Southampton Airport GHG Inventory 2025

SOU Southampton Airport

Report for Southampton Airport

VERSION: 1

Produced by Ricardo
https://www.ricardo.com/en/markets/security/aerospace

Project Summary

Southampton International Airport Limited (SOU) is operated by AGS Airports Limited. AGS Airports is held by AviAlliance, one of the world's leading private industrial airport investors and operators. The airport operates 364 days per year and in 2025 served more than 890,000 passengers and handled more than 20,000 aircraft movements. As of the end of 2025, AGS Airports employed around 471 full time employees (FTE), of which around 70 were based in Southampton Airport, many of whom commute to the airport by car or public transport.

This report presents the GHG inventory for the 2025 calendar year for Southampton Airport, covering the period 1st January 2025 to 31st December 2025.

To continue operating in an environmentally responsible manner, it is important for the airport to monitor and manage all its emissions from all operations – both those the airport is directly responsible for, and those it can influence under its Scope 3 emissions.

The calculation of the annual GHG inventory will help AGS Airports, and the individual airports understand the different areas which contribute to their overall GHG inventory and monitor changes on a yearly basis. This process will help identify improvement opportunities, which will ultimately reduce AGS Airports' GHG inventory and associated costs. In addition, the success of any management strategies previously implemented can be evaluated year-on-year through monitoring emissions reductions.

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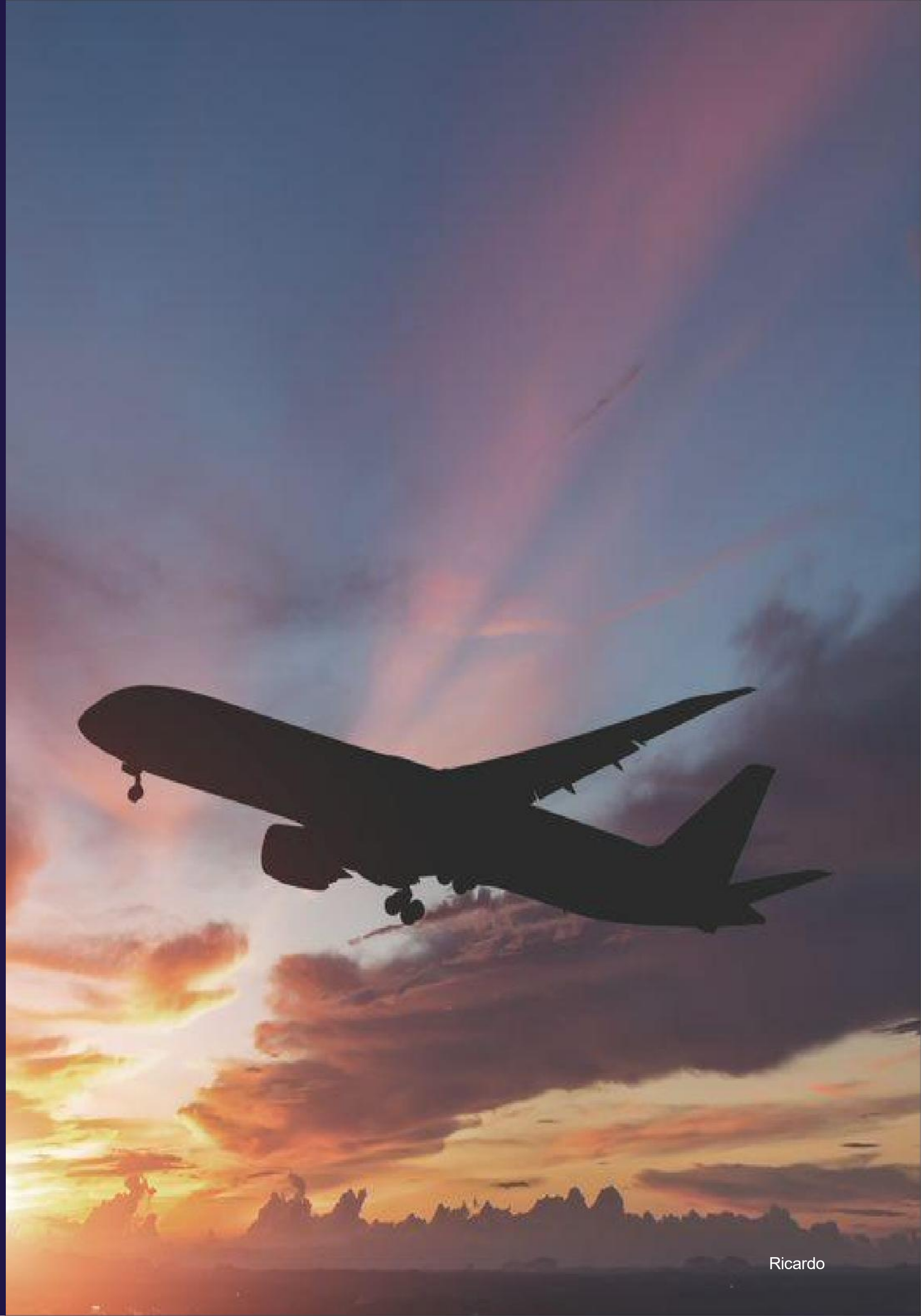


GHG INVENTORY

2025 EMISSIONS OVERVIEW

2025 EMISSIONS OVERVIEW

ACA LEVEL 4 SUMMARY

These following slides show the complete ACA Level 4 GHG Inventory.

All emissions have been calculated in line with the GHG Protocol Corporate Reporting Standard, ACA Level 4 and ISO 14064-1.

Emissions are reported using the market-based methodology unless clearly indicated otherwise. For an explanation of location and market-based reporting methodologies see this slide.

The GHG Protocol requires organisations to report their GHG emissions under 3 scopes: Scope 1, 2 and 3. The emission sources included within each scope of the footprint can be seen to the right.

Scope 1

"Direct Emissions"

- Owned operational vehicles and equipment
- Natural gas
- Fuel used in generators and other equipment
- Fuel used in fire training
- Refrigerant losses from chillers and air conditioners
- Surface de-icer used by the airport

Scope 2

"Indirect Emissions"

- Electricity consumption by the airport

Outside of Scope

"Biogenic Fuel Emissions"

Emissions from fuels with biogenic content. Scope 1 or 3 impact of the biogenic component of these fuels has been determined to be net "0".
For complete reporting of emissions at point of combustion, the emissions associated with the biogenic component of the fuel is reported as Outside of Scopes and are not includes in Scope 1-3 total.

Scope 3

"Indirect Emissions"

- Category 1: Purchased goods and services – includes supply chain, water consumption and non-road construction
- Category 2: Capital goods
- Category 3: Fuel- and energy-related activities (not included in scope 1 or 2)
- Category 5: Waste generated in operations
- Category 6: Business travel
- Category 7: Employee commuting
- Category 11: Use of sold products:
  - Aviation emissions: Landing take-off (LTO), climb, cruise and descent (CCD), auxiliary power unit (APU), engine testing
  - Third party operational vehicles
  - Aircraft de-icer used by third parties
  - Passenger surface access
  - Tenant staff commuting
  - Landside cargo transport
- Category 13: Downstream leased assets – includes tenant electricity consumption

