricity (4 NMIs - includes tenancies)	kWh	3,179,002	NA	NA	0.71	Kg CO2e / kWh	NA	NA	2257.09	8.37%
Tenancies purchased electricity (scope 3)	kWh	1,073,106	NA	NA	0.71	Kg CO2e / kWh	NA	NA	761.91	2.82%
Net purchased electricity (total less tenancies)	kWh	2,105,896	NA	NA	0.71	Kg CO2e / kWh	NA	NA	1495.19	5.54%
TOTAL SCOPE 2									1495.19	5.54%
TOTAL SCOPE 1 & 2 EMISSIONS									1606.13	5.95%

Scope 3 Other Indirect Emissions											
Aircraft - Landing and Take-off Cycles (LTO) (Kerosene - for use as fuel in an aircraft)	Litres	5,583,419	36.8	GJ/Kl	69.6	Kg CO2e / GJ	NA	NA	14300.70	53.02%	
Aircraft - Landing and Take-off Cycles (LTO) (Gasoline - for use as fuel in an aircraft)	Litres	ACERT FY24.xlsx & airport-movements-2024.pdf	33.1	GJ/Kl	67	Kg CO2e / GJ	NA	NA		0.00%	
Aircraft - Auxiliary Power Units (APU) (Kerosene - for use as fuel in an aircraft)	Litres	595,159	36.8	GJ/Kl	69.6	Kg CO2e / GJ	NA	NA	1524.37	5.65%	
Diesel Fuel - (Transport) - Transport & distribution	Litres	16,111	38.60	GJ/Kl	3.6	Kg CO2e / GJ	NA	NA	2.24	0.01%	
Diesel Fuel - (Stationary) - Transport & distribution	Litres	2,402	38.60	GJ/Kl	3.6	Kg CO2e / GJ	NA	NA	0.33	0.00%	
Airport Staff Ground travel (ULP)	Litres	17,240	34.2	GJ/Kl	67.4	Kg CO2e / GJ	NA	NA	39.74	0.15%	
Airport Staff Ground travel (Diesel)	Litres	10,087	38.6	GJ/Kl	69.9	Kg CO2e / GJ	NA	NA	27.22	0.10%	
Passenger Ground travel (ULP)	Litres	2,482,565	34.2	GJ/Kl	67.4	Kg CO2e / GJ	NA	NA	5722.51	21.22%	
Passenger Ground travel (Diesel)	Litres	852,885	38.6	GJ/Kl	69.9	Kg CO2e / GJ	NA	NA	2301.20	8.53%	
Passenger Ground travel (LPG)	Litres	32,969	26.2	GJ/Kl	60.2	Kg CO2e / GJ	NA	NA	52.00	0.19%	
Airport Staff Corporate travel (ULP)	Litres	279	34.2	GJ/Kl	67.4	Kg CO2e / GJ	NA	NA	0.64	0.00%	
Airport Staff Corporate travel (Diesel)	Litres	199	38.6	GJ/Kl	69.9	Kg CO2e / GJ	NA	NA	0.54	0.00%	
Airport Staff Corporate travel (Flights) (Kerosene - for use as fuel in an aircraft)	Litres	ICAO Calculator used to calculate tCO2e	36.8	GJ/Kl	69.6	Kg CO2e / GJ	NA	NA	16.78	0.06%	
Ground Service Equipment (Diesel)	Litres	24,853.0	38.6	GJ/Kl	69.9	Kg CO2e / GJ	NA	NA	67.06	0.25%	
Ground Service Equipment (ULP)	Litres	0	34.2	GJ/Kl	67.4	Kg CO2e / GJ	NA	NA	0.00	0.00%	
Tenancies purchased electricity (scope 3)	kWh	1,073,106	NA	NA	0.71	Kg CO2e / kWh	NA	NA	761.91	2.82%	
Losses from T&D from scope 2 purchased electricity (airport)	kWh	2,105,896	NA	NA	0.1	Kg CO2e / kWh	NA	NA	210.59	0.78%	
Losses from T&D from scope 3 electricity (tenants)	kWh	1,073,106	NA	NA	0.1	Kg CO2e / kWh	NA	NA	107.31	0.40%	
Waste - Food	Tonnes	29.90	NA	NA	2.1	t CO2e / Tonnes	NA	NA	62.79	0.23%	
Waste - Paper & Cardboard	Tonnes	45.92	NA	NA	3.3	t CO2e / Tonnes	NA	NA	151.54	0.56%	
Waste - green & garden waste	Tonnes	0.00	NA	NA	1.6	t CO2e / Tonnes	NA	NA	0.00	0.00%	
Waste - Wood	Tonnes	0.00	NA	NA	0.7	t CO2e / Tonnes	NA	NA	0.00	0.00%	
Waste - Sludge	Tonnes	1.04	NA	NA	0.4	t CO2e / Tonnes	NA	NA	0.42	0.00%	
Waste - Textiles	Tonnes	3.12	NA	NA	2	t CO2e / Tonnes	NA	NA	6.24	0.02%	
Waste - Nappies	Tonnes	0.00	NA	NA	2	t CO2e / Tonnes	NA	NA	0.00	0.00%	
Waste - Rubber & Leather	Tonnes	2.08	NA	NA	3.3	t CO2e / Tonnes	NA	NA	6.86	0.03%	
Waste - Inert Waste	Tonnes	17.06	NA	NA	0	t CO2e / Tonnes	NA	NA	0.00	0.00%	
TOTAL SCOPE 3									25363.0	94.04%	
TOTAL SCOPE 1, 2 & 3 EMISSIONS									26969.1	100%	
				FY24					FY24 CARBON / PAX		
Offsets Required	FY24		waste variation	99.12					0.8501	kgCO2-e/PAX	

