Section 1: Our environmental data

1.1 Greenhouse gas (GHG) emissions

Table 1A – GHG emissions by scope ($mtCO_2e$)

	FY20	FY21	FY22	FY23
Scope 1	118,100	123,704	139,413	**144,960**
Scope 2				
Location-based	4,328,916	5,010,667	6,381,250	**8,077,403**
Market-based	456,119	429,405	288,029	**393,134**
Subtotal emissions (Scope 1 + 2 market-based)	574,219	553,109	427,442	**538,094**
Scope 3[1]				
Category 1 – Purchased Goods & Services[2]	4,415,000	4,930,000	5,780,000	**5,564,000**
Category 2 – Capital Goods	2,962,000	4,179,000	4,026,000	**5,872,000**
Category 3 – Fuel- and Energy-Related Activities	300,000	350,000	450,000	**521,000**
Category 4 – Upstream Transportation[3]	243,000	225,000	371,000	**318,000**
Category 5 – Waste	9,500	5,700	8,000	**8,000**
Category 6 – Business Travel	329,356	21,901	139,000	**133,000**
Category 7 – Employee Commuting	317,000	80,000	141,000	**187,000**
Category 9 – Downstream Transportation	65,000	69,000	69,000	**69,000**
Category 11 – Use of Sold Products	2,983,000	3,950,000	5,101,000	**3,941,000**
Category 12 – End-of-Life of Sold Products	17,000	19,000	18,000	**4,000**
Category 13 – Downstream Leased Assets	11,800	9,600	8,000	**7,000**
Subtotal emissions[4]	11,653,000	13,839,000	16,111,000	**16,624,000**
Total emissions (Scope 1 + 2 + 3)[4]	12,227,000	14,392,000	16,538,000	**17,162,000**

1. For FY20 and FY21, values have been rounded except for Business Travel. Starting in FY22, all reported Scope 3 values are rounded to the nearest thousand $mtCO_2e$.
2. Reported emissions for this category now incorporate emissions calculated using the life cycle assessment (LCA) coefficients for the portion associated with the manufacture of Microsoft devices as outlined in Section 1.9. Values for FY22 (previous year), and FY20 (base year) have been adjusted to reflect the following changes: incorporation of LCA methodology and estimation for the Nuance acquisition.
3. Reported emissions for this category now incorporate emissions calculated following the Global Logistics Emissions Council (GLEC) Framework for our Devices and Cloud business groups as outlined in Section 1.9. Values for FY22 (previous year), and FY20 (base year) have been adjusted to reflect this change.
4. These values reflect market-based emissions. Values rounded to nearest thousand $mtCO_2e$.

Table 1B – GHG emissions by scope ($mtCO_2e$) with management's criteria

	FY20	FY21	FY22	FY23
Scope 1 + 2[1]	574,219	553,109	427,442	**538,094**
Scope 3				
Management's criteria[2]				
Category 4 – Upstream Transportation with SAFc	243,000	225,000	371,000	**305,000**
Category 6 – Business Travel with SAFc	385,000	23,000	157,000	**124,000**
Category 11 – Use of Sold Products[3]	2,600,000	2,622,000	1,332,000	**2,158,000**
GHGP-aligned				
Rest of the categories[1,4]	8,097,000	9,642,000	10,500,000	**12,232,000**
Subtotal emissions	11,325,000	12,512,000	12,360,000	**14,819,000**
Total emissions (Scope 1 + 2 + 3)[1]	11,899,000	13,065,000	12,787,000	**15,357,000**

1. These values reflect market-based emissions.
2. Emissions for these categories are reported per the reporting criteria defined in Section 1.10 of this fact sheet and per the methodologies outlined in Section 1.9. All values have been rounded to the nearest thousand $mtCO_2e$.
3. Per the reporting criteria defined in Section 1.10 of this fact sheet, reported values are gross emissions net of renewable electricity. Gross emissions without the impact of renewable electricity are as follows: 2,158,000 $mtCO_2e$ (FY23), 2,207,000 $mtCO_2e$ (FY22), 2,622,000 $mtCO_2e$ (FY21), 2,600,000 $mtCO_2e$ (FY20).
4. Reported value represents a sum of Category 1 – Purchased Goods & Services, Category 2 – Capital Goods, Category 3 – Fuel- and Energy-Related Activities, Category 5 – Waste, Category 7 – Employee Commuting, Category 9 – Downstream Transportation, Category 12 – End-of-Life of Sold Products, and Category 13 – Downstream Leased Assets. All values have been rounded to the nearest thousand $mtCO_2e$.