Southampton Airport

2025 EMISSIONS OVERVIEW

ACA LEVEL 4 SUMMARY – MARKET BASED

Scope 3

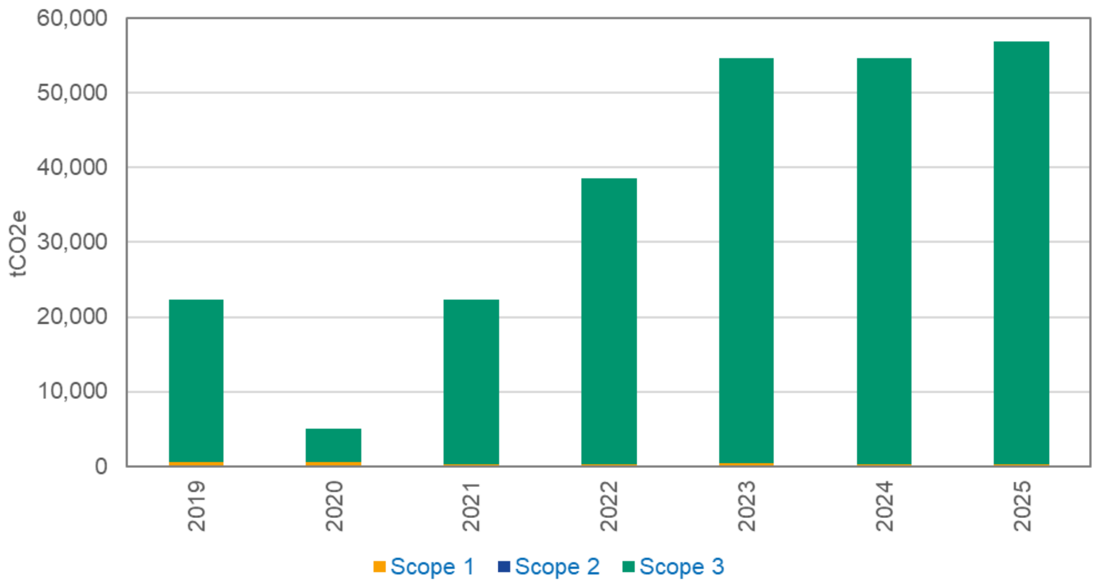
56,646 tCO_2e 99.6%

Scope 1

251 tCO_2e 0.4%

Scope 2

0 tCO_2e 0.0%



56,897 $tCO_2e/year$

Market-based emissions figures

0.4%

Scope 1

0.0%

Scope 2

99.6% **(55% CCD, 21% LTO)**

Scope 3

All emissions have been calculated in line with the GHG Protocol, to ACA Level 4 standard and ISO 14064-1. Outside of scope emissions have not been shown.

Emissions are reported using the market-based methodology. In 2025, Southampton Airport purchased green electricity, reducing market-based scope 2 emissions to zero. For an explanation of location and market-based and annual trends see this slide.

2025 EMISSIONS OVERVIEW

ALL EMISSION SOURCES – MARKET BASED (1 of 3)

Scope 1

Direct GHG emissions that occur from sources that are owned and/or controlled by the airport

Summary Category	ACA Category	Emissions (tCO_2e)	% of Scope	% of Total Emissions
Scope 1 – Total		251	100.00%	0.44%
Mobile sources	Operational vehicles (airport)	57	22.87%	0.10%
Stationary sources	Heating and generation	1	0.20%	0.00%
	Natural gas (airport)	157	62.57%	0.28%
	Fire training	21	8.54%	0.04%
Process emissions	Refrigerant losses	-	-	0.00%
	De-icing	15	5.81%	0.03%

Scope 2

Indirect GHG emissions that occur from the generation of purchased electricity, steam, heat, or cooling consumed by the airport

Summary Category	ACA Category	Emissions (tCO_2e)	% of Scope	% of Total Emissions
Scope 2 – Total		0	-	0.0%
Purchased electricity	Purchased electricity (airport)	0	100%	0.0%

2025 EMISSIONS OVERVIEW

ALL EMISSION SOURCES – MARKET BASED (2 of 3)

Scope 3

All other indirect emissions in the value chain of the airport operator that occur from sources not owned and/or controlled by the company

Summary Category	ACA Category	Emissions (tCO_2e)	% of Scope	% of Total Emissions
Scope 3 – Total		56,646	100.00%	99.56%
Category 1: Purchased goods and services	Water consumption	5	0.01%	0.01%
	Non-road construction vehicles	201	0.35%	0.35%
Category 1: Purchased goods and services, and Category 2: Capital goods	Supply chain	2,599	4.59%	4.57%
Category 3: Fuel- and energy-related activities	WTT/T&D of scope 1 and 2	44	0.08%	0.08%
Category 5: Waste generated in operations	Waste	6	0.01%	0.01%
	Wastewater	4	0.01%	0.01%
Category 6: Business travel	Business travel	15	0.03%	0.03%
Category 7: Employee commuting and home office	Staff commute	1,637	2.89%	2.88%
Category 11: Use of sold products	Aircraft LTO and APU	11,769	20.78%	20.68%
	Aircraft CCD	31,288	55.23%	54.99%
	Aircraft engine testing	12	0.02%	0.02%
	Operational vehicles (third party)	157	0.28%	0.28%
	Aircraft de-icing	7	0.01%	0.01%
	Passenger surface access	8,892	15.70%	15.63%
	Landside cargo transport	3	0.00%	0.00%
	Heating and generation (tenant)	4	0.01%	0.01%
	Refrigerant losses (tenant)	-	0.00%	0.00%
Category 13: Downstream leased assets	Purchased electricity (tenant)	-	0.00%	0.00%
	Natural gas (tenant)	5	0.01%	0.01%

Note: WTT emissions for scope 3 sources are included in the figures shown. E.g. for Aircraft CCD this includes both fuel and WTT emissions from this source.

2025 EMISSIONS OVERVIEW

ALL EMISSION SOURCES – MARKET BASED (3 of 3)

Outside of Scopes

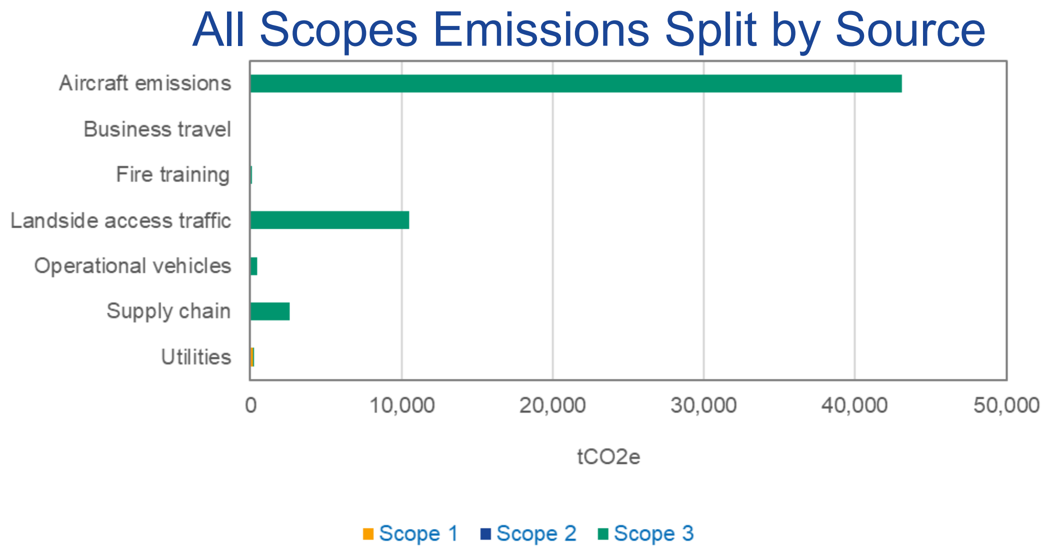
The direct CO_2e emissions released through the combustion of biofuels

Summary Category	ACA Category	Emissions (tCO_2e)	% of Scope	% of Total Emissions
Outside of Scopes – Total		425	100.00%	N/A
N/A	Heating and generation	0	0.05%	N/A
	Fire training	3	0.61%	N/A
	Business travel	0.02	0.01%	N/A
	Operational vehicles (airport)	3	0.74%	N/A
	Operational vehicles (third party)	6	1.49%	N/A
	Non-road construction vehicles	9	2.08%	N/A
	Purchased electricity (airport)	343	80.64%	N/A
	Purchased electricity (tenant)	61	14.39%	N/A

