Ricardo Energy & Environment

HIAL Airports Carbon Footprint 2019

In accordance with the UK Government's Conversion Factors for Company Reporting

Report for HIAL Airports Limited

hia Highlands and Islands Airports Limited
Puirt-adhair na Gàidhealtachd is nan Eilean Earranta

Included Emissions Sources

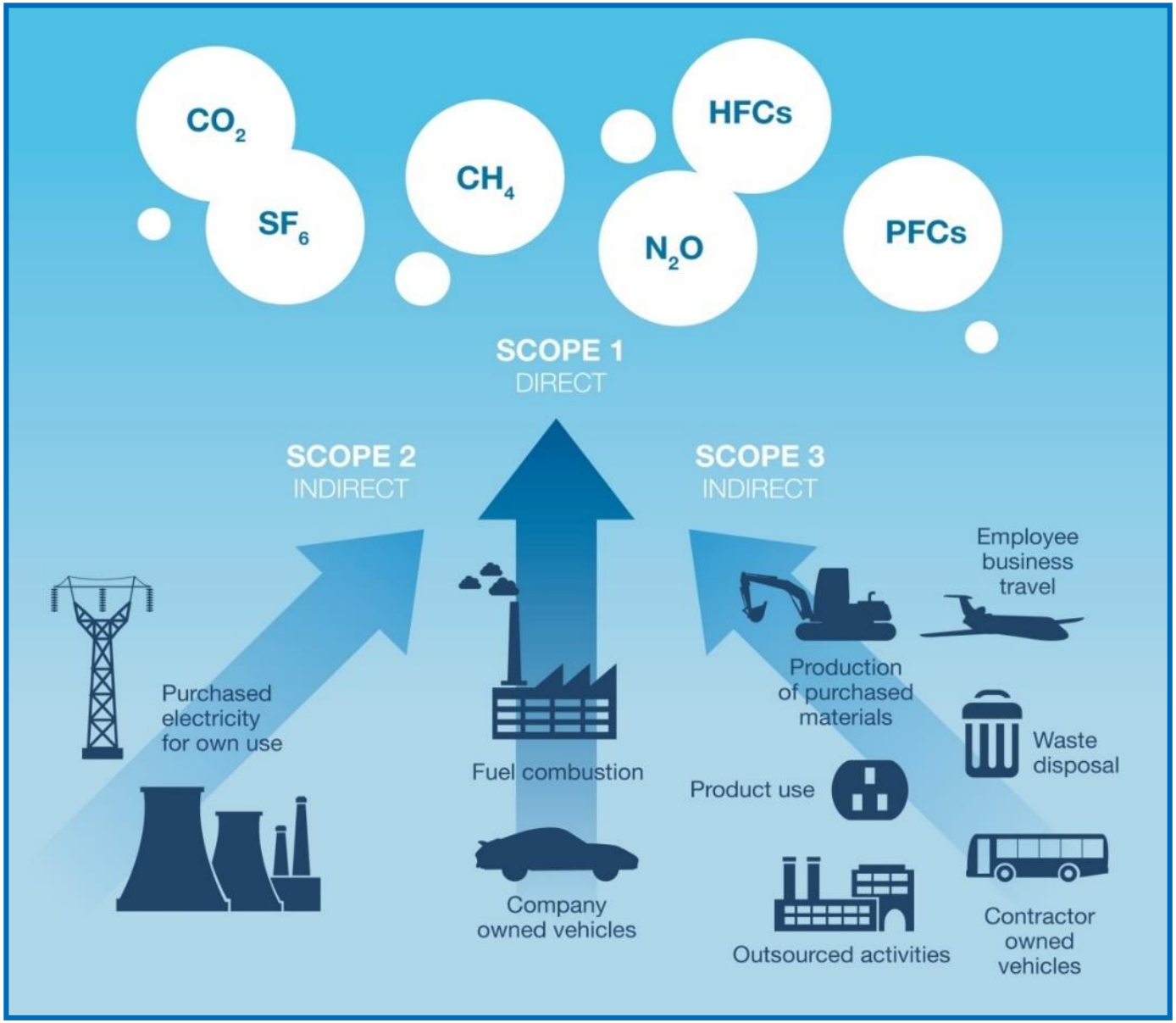
The following emissions sources are included in the 2019 carbon footprint for the HIAL Airports:

Scope 1: Direct emissions:

