Belfast International Airport Streamlined Energy and Carbon Report

Introduction

Belfast International Airport in County Antrim, 12 miles northwest of Belfast, Northern Ireland. It is the busiest airport in Northern Ireland, handling 5.9 million passengers in 2023. It is a large flat site dominated by the two runways, taxiways, aprons, and ancillary buildings. There is a large terminal building with extensive car parks situated to the north of the runway.

VINCI Airports purchased Belfast International Airport in 2018. The airport consists of several departments including Operations; Rescue and Fire Fighting Service (RFFS) and Engineering along with the service departments of Finance; Compliance; Human Resources; Information Technology; Police; Security; Commercial and Business Development.

Limitations

None.

Time Period

This document presents the greenhouse gas (GHG) emissions inventory of Belfast International Airport occurring between 01/01/2023 and 31/12/2023. This mirrors the company's financial year.

Organisational Boundaries

The GHG inventory includes all GHG emissions issued from Belfast International Airport's business activities.

The GHG emissions were consolidated according to a control approach. Therefore, all GHG emissions and removals from facilities over which Belfast International Airport has operational control were considered.

Belfast International Airport is an unquoted company.

Operational Boundaries

Definition of the operational boundaries began by identifying all GHG sources that Belfast International Airport should include in its inventory. These were subdivided into three distinct categories:

Scope 1: DIRECT GHG EMISSIONS are emissions issued from sources directly controlled by Belfast International Airport, such as stationary combustion equipment used for building heating.

Scope 2: INDIRECT GHG EMISSIONS are emissions issued from electricity production, or from the imported heat or vapour consumed in the buildings and equipment operation, provided by an external entity (sources out of the organisational boundaries).

Scope 3: OTHER INDIRECT EMISSIONS are emission issued from Belfast International Airport activities but from sources controlled by external organisations, such as waste disposal (transport and processing) and the transportation means of employees.

Methodology

This report was produced in accordance with the GHG Reporting Protocol – Corporate Standard methodology and the Scope 3 Standard.

The GHG Reporting Protocol recommends that the reporting organisation quantifies, minimally, GHG emissions from direct and energy indirect categories (scope 1 and scope 2 in GHG Protocol). These must be included in the GHG inventory.

The Scope 3 standard outlines 15 distinct reporting categories in scope 3. The scope 3 standard recommends that companies identify which scope 3 activities are expected to have the most significant GHG emissions, off er the most significant GHG reduction opportunities and are most relevant to the organisation's goals.

Omissions

Scope 3 Purchased Goods and Services and Capital Goods have been excluded due to the lack of available data.

Adjustments to base year

None.

Identification of GHG sources

The potential GHG emissions sources are:

Scope 1:

- Fixed combustion: combustion of fossil fuels in fixed installations such as central heating boilers, turbines, radiators, motors, and flares.
- Mobile combustion: combustion of fossil fuels in motorised equipment such as cars, trucks, bus, trains, planes, and ships.
- Emissions from physical or chemical processes: emissions resulting from physical or chemical processes such as CO_2 emissions from acetylene combustion and consumed dry ice.
- Fugitive emissions: intentional or non-intentional (leaks) discharges such as GHG emissions from wastewater treatment and refrigerants.

Scope 2:

- Electricity: All companies use this type of energy. It is used to operate machines, lighting, electric vehicle charging, and certain types of heat and cooling systems.

Scope 3:

- Purchased goods and services: All upstream (cradle-to-gate) emissions of purchased goods and services.
- Capital goods: All upstream (cradle-to-gate) emissions of purchased capital goods.

- Fuel and energy related activities (not included in scope 1 or scope 2): All upstream (cradle-to-gate) emissions of purchased fuels and electricity and transmission and distribution (T&D) losses.
- Waste generated in operations: emissions of waste that occur during disposal or treatment. Can include transportation if data available.
- Business travel: scope 1 and scope 2 emissions of transportation carriers that occur during use of vehicles (e.g., from energy use).
- Employee commuting: scope 1 and scope 2 emissions of employees and transportation providers that occur during use of vehicles.
- Use of sold products: direct emissions of sold products over their expected lifetime (i.e., the scope 1 and scope 2 emissions of end users that occur from the use of products that directly consume energy (fuels or electricity) during use). For airports this includes aircraft landing and take off cycles (LTO cycles), third party fuel consumption, de-icing chemicals consumption and passenger surface access amongst others.
- Downstream leased assets: scope 1 and scope 2 emissions of lessees that occur during operation of leased assets (e.g., from energy use).