Table 2 – GHG emissions by type

(mt)	FY20	FY21	FY22	FY23
Scope 1				
Scope 1 – CO_2	96,700	94,292	99,123	**92,466**
Scope 1 – CH_4	2	3	2	**3**
Scope 1 – N_2O	1	1	1	**1**
Scope 1 – HFCs	19	27	37	**49**
Scope 1 – SF_6	0	0	0	**0**
Scope 2 (location-based)				
Scope 2 – CO_2	4,305,119	4,984,442	6,349,431	**8,034,943**
Scope 2 – CH_4	283	330	382	**515**
Scope 2 – N_2O	56	60	75	**99**
Scope 2 (market-based)				
Scope 2 – CO_2	454,034	427,606	286,992	**390,884**
Scope 2 – CH_4	19	18	10	**23**
Scope 2 – N_2O	5	5	3	**6**
($mtCO_2e$)				
Scope 1	**118,100**	**123,704**	**139,413**	**144,960**
Scope 1 – CO_2	96,700	94,292	99,123	**92,466**
Scope 1 – CH_4	53	63	62	**63**
Scope 1 – N_2O	236	150	209	**292**
Scope 1 – HFCs	21,070	29,177	39,993	**52,087**
Scope 1 – SF_6	41	22	26	**52**
Scope 2 (location-based)	**4,328,916**	**5,010,667**	**6,381,250**	**8,077,403**
Scope 2 – CO_2	4,305,119	4,984,442	6,349,431	**8,034,943**
Scope 2 – CH_4	7,063	8,248	9,543	**12,868**
Scope 2 – N_2O	16,734	17,977	22,276	**29,592**
Scope 2 (market-based)	**456,119**	**429,405**	**288,029**	**393,134**
Scope 2 – CO_2	454,034	427,606	286,992	**390,884**
Scope 2 – CH_4	483	456	243	**571**
Scope 2 – N_2O	1,602	1,343	794	**1,679**

Table 3 – GHG emissions by region ($mtCO_2e$)

	FY20	FY21	FY22	FY23
Scope 1				
Asia	8,650	9,664	13,532	**18,529**
Europe, Middle East, Africa	61,719	69,251	68,181	**51,866**
Latin America	3,871	4,403	4,522	**4,604**
North America	43,860	40,386	53,178	**69,961**
Subtotal	**118,100**	**123,704**	**139,413**	**144,960**
Scope 2 (location-based)				
Asia	905,585	1,082,697	1,660,153	**2,044,242**
Europe, Middle East, Africa	902,859	916,141	1,252,717	**1,547,728**
Latin America	16,022	16,479	51,328	**45,038**
North America	2,504,450	2,995,350	3,417,052	**4,440,395**
Subtotal	**4,328,916**	**5,010,667**	**6,381,250**	**8,077,403**
Scope 2 (market-based)				
Asia	320,449	297,646	274,585	**369,346**
Europe, Middle East, Africa	49,377	54,805	13,167	**22,775**
Latin America	594	708	247	**202**
North America	85,699	76,246	30	**811**
Subtotal	**456,119**	**429,405**	**288,029**	**393,134**

Table 4 – GHG emissions intensity ($mtCO_2e$/revenue $M)

	FY20	FY21	FY22	FY23
Revenue ($M)	143,015	168,088	198,270	**211,915**
Scope 1	0.8	0.7	0.7	**0.7**
Scope 2 (location-based)	30.3	29.8	32.2	**38.1**
Scope 2 (market-based)	3.2	2.6	1.5	**1.9**
Scope 3 (market-based)[1]	81.5	82.3	81.3	**78.4**
Scope 1 + 2 (location-based)	31.1	30.5	32.9	**38.8**
Scope 1 + 2 (market-based)	4.0	3.3	2.2	**2.6**
Scope 1 + 2 + 3 (market-based)[1]	85.5	85.6	83.5	**81.0**

1. Emission values (numerator) for FY22 (previous year) and FY20 (base year) have been adjusted to reflect the following changes: incorporation of LCA methodology, estimation for the Nuance acquisition, and emissions calculated following the Global Logistics Emissions Council (GLEC) Framework for our devices and Cloud business groups.