Table 14: Scope 1, 2 and 3 Emissions produced by SCA within the FY24 reporting period

Carbon Footprint – Comparison FY20/21 – FY24

Table 15 below provides a comparison of the Scope 1, and 2 emissions produced in FY24 compared to the rolling average tCO2e of the previous three reporting periods. It is important to note that fluctuations in usage are expected year on year, hence why FY24 is compared to rolling average tCO2e. If an increase of more than 10% is noted, an examination of data is conducted.

Accounting for all Scope 1 emissions, a minor decrease (-3%) was observed in total emissions generated when comparing FY24 to the rolling average of the previous three years. This minor decrease was potentially due to refrigerant upgrades across the entire site. Large variations between years FY20/21-FY24 are evident in diesel generator usage, as the generators are only used in emergency power outages and routine run testing. In FY24, emergency generators were required to be run on multiple occasions. Investigations of Darwin Airport's hydrogen generator is currently being made to replace our diesel generators in time.

As highlighted below, Scope 2 emissions have experienced a minor increase in comparison to previous years, however this can be attributed to a 5% increase in tenancy electricity consumption coupled with an 9% increase in airport electricity usage. Overall minor increase in scope 2 indirect emissions (9%) is not considered significant. This minor increase period may be attributed to the greater number of tenants occupying SCA, development of the Ready Bay Car Rental site and installation of the two new marquees in the Terminal.

Scope 1 Direct Emissions	FY20/ 21	FY22	FY23	Rolling average (RA)	FY24	Change FY23 vs RA	Comment (considered noteworthy if >10% increase)
Diesel for Sunshine Coast Airport vehicles (mobile)	36.2	41.8	57.3	45.1	43.47	-4%	Minimal decrease in diesel consumption. Additional improvements in data collection methodology allowing for increased accuracy of reported usage & improved fuel efficiencies of newer vehicles. EV's will be considered after HV installed 2026/7.
Diesel for Sunshine Coast Airport generator 500 KVA & 200 KVA (stationary)	2.1	0.7	1.6	1.5	1.86	25%	Large variations between years due to fluctuations in generator usage as they are only used in emergencies, power outages and for testing. In FY24, emergency generators were required to be run on multiple occasions.
Diesel for Sunshine Coast Airport mowers (stationary)	1.0	0.3	0.0	0.4	4.62	1045%	Diesel for the mowers and tractors increased from previous year, due to completing mowing internally (not outsourcing). Mowing was completely outsourced in FY23. NB EV transition after HV installed 26/27.
Refrigerants leakage for air conditioning systems of R410A	55.0	55.0	55.0	55.0	45.77	-17%	Decrease in leakage is evident from FY19 to FY24. This decrease in refrigerant leakage in FY24 is due to the refrigerant upgrades/ replacements on site.
Refrigerant leakage for air conditioning systems of R407C	12.3	12.3	12.3	12.3	14.56	18%	Minor increase in refrigerant leakage from previous years. This increase is due to the installation of two more R407C units in FY24.
Refrigerants leakage for domestic refrigerators and freezers HFC-134a	0.06	0.07	0.07	0.07	0	5%	Removal of all HFC-134a refrigerants during refrigerant upgrades/ replacements.
Refrigerant leakage for air conditioning systems of R32	N/A	N/A	N/A	N/A	0.67	N/A	New refrigerant category installed on site. GWP is much lower than HFC-134a refrigerants.
Total change	106.6	110.1	126.3	114.3	110.95	-3%	Minor decrease in scope 1 total change vs RA. This is believed to be due to the refrigerant upgrades that occurred in FY24.