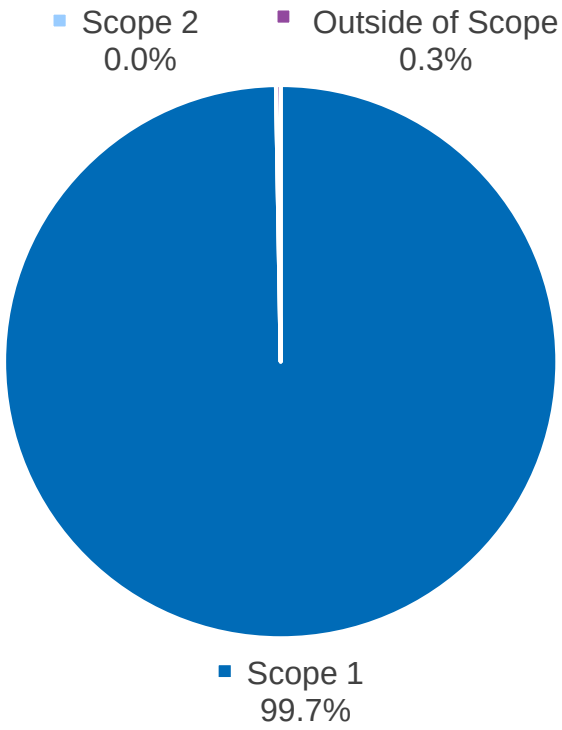
- Fuels directly combusted on site (boilers, generators, operational vehicles, fire training)
- Refrigerant gas losses (leakages of gases such as R407c, R410a, R22 and R134a).

Scope 2: Indirect emissions:

- Purchased electricity



Key Stats - Carbon Emissions by Scope 2019



	Total 2019 emissions (tCO_2e)	% of total emissions
Scope 1	2,750.6	99.7
Scope 2	0.0	0.0
Outside of Scopes	7.5	0.3
Total	**2,758.1**	**100%**

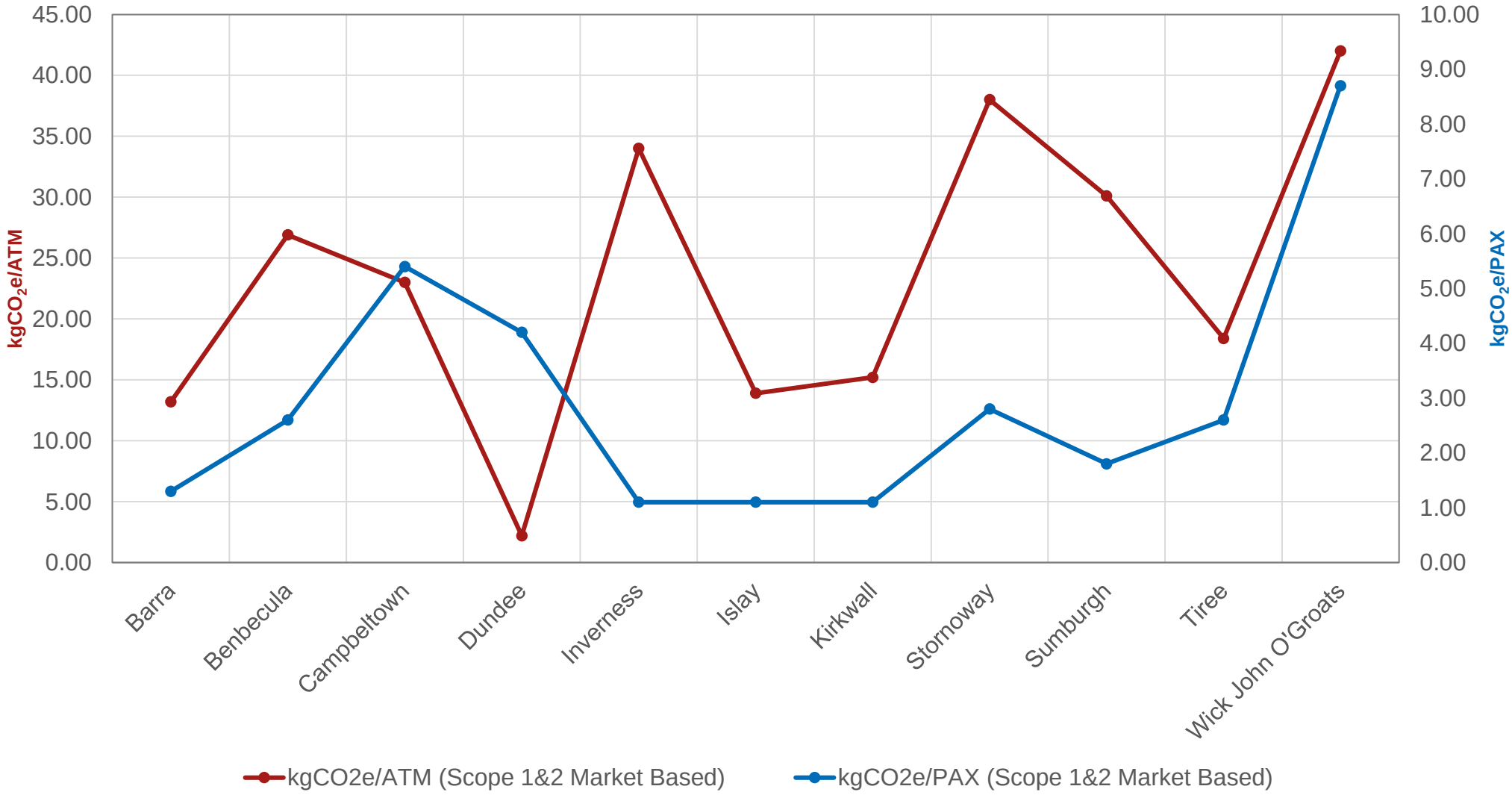
Scope 1:
Emissions on-site, or an associated process, from the combustion of fossil fuels, e.g. natural gas, oil, LPG and company-owned vehicles.

