

2023 United Airlines Environmental Performance Data

Greenhouse Gas Emissions

	2023	2022	2021	2020	2019
	metric tons CO ₂ e	metric tons CO ₂ e	metric tons CO ₂ e	metric tons CO ₂ e	metric tons CO ₂ e
Direct (Scope 1) emissions	38,138,662	30,400,715	21,373,624	15,485,363	34,406,941
Mainline aircraft direct emissions	36,454,532	30,263,431	21,253,385	15,392,492	34,263,909
Conventional jet fuel	36,454,016	30,263,216	21,253,316*	15,392,491*	34,263,908*
Sustainable aviation fuel - CH ₄ and N ₂ O	517	215	68*	45*	82*
Mainline vehicles (diesel, gasoline, CNG, LPG) ²	1,601,166	47,447	38,242	24,766	65,161
Facilities (natural gas combustion, engine test cells)	82,964	89,837	81,997	70,797	80,573
Dry ice from catering	0	0	1,720	2,015	4,147

	2023	2022	2021	2020	2019
	metric tons CO ₂ e	metric tons CO ₂ e	metric tons CO ₂ e	metric tons CO ₂ e	metric tons CO ₂ e
Biogenic emissions - outside of scopes	67,395	26,806	7,768*	5,975*	13,852*
Mainline aircraft emissions - CO ₂ from sustainable aviation fuel	67,395	26,806	7,768*	5,975*	13,852*

	2023	2022	2021	2020	2019
	metric tons CO ₂ e	metric tons CO ₂ e	metric tons CO ₂ e	metric tons CO ₂ e	metric tons CO ₂ e
Indirect (Scope 2) emissions	144,019	149,252	160,794	175,087	189,682
Electricity consumption (location-based)	160,340	166,757	183,311	196,066	201,690
Electricity consumption (market-based)	143,991	149,251	160,794	175,087	189,682
Steam consumption	28	0	0	0	0

	2023	2022	2021	2020	2019
	metric tons CO ₂ e	metric tons CO ₂ e	metric tons CO ₂ e	metric tons CO ₂ e	metric tons CO ₂ e
Other Indirect (Scope 3) emissions	13,074,061	13,343,676	11,926,943*	8,982,191*	17,481,978*
3: Mainline aircraft fuel production	7,391,936	7,250,196	5,106,045*	4,701,874*	10,010,679*
Conventional jet fuel	7,377,946	7,246,478	5,104,506*	3,752,824*	8,356,884*
Sustainable aviation fuel	13,990	3,718	1,538*	1,491*	13,653*
4: Regional aircraft direct emissions and fuel production	5,276,113	5,587,322	1,259,152*	94,7558*	7,050,476*
Regional aircraft and bus-operated flights flown under capacity purchase agreement - direct emissions	4,071,885	4,504,664	5,294,725	4,053,434	7,025,889
Regional vehicles (diesel, gasoline, CNG, LPG) ²	391,647	14,533	15,481	13,658	24,588
Regional aircraft flown under capacity purchase agreement - fuel production	789,189	1,030,688	1,202,863*	908,708*	1,640,141*
Regional aircraft flown on an at-risk basis - fuel production	23,391	37,437	56,289*	38,849*	0*
7: Employee commuting	125,795	111,108	52,278	80,980	176,205
14: Regional aircraft flown on an at-risk basis	122,425	163,902	243,553	0	
15: Ownership stake in Azul Brazilian Airlines	156,432	229,912	199,099	132,220	244,605
15: United Airlines Ventures investments ³	1,361	1,236	162	24	12

	2023	2022	2021	2020	2019
	metric tons CO ₂ e	metric tons CO ₂ e	metric tons CO ₂ e	metric tons CO ₂ e	metric tons CO ₂ e
Gross GHG emissions	51,356,742	43,893,642	33,461,342*	24,647,395*	52,085,532*
Carbon offsets	0	0	0	0	0
Net GHG emissions	51,356,742	43,893,642	33,461,342*	24,647,395*	52,085,532*