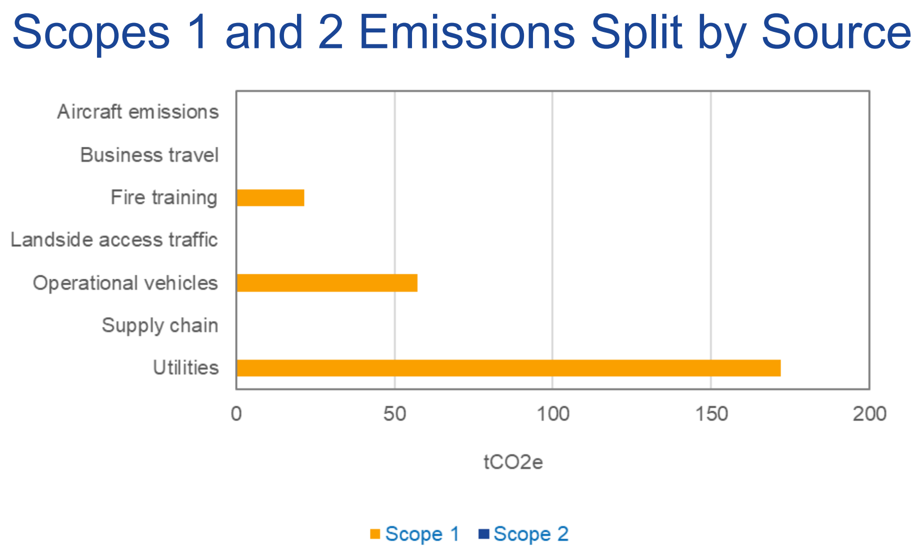
Total Emissions Summary by Scope

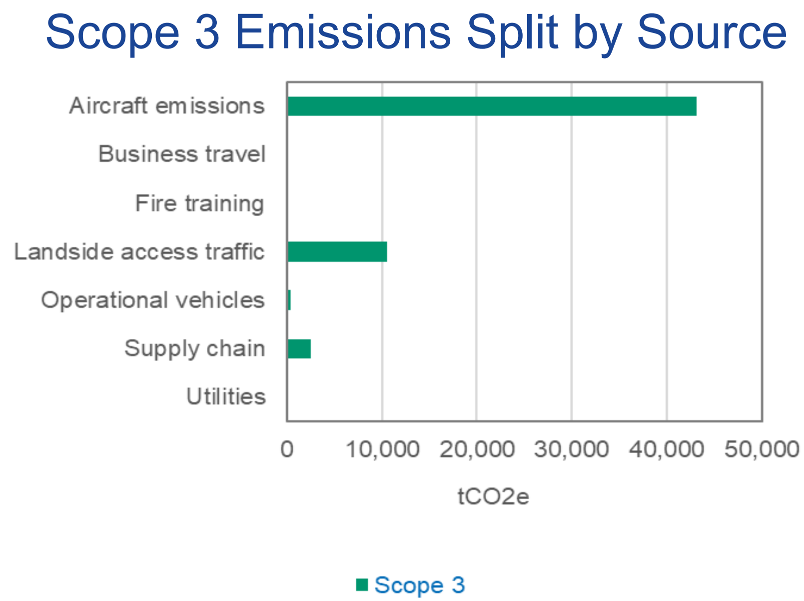
Scope	Emissions (tCO_2e)	% of Total Emissions
Scope 1	251	0.4%
Scope 2	0.00	0.0%
Scope 3	56,646	99.6%
Scopes 1-3 Total	**56,897**	**100.0%**
Outside of Scopes	425	N/A

GHG Inventory– By Emissions Source (Market-Based)



Note: 'Aircraft emissions' includes emissions from LTO, APU and engine testing.





GHG INVENTORY

ANNUAL EMISSIONS TRENDS

ANNUAL EMISSIONS TRENDS

ANNUAL EMISSIONS BY SOURCE – MARKET BASED (1 of 3)

Scope 1

Direct GHG emissions that occur from sources that are owned and/or controlled by the airport

		Emissions (tCO_2e)			2024 to 2025 % Change
Summary Category	**ACA Category**	**2019**	**2024**	**2025**	
Scope 1 – Total		547	322	251	-22.08%
Mobile sources	Operational vehicles (airport)	105	67	57	-14.16%
Stationary sources	Heating and generation	32	14	1	-96.39%
	Natural gas (airport)	327	220	157	-28.45%
	Fire training	50	18	21	21.68%
Process emissions	Refrigerant losses	32	-	-	0.00%
	De-icing	-	4	15	275.61%

Scope 2

Indirect GHG emissions that occur from the generation of purchased electricity, steam, heat, or cooling consumed by the airport

		Emissions (tCO_2e)			2024 to 2025 % Change
Summary Category	**ACA Category**	**2019**	**2024**	**2025**	
Scope 2 – Total		0	0	0	-
Purchased electricity	Purchased electricity (airport)	0	0	0	-

ANNUAL EMISSIONS TRENDS

ANNUAL EMISSIONS BY SOURCE – MARKET BASED (2 of 3)

Scope 3

All other indirect emissions in the value chain of the airport operator that occur from sources not owned and/or controlled by the company

		Emissions (tCO_2e)			2024 to 2025 % Change
Summary Category	**ACA Category**	**2019**	**2024**	**2025**	
Scope 3 – Total		21,811	54,295	56,646	4.33%
Category 1: Purchased goods and services	Water consumption	20	3	5	63.92%
	Non-road construction	-	40	201	397.99%
Category 2: Capital goods	Supply chain	-	2,937	2,599	-11.52%
Category 3: Fuel- and energy-related activities	WTT/T&D	252	255	44	-82.94%
Category 5: Waste generated in operations	Waste	648	7	6	-18.97%
	Wastewater	-	3	4	20.70%
Category 6: Business travel	Business travel	14	15	15	-3.43%
Category 7: Employee commuting and home office	Staff commute	1,052	1,802	1,637	-9.16%
Category 11: Use of sold products	Aircraft LTO and APU	11,573	12,104	11,769	-2.77%
	Aircraft CCD	-	32,680	31,288	-4.26%
	Aircraft engine testing	23	13	12	-6.99%
	Operational vehicles (third party)	357	186	157	-15.62%
	Aircraft de-icing	-	7	7	0.57%
	Passenger surface access	7,869	4,192	8,892	112.13%
	Landside cargo transport	-	2	3	40.04%
	Heating and generation (tenant)	-	-	4	0.00%
	Refrigerant losses (tenant)	-	5	-	-100.00%
Category 13: Downstream leased assets	Purchased electricity (tenant)	-	37	-	-100.00%
	Natural gas (tenant)	4	5	5	6.60%

Note: WTT emissions for scope 3 sources are included in the figures shown. E.g. for Aircraft CCD this includes both fuel and WTT emissions from this source.

ANNUAL EMISSIONS TRENDS

ANNUAL EMISSIONS BY SOURCE – MARKET BASED (3 of 3)

Outside of Scopes

The direct CO_2e emissions released through the combustion of biofuels

Summary Category	ACA Category	Emissions (tCO_2e) 2019	2024	2025	2024 to 2025 % Change
Outside of Scopes – Total		1	414	425	2.70%
N/A	Heating and generation	0.4	1	0	-76.05%
	Fire training	0.1	3	3	-25.62%
	Business travel	-	0.01	0.02	243.50%
	Operational vehicles (airport)	0.4	4	3	-26.00%
	Operational vehicles (third party)	-	10	6	-33.52%
	Non-road construction vehicles	-	2	9	327.79%
	Purchased electricity (airport)	-	331	343	3.44%
	Purchased electricity (tenant)	-	62	61	-1.85%

Total Emissions Summary by Scope

Scope	Emissions (tCO_2e) 2019	2024	2025	2024 to 2025 % Change
Scope 1	547	322	251	-22.08%
Scope 2	0	0	0.00	-
Scope 3	21,811	54,295	56,646	4.33%
Scopes 1-3 Total	**22,358**	**54,617**	**56,897**	4.17%
Outside of Scopes	1	414	425	2.70%

ANNUAL EMISSIONS TRENDS

ANNUAL EMISSIONS TRENDS: SCOPES 1 & 2

Scope 1 (0.4% of total emissions)

Scope 1 emissions have decreased in 2025 across most of the emissions categories, with an overall decrease of 22%.

Subsequently, Scope 1 and 2 intensity- based emissions metrics have shown a decrease on both a per passenger (-25%) and per ATM basis (-17%) in comparison to 2024.

Mobile Sources:

- Airport operational vehicles and equipment emissions have decreased by 14% due to decreased consumption.

Stationary Sources:

- Fire training emissions have increased by 21% due to increased consumption, fire training emissions make up less than 10% of Scope 1 emissions.
- Natural gas heating emissions have decreased by 28% due to decreased consumption. The main terminal boilers were turned off for major maintenance during the summer months and fire station heating has now been electrified.
- Emissions from Heating and Generation have decreased by 96% compared to 2024, the generator utilised for fire training simulation has been replaced with fixed power.