Scope 2:
Emissions associated with the use of electricity imported from the grid or from a third party supplier of energy in the form of heat or electricity.

Scope 3:
Emissions arising as a direct consequence of the use of goods or services provided by the company. For example, sources include aircraft movements, passenger and staff travel to the airport, airside activities, waste disposal, water and business travel.

Key Stats - Intensity Metrics

The chart below shows the comparison between the eleven HIAL airports 2019 intensity metrics for the Market-based Scope 2 methodology.



Key Stats - Intensity Metrics 2

The table below shows the 2019 intensity metric figures for each of the eleven HIAL airports for Market vs Location based Scope 1 & 2 emissions

	BAR 2019	BEB 2019	CAL 2019	DND 2019	INV 2019	ILY 2019	KOI 2019	SYY 2019	LSI 2019	TRE 2019	WIC 2019	Total HIAL 2019
ATM	1,424	3,649	2,036	42,857	29,756	2,771	14,601	10,124	20,973	1,860	4,043	134,094
PAX	14,804	38,007	8,724	22,202	909,159	35,419	195,945	137,181	348,443	13,032	19,450	1,742,366
Scope 1&2 (tCO_2e) Location Based	61	211	65	211	1,801	142	413	782	1,014	103	285	5,090
$kgCO_2e$/ATM	42.9	57.9	32.0	4.9	60.5	51.2	28.3	77.2	48.4	55.6	70.6	38.0
$kgCO_2e$/PAX	4.1	5.6	7.5	9.5	2.0	4.0	2.1	5.7	2.9	7.9	14.7	2.9
Scope 1&2 (tCO_2e) Market Based	19	98	47	94	1,011	38	222	385	632	34	170	2,751
$kgCO_2e$/ATM	13.2	26.9	23.0	2.2	34.0	13.9	15.2	38.0	30.1	18.4	42.0	20.5
$kgCO_2e$/PAX	1.3	2.6	5.4	4.2	1.1	1.1	1.1	2.8	1.8	2.6	8.7	1.6

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Background

HIAL is a public corporation owned by the Scottish Ministers and subsidised by the Scottish Government in accordance with Section 34 of the Civil Aviation Act 1982. HIAL operates and manages 11 airports in total; Barra, Benbecula, Campbeltown, Dundee, Inverness, Islay, Kirkwall, Stornoway, Sumburgh, Tiree and Wick. HIAL served 1,742,366 passengers with a total 134,094 aircraft movements in the 2018/2019 year.

The calculation of the annual carbon footprint will help HIAL Airports Limited and the individual airports understand the different areas which contribute to their overall carbon footprint and monitor changes on a yearly basis. This process will help identify improvement opportunities, which will ultimately reduce HIAL Airports' carbon footprint and associated costs. In addition, the success of any management strategies previously implemented can be evaluated.

Carbon Emissions by Source and Activity 2019 - 1

The combined HIAL Airport's emissions can be broken down by activity as seen in this table.

The main activities that contribute to the footprint are fuel combustion (gas oil, LPG, diesel and kerosene)