Table 5 – Carbon offsets ($mtCO_2e$)

	FY20	FY21	FY22	FY23
GHG emissions within carbon neutral boundary[1]	612,927	292,106	514,156	**605,354**
Offsets applied to reporting year	612,927	292,106	514,156	**605,354**
Net GHG emissions within carbon neutral boundary[1,2]	–	–	–	**–**
Total removal offsets contracted[3]	–	1,391,187	1,443,981	**5,015,019**

1. This data supports Microsoft's target to be carbon neutral every year since fiscal year 2013. Microsoft defines carbon neutrality as matching the emissions within the carbon neutrality boundary with an equivalent amount of carbon offsets as shown in this table. The boundary for this carbon neutral goal includes global Scope 1, Scope 2 market-based, and Scope 3 business air travel emissions. Starting in FY23, values for Scope 3 business air travel emissions follow management's criteria as reported under Category 6 – Business Travel with SAFc. For more detail on carbon credits we purchase and emissions methodology, please see Sections 1.8 and 1.9 of this Fact Sheet. As we made progress towards our carbon negative targets, which included purchasing removal offsets, we also maintained carbon neutrality.
2. Values reflect Microsoft's carbon neutrality at the time of reporting. Per our carbon negative target, by 2050 we expect to have removed from the environment all the carbon the company has emitted either directly or by electrical consumption since it was founded in 1975.
3. Values reported represent offsets contracted to be delivered in the current or future fiscal year. Contracted removal values only include removal credits that have been evaluated as consistent with Microsoft's quality removal criteria. This number might change based on actual versus projected outcomes related to contract fulfillment (delivery of offsets). Only removal offsets that are delivered get applied/retired against our carbon neutral boundary.

For carbon removal, the following Microsoft criteria is used to select carbon removal offsets that we contract: Microsoft Criteria for High-Quality Carbon Dioxide Removal. Both third-party certified and uncertified tons are purchased in an effort to help develop the market, and only certified tons are applied to the carbon neutrality scope (Scope 1, Scope 2 market-based, and business air travel). For the certified portion, the following validation and verification bodies have provided the certification: Voluntary Carbon Standard (VCS), American Carbon Registry (ACR), Climate Action Reserve (CAR), and California Air Resources Board (CARB). The reported carbon removal contracted value total also includes future tons that are to be delivered in subsequent years.

Microsoft procures and uses renewable energy from onsite generation, unbundled EACs, power purchase agreements (PPAs), and green power products. The purchases of EACs include renewable energy certificates (RECs) (Green-e certified), guarantees of origin (GO), renewable energy guarantees of origin (REGO), I-RECs, tradable instrument for global renewables (TIGR), J-Credits, Non-Fossil Fuel Certificates (NFCs), large-scale energy certificates (LGC), Green Electricity Certificates (GECs), and PowerPlus. In some cases for unbundled EAC purchases, Microsoft receives the certificates after our inventory has been compiled and assured, due to the timing certificate registry processes follow. Microsoft procures enough renewable electricity to match 100% of our global electricity consumption. To calculate Scope 2 emissions from a market-based approach, Microsoft captures the impact across all renewable electricity purchases and matches that with the market where we operate, aligned with the GHG Protocol. In the case that renewable electricity is not procured in the markets where we operate and to ensure we maintain the 100% renewable electricity commitment, enough renewable electricity from nearby markets is purchased. Finally, Microsoft captures the impact from onsite generation, PPAs, and green power products to support our progress against our commitment to have 100% direct renewable electricity by 2025.

Microsoft's water inventory includes the withdrawal, consumption, and discharge associated with assets under our operational control. These volumes represent global enterprise-wide operations including owned and leased offices, datacenters, labs, and retail. This data supports progress tracking against current water positive program commitments.

For waste and circularity, operational waste and product packaging recyclability and single-use plastics are included. The operational waste inventory includes the mass of waste generated from operations within Microsoft's operational control that are landfilled, incinerated, recycled, reused, and composted for both non-hazardous and hazardous categories, for both owned and leased facilities. This waste inventory supports progress tracking against the commitment of diverting 90% of operational waste at datacenters and campuses. Currently the waste inventory does not include waste from construction and deconstruction activities.

For product packaging, both packaging recyclability and single-use plastics metrics consider all hardware packaging (retail and commercial) and consumer software packaging of the products produced and sold during the reporting year. Similarly, these metrics support our product packaging-related commitments to make fully recyclable product packaging by 2030, and to eliminate single-use plastic in packaging by 2025. The calculations exclude impact from inks, glues, coatings, and label liner material that is removed before a label is applied.