Process Emissions:

- Fugitive emissions from refrigerants losses have remained unchanged, as there were no refrigerant leaks in 2023, 2024 and 2025.
- Scope 1 airport de-icer emissions have increased by 276%. This is down to a colder winter and de icer emissions being very low in 2024.

Scope 2 (0.0% of total emissions)

- Emissions from purchased electricity have remained the same as the airport procures zero carbon electricity as reported under the market-based method.

ANNUAL EMISSIONS TRENDS

ANNUAL EMISSIONS TRENDS: SCOPE 3 & OUTSIDE OF SCOPES

Scope 3 (99.6% of total emissions)

Scope 3 emissions have increased by 4% overall in 2025.

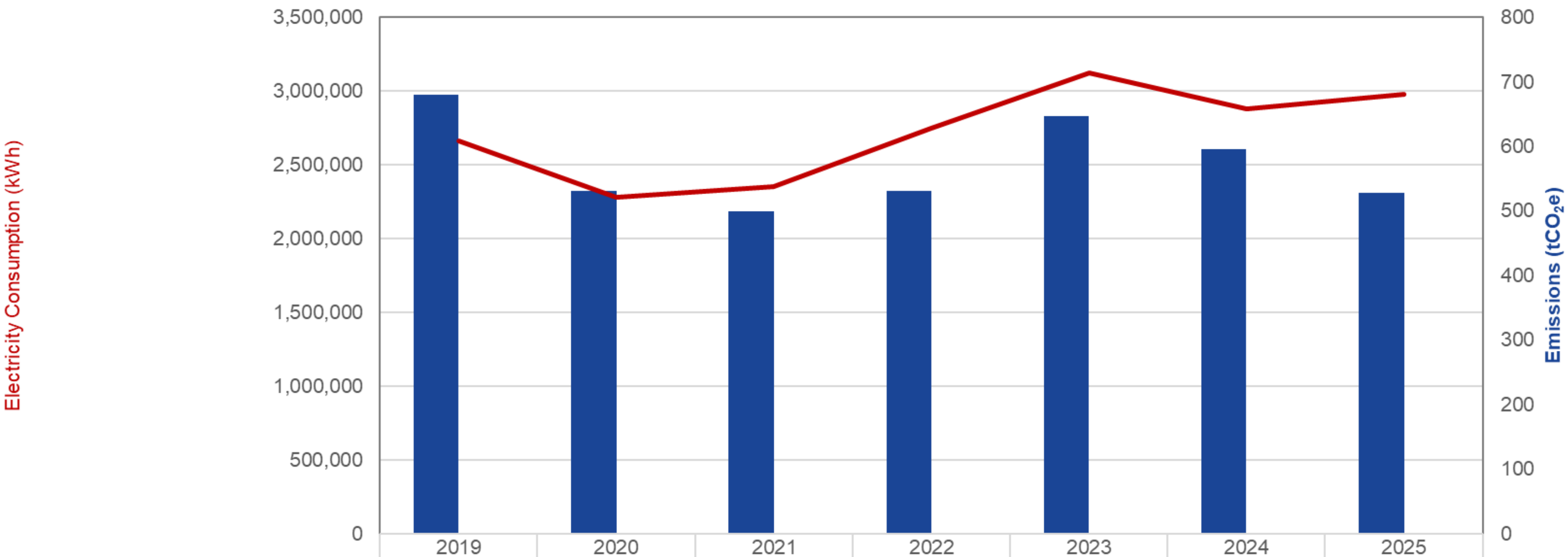
- Water emissions decreased by 19% due to lower consumption.
- Non-road construction vehicles emissions have increased by 398%. The large proportional increase is due to the relatively low emissions in this category in 2024 and increased construction activity with an aircraft stand resurfacing project in 2025.
- Aircraft LTO emissions have decreased by 3%, CCD emissions have decreased 4%. The decrease in CCD emissions is reflective of the 5.9% decrease in ATM in 2025. In addition, the decrease in LTO emissions also reflects a decrease in the taxiing times at the airport compared to 2024.
- Third-party operational vehicles and equipment emissions have decreased 16% due to decreased consumption.
- Business travel emissions have decreased 3%.
- Passenger surface access emissions have increased by 112%. The large increase is caused by the use of a newer 2024 passenger survey with updated modal share, a review of previous distance calculation methodologies and an increase in passenger numbers.
- Waste emissions have decreased by 19%, related to a reduction in several emissions factors in the UK Government GHG emissions factors for 2025.
- Aircraft de-icer emissions have remained comparable to 2024.
- WTT (Well-to-Tank) and T&D (Transmission and Distribution) of scope 1 and 2 has decreased by 83%. The reduction under market-based reporting is due to the purchase of renewable energy electricity contracts which cover losses from T&D. For this reason, tenant electricity consumption has fallen to zero.
- Staff commute emissions have decreased by 9% due to an updated survey from 2025 being utilised which reflected an uptake in EV and hybrid cars being utilised for commuting.
- Supply chain emissions have decreased by 12% due to lower overall spend when compared with 2024.

ANNUAL EMISSIONS TRENDS

ELECTRICITY LOCATION AND MARKET BASED EMISSIONS

Electricity emissions can be reported using the following two methodologies:

- **Location based method**; this reflects the average emissions intensity of macro-scale (regional/national) electricity grids where energy consumption occurs. Companies reporting using this method should use the regional/National Grid average emission factor. In the UK, this would be sourced from the Department for Energy Security and Net Zero's Government conversion factors for Company Reporting.
- **Market based method**; this reflects the emissions from the electricity that a company is purchasing. Southampton Airport has purchased green electricity with all consumption covered by renewable energy guarantees of origin (REGO) certificates that cover all consumption for 2019-2025. Therefore, electricity emissions are reported as zero carbon under the market-based methodology.



	2019	2020	2021	2022	2023	2024	2025
Location-Based Emissions (tCO2e)	680	531	500	531	647	596	527
Market-Based Emissions (tCO2e)	0	0	0	0	0	0	0
Electricity Consumption (kWh)	2,660,337	2,277,865	2,356,111	2,747,024	3,122,529	2,880,676	2,979,857

Location-Based Emissions (tCO2e) Market-Based Emissions (tCO2e) Electricity Consumption (kWh)

Note: The electricity consumption shown includes electricity use by the airport (scope 2) only.

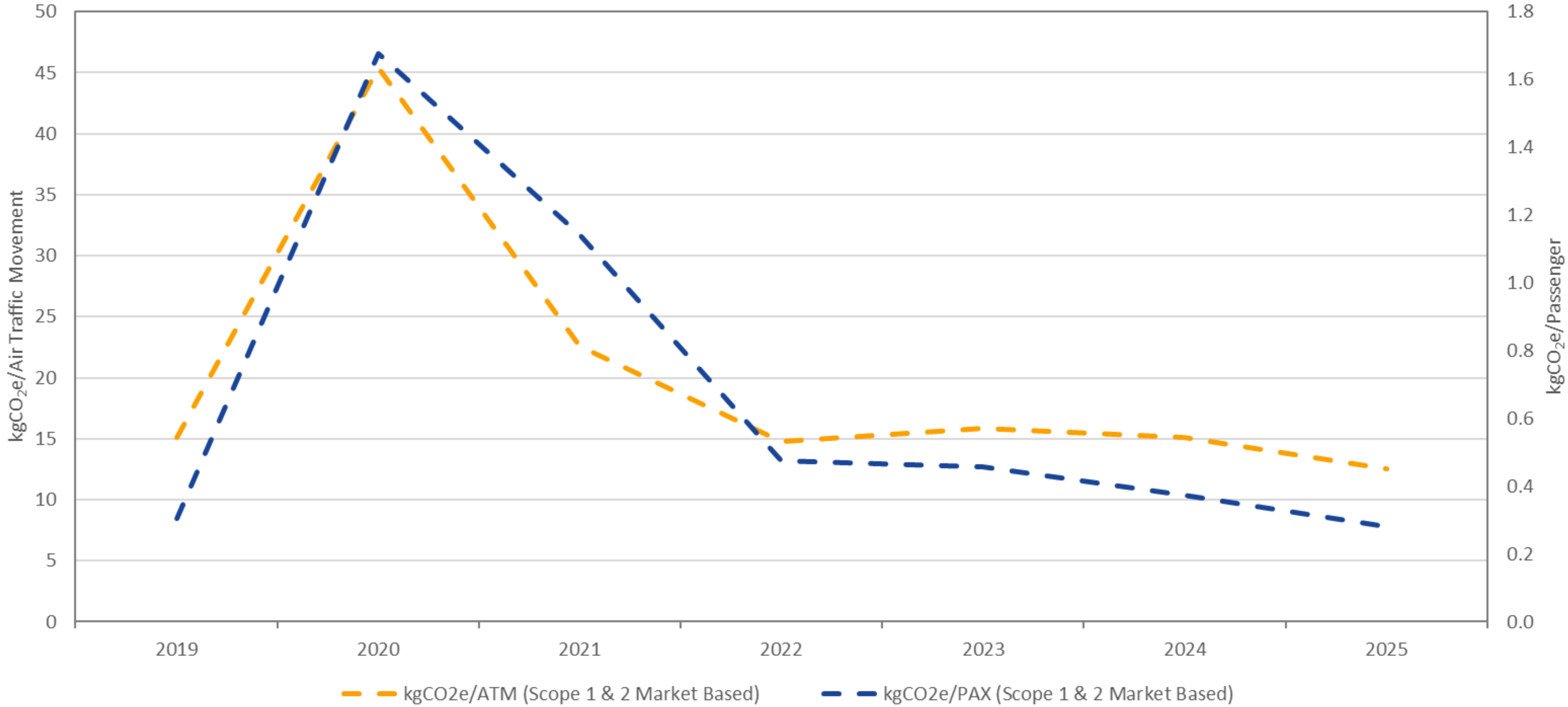
Emissions shown here exclude T&D losses and WTT emissions.