Selection and collection of GHG activity data

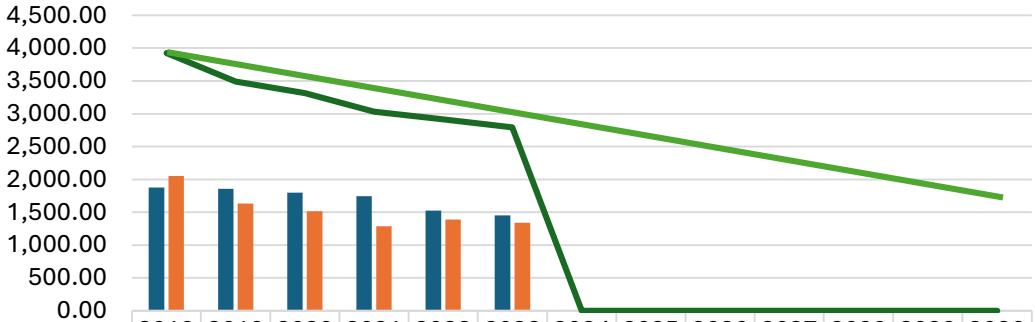
Selection and data collection were based on primary and secondary information sources. Primary sources collected were from official documentation, such as bills and invoices, and from onsite metering used to remove third party consumption. Scope 3 data sources included VEOVO, conducting surveys to collect a sample of staff and passenger data and using the Airport Carbon Accreditation (ACA) ACERT tool (Airport Carbon and Emissions Reporting Tool).

Results

The following tables and charts provide a breakdown of Belfast International Airport's GHG emissions between 01/01/2023 and 31/12/2023. Emissions were calculated as per the GHG Protocol Standards. Year chosen as bae year was 01/01/2018 to 31/12/2018. Scope 3 data was collected and collated for the first time in 2023 therefore there is no 2018 or 2022 scope 3 data.

Emissions breakdown by scope	2023 Emissions tCO_2e	2022 Emissions tCO_2e	% Change	2018 base year Emissions tCO_2e	% Change Current to base year
Scope 1					
Natural Gas	822.86	913.78	-10%	1,066.30	-23%
Diesel	339.13	216.69	+57%	191.46	+77%
Gas Oil	0.00	270.32	-100%	512.77	-100%
Hydrotreated Vegetable Oil (HVO)	0.22	0.00	+100%	0.00	+100%
Kerosene (Burning Oil)	256.81	91.99	+176%	88.70	+189%
Liquified Petroleum Gas (LPG)	10.37	17.78	-42%	19.18	-45%
Petrol	21.57	16.81	+28%	0.00	+100%
Subtotal	1,450.96	1,527.38	-5%	1,878.40	-30%
Scope 2					
Electricity (location based)	1,339.80	1,387.66	-3%	2,050.66	-35%
Electricity (market based)	845.32	924.41	-9%	2,576.16	-67%
Scope 3					
Upstream					
Fuel and energy related activities	170.3	N/A	N/A	N/A	N/A
Waste and wastewater treatment	97.9	N/A	N/A	N/A	N/A
Staff business travel	17.1	N/A	N/A	N/A	N/A
Staff commuting	160.3	N/A	N/A	N/A	N/A
Downstream					
Use of sold products	68,177.8	N/A	N/A	N/A	N/A
Downstream leased assets	446.5	N/A	N/A	N/A	N/A
Subtotal	69,069.9	N/A	N/A	N/A	N/A
Total					
Total tCO_2e (location based) excluding scope 3	2,790.76	2,915.04	-4%	3,929.07	-29%
Total tCO_2e (market based) excluding scope 3	2,296.28	2,451.79	-6%	4,454.56	-48%
Total tCO_2e (location based) including scope 3	71,860.66	N/A	N/A	N/A	N/A
Total tCO_2e (market based) including scope 3	71,366.18	N/A	N/A	N/A	N/A
Intensity ratios – tCO_2e/£m turnover					
Scope 1 and 2 tCO_2e/turnover (location based)	50.90	72.39	-30%	86.23	-41%