Efficiency numbers

	2023	2022	2021	2020	2019
Revenue passenger-miles (RPM - millions) - consolidated	244,585	206,791	128,979	73,883	239,360
Metric tons CO ₂ e per million RTKs - Mainline + Regional ⁴	1,099.0	1,097.7	1,106.6**	1,337.7*	1,246.6*
Revenue tonnes-kilometers (RTKs - millions) - Mainline + Regional	46,361	39,526	25,212	15,934	42,760
Available seat-miles (ASMs - millions) - Mainline + Regional	291,566	247,858	178,684	122,804	284,999
Metric tons CO ₂ e per million ASMs - Mainline + Regional	175.6	176.2	186.2**	199.6*	181.8*

Energy consumption

	2023	2022	2021	2020	2019
Conventional jet fuel - Mainline aircraft (gallons - millions)	3,779	3,139	2,205	1,600	3,562
Sustainable aviation fuel - Mainline aircraft (gallons - millions)	7	3	1	1	1
Lifecycle reduction from SAF	77.9%	86.9%	83.4%	79.3%	62.0%
Emissions reductions from SAF (metric tons CO ₂ e)	11,308	3,419	987	1,220	8,517
Conventional jet fuel - Regional aircraft (gallons - millions)	418	466	523	404	729
Electricity (MWh)	434,790	435,259	447,714	477,751	489,197
Natural gas (MM BTUs)	1,481,604	1,628,722	1,494,698	1,264,964	1,432,250

Local air quality

	2023	2022	2021	2020	2019
	tons	tons	tons	tons	tons
NO _x emissions from mainline aircraft	10,356	14,948	10,813	7,660	14,720
NO _x emissions (old)	11,554	16,144	11,626	8,565	16,410
Mainline aircraft (jet fuel)	10,356	14,948	10,813	7,660	14,720
Vehicles (diesel, gasoline, CNG, LPG) ²	1,197	1,196	813	905	2,035
Facilities (Natural gas combustion, engine test cells)	156	153	121	130	148

	2023	2022	2021	2020	2019
	tons	tons	tons	tons	tons
SO ₂ emissions from mainline aircraft	1,250	1,413	1,022	730	1,426
SO ₂ emissions (old)	1,251	1,414	1,022	731	1,427
Mainline aircraft (jet fuel)	1,250	1,413	1,022	730	1,426
Vehicles (diesel, gasoline, CNG, LPG)	0	0	0	0	0
Facilities (Natural gas combustion, engine test cells)	1	1	1	1	1

	2023	2022	2021	2020	2019
	tons	tons	tons	tons	tons
CO emissions from mainline aircraft	9,027	7,805	5,503	3,743	8,010
CO emissions (old)	16,089	16,759	10,507	9,207	21,153
Mainline aircraft (jet fuel)	9,027	7,805	5,503	3,743	8,010
Vehicles (diesel, gasoline, CNG, LPG) ²	6,977	8,864	4,921	5,388	8,175
Facilities (Natural gas combustion, engine test cells)	85	91	83	76	83

Waste management

	2023	2022	2021	2020	2019
	metric tons	metric tons	metric tons	metric tons	metric tons
Waste – total	59,025	25,176	31,407	26,667	53,832
Hazardous and non-hazardous waste generation	19,303	22,399	24,253	15,602	26,621
Catering – Municipal waste	37,014	2,776	10,367	11,066	27,210
Hazardous	Moved to new category	Moved to new category	Moved to new category	Moved to new category	Moved to new category
Non-hazardous/other waste	Moved to new category	Moved to new category	Moved to new category	Moved to new category	Moved to new category
Recycling – total	9,209	6,112	5,818	4,468	8,332
Non-catering – recycled	5,047	5,255	4,446	3,302	4,489
Catering – recycled	4,158	857	1,372	1,166	3,843