Reported data for ecosystems includes the total area of land that has been funded and protected based on the presented definition in Table 1.10 for reporting criteria. Microsoft's land protection commitment was established in FY20. Reported data represents progress through the end of FY23.

According to Microsoft's structural changes policy previously described in the introduction section, FY23 data across metrics now incorporates impact from the Nuance acquisition which was previously completed in March 2022. Additional details are included as needed in the table footnotes to highlight any prior year adjustments. Structural changes items are part of Microsoft's continuous data improvement activities and will be included and highlighted accordingly in the relevant reporting cycle.

1.9 Methodology and emission factors

Carbon - Scope 1 and 2

Primary data is used to calculate emissions for both Scope 1 and 2 emissions. Estimates are used where primary data is not available. Depending on the type of site, the estimation methodology uses capacity (MW) or floorspace based coefficients to extrapolate emissions for those locations where primary data is unavailable. Activity data is collected internally and stored in an internally developed data platform which then applies the corresponding emission factors to calculate emissions. Microsoft uses the 100-year IPCC Fourth Assessment when it comes to applying global warming potential values.

Scope and source	Emission factors source
Scope 1 (all fuels)	EPA Emission Factors Hub. March 2018.
Scope 2 Electricity (US)	Year 2021 eGRID Subregion Emission Factors: eGRID 2021, January 2023.
Scope 2 Electricity (international unless otherwise sourced)	IEA (2022), Emission Factors
Scope 2 Electricity (Australia)	Year 2022 factors from "Table 1: Indirect (Scope 2 and Scope 3) emission factors from consumption of purchased or acquired electricity: Location based approach", Australian National Greenhouse Accounts Factors, August 2023.
Scope 2 Electricity (Brazil)	Year 2022 factors from the Brazilian Ministry of Science, Technology, Innovation and Communication: Fator médio - Inventários corporativos.
Scope 2 Electricity (Canada)	National inventory report 1990-2021. Annex 13. Year 2021 factors. From April 2023 release.
Scope 2 Electricity (UK)	2023 Government Greenhouse Gas Conversion Factors for Company Reporting: Methodology Paper for Conversion Factors. Year 2021 factors from June 2023 release.

Emission factors presented in the preceding table apply to current reporting year and are used for location-based accounting. For market-based accounting, Microsoft uses a zero-emission factor for procured renewable electricity. In the locations where Microsoft did not procure renewable electricity, utility-based and residual emission factors were unavailable; therefore we used the average grid factors presented previously.

Carbon - Scope 3

Microsoft calculates and reports Scope 3 emissions for all relevant categories. The following table summarizes which categories are relevant and a description of the methodologies and emission factors used.

Scope 3 category	Emissions calculation methodology	Percentage of emissions calculated using supplier data
Purchased Goods and Services	This category includes emissions from upstream purchasing of goods and services, including direct and indirect goods. Microsoft has been using an ISO 14040/ISO 14044 compliant life cycle assessment (LCA) approach for many years to track the emissions associated with its devices. In FY23, Microsoft started using its LCAs to calculate the portion of emissions associated with the manufacture of devices Microsoft sold during the reporting year including Xbox devices, Surface devices, HoloLens, keyboards, mice, and other peripherals. Microsoft utilized Makersite and internal software engineering teams in order to automate and scale the modeling of complex electronic products. To ensure a more supply chain specific accounting process, the system analyzes the bill of materials and material composition from full material declarations collected from suppliers, resulting in LCA-based emissions that have increased accuracy, transparency, and representativeness. GWPs are from the IPCC Fourth Assessment Report (AR4), 100-year average. For the rest of the emissions, Microsoft requests carbon emissions data from its suppliers and uses their responses to determine Scope 1, Scope 2, and upstream Scope 3 emission factors ($mtCO_2e$/$ revenue). The latest available responses are used, so this report's inventory considers 2023 submissions (that is, 2022 data). Microsoft estimates emissions for suppliers who submitted data by multiplying their response-derived factor by the annual spend with the supplier. All other spend is mapped to corresponding industry sectors and then multiplied by cradle-to-gate emission factors by sector from UK Defra's "UK Defra, Table 13 — Indirect emissions from the supply chain. March 2014"—updated per the latest inflation and currency conversion rates. Corporate-wide expense data for all company divisions is obtained from the finance department. Activities already included in Scope 1 and Scope 2 (such as electricity purchases) and other Scope 3 categories (such as capital goods) were removed to prevent double counting. Global warming potentials (GWP) values are derived from the underlying supplier responses and Defra data sources.	51%