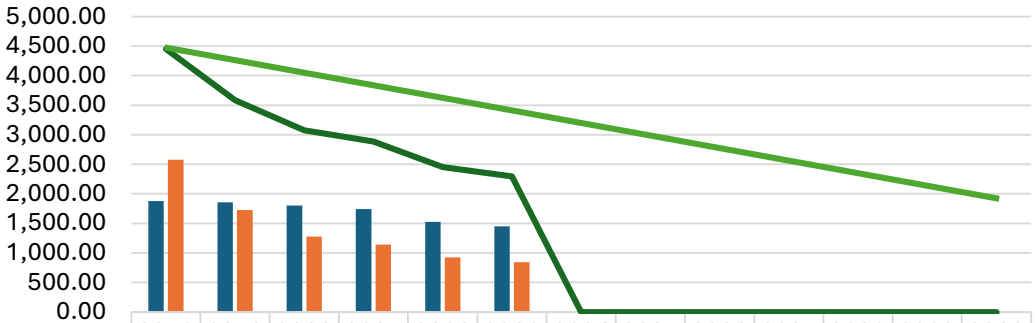
Scope 1 and 2 Emissions (Location Based)



	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030
Scope 1	1,878	1,857	1,800	1,743	1,527	1,450							
Scope 2	2,050	1,631	1,516	1,286	1,387	1,339							
Total (TCO2e)	3,929	3,488	3,317	3,029	2,915	2,790	0.00	0.00	0.00	0.00	0.00	0.00	0.00

Scope 1 Scope 2 Total (TCO2e)

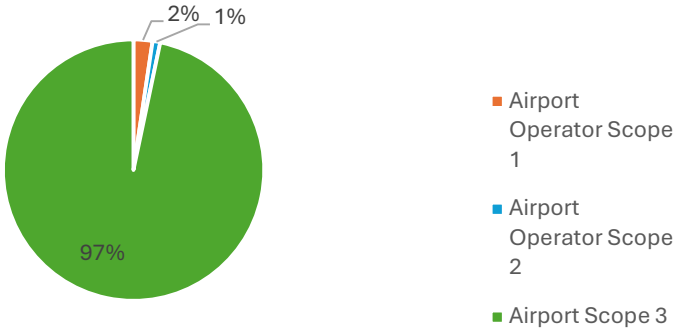
Scope 1 and 2 Emissions (Market Based)



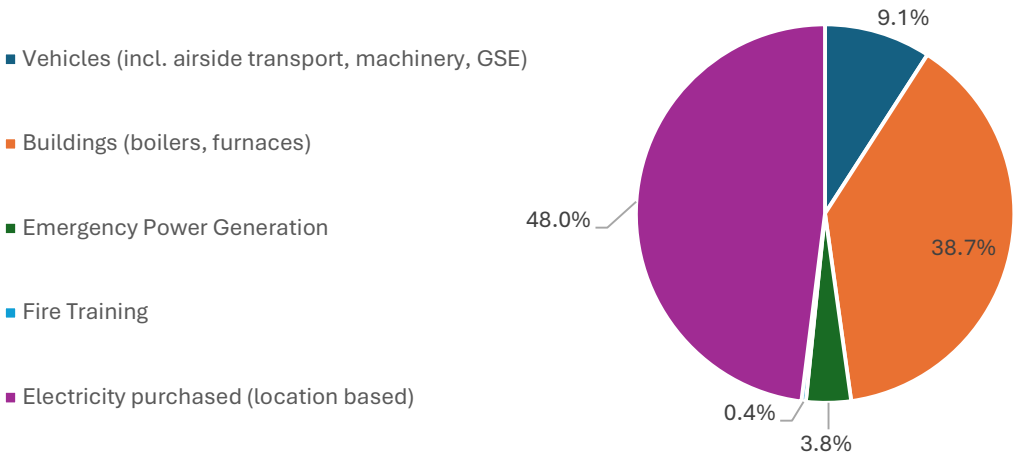
	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030
Scope 1	1,878	1,857	1,800	1,743	1,527	1,450							
Scope 2	2,575	1,727	1,273	1,139	924.4	845.3							
Total (TCO2e)	4,453	3,584	3,074	2,883	2,451	2,296	0.00	0.00	0.00	0.00	0.00	0.00	0.00

Scope 1 Scope 2 Total (TCO2e)