Water consumption

	2023	2022	2021	2020	2019
	millions of gallons	millions of gallons	millions of gallons	millions of gallons	millions of gallons
Billed water consumption ⁵	429	329	661	484	521

The data presented herein reflecting United's 2023 GHG emissions footprint has been internally validated by United Airlines Internal Audit Department and externally verified by our third-party verification party ERM. United obtains this third-party verification of our GHG emissions on an annual basis. ERM Certification and Verification Services (ERM CVS, a wholly owned subsidiary of the ERM Group, a global market leader in sustainability services) conducts our emissions verification and provides an ISO 14064-3 limited assurance on our GHG emissions for reporting.

Footnotes:

1. United accounts emissions reductions associated with the use and combustion of sustainable aviation fuel (SAF) to be a Scope 1 reduction, as it is in-sector and a sustainable alternative to the conventional jet fuel usage that is accounted in the gross emissions of this Scope. This is an interpretation of the GHG Protocol, until such time that an accepted GHG accounting methodology is developed to reflect in-sector reductions associated to biogenic products.

2. United changed to a more straightforward methodology to determine GHG emissions from GSE starting with 2018 reporting, but has not restated prior years; this change also re-allocated GHG emissions between Mainline and Regional GSE

3. United Airlines Ventures investments in Alder Fuels, Archer Aviation, Boom, Clear, Fulcrum BioEnergy, Heart Aerospace, and ZeroAvia (some of which may not have developed GHG inventories yet)

4. Intensity metric is used to track United's progress against our SBTi near term target it includes Scope 1, Scope 2, and Scope 3 category 3 and 4 emissions

5. Does not account for all United locations or locations shared with other companies (e.g., airport terminals) and as a result may change considerably from year to year

*This data point has been added or updated to reflect the change in our GHG accounting methodology made in 2023 as referenced in our 2023 Corporate Responsibility Report and accurately tracking against our SBTi validated mid-term goal.

**This calculation has been updated since the publishing of United's Form 10K to include Scope 3 Categories 3 & 4 for comparability with the 2023 emissions disclosures which include these emission categories. Inclusion of these Scope 3 emission categories reflects a change in our GHG accounting methodology as referenced in our Corporate Responsibility Report and accurately tracking against our SBTi-validated mid-term goal.

Totals may not add up due to rounding.

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Independent Limited Assurance Report to United Airlines, Inc.

ERM Certification & Verification Services Incorporated (“ERM CVS”) was engaged by United Airlines, Inc. (United) to provide limited assurance in relation to the selected information set out below and presented in the greenhouse gas (GHG) emissions and other information listed in Appendix 1, included in United’s 2024 CDP Climate Change Questionnaire.

Engagement summary

Whether the 2023 data for the following selected disclosures are fairly presented in the Report, in all material respects, in accordance with the reporting criteria.

GHG Emissions

- Total Scope 1 GHG emissions [metric tonnes CO₂e] from mainline jet fuel combustion, ground support equipment (GSE) fuel combustion, stationary source fuel combustion
- Total Scope 2 (location-based and market-based) GHG emissions [metric tonnes CO₂e] from purchased electricity and steam
- Total Scope 3 GHG emissions [metric tonnes CO₂e] from the following categories:
 - Category 3: Fuel- and Energy-related Activities
 - Category 4: Upstream transportation and distribution
 - Category 7: Employee commuting
 - Category 14: Franchises
 - Category 15: Investments

Whether the following metrics and information for 2023 which United will disclose in its 2024 CDP Climate Change Questionnaire are fairly presented in accordance with the Reporting Criteria:

Intensity metrics

- Scope 1 and 2 (market-based) GHG emissions per Revenue [metric tonnes CO₂e / million USD]*
- Scope 1, 2 and 3 (Capacity Purchase Agreement Regional Partners only) GHG emissions per Revenue [metric tonnes CO₂e / million USD]*
- Scope 1, 2 and 3 (Category 4 only) GHG emissions per Consolidated Available Seat Mile (ASM) [metric tonnes CO₂e / million ASM]
- Scope 1, 2 and 3 (Category 4 only) GHG emissions per Consolidated Revenue Passenger Mile (RPM) [metric tonnes CO₂e / million RPM]
- Scope 1 and 2 (market-based) and 3 (Categories 3 & 4 only) GHG emissions per Revenue Tonne-Kilometre (RTK) [metric tonnes CO₂e / million RTK]

* ERM CVS did not independently assure revenue but relied on reported in the 10-K filing.