Scope 2 Indirect Emissions							
Total purchased electricity (4 NMIs - includes tenancies)	2183.1	1943.1	1998.1	2063.1	2257.09	9%	Overall increase in total purchased electricity is evident due to an increase in tenancy and passenger numbers.
Tenancies purchased electricity (scope 3)	753.5	700.3	734.8	726.9	761.91	5%	Increased tenancy usage after Covid-19 period, including the developing of Ready Bay Car Rentals and installation of the two new marquees in the Terminal.
Correct purchased electricity (total less tenancies)	1429.5	1242.8	1263.3	1336.2	1495.19	12%	Overall increase of purchased electricity, due to more tenants operating at SCA compared to previous years.
Total change	4366.2	3886.2	3996.2	4126.2	4514.19	9%	Overall increase in scope 2 indirect emissions. Installation of rooftop solar at terminal in May 2025 will reduce purchased electricity approx. -15%.

Table 15: SCA Scope 1 and 2 GHG emissions produced and rolling average.

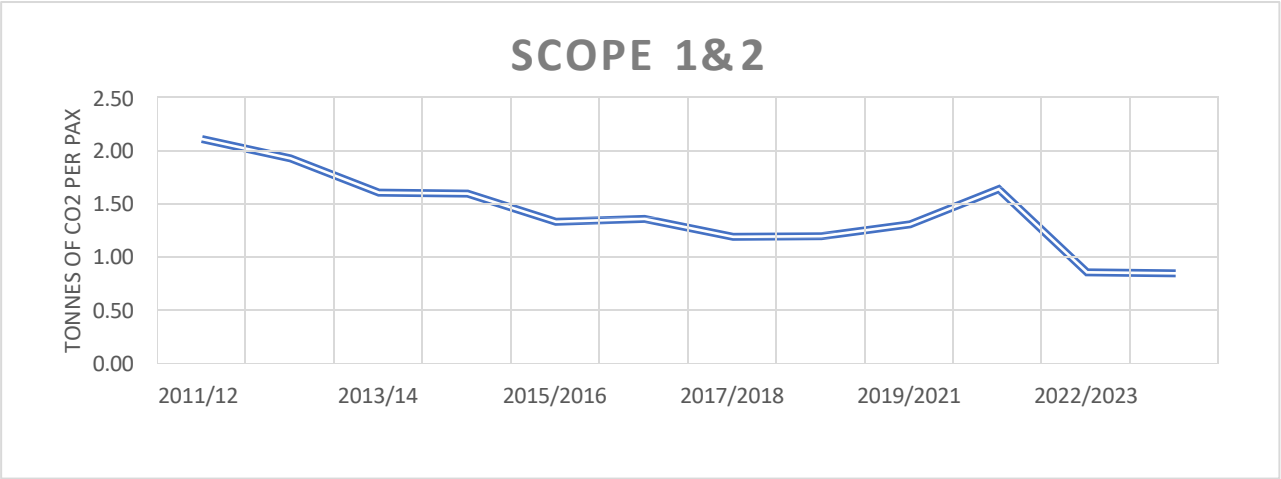
Table 16 below demonstrates a reduction of ~56% in kg of Scope 1 and 2 emissions per passenger compared to the baseline year (2012). SCA notes a slight increase in Scope 1 and Scope 2 absolute footprint in FY23 (1,390 T) compared to FY24 (1,606 T). CO2 produced per passenger slightly improved in FY24 (0.85 kg scope 1 & 2/Pax) from previous budget year FY23 (0.86 kg scope 1 & 2/Pax), as passenger numbers have recovered from the COVID-19 pandemic.