ANNUAL EMISSIONS TRENDS

INTENSITY METRICS COMPARISON OVER TIME – MARKET BASED

Intensity metrics allow comparison over time against other factors that fluctuate and have an impact on the environmental performance of the airport. The two chosen key performance indicators are aircraft traffic movements (ATM) and passenger numbers (PAX).

This chart shows intensity metrics Southampton Airport scope 1 and 2 kgCO_2e/PAX and kgCO_2e/ATM for market-based reporting. Note that the impacts of COVID-19 on airport operations led to increased carbon intensity per ATM and PAX in 2020 and 2021.



ANNUAL EMISSIONS TRENDS

INTENSITY METRICS COMPARISON OVER TIME

This table shows intensity metrics for scope 1 and 2 kgCO_2e/PAX and kgCO_2e/ATM for both location and market-based reporting.

Note that the impacts of COVID-19 on airport operations led to increased carbon intensity per ATM and PAX in 2020 and 2021.

	2019	2020	2021	2022	2023	2024	2025
ATM	36,308	10,932	11,917	20,613	22,084	21,343	20,094
PAX	1,793,744	296,260	235,760	640,408	764,874	862,502	894,990
% Change in ATM (year-on-year)	-	-69.9%	9.0%	73.0%	7.1%	-3.4%	-5.9%
% Change in PAX (year-on-year)	-	-83.5%	-20.4%	171.6%	19.4%	12.8%	3.8%
Scope 1 and 2 (tCO_2e) Location Based Scope	1,227.19	1,027.31	769.67	835.63	996.07	918.63	778.46
kgCO_2e/ATM	33.8	94.0	64.6	40.5	45.1	43.0	38.7
kgCO_2e/PAX	0.7	3.5	3.3	1.3	1.3	1.1	0.9
Scope 1 and 2 (tCO_2e) Market Based Scope 2	547.21	496.25	269.39	304.41	349.47	322.18	251.03
kgCO_2e/ATM	15.1	45.4	22.6	14.8	15.8	15.1	12.5
kgCO_2e/PAX	0.3	1.7	1.1	0.5	0.5	0.4	0.3

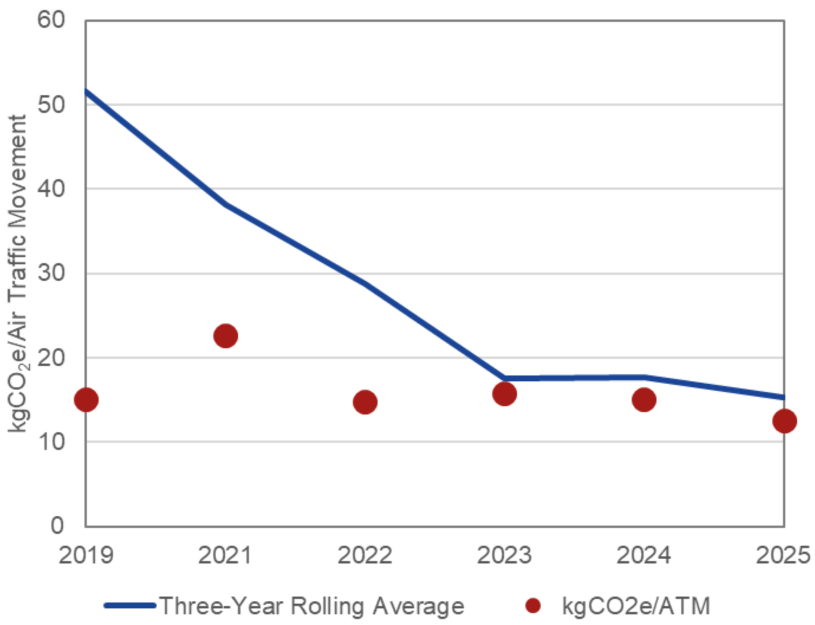
ANNUAL EMISSIONS TRENDS

THREE-YEAR ROLLING AVERAGE (MARKET BASED)

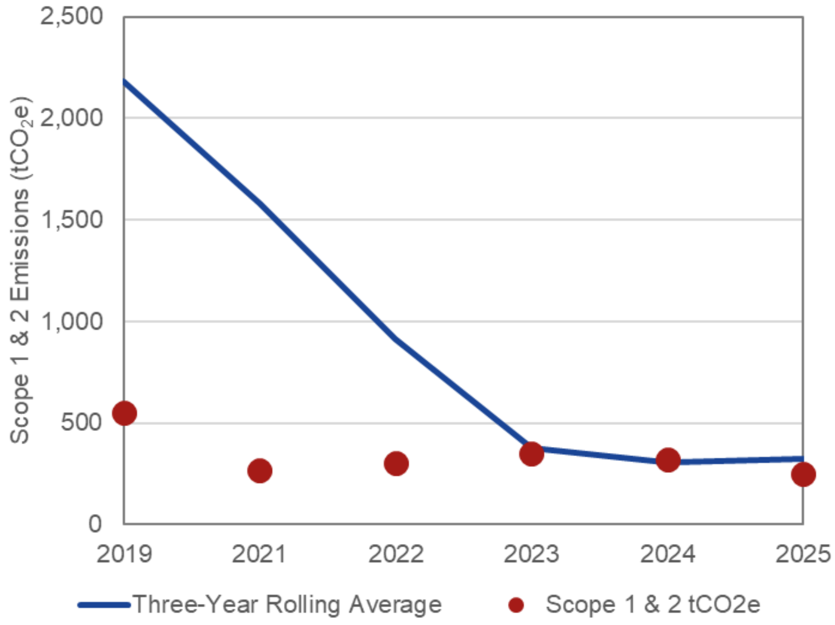
In 2025, Southampton Airport have demonstrated a reduction in their Scope 1 and 2 emissions against the three-year rolling average for intensity-based and absolute emissions, which is compliant with ACA requirements.

Note: due to impacts of COVID-19, 2020 data is not included within the three-year rolling average when reporting these figures for ACA purposes. Reduced passenger and flight numbers in 2021 also impacts the intensity-based emissions for 2021, but absolute emissions remained below the three-year rolling average.

Intensity-Based Emissions (kgCO_2e/ATM)



Absolute Emissions (tCO_2e)



* Note: ATMs are based on number of movements captured in the aircraft emissions calculations, which each year show slight variation from the annual airport statistics dataset.