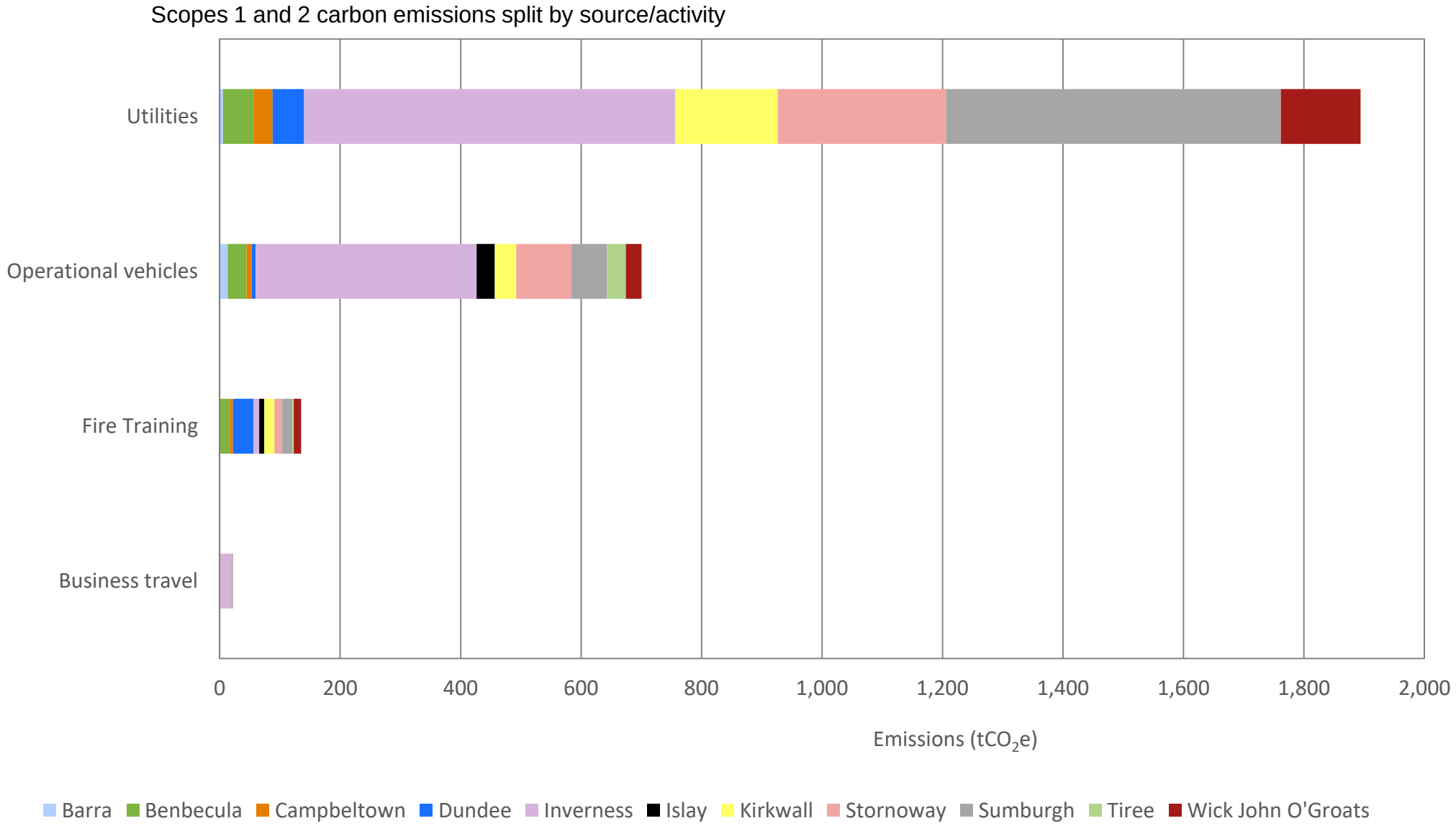
Utilities include natural gas and refrigerant usage in the terminal as well as electricity consumption

Daily operation and staff activities, such as fire training at the airport contribute a small overall percentage of the carbon footprint

Emissions Source	Scope 1 (tCO_2e)	Scope 2 (tCO_2e)	Outside of Scope (tCO_2e)	Total (tCO_2e)	% of Total Emissions
Utilities	1,894.0	0.0	0.0	1,894	68.7
Operational vehicles	700.2	0.0	7.5	707.7	25.7
Fire Training	135.1	0.0	0.0	135.1	4.9
Business travel	21.3	0.0	0.0	21.3	0.7
Total	**2,750.6**	**0.0**	**7.5**	**2,758.1**	**100.0%**

Accounts for the direct carbon dioxide (CO_2) impact of using biofuels in airport vehicles