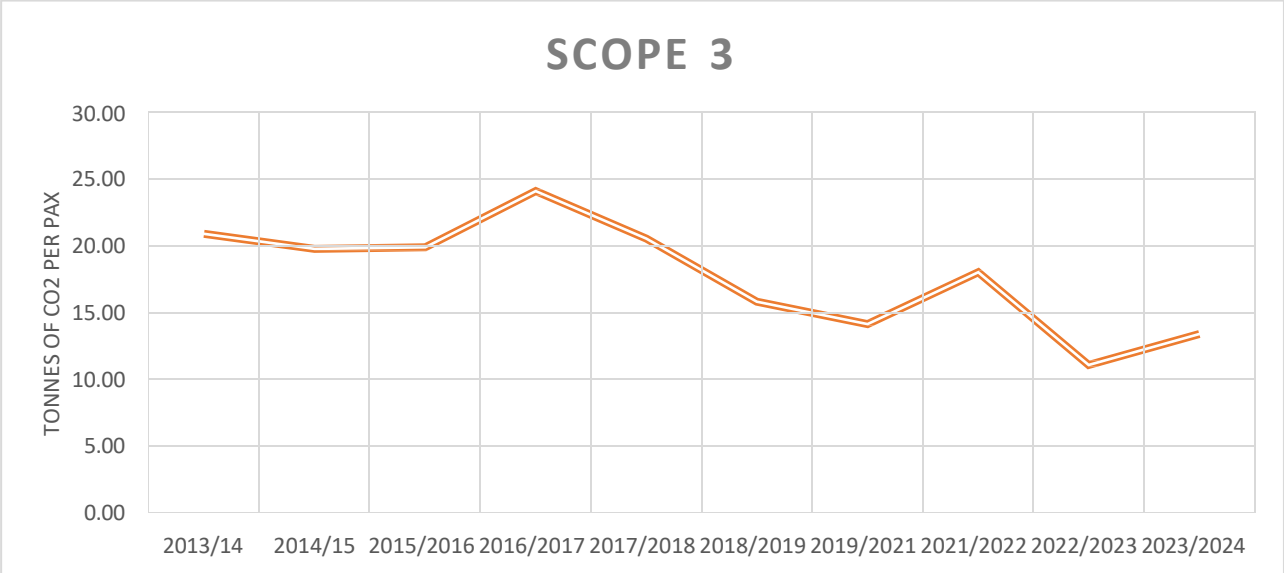
Comparison of Scope 3 emissions from FY24 to previous year shows a slight increase in tonnes CO2e/PAX. This is potentially due to an increase of operational hours to allow for the increased growth. A range of environmental initiatives and upgrades are being rolled out across the airport including LED lighting upgrades, installation of 195kw terminal roof top solar system, improved air-conditioning systems as well as an improved waste recycling system.

As outlined in the Carbon Management Plan, the Sunshine Coast Airport is encouraging and assisting tenants to participate in programs to reduce their electricity consumption, as well as improve waste generation education.

Scope 1 & 2												
	2011/12	2012/13	2013/14	2014/15	2015/2016	2016/2017	2017/2018	2018/2019	2019/2021	2021/2022	2022/2023	2023/2024
Pax	790,819	810,835	901,987	851,930	964,362	1,067,759	1,194,206	1,263,731	1,164,547	824,099	1,625,570	1,889,334
Scope 1 & 2 (tonnes)	1,668	1,562	1,450	1,360	1,285	1,452	1,423	1,512	1,536	1,353	1,390	1,606
Tonnes Scope 1 & 2 CO2e /Pax	2.11	1.93	1.61	1.60	1.33	1.36	1.19	1.20	1.32	1.64	0.86	0.85
Reduction from baseline 2012	-	8.66%	23.80%	24.32%	36.83%	35.55%	43.51%	43.27%	37.47%	22.18%	59.47%	55.88%
Reduction from previous year	-	8.66%	16.57%	0.69%	16.53%	-2.03%	12.35%	-0.42%	-10.21%	-24.47%	47.92%	0.59%
Scope 3												
	2011/12	2012/13	2013/14	2014/15	2015/2016	2016/2017	2017/2018	2018/2019	2019/2021	2021/2022	2022/2023	2023/2024
Pax	790,819	810,835	901,987	851,930	964,362	1,067,759	1,194,206	1,263,731	1,164,547	824,099	1,625,570	1,889,334
Scope 3 (tonnes)	-	-	18871.91	16857.60	19,208	25,752	24,555	20,024	16,479	14,878	18,036	25,363
Tonnes Scope 3 CO2e /Pax	-	-	20.92	19.79	19.92	24.12	20.56	15.85	14.15	18.05	11.10	13.42
Reduction from baseline 2012	-	-	-	5.43%	4.80%	-15.27%	1.72%	24.27%	32.37%	13.71%	46.97%	35.84%
Reduction from previous year	-	-	-	5.43%	-0.66%	-21.09%	14.74%	22.94%	10.70%	-27.58%	38.54%	-20.99%

Table 16: SCA GHG emissions compared to 2012 baseline





Carbon Offsets

Sunshine Coast Airport continues to reduce its carbon emissions through the following strategies:

- Energy efficiency.
- Considering renewable energy options
- Behaviour-change initiatives
- Collaborating with stakeholders and tenants

Following this assessment, and in alignment with the requirement of 3+ criteria SCA has decided to offset its residual Scope 1, 2 and Scope 3 business travel through the purchase of carbon offsets to a standard that is accepted at the ACA. The number of offsets have been calculated and are presented in Table 17 below. The offset purchase certificate has been included in the Carbon Offsetting section of the ACA Application.