GHG INVENTORY

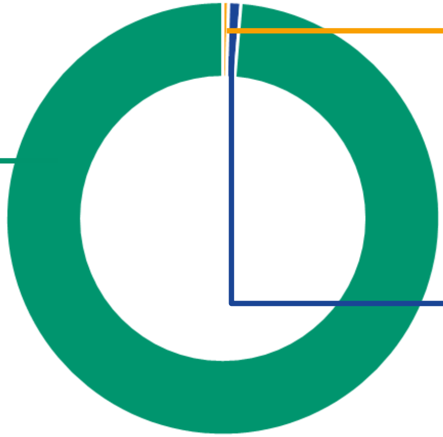
2025 LOCATION BASED EMISSIONS SUMMARY

2025 EMISSIONS OVERVIEW

ANNUAL SUMMARY – LOCATION BASED

Scope 3

55,981 tCO_2e 98.7%

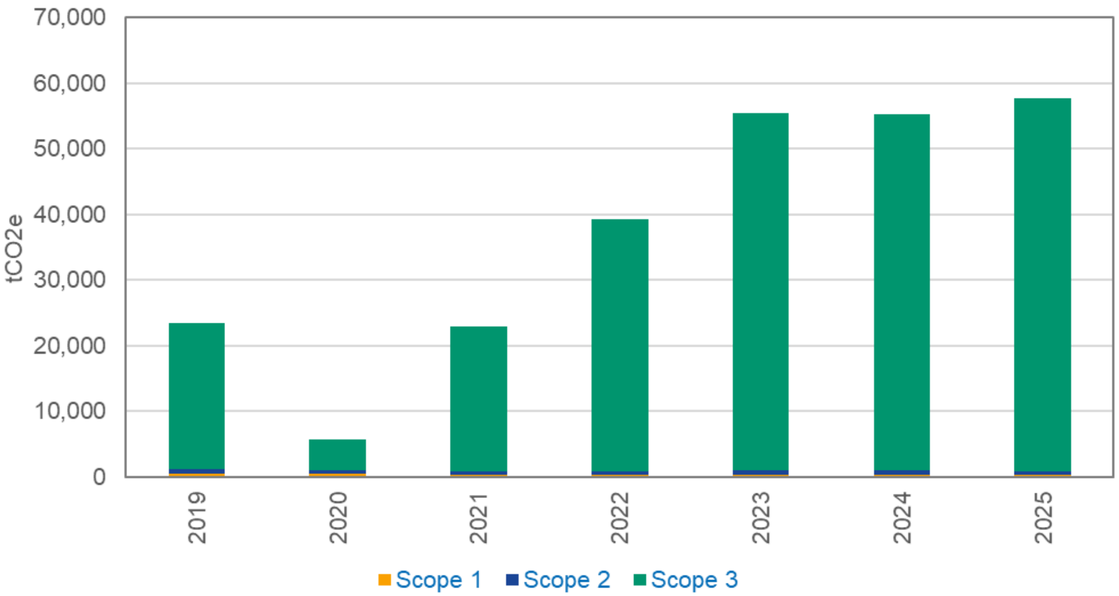


Scope 1

251 tCO_2e 0.4%

Scope 2

527 tCO_2e 0.9%



57,759 **tCO_2e/year**

Location-based emissions figures

0.4%

Scope 1

0.9%

Scope 2

98.7% **(55% CCD, 21% LTO)**

Scope 3

All emissions have been calculated in line with the GHG Protocol, to ACA Level 4 standard and ISO 14064-1. Outside of scope emissions have not been shown.

Emissions are reported using the location-based methodology. In 2025, Southampton Airport purchased green electricity, reducing market-based scope 2 emissions to zero. For an explanation of location and market-based and annual trends see this slide.

ANNUAL EMISSIONS TRENDS

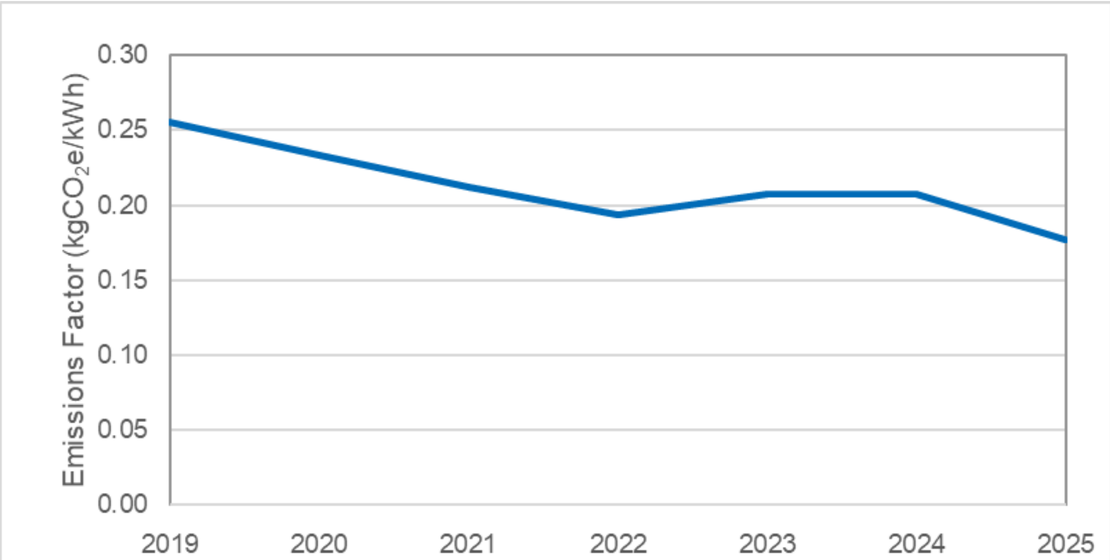
UK ELECTRICITY LOCATION BASED EMISSIONS FACTORS

The annual trends in electricity emissions reported under the location-based method can be attributed to two main factors: Consumption (kWh) and the UK grid emissions factor.

Southampton Airport can directly impact the consumption of grid electricity at the airport through energy efficiency measures, changes to operational practices, and the installation of on-site renewables that reduce the demand for imported electricity.

However, they cannot impact the emissions intensity of the UK grid. The UK grid average emissions intensity ($kgCO_2e/kWh$) has been reducing over the past decade due to changes in the fuel mix used to generate electricity, with significantly higher proportion of renewables and a decrease in the more carbon intensive fuels such as coal.

DEFRA release factors for the UK grid annually, and these have been plotted in the chart below to give some insight into how the UK grid has been decarbonising in recent years.



Year	Emissions Factor ($kgCO_2e/kWh$)
2019	0.25560
2020	0.23314
2021	0.21233
2022	0.19338
2023	0.20707
2024	0.20705
2025	0.17700

APPENDIX 1

CALCULATION METHODOLOGY

Southampton Airport

METHODOLOGY

CALCULATION APPROACH

This section provides a summary of the methodology followed by Ricardo to calculate the 2025 GHG inventory for the airport.

The standard approach to calculating GHG emissions is to use the GHG Protocol Corporate Accounting and Reporting Standard developed by World Business Council for Sustainable Development (WBCSD) and the World Resources Institute (WRI). This approach has been adhered to in the production of this inventory. Reporting is based on operations over which the airport has operational control and is aligned with the GHG Protocol 'operational control' approach, under which a company accounts for 100% of emissions from operations over which it, or one of its subsidiaries, has control to make decisions. The GHG inventory is also calculated in line with the requirements of ISO 14064-1, Specification with Guidance at the Organisation Level for Quantification and Reporting of Greenhouse Gas Emissions and Removals. Sector specific guidance for airports is provided by the Airport Carbon Accreditation (ACA) Scheme and the GHG inventory calculations have been completed to meet the requirements of Level 4 of the ACA Scheme. The GHG Protocol requires organisations to report their GHG emissions under 3 scopes:

SCOPE 1 EMISSIONS

Scope 1 emissions are defined as direct GHG emissions arising from sources that are owned or controlled by the company. The emissions result from activities that the company can have direct influence on through its actions. AGS Airports' emissions that are included are: natural gas use, company owned vehicles fuel use, fuel use for heating or in generators or equipment, refrigerant gas use (from leaks during maintenance or malfunction), surface de-icer and fuel (such as wood pallets and kerosene) used for fire training.