Scope 3 category	Emissions calculation methodology	Percentage of emissions calculated using supplier data
Capital Goods	This category includes emissions from upstream purchasing of capital goods, including server equipment and other long-term assets. Microsoft requests carbon emissions data from its suppliers and uses their responses to determine Scope 1, Scope 2, and upstream Scope 3 emission factors (tCO_2e/$ revenue). The latest available responses are used, so this report's inventory considers 2023 submissions (that is, 2022 data). Microsoft estimates emissions for suppliers who submitted data by multiplying their response-derived factor by the annual spend with the supplier. All other spend is mapped to corresponding industry sectors and then multiplied by cradle-to-gate emission factors by sector from UK Defra's "UK Defra, Table 13 – Indirect emissions from the supply chain. March 2014"—updated per the latest inflation and currency conversion rates. Corporate-wide expense data for all company divisions is obtained from the finance department. Activities already included in Scope 1 and Scope 2 (such as electricity purchases) and other Scope 3 categories (such as purchased goods and services) were removed to prevent double counting. GWP values are derived from the underlying supplier responses and Defra data sources.	70%
Fuel- and Energy-Related Activities (not included in Scope 1 or 2)	Starting in FY23, Microsoft reports this category using a market-based approach only, which has been the approach used to track progress against our carbon negative commitment. Fuel- and energy-related activities (not included in Scope 1 or 2) include three emission sources. First, upstream emissions of purchased electricity were calculated by multiplying electricity use by emission factors from life cycle analysis tools for the United States and UK Defra 2015 Guidelines for non-US countries. When calculating the market-based approach and including the impact from purchased renewable electricity, the upstream emissions associated with fuel are zero. Second, fuel consumption was multiplied by emission factors from the GREET and Ecoinvent life cycle analysis tools. And third, transmission and distribution (T&D) losses (by energy use type) were multiplied by loss percentages from the EPA's eGRID2020 database for the United States and emission factors from IEA (2022) emission factors for other countries. GWPs are from the IPCC Fourth Assessment Report (AR4), 100-year average.	96%
Upstream Transportation and Distribution	This category includes emissions from upstream transportation of goods, including all transportation of goods that Microsoft finances. In FY23, Microsoft started calculating emissions for this category following the Global Logistics Emissions Council (GLEC) Framework using data inputs from Microsoft's fourth-party logistics service provider, TMC. Our Devices business group applies this calculation considering the shipment weight, distance traveled, and the corresponding well-to-wheel (WTW) fuel emission factor appropriate for each mode or vehicle type. In addition to these inputs, our Cloud business group uses the EcoTransIT tool which identifies the mode of transportation on each leg by breaking down the route through milestones, and incorporates more granular location data, equipment data, and WTW emissions factors. For the rest of the emissions, Microsoft requests carbon emissions data from its suppliers and uses their responses to determine Scope 1, Scope 2, and upstream Scope 3 emission factors ($mtCO_2e$/$ revenue). The latest available responses are used, so this report's inventory considers 2023 submissions (that is, 2022 data). Microsoft estimates emissions for suppliers who submitted data by multiplying their response-derived factor by the annual spend with the supplier. All other spend is mapped to corresponding industry sectors and then multiplied by cradle-to-gate emission factors by sector from UK Defra's "UK Defra, Table 13 — Indirect emissions from the supply chain. March 2014"—updated per the latest inflation and currency conversion rates. Corporate-wide expense data for all company divisions is obtained from the finance department. Spend data associated with our upstream transportation and distribution activities is then isolated within the corporate spend report. GWP values are derived from the underlying supplier responses and Defra data sources.	97%
Waste Generated in Operations	The waste figure represents emissions from waste disposed via landfilling, incineration, recycling, and compost. Emissions from waste are calculated using methodologies and emission factors from the EPA's Waste Reduction Model (WARM), version 15. This model uses waste mass as the data input and bases its emissions calculations on a life cycle analysis, including emissions from the long-term decomposition of waste in a landfill or from upstream sources/sinks. GWPs are from the IPCC Fourth Assessment Report (AR4), 100-year average.	64%