Offsets Required	FY24
Scope 1	110.9
Scope 2	1495.2
Scope 3- Business Travel	18.0
Total Required	1624.1
5%to cover uncertain in calculation	81.2
Total Required	**1705**

Table 17: Offsets required for SCA to purchase

The SCAs Environmental Management Plan (EMP) has been updated in June-23 to capture our newly revised standards, expectations, initiatives, and future projects that play a vital role in reducing our carbon footprint. This includes future project considerations, the new runway project as well as Carbon Management, Stakeholder Engagement initiatives, current projects, and potential opportunities for improvement. This document is attached to the submission within the 'Carbon Management' stage.

Independent Verification

The last independent verification was undertaken for the FY22 ACA submission. Being a 2-yearly requirement of ACA, this submission will undergo verification.

In FY24, SCA requested level 3 plus (+)/ 3-year renewable option.

Sunshine Coast Airport

Climate
Positive Action for Planet + People

We are delighted to confirm the retirement of

348 Verified Emission Reductions (VERs)

by

ClimatePartner GmbH

on **23/10/2024**

These credits were retired on behalf of Sunshine Coast Airport Pty Ltd.

Retired on behalf of Sunshine Coast Airport Pty Ltd for their ACA Carbon Neutral 3+ Accreditation

Project: GS5658 VPA 1: Borehole project "Ease Water Madagascar"

These credits have been retired, saving 348 tonnes of CO2 emissions from being released into the atmosphere. Thank you for investing in a safer climate and more sustainable world.

View retirement

Gold Standard

Retirement certificates are hosted on the Gold Standard Impact Registry, view your certificate.

Gold Standard | Chemin de Balexert 7-9 1219 Châtelaine, International Environnment House 2, Switzerland | goldstandard.org. +41 22 788 70 80, help@goldstandard.org

Sunshine Coast Airport

VERRA

Verified Carbon Standard

Certificate of Verified Carbon Unit (VCU) Retirement

Verra, in its capacity as administrator of the Verra Registry, does hereby certify that on 13 Mar 2025, 1,200 Verified Carbon Units (VCUs) were retired on behalf of:

Sunshine Coast Airport Pty Ltd

Project Name

Katingan Peatland Restoration and Conservation Project

VCU Serial Number

12354-406455546-406456745-VCS-VCU-263-VER-ID-14-1477-01012019-31122019-1

Additional Certifications

CCB-Biodiversity Gold; CCB-Climate Gold; CCB-Community Gold

Ask AI Assistant Simplify the document for me ...


ClimatePartner
Certificate
Partner in climate action
Sunshine Coast Airport
Sunshine Coast Airport Pty Ltd
2025 purchase for July 2023 – June 2024 footprint
This certificate confirms the financing of climate projects.
CO2-equivalents
500,000 kg
Supported climate project
Microloans for solar lamps + improved cookstoves
Countrywide
India
ClimatePartner-ID
27579-2503-1001
Issued on
25.03.2025
Use the following URL for more information:
climatepartner.com/27579-2503-1001

Appendices

Appendix A Sources of Data

Emissions Source	Data Source	Frequency
Fuel for SCA vehicle use (transport)	Fuel Records Spreadsheet (Finance) - Credit Card purchases - Fuel cards	Monthly
Fuel for SCA generator (stationary)	Fuel Records Spreadsheet (Finance) - SCA bulk diesel usage records	Monthly
Refrigerant Leakage	CV Services	Upon Request
Electricity Consumption	Origin Australia	Monthly / Quarterly
Aircraft Landing & Take-off Cycle	SCA Finance Officer CASA – Civil Aircraft Register SCA Operations and Assets Avidata Airservices Australia - Australian Airports Movement Summary	End of FY Annually Updated on website annually Monthly and upon request
Auxiliary Power Units	SCA Finance Officer CASA Aircraft Register	End of FY Updated on website annually
SCA Staff Surface Access	SCA Executive Team	Upon request and at end of FY
SCA Business Travel - Flights	SCA Accountant	End of FY
SCA Business Travel – Hire Car	SCA Accountant Avis Australia	End of FY
SCA Business Travel – Taxi	SCA Accountant	End of FY
Ground Service Equipment	Swissport/ Oceania Flight Support	Upon request
Tenant Electricity	Origin Australia	Monthly
Transmission & Distribution Losses	Origin Australia	Monthly
Waste to Landfill	SCA Waste Report Waste & Resources Management Branch (SCC)	Audit conducted August 2024 Upon request