Year-over-Year (2023 vs 2022) change in [%]:

- Total Scope 1 GHG emissions
- Total Scope 2 (location-based) GHG emissions
- Total Scope 2 (market-based) GHG emissions
- Total Scope 1 and Total Scope 2 (location-based) GHG emissions
- Total Scope 1 and Total Scope 2 (market-based) GHG emissions
- Total Scope 1 and Total Scope 3 GHG emissions

Our assurance engagement does not extend to information in respect of earlier reports or to any other information included in the Report.

Reporting period

2023 (1st January 2023 to 31st December 2023)

Reporting criteria	United's 2023 GHG Footprint Protocol, aligned with ISO 14064-1, <i>Specification with guidance at the organization level for quantification and reporting of greenhouse gas emissions and removals</i> .
Assurance standard and level of assurance	<p>We performed a limited assurance engagement, in accordance with the International Standard on Assurance Engagements ISAE 3000 (Revised) 'Assurance Engagements other than Audits or Reviews of Historical Financial Information' and in accordance with ISAE3410 for Greenhouse Gas data issued by the International Auditing and Assurance Standards Board and ISO 14064:3 for Greenhouse Gas data.</p> <p>The procedures performed in a limited assurance engagement vary in nature and timing from and are less in extent than for a reasonable assurance engagement and consequently, the level of assurance obtained in a limited assurance engagement is substantially lower than the assurance that would have been obtained had a reasonable assurance engagement been performed.</p>
Respective responsibilities	<p>United is responsible for preparing the Report's and for the collection and presentation of the information within it, and for the designing, implementing and maintaining of internal controls relevant to the preparation and presentation of the Report's.</p> <p>ERM CVS' responsibility is to provide a conclusion to United on the agreed scope based on our engagement terms with United, the assurance activities performed and exercising our professional judgement.</p>

Our conclusion

Based on our activities, as described below, nothing has come to our attention to indicate that the 2023 data and information for the disclosures listed under 'Scope' above are not fairly presented in the Report, in all material respects, in accordance with the reporting criteria.

Our assurance activities

Considering the level of assurance and our assessment of the risk of material misstatement of the Report a multi-disciplinary team of sustainability and assurance specialists performed a range of procedures that included, but was not restricted to, the following:

- Evaluating the appropriateness of the reporting criteria for the Report's;
- Performing an analysis of the external environment, including a media search, to identify sustainability risks and issues in the reporting period that may be relevant to the assurance scope;
- Interviewing relevant staff to understand and evaluate the management systems and processes (including internal review and control processes) used for collecting and reporting the selected disclosures;
- Obtaining an understanding of the procedures performed by the internal audit department;
- Conducting a review at corporate level of a sample of qualitative and quantitative evidence supporting the reported information;
- Conducting an analytical review of the year-end data submitted by all locations included in the consolidated 2023 group data for the selected disclosures which included testing the completeness and mathematical accuracy of conversions and calculations, and consolidation in line with the stated reporting boundary;
- Evaluating the conversion and emission factors and assumptions used; and
- Reviewing the presentation of information relevant to the scope of our work in the Report to ensure consistency with our findings.

The limitations of our engagement

The reliability of the assured information is subject to inherent uncertainties, given the available methods for determining, calculating or estimating the underlying information. It is important to understand our assurance conclusions in this context.