Carbon Emissions by Source and Activity 2019 - 2

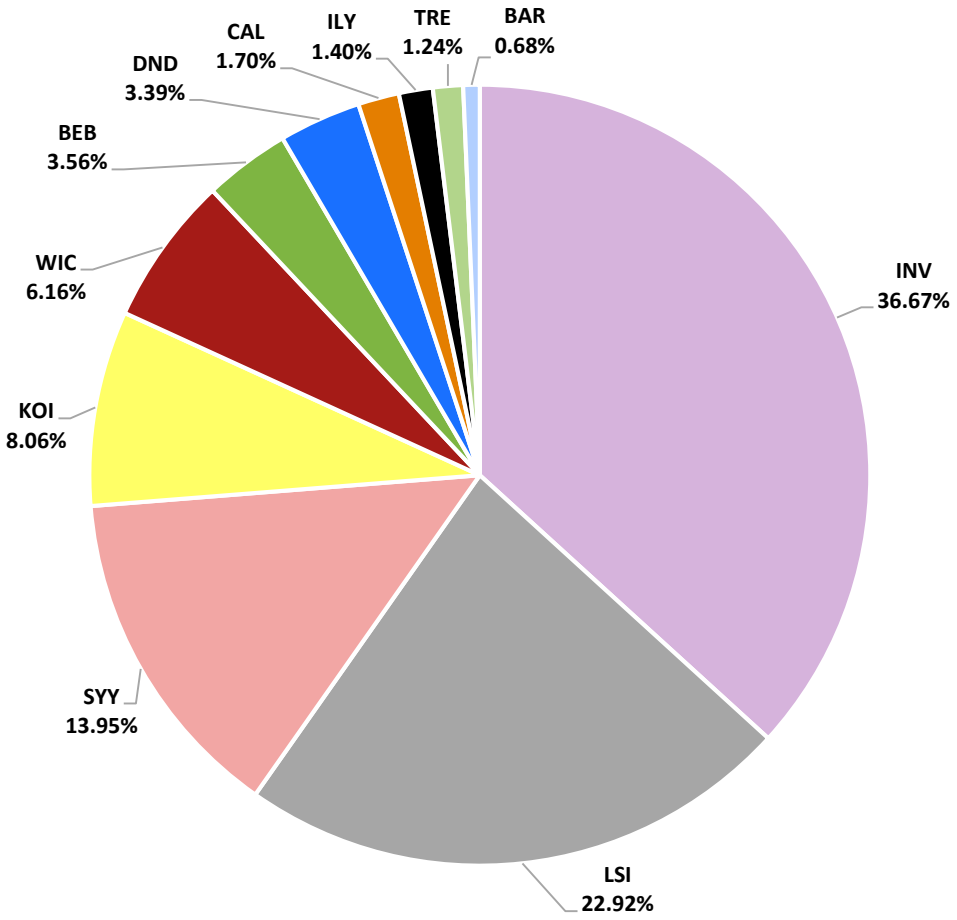


Airport Carbon Emissions by Scope

Scope 1

2,751 tCO_2e

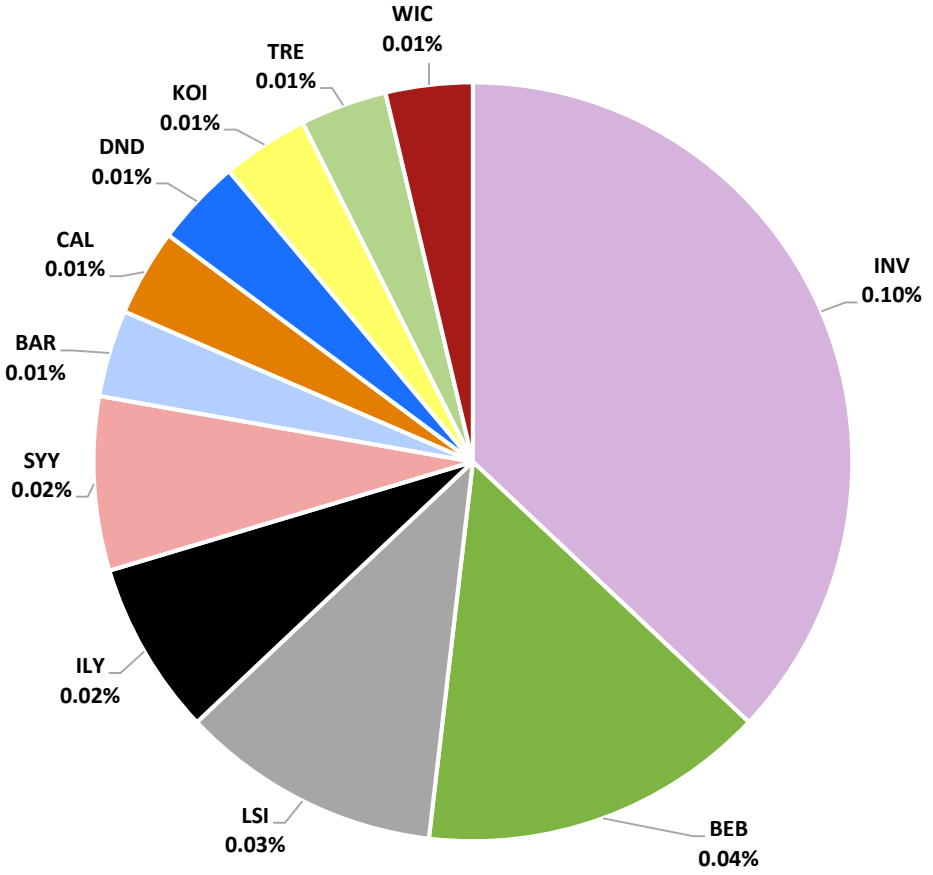
99.7% of Total Emissions



Outside of Scopes

7 tCO_2e

0.3% of Total Emissions



** Percentages shown are of total HIAL emissions (2019)*

Note: Out of Scope fuels are considered net zero as the growth phase absorbs the amount of CO_2 released through combustion