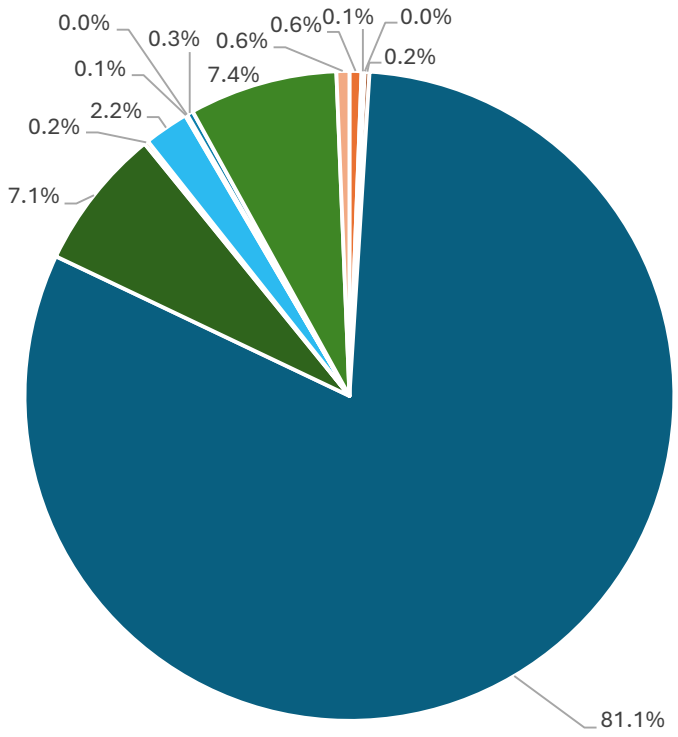
Scope 1, 2 and 3 2023 emissions



Scope 1 and 2 2023 source breakdown



Scope 3 2023 source breakdown



- Fuels and Energy
- Waste and Waste Water
- Airport Operator Staff Business Travel
- Airport Operator Staff Commuting & Home Office
- Aircraft; LTO emissions
- Aircraft APU
- Aircraft MRO
- Fuel for vehicles, machinery, GSE
- Fuel for electricity and heat generation
- Fuel for Emergency Power Generation
- De-icing chemicals for aircraft and surface de-icing
- Landside Ground Access
- Energy bought from airport operator or third party

2023 Scope 1 and 2 breakdown by GHG

	$kgCO_2e$	**tCO_2e**
Carbon Dioxide (CO_2)	2,769,584	2,769.58
Methane (CH_4)	7,860	7.86
Nitrous Oxide (N_2O)	13,130	13.13
Perfluorocarbons (PFCs)	0	0
Hydrofluorocarbons (HFCs)	0	0
Sulfur Hexafluoride (SF_6)	0	0
Nitrogen Trifluoride (NF_3)	0	0
	2,790,573	2,790

Using location-based data

2023 Scope 1 and 2 breakdown by activity

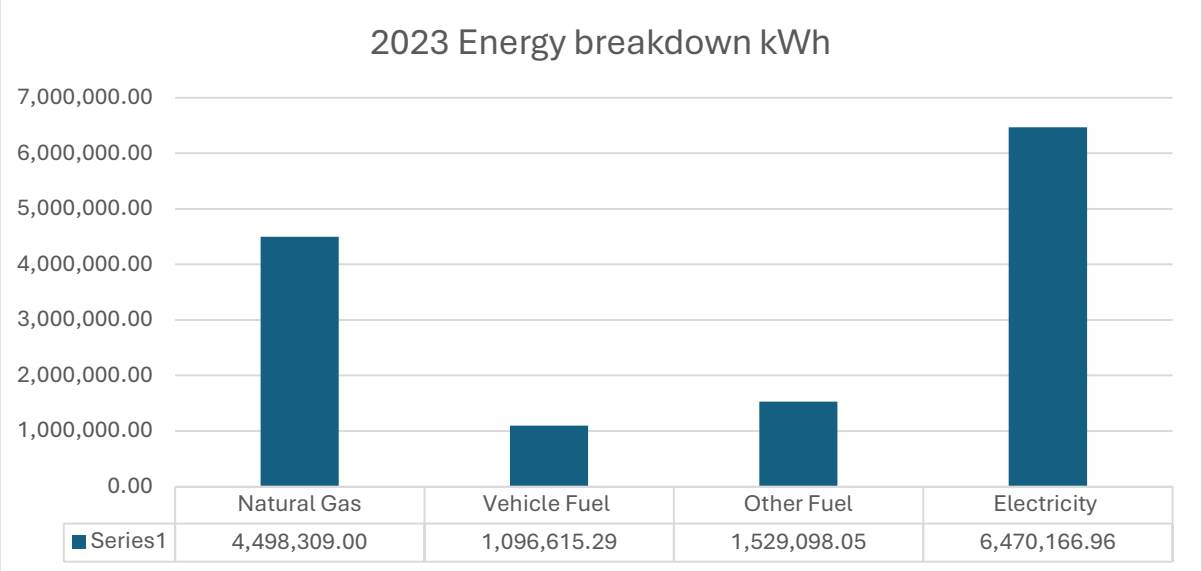
	Activity	**tCO_2e**
Scope 1	Vehicles (incl. airside transport, machinery, GSE)	254.1
Scope 1	Buildings (boilers, furnaces)	1,079.7
Scope 1	Emergency Power Generation	106.8
Scope 1	Fire Training	10.4
Scope 2	Electricity purchased (location-based)	1,339.8