Our independence, integrity and quality control

ERM CVS is an independent certification and verification body accredited by UKAS to ISO 17021:2015. Accordingly we maintain a comprehensive system of quality control, including documented policies and procedures regarding compliance with ethical requirements, professional standards, and applicable legal and regulatory requirements. Our quality management system is at least as demanding as the relevant sections of ISQM-1 and ISQM-2 (2022).

ERM CVS applies a Code of Conduct and related policies to ensure that its employees maintain integrity, objectivity, professional competence and high ethical standards in their work. Our processes are designed and implemented to ensure that the work we undertake is objective, impartial and free from bias and conflict of interest. Our certified management system covers independence and ethical requirements that are at least as demanding as the relevant sections of the IESBA Code relating to assurance engagements.

ERM CVS has extensive experience in conducting assurance on environmental, social, ethical and health and safety information, systems and processes, and provides no consultancy related services to United in any respect.

Other Matters - observations

Based on the work outlined above, we have provided United's management with a separate, confidential report detailing our assessment of its GHG emissions data for the year ended 31st December 2023.



Heather I. Moore
Partner, Corporate Assurance
Malvern, PA

2024, April 11

On behalf of:

ERM Certification & Verification Services Incorporated
www.ermcvs.com | post@ermcvs.com

The logo for ERM CVS, featuring the letters 'ERM CVS' in a bold, green, serif font. A green checkmark is integrated into the top right of the letter 'S'.

Appendix 1: Assured 2023 GHG emissions data and other information included in United's 2024 CDP Climate Change Questionnaire.

	Unit of measure	Amount
Scope 1 GHG emissions*	Metric tonnes CO ₂ e	38,138,662
Scope 2 GHG emissions (location-based)**	Metric tonnes CO ₂ e	160,340
Scope 2 GHG emissions (market-based)**	Metric tonnes CO ₂ e	143,991
Scope 3 GHG emissions***	Metric tonnes CO ₂ e	13,074,061
Scope 1 and 2 (market-based) GHG emissions per Revenue	Metric tonnes CO ₂ e / million USD	\$713
Scope 1, 2 (market-based) and 3 GHG emissions per Revenue	Metric tonnes CO ₂ e / million USD	\$956
Scope 1, 2 and 3 (Category 4 only) GHG emissions per Consolidated ASM	Metric tonnes CO ₂ e / million ASM	149.3
Scope 1, 2 and 3 (Category 4 only) GHG emissions per Consolidated RPM	Metric tonnes CO ₂ e / million RPM	178.0
Scope 1, 2 (market-based) and 3 (Categories 3 and 4 only) GHG emissions per Consolidated RTK	Metric tonnes CO ₂ e / million RTK	1,099.0
Year-over-year change in Total Scope 1 emissions (2023 vs 2022)	%	25.5%
Year-over-year change in Total Scope 2 (location-based) emissions (2023 vs 2022)	%	-3.8%
Year-over-year change in Total Scope 2 (market-based) emissions (2023 vs 2022)	%	-3.5%
Year-over-year change in Total Scope 1 and Total Scope 2 (location-based) emissions (2023 vs 2022)	%	25.3%
Year-over-year change in Total Scope 1 and Total Scope 2 (market-based) emissions (2023 vs 2022)	%	25.3%
Year-over-year change in Total Scope 1 and Total Scope 3 (CPA Regional Partners only) emissions (2023 vs 2022)	%	21.9%

* **Scope 1 Direct GHG emissions** from mainline jet fuel combustion, ground support equipment (GSE) fuel combustion, stationary source fuel combustion. Emissions from refrigerants are excluded from the inventory as these are deemed a non-material source of emissions.

** **Scope 2 Indirect GHG emissions (location-based & market-based)** from purchased electricity and steam

*** **Scope 3 Other indirect GHG Emissions** from Fuel Production; Upstream transportation and distribution, which includes regional jet fuel and GSE fuel combustion; Employee commuting; Franchises; Investments (equity share basis)