Appendix B Stationary Sources

Asset No.	Plant No	Fuel Type	Asset Description
FLEE-MELC-005		NA	Slasher Land Pride RC56
FLEE-MELC-008		2 stroke Unleaded	Brushcutter Stihl FS130R
FLEE-MELC-009		2 stroke Unleaded	Blower Vac Handheld Stihl SH86C
PROP-ELGN-GN01	TCM180C	Diesel	Generator City Generators Site S 200KVA
PROP-ELGN-GN01		Diesel	Terminal Generator 500KVA
ALER-ELGN-GENR		Diesel	Atlas Copco Generator 300KVA
FLEE-MELC-001	C96705	Diesel	Tractor Kubota M9540
FLEE-MELC-002	39788C	Diesel	Mower Ride on Kubota F3690 Out Front
FLEE-MELC0006		4 stroke Unleaded	Generator Honda EU20i 2KVA
FLEE-MELC-010		4 stroke unleaded petrol	Vacuum Billy Goat 187cc

Appendix C Mobile (transport) Sources

Asset ID	Registration	Fuel Type	User	Asset Name	Model	Shop Name
FLEE-MEVH-001	165-WJR	Diesel	Airfield Operations	Utility Ford Ranger 4x4 Dual Cab	Car 2	Bulk Fuel + Credit Card
FLE-MEVH-002	187-WJR	Diesel	Airfield Operations	Utility Ford Ranger 4x4 Dual Cab	Car 1	Bulk Fuel + Credit Card
FLEE-MEVH-005	657-WKY	Diesel	Facilities Maintenance	Utility Ford Ranger 4x4 Dual Cab	Car 5	Bulk Fuel + Credit Card
FLEE-MEVH-004	119-WES	Diesel	Facilities Maintenance	Wagon Toyota Rav4 GX	Car 8	Credit Card
FLEE-MEVH-03	241-TGC	Diesel	SCAEP Work Safety	Utility Ford Ranger 4x4 Dual Cab	Car 3	Credit Card
FLEE-MEVH-006	433-YSV	Diesel	Airfield Operations	Utility Ford Ranger 4x4 Dual Cab	Car 6	Credit Card