Scope 2 Location and Market Based Emissions

Scope 2 = 0.0 tCO_2e (0.0% of Total)

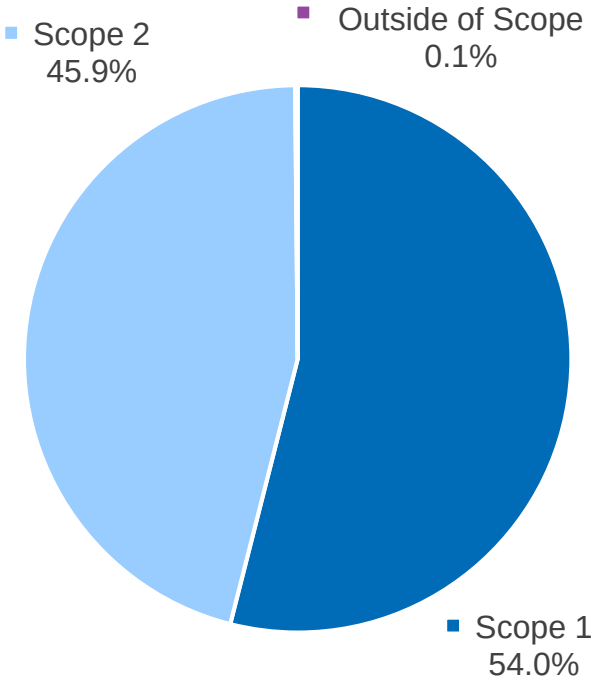
Scope 2 emissions relate to the electricity consumption at the airport. These can be calculated as:

- 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 Defra/DECC UK Government conversion factors for Company Reporting.
- Market-based method; this reflects the emissions from the electricity that a company is purchasing. Energy suppliers in the EU are already required, by law, to disclose to consumers the fuel mix and GHG emissions associated with their portfolio or tariffs. This airport selects to purchase energy that is greener than the National Grid average emissions factor. The advantage of procuring energy that is higher in renewable energy sources than that of the National Grid average emissions factor is outlined in the table below.

	Location-based (tCO_2e)	Market-based (tCO_2e)
Airport Electricity Emissions (Scope 2)	2,339	0

- Here, market-based emissions are zero because the airport purchased 100% green electricity from its energy suppliers. A supplier statement has been provided for electricity consumed between Apr 2018 – Mar 2019, that indicates that the supply is 100% renewable.

Carbon Emissions by Scope 2019 (location based)



	Total 2019 emissions (tCO_2e)	% of total emissions
Scope 1	2,750.6	54.0
Scope 2	2,339.0	45.9
Outside of Scopes	7.5	0.1
Total	5,097.1	100.0%