SCOPE 2 EMISSIONS

Scope 2 emissions are associated with the use of electricity imported from the grid or from a third-party energy supplier in the form of heat or electricity. These indirect emissions are due to upstream emissions from the production and delivery of fuel to power stations. The airport can influence the amount of electricity it uses; however, it has little control over the generation of the electricity and these emissions are therefore classed as Scope 2. The inventory includes dual reporting using location and market-based approaches for electricity consumption to reflect use of a renewable electricity contract.

METHODOLOGY

CALCULATION APPROACH

SCOPE 3 EMISSIONS

Scope 3 emissions are defined as those arising as an indirect consequence of the use of goods or services provided by the company. The airport does have some influence over Scope 3 emissions, but the activities are not under its control. Sources included by the airport include aircraft LTO and CCD, engine testing, employees commuting to the airport, passenger surface access, airside vehicle activities by third-party operators, waste disposal, water (supply and treatment), airport business travel, tenant utilities consumption, aircraft de-icer used by third parties, fuel used for non-road construction vehicles, electricity T&D losses, supply chain emissions from purchased goods and services and capital goods, landside cargo emissions and WTT emissions of all relevant Scope 1, 2 and 3 sources aligning to ACA level 4 requirements.

OUTSIDE OF SCOPE EMISSIONS

As per UK Government GHG Conversion Factors for Company Reporting guidance, Outside of Scope factors have been used to account for the direct carbon dioxide (CO_2e) impact of burning biomass and biofuels. The emissions are labelled ‘outside of scope’ because the Scope 1 impact of these fuels has been determined to be a net ‘0’ (since the fuel source itself absorbs an equivalent amount of CO_2e during the growth phase as the amount of CO_2e released through combustion). As a result, full reporting of any fuel from a biogenic source have included the ‘outside of scope’ CO_2e value, documented to ensure complete accounting for the emissions created.

METHODOLOGY

EMISSIONS SOURCE METHODOLOGY

The uncertainties associated with GHG inventory calculations can be broadly categorised into scientific uncertainty and estimation uncertainty. Scientific uncertainty arises when the science of the actual emission is not completely understood. For example, GWP values involve significant scientific uncertainty. Estimation uncertainty arises any time emissions are quantified. Estimations have been made within this inventory where areas of uncertainty have arisen. These are detailed in the methodology descriptions below.

Emissions factors are sourced from the Department for Energy Security and Net Zero's 2025 UK Government GHG Conversion Factors for Company Reporting. De-icer emissions factors are sourced from the Airport Carbon and Emissions Reporting Tool (ACERT) provided by the ACA Scheme. Emissions are reported in carbon dioxide equivalent (CO_2e), which allows different GHGs to be compared on a like-for-like basis.

UTILITIES

Utility emissions include electricity and natural gas (both airport and third parties), fuel used for heating and power generation, water supply and wastewater treatment, de-icer usage (aircraft and ground), and refrigerant lost to atmosphere from cooling systems (including from third-party units). Data was provided by the airport and converted to emissions using the appropriate emissions factors from UK Government and ACERT for de-icer.

Scope 3 refrigerant emissions were assumed to be nil where stated by the tenants and otherwise estimated using default assumptions from IPCC Good Practice Guidelines on average refrigerant charge and annual leakage rate where refrigerant type or leaked volume information was missing.

OPERATIONAL VEHICLES

Operational vehicle fuel use was calculated using fuel volume data provided by the airport for their own and third-party operations, including fuel used in off-road construction vehicles. Some third-parties provided annual mileage data and vehicle types rather than fuel volume. Fuel volume and mileage was converted to emissions using the appropriate emissions factors from UK Government GHG Conversion Factors for Company Reporting (fuel type or appropriate vehicle km).

FIRE TRAINING

Records of fuel and material consumed by fire training were reviewed and converted to emissions using the appropriate emissions factors from UK Government.

METHODOLOGY

EMISSIONS SOURCE METHODOLOGY

PASSENGER SURFACE ACCESS

Emissions are based on surveys undertaken in 2019 and 2024, taking the travel distances from the 2019 and the modal share from the 2024 survey, scaled to 2025 passenger numbers. Information was collated on the mode of travel and location of those who answered the survey to estimate distance travelled by each mode of transport.

STAFF COMMUTE

For emissions due to staff commuting, the 2025 staff travel survey for AGS was utilised. The completion response rate was 61% for AGS and 3% for third party (based on third party pass numbers), so final data was scaled to the full headcount of airport and AGS staff in 2025. The survey respondents provided information on their modes of transport, distance travelled to work (first half of home postcode), number of days worked per week, and number of days worked from home per week. This was scaled up to reflect a full working year by calculating working weeks per year using holiday responses plus bank holidays and that there are 8 working hours in each day (used to estimate emissions produced by staff working from home). Total annual distance travelled was converted to emissions using the appropriate emissions factors from UK Government.

BUSINESS TRAVEL

Accounts data was provided for business travel (Scope 3) for the 2025 financial year. Purchased fuel and travel ticket data was provided in £ value and converted to fuel volume using the cost/litre assumptions from the Carbon Footprint and Project Register Tool (CFPRT). The CFPRT collates cost data for all forms of public transport across the UK and is managed and updated by Sustainable Network Scotland and Resource Efficient Scotland. Assumptions for Bus, Coach were taken from a DfT Public Service Vehicle Survey (last updated March 2026). Assumptions for Rail travel were taken from publications by the UK Government's Office for Rail and Road in March 2026. Assumptions for fuel purchase were taken from the UK Government Weekly Road Fuel Prices dataset.

Reported distance travelled by grey fleet was converted to emissions using the appropriate emissions factors from UK Government. Where destination and transport data had been provided, online distance calculators were employed to estimate the distances travelled, from which emissions were calculated. Where information about the journey was missing, the ticket price was used to estimate distance travelled, using the sources identified above. The following assumptions were made in the calculations: all flight, bus and train tickets assumed to be for single passenger, return journeys unless otherwise stated; and all taxi tickets were assumed to be for single passenger, one-way journeys unless otherwise stated. Within the 'Coach, Bus and Rail' spend category, there were some lines for which transport mode was not stated – an equal split between national rail and local bus journeys was assumed.

METHODOLOGY

EMISSIONS SOURCE METHODOLOGY

WASTE

A full breakdown of waste type, tonnage and destination (e.g. combustion, recycling, landfill) was provided by Southampton Airport's waste management provider for 2025. The emissions produced during waste disposal were calculated by using the appropriate factors from UK Government GHG Conversion Factors for Company Reporting. Sewerage rate was provided by the Water supplier to the airport

LANDING TAKE-OFF CYCLE (LTO)

The LTO cycle is split into several stages as defined by ICAO (Taxi out, take-off, climb out, approach/landing, taxi-in), and consist of all fuel consuming movements below 1,000 m altitude.

Fuel usage for each aircraft from the LTO cycle are calculated by using fuel burn rates (kg/second) from the ICAO Databank (Jet engines) or FOCA Aircraft Piston Engine database (Piston engines) for each aircraft, multiplied by the time the aircraft spends in each section of the LTO cycle (e.g. Taxi Out, Initial Climb). Fuel use is then converted to carbon emissions using the emissions factor for aviation fuel provided by the UK Government. Efforts have been made to improve the assumptions around the time aircraft spend in each stage of the LTO cycle, using real taxi time data for fixed-wing aircraft for example.

For 2025, the Ricardo aircraft emissions calculators reflect the aircraft database from EMEP/EEA air pollutant emission inventory guidebook 2023, and updates to fuel flow databases including the ICAO Databank. The EMEP/EEA database now includes next-generation aircraft types, so assumptions are no longer used to account for the reduction in emissions in comparison to last-generation aircraft they replace. The calculations also now include a full helicopter database from FOCA.

Additional efforts have been made to improve the accuracy of the LTO calculations from 2022 to reflect the impact of aircraft fuel efficiency improvements that were not otherwise captured by the methodology used in previous years. One improvement to the methodology was accounting for the fuel savings from the use of wingtips on aircraft. New designs for the tips of the aircraft wings can reduce drag and improve fuel efficiency. An example of a modern wingtip design is shown below. Wingtips can reduce fuel burn by 4-6% for larger aircraft, which reduces the carbon emissions by the same amount. A 4% reduction in fuel use was used as a conservative estimate of fuel burn savings for the calculations for the airport's LTO emissions. Note that wing tip fuel burn savings only apply to the following LTO stages: Take-off, Initial climb, Climb out.