Appendix D Refrigerant Sources

Sunshine Coast Airport: Refridgerant amounts – conducted April 2024						
Area	**Plant no.**	**Model**	**Serial Number**	**Brand**	**Type**	**Total refrigerant (kg)**
Main Terminal	A/C 1	AC1350P	4100082533	Accent Air	R410a	31.5
Main Terminal	A/C 2	OSA 380RKTBV	804181	Temper Zone	R407c	28
Main Terminal	A/C 3	SCR1250RO	97073	Temper Zone	R407c	33.6
Main Terminal	A/C 4	AC0900P	41000825636	-	R410a	27.6
Main Terminal	A/C 5	AC0900P		Accent Air	R410a	23.6
Main Terminal	A/C 6-a	OSA780RB-X	97083	Temper Zone	R407c	19
Main Terminal	A/C 6-b				R407c	19
Main Terminal	A/C 7	OSA670RKTBV	96991	Temper Zone	R410a	31
Main Terminal	A/C 8	OSA950RKTBV	97063		R410a	20
Main Terminal	A/C 9	AC0900P		Accent Air	R410a	40.4
Main Terminal	Swissport Comms Room	MUZ-GE50VAD	4005153T	Mitsubishi	R410a	1.55
Main Terminal	Oversized Baggage Room	CU-RZ80YKR	F031802377	Panasonic	R32	1.49
Main Terminal	A/C 12	RXYQ8PAY19	E003512	Daiken	R410a	7.2
Main Terminal	Arrivals/ pamplet area	MUZ-AP50VGD	2003293	Mitsubishi	R32	1
Main Terminal	International Arrivals ducted	RZA100CZY1			R410a	2.6
Main Terminal	X-ray	OSA141RKT6A			R410A	4.5
AOC	A/C 1	SRC25ZSA-W	979512315BE	Mitsubishi	R32	0.75
AOC	A/C 2	SRC35ZSA-W	880409580BE	Mitsubishi	R32	0.75
AOC	A/C 3	SRC25ZSA-W	979512145BE	Mitsubishi	R32	0.75
AOC	A/C 4	SEC25ZSA-W	88040984BE	Mitsubishi	R32	0.75
AOC	ASO Office	FTXS35KVMA			R32	0.9
AOC	Lunch room shed		979801711BE	Mitsubishi	R32	0.675
AOC	MDF Room	RXS35LVMA			R410A	1.2
Admin Building (AMO)	A/C 1	OPA550 RKTBGO1-P	120774	Temper Zone	R410a	25
Admin Building (AMO)	A/C 2	OPA550 RKTBGO1-P	120776	Temper Zone	R410a	25
Admin Building (AMO)	A/C 3	AUUW486DH1	209KASL00014	LG	R410a	3.6
Admin Building (AMO)	A/C 4	AUUW486DH1	209KASL00016	LG	R410a	3.6
Admin Building (AMO)	A/C 5	PUZ-ZM 140 VKA- AR1.TI	39P 01549	Mitsubishi	R32	4
Admin Building (AMO)	Ducted Reception	LBUK4882BL		LG	R22	3.35
Admin Building (AMO)	Upstairs	AOTG18LVCC	E067182	Fujitsu	R410a	0.145
Admin Building (AMO)		RXS50LVMA	E049316	Daiken	R410a	1.8
ALER	A/C 1	RXS85LVMA	E043782	Daiken	R410a	2.8
ALER	A/C 2	RXS85LVMA	E043907	Daiken	R410a	2.8
ALER	A/C 3	RXS85LVMA	E043698	Daiken	R410a	2.8
ALER	A/C 4	RXS85LVMA	E043697	Daiken	R410a	2.8
ALER	A/C 5	RXS85LVMA	-	Daiken	R410a	2.8
					Total estimated – R410a	264.295
					Total estimated – R407c	93.6
					Total estimated – R32	11.065
					Total estimated – R22	3.35

Note: Refrigerants at SCA were updated in the end of 2023 (FY24). Updates are included in the table above.

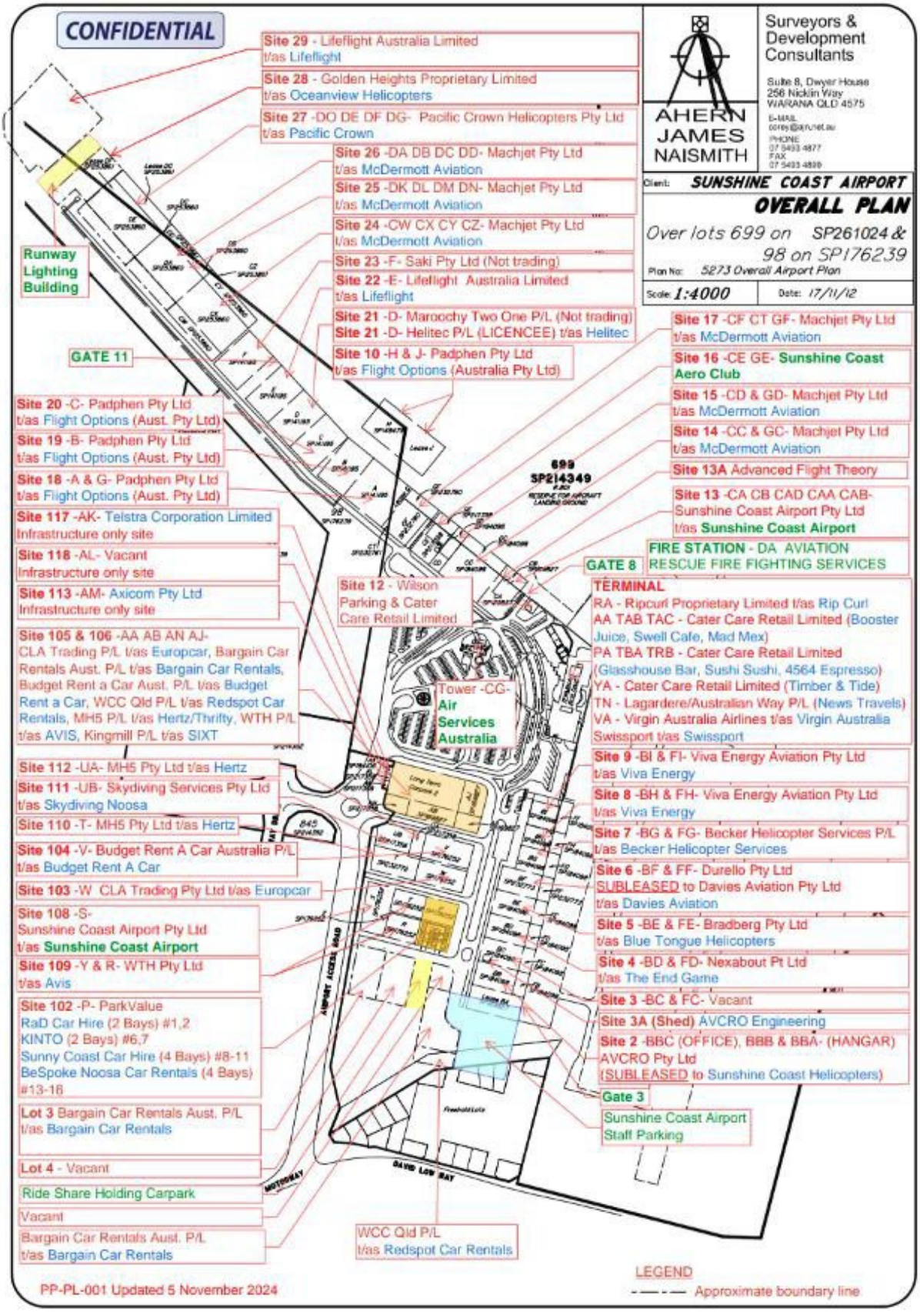
Appendix E SCA Owned and Occupied Facilities