Using location-based data

2023 Scope 1 and 2 energy breakdown

Energy breakdown	**2023 kWh**	**2022 kWh**	**% Change**	**2018 base year kWh**	**% Change Current to base year**
Natural Gas	4,498,309.00	5,005,925.00	-10.14%	5,796,379.00	-22.39%
Vehicle Fuel	1,096,615.29	894,544.55	+22.59%	1,252,444.10	-12.44%
Other Fuels	1,529,098.05	1,692,094.17	-9.63%	2,020,774.13	-24.33%
Electricity	6,470,166.96	7,175,807.00	-9.83%	7,244,366.00	-10.69%
Subtotal	**13,594,189.30**	**14,768,370.72**	-7.95%	**16,313,963.23**	-16.67%

Vehicle fuel – diesel, gas oil, HVO petrol. Other fuels – LPG, kerosene, diesel, gas oil, HVO for power generation



Summary of Results

Energy intensity ratio (tCO2/£m turnover)

SECR requires organisations to express the organisation's emissions by way of at least one intensity ratio. Intensity ratios compare emissions data with an appropriate business metric or financial indicator.

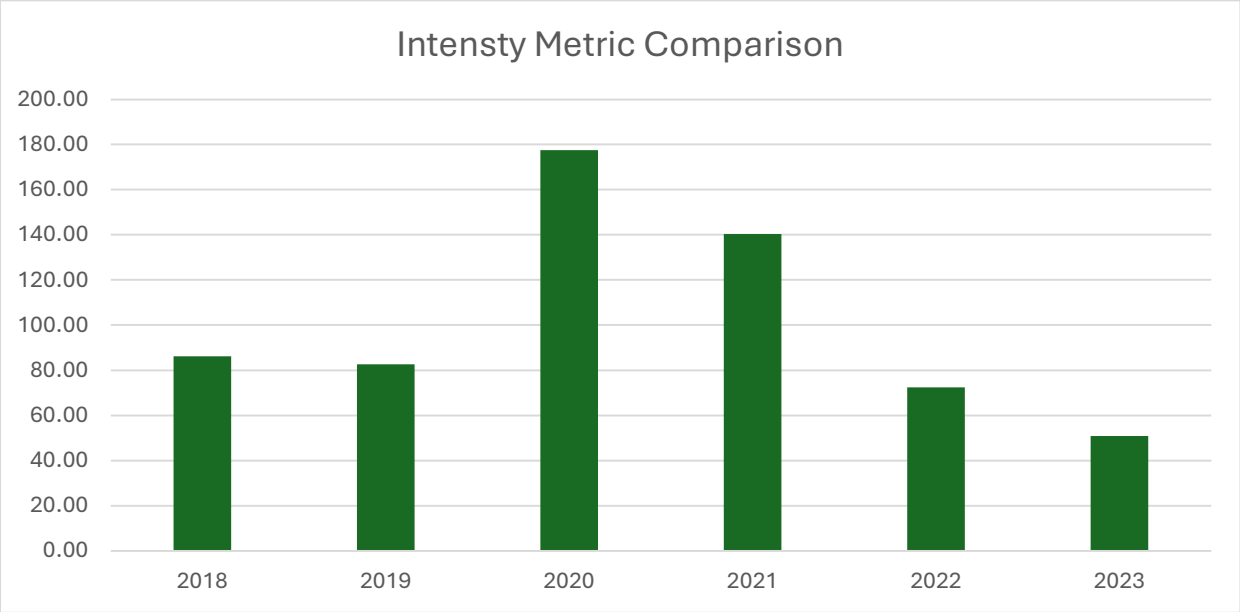
Chosen metric: £ turnover

Intensity Ratio: Scope 1 and 2 tCO_2e/£m turnover

Between 01/01/2023 and 31/12/2023 Belfast International Airport emitted an intensity ratio of:

50.902 tCO_2e/£m turnover

This signifies a 40% reduction on the 2018 baseline intensity ratio of 86.23 tCO2e/£m turnover.