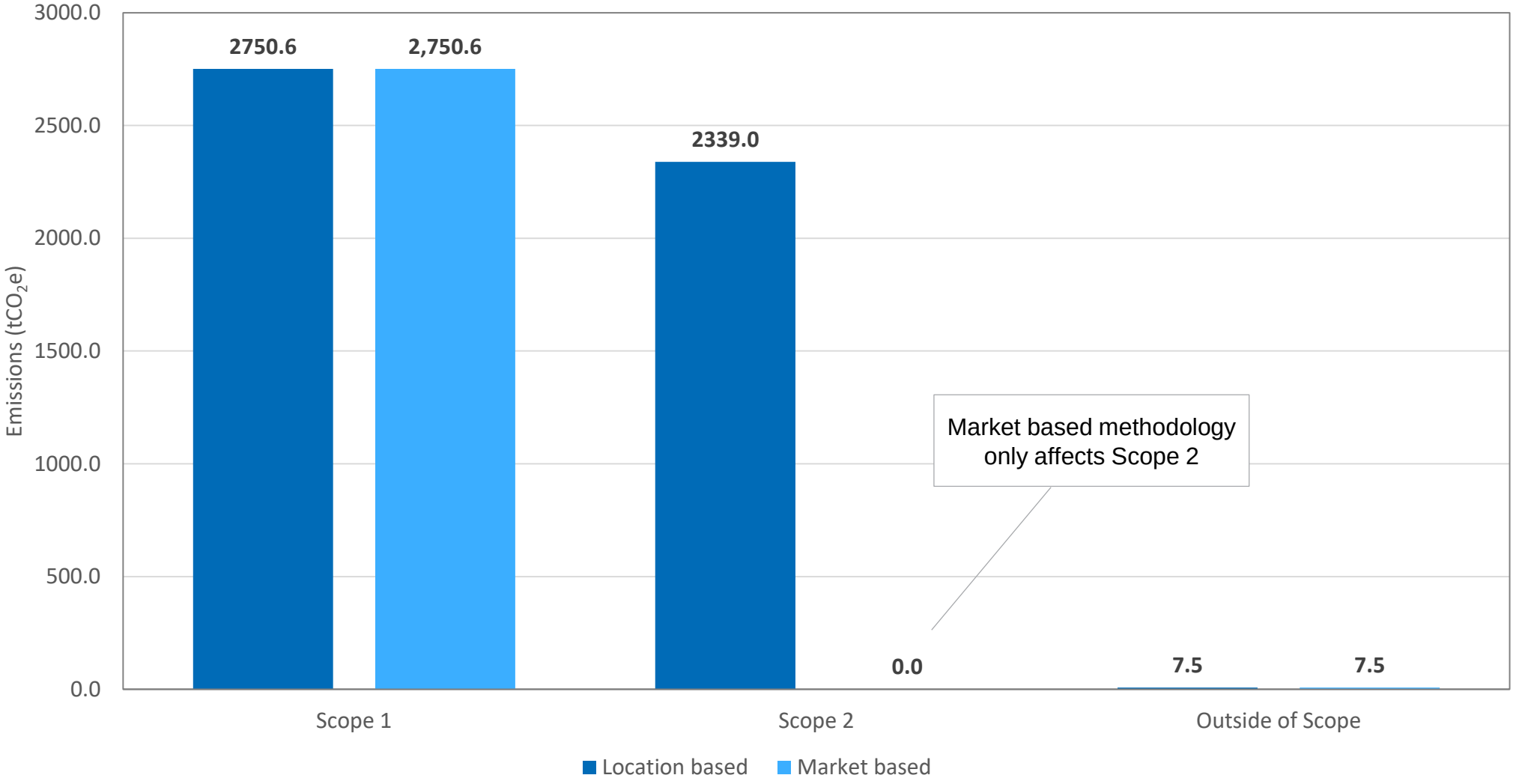
Scope 1:
Emissions on-site, or an associated process, from the combustion of fossil fuels, e.g. natural gas, oil, LPG and company-owned vehicles.

Scope 2:
Emissions associated with the use of electricity imported from the grid or from a third party supplier of energy in the form of heat or electricity.

Outside of scope emissions:
Outside of scope emissions account for the direct carbon dioxide (CO_2) 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'.

Location vs Market Based Emissions 2019: All Scopes

Emissions totals by scope calculated using either the location or market based emissions factors.



Recommendations for improving your GHG footprint

Recommendation	Benefit
Review why the performance metrics are so different for each of the airports. Investigate or consider if other performance metrics or additional metrics would give better clarity	The intensity metrics for each of the HIAL airports are significantly different and, to the untrained eye, might lead someone to think that one airport is performing better/worse than another. By considering additional metrics or combination of metrics a greater transparency and reasoning for the differences in performance data can be achieved. Suggested metrics are: • Taking into account degree days to provide insight into the variability in PAX metrics. • Include floor area to create a $kgCO_2e/PAX/m^2$ metric that will show trends relevant to the size of the airport • Consider using the size and type of flight for ATM
Consider joining a carbon footprint verification scheme (ACA)	Highlight the work that has been carried out at each of the airports over the past 5 years as a marketing/PR option.
Provide distance and/or fuel data for business travel rather than just financial costs	A more accurate footprint based on the actual distance.
Develop infographic of carbon emissions	Portray airports good work in reducing carbon emissions.
Consider investigating LTO optimisation	This can reduce the time taken in the LTO cycle and therefore reduce Scope 3 emissions.

Other Environmental Initiatives to be Considered

- Investigate the reduction in operational carbon on local air quality
- Change airside vehicles to electric vehicles in order to optimise use of lower carbon fuels
- Incorporate green policies of procurement
- Site development considerations to reduce environmental impacts

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Appendix – Outside of Scope Emissions

As per UK Government GHG Conversion Factors for Company Reporting guidance, Outside of Scope factors should be used to account for the direct carbon dioxide (CO_2) 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_2 during the growth phase as the amount of CO_2 released through combustion). As a result, full reporting of any fuel from a biogenic source should have the 'outside of scope' CO_2 value documented to ensure complete accounting for the emissions created.