Owned and Occupied by Sunshine Coast Airport	Location
Various spaces within the terminal	Terminal
Maintenance Shed	North of terminal on the map
Sunshine Coast Airport Office space	Site 108
Vacant land	Site 24, 26 & 118
Sunshine Coast Airport Office operations space	Site 108
Runways	Not shown on map
Aprons	Not shown on map
Taxi ways	Not shown on map
Staff Car park and street lighting	Site 102
Public car park	Shown in centre of map

Appendix F Tenants within SCA (meters and map)

Sub meter number	Tenant	Location on map
East: National Meter Identifier QB123175861		
19295	WTH Pty Ltd C-/ Avis Rent a Car	109
9500649, 9500650, 9500651, 9602826	Park Saver	106A&B
2006-756456, 2012-096940	SCA HQ	108
2503074, 9607545	Becker Helicopter Services Pty Ltd	7
9509082	Bradberg Pty Ltd	5
9410922, 9410957, 94010960	BC &FC- Vacant	3
9107009	Durello Pty Ltd	6
42636106	Budget Rent a Car Aust Pty Ltd	104
44152523	End Game	4
9700961, BH 0001	Viva Energy Aviation Pty Ltd Pty Ltd	8 & 9
9900347, U9803928	BBC Office AVCRO subleased to SC Helicopters	2
2010-01-00009570	Skydiving Services Pty Ltd	111
28792512	Telstra Corporation Limited	117
2013-08-10005958	MH5 Pty Ltd	110 & 112
9500400, 42636045	Axicom Pty Ltd	113
Terminal: National Meter Identifier QB18027391		
83N061574, 83N061575, 83N061576	AirServices Australia	DA
9601333	Virgin Australia Airlines Pty Ltd	Terminal
17076	Jetstar Airways Pty Ltd	Terminal
9604341, 9604343, 9604345, 9606563, 00002264	Cater Care Pty Ltd	Terminal
DB-TE	Australian Way Pty Ltd	Terminal
2008-09-00002319	RC Airports Pty Ltd- (Rip Curl)	Terminal
00602164	Cater Care Pty Ltd	Terminal
2600521 & 2701040	SCA (in house)	Terminal
West: National Meter Identifier QB120854210		
9515615, 87N15470	Machjet Pty Ltd	14 & 17
33092725, 36890741, 36890742	Maroochy Two One Pty Ltd	21
82N117649	Machjet Pty Ltd	15
SCHR	Life Flight Australia Limited	22
53813270	Sunshine Coast Aero Club	16
33275804	Saki Pty Ltd	23
9902967, 24526819	Padphen Pty Ltd	10, 18, 19 & 20
16868608	Advanced Flight Theory	13

Sunshine Coast Airport



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