Energy efficiency activities over financial year

Belfast International Airport has undertaken the following energy efficiency activities over the last number of years:

- Terminal Lighting Phases 1 and 2 – £197,000 was invested to begin a programme of LED replacement across the airport terminal, international pier, and admin areas. This investment generated savings of 340,000 kWh. PIR (passive infrared) sensors were also installed to ensure lights are only on when they are needed.
- HVO Introduction – HVO (hydrotreated vegetable oil) fuel will be introduced in 2024 after an initial trial onsite in 2023. HVO is a direct drop-in replacement for white diesel and was found to be a suitable replacement due to many vehicles not travelling long distances or driving at fast speeds. HVO will also be used to replace white diesel in emergency power generation. This significant investment will generate savings of 290 tCO2e.

- Electric Vehicles – BIA has an ongoing fleet replacement programme for replacing vehicles which have reached the end of the lifecycle. At present BIA has 5 electric vehicles: 1 fire vehicle, 2 operational vehicles, 1 engineering van and an electric passenger bus. Any vehicles that have reached the end of their lifecycle are managed in line with circular economy principles.
- Energy Management System – Work commenced on implementing an ISO 50001 certified Energy Management System (EnMS). The EnMS will identify significant energy users on site and improve controls including designing robust time and temperature controls.
- Building efficiency projects - Rolling programme taking place on site to replace expired or damaged double-glazing panels to reduce terminal heat loss.
- BIA has been building a BREEAM certified terminal extension to house the new next generation security scanners. The BREEAM certification highlights carbon and energy efficient design and construction considerations.

Future Initiatives

Levelling Up Funding (LUF) has been secured by BIA from the UK government to be used in various energy saving projects to level up infrastructure in Northern Ireland.

- External Lighting - £448,000 has been secured for upgrades to external lighting.
    - £153,000 earmarked for apron lighting
    - £259,000 earmarked for car parks, cargo, fire training ground, Delta apron, streetlights, and fire station lighting.
- Conversion from existing SON lamps to LED will reduce consumption by 62% saving 746,1000 kWh, equating to around 10% of current annual consumption.
- Fixed Electrical Ground Power – BIA will install fixed electrical ground power (FEGP) on stands in the East Apron in an investment worth £573,000. Once. This will replace the use of diesel generators during aircraft turn arounds reducing emissions, improving air quality, and reducing noise pollution. Airlines will also reduce their emissions during turnaround as pilots can switch off aircraft auxiliary power units (APUs) and receive power from electrical ground power. This will feed into the reduction of BIA's scope 3 emissions.
- Electric vehicles – £812,000 of funding has also been secured for two electric passenger buses to further decarbonise airside operations. These will be bought from a local company, supporting local innovation. BIA currently has one electric bus on site on a lease basis to provide staff training.

Other planned improvement projects include:

- Terminal Lighting Phase 3 – As part of an ongoing LOOK&FEEL project at the airport, phase 3 of LED replacement will replace end of life lighting with LEDs in the arrival's concourse.

- Aeronautical Ground Lighting (AGL) – AGL are lights in the runway, taxiways and aprons which assist aircraft manoeuvring. At present, AGL lighting are being replaced with LEDs during reactive maintenance however proactive refitting is scheduled to take place.
- Boiler House Replacement – CAPEX has been pre-empted to potentially replace the boiler house if biogas is determined not to be a feasible green fuel alternative in Northern Ireland.
- Electric Charging Points – BIA aims to provide electric charging points for staff and customers to reduce surface access scope 3 emissions.
- In addition to this, the airport land will be used to develop a 25 MWp solar farm on BIA land. This solar farm will be connected to the grid, contributing to Northern Ireland's net zero strategy, and providing energy security to the region.

References:

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