2019 = **7.5 tCO_2e** (0.3% of total emissions)

Data Sources

	Electricity (Scope 2)	Natural gas (Scope 1)	Operational vehicle fuel	Refrigerants	Fire training	Business travel	Other utilities (gas oil, diesel, kerosene)
Barra		*N/A*			*N/A*	*N/A*	
Benbecula		*N/A*					
Campbeltown		*N/A*					
Dundee						*N/A*	
Inverness		*N/A*					
Islay		*N/A*					*N/A*
Kirkwall		*N/A*				*N/A*	
Stornoway		*N/A*				*N/A*	
Sumburgh		*N/A*					
Tiree		*N/A*					*N/A*
Wick		*N/A*					
% of emissions	0.0%	1.6%	25.7%	0.7%	4.9%	0.8%	66.3%

Data RAG rating commentary

- The Key below demonstrates the data quality rating categories used for this carbon footprint.
- Much of the data comes from supplier invoices/statements such as electricity, natural gas and operational vehicle usage, hence the large quantity of green rated data sources.
- The fire training data sources for a majority of the airports is mixed. For example the physical supply of fuels is provided by a supplier invoice (green rating), however the actual use of the fuel is based on recorded usage/assumptions/estimates, meaning the data source rating is categorised as amber/red.

Key		
Verifiable, regular, automated and/or non-editable data source (e.g. data provided is based on half hourly meter readings, supplier invoices, contractors' worksheet, etc.)	Verifiable, manual readings/data of non-consumption data (e.g. data provided is based on recorded usage, expenses, etc.)	Non-verifiable data (e.g. data is based on estimates/calculations, scaled from previous years or assumptions, etc.)

Potential Data Sources Improvements

- Standardise data capture techniques across all airports for streamlined and more accurate data collection
- Ensure fuel invoices/fuel consumption records are split out by use (e.g. generators, operational vehicles, business travel) and user (i.e. HIAL direct fuel use or 3rd party use)
- Monitor fire training ground fuel consumption utilising invoices or meter readings for all fuel sources

Methodology

The following sections provide a summary of the methodology adopted by Ricardo Energy & Environment to calculate the 2019 carbon footprint for the Airports.

The standard approach to carbon footprinting is to use the Greenhouse Gas (GHG) Protocol Corporate Accounting and Reporting Standard developed by World Business Council for Sustainable Development (WBCSD) and the World Resources Institute (WRI); this sets out a corporate accounting and reporting methodology for GHGs.

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. Airports' emissions that are included are: natural gas use, company owned vehicles fuel use, fuel use for business travel, refrigerant gas use (from leaks during maintenance or malfunction), wood pallets and diesel use for fire training, propane combustion and kerosene combustion.

Scope 2 emissions are associated with the use of electricity imported from the grid or from a third-party supplier of energy in the form of heat or electricity. These indirect GHG emissions are due to upstream emissions from the production and delivery of fuel to power stations. Airports 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.

Scope 3 emissions are defined as those arising as an indirect consequence of the use of goods or services provided by the company. Airports do have some influence over Scope 3 emissions but the activities are not under its control. Sources included by Airports include aircraft (all aircraft movements up to a height of 1,000m above aerodrome level), employees commuting to the airport, passenger surface access to the airport, airside vehicle activities by third party operators, waste disposal (including production of the virgin materials), water (supply and treatment) and airport business travel. These emissions were not included within this carbon footprint.

Location v Market Based

Market-based method: As all of the 9,150,824 kWh of electricity consumption was supplied to the HIAL Airports by a single supplier. HIAL Airports contacted the supplier and asked for the details of the fuel mix. The following breakdown was provided for the year-ending 31st March 2019 (Source of Electricity, Percentage):

- **Renewables - 100%**

A supplier statement has been provided for electricity consumed between Apr 2018 – Mar 2019 that indicates that the supply is 100% renewable.

The weighted emission factor was provided as 0 gCO_2/kWh (or 0 $kgCO_2$/kWh). Multiplying the electricity consumption of 9,150,824 kWh by the emission factor of 0 $kgCO_2$/kWh calculates the emissions as 0 tCO_2e.

Glossary

Term	Definition
Arisings	Materials forming the secondary or waste products of industrial operations.
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).
Carbon footprint	A carbon footprint measures the total greenhouse gas emissions caused directly and indirectly by a person, organisation, event or product. A carbon footprint is measured in tonnes of carbon dioxide equivalent (tCO_2e).
Degree days	A unit used to determine the heating or cooling requirements of buildings, representing a fall or increase of one degree below a specified average outdoor temperature for one day.
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.
Outside of Scope	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 that CO_2 is released through combustion).
PAX	Number of passengers.