Finally, data provided by the airport included actual taxi times, and so the time used for taxiing was updated to reflect the average times for 2025 aircraft movements.

METHODOLOGY

EMISSIONS SOURCE METHODOLOGY

AIRCRAFT ENGINE TESTING

To calculate the emissions from engine testing at the airport, the aircraft ICAO type, date of test and duration of test was provided. A similar process was carried out to identify the aircraft engine type and fuel used per second as per the LTO cycle, using the EMEP/EEA guidebook and engine fuel flow from the ICAO Databank and others. Other assumptions used for the calculations are:

If the number of engines tested is not stated, this was assumed to be 2 engines.

High power testing occurred for 5% of the full test time if not otherwise specified.

If engine information is not available from the databases, average fuel flow information is sourced from available data.

FUEL USED FOR NON-ROAD CONSTRUCTION VEHICLES

Fuel from the Volkers and Stand 5 data sets was provided, relating to the Stand 5 construction project in 2025, and subtracted from the third-party operational vehicles fuel quantities. The fuel volume was converted to emissions using the appropriate emissions factors from UK Government GHG Conversion Factors for Company Reporting.

Where hours of operation were provided instead of fuel consumption, consumption was estimated using the average fuel burn listed in the product specifications of common examples of similar machinery.

METHODOLOGY

EMISSIONS SOURCE METHODOLOGY

CLIMB, CRUISE AND DESCENT (CCD)

CCD emissions are reported in accordance with the halfway approach defined by the ACA Scheme, where full journey emissions from departing aircraft are taken into account. This is perceived to be the most neutral and comprehensive methodology.

Data provided by the airport included the following information for each aircraft movement: Carrier, aircraft ICAO code, arriving/departing, destination/origin airport, and date of movement.

For 2025, the Ricardo aircraft emissions calculators reflect the aircraft database from EMEP/EEA guidebook 2023. The EMEP/EEA database now includes next-generation aircraft types, so assumptions are no longer used to account for the reduction in emissions in comparison to last-generation aircraft they replace. The calculations also now include a more comprehensive helicopter CCD database from Eurocontrol Small Emitters Tool.

For aircraft types not in the EMEP/EEA database, suitable proxy aircraft have been selected where ATMs >100, where they are <100 ATMs then average aircraft information is used. Wing tip additions reduce fuel use during flight and a 4% efficiency has been assumed for aircraft with winglets/sharklets.

Flight distance was calculated with the great circle equation, utilising the origin and destination airport latitude and longitude. If an airport's latitude and longitude is not in the database, the distance travelled is taken to be the average distance of all journeys. This flight distance was uplifted by 5.5% to reflect the fact that aircraft do not fly in a perfect straight line from one airport to another. This figure has come from studies carried out by Ricardo for the UK Department for Transport and is an update to the commonly used figure of 9%.

Emissions are calculated from fuel consumption per flight, using the UK Government emissions factor for aviation turbine fuel and aviation spirit (piston engines).

No non-carbon warming impacts have been taken into account as part of the CCD emissions.

METHODOLOGY

EMISSIONS SOURCE METHODOLOGY

WELL-TO-TANK (WTT)

Since 2021, the WTT emissions for Scope 2 and 3 electricity consumption have been calculated, with reporting now expanded to all Scope 1 and 3 emission sources. WTT emissions are the emissions associated with extracting, processing, and transporting fuel before application. They are calculated using the same activity data methodology and assumptions defined in the categories previously described. The appropriate WTT emissions factors were sourced from the UK Government.

SUPPLY CHAIN (SCOPE 3 CATEGORIES 1&2)

Ricardo's Spend Data Evaluator Tool was used to calculate emissions from Scope 3 supply chain categories: Category 1. Purchased Goods & Services and Category 2. Capital Goods. The Spend Data Evaluator Tool uses UK Government Standard Industrial Classification (SIC) and Classification of Individual Consumption by Purpose (COICOP) economic intensity conversion factors. These represent the cradle to gate emissions from purchased goods and services. AGS Airports supplied OPEX and CAPEX financial data from their 2025 financial accounts which was categorised according to the PO number and description. Each PO was assigned a Scope 3 spend category and assigned a percentage as to how much the category applied to the PO. This process was repeated for each AGS airport. Where POs were categorised at group level, the spend was attributed to each airport according to assumption made by AGS: The distributions attributed 50% to Glasgow Airport, 30% to Aberdeen Airport and 20% to Southampton Airport.

METHODOLOGY

EMISSIONS SOURCE METHODOLOGY

LANDSIDE CARGO TRANSPORT

The emissions from this source represent the transport emissions for cargo departing the airport and to its destination, and for cargo being transported to the airport from its origin. Only the first step on the outward journey, and the final step on the inbound journey are considered.

Landside cargo transport was introduced in 2024, and as such the available information is currently quite sparse. The ideal dataset required to calculate the emissions from this source is as follows:

1. Destination/origin of all cargo departing from or arriving to the airport. Allows for calculation of distance cargo travels.
2. Vehicle type and fuel type used to transport vehicle AND the weight of cargo transported in each vehicle (payload)

The above data points are used in conjunction with the tonne.km emissions factors for freighting vehicles sourced from the UK Government to accurately calculate emissions from landside cargo transport.

For Southampton airport, the only available information was the total weight of cargo for arriving and departing flights. Therefore, to calculate emissions from this source assumptions needed to be made for the distance the cargo travelled, as well as the vehicle type and payload weight per vehicle.

Distance travelled: The average distance travelled by HGVs within the UK was used (2024 data latest available – 106km). This was sourced from the UK Government Department of Transport.

Vehicle Type & Payload: Assumed a 33tonne articulated HGV. The maximum payload is 28tonnes once the cab and trailer have been removed, and it is assumed that on average 87.5% of this maximum payload is utilised. This payload utilisation value has been obtained from referencing the UK Government emissions factors for this HGV size, where an “average laden” factor is available with its associated payload value.

Future improvements to this emissions source include obtaining additional data from cargo handlers to understand the origin/destination of cargo and the vehicles used to transport it.

GLOSSARY

Term	Definition
ATM	Air traffic movements – an aircraft take-off or landing at an airport. For airport traffic purposes one arrival and one departure is counted as two movements.
Carbon dioxide equivalent (CO_2e)	The carbon dioxide equivalent (CO_2e) allows the different greenhouse gases to be compared on a like-for-like basis relative to one unit of CO_2. CO_2e is calculated by multiplying the emissions of each of the six greenhouse gases by its 100-year global warming potential (GWP).
Emission factor	An emissions factor is a representative value that attempts to relate the quantity of a pollutant released to the atmosphere with an activity associated with the release of that pollutant.
GHG	Greenhouse gas – a gas in an atmosphere that absorbs and emits radiation within the thermal infrared range. This process is the fundamental cause of the greenhouse effect. The primary greenhouse gases in Earth's atmosphere are water vapour, carbon dioxide, methane, nitrous oxide, and ozone.
GHG inventory	A GHG inventory measures the total greenhouse gas emissions caused directly and indirectly by a person, organisation, event or product. GHG emissions are measured in tonnes of carbon dioxide equivalent (tCO_2e).
Outside of Scope (OoS)	All fuels with biogenic content (e.g. 'Diesel and petrol (average biofuel blend)') should have the 'Outside of Scope' emissions reported to ensure a complete picture of an organisations' emissions are created. The emissions are labelled 'Outside of Scope' because the Scope 1 impact of these fuels has been determined to be a net '0' (since the fuel source itself absorbs an equivalent amount of CO_2 during the growth phase as the CO_2 is released through combustion).
PAX	Number of passengers.
APU	Auxiliary power unit.
CAA	Civil Aviation Authority
LTO	Landing and Take Off (LTO) is defined as the modes of operation by an aircraft below 1,000m altitude – idle, taxiing, approach, climb out and take off. Emissions in this category are from fuel used in aircraft engines during these modes of operation.
CCD	Climb, Cruise and Descent (CCD) emissions account for fuel used during all aircraft movements which occur above 1,000 m during flight.
WTT	Well-To-Tank (WTT) emissions are the emissions associated with extracting, processing and transporting fuel before application.

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