

2019 Data Factsheet: Environmental Indicators

As part of Microsoft's commitment to disclose information about our environmental footprint, below is a compilation of environmental indicators including our greenhouse gas emissions, energy consumption, water consumption and discharge, and waste. All reported values represent best available data at the time of publication. Data is adjusted to incorporate updated methodology, structural changes, and/or minor corrections. Additional detail on these changes is included as footnotes where applicable.

Greenhouse Gas Emissions (mtCO₂e)

	FY19	FY18	FY17
Scope 1 ¹	113,412	90,462	97,680
Scope 2 - Location-Based	3,556,553	2,945,974	2,697,464
Scope 2 - Market-Based ¹	275,375	183,329	139,108
Scope 3 - Purchased Goods & Services ^{2,3}	4,200,000	4,300,000	4,100,000
Scope 3 - Capital Goods ^{2,3}	2,100,000	2,100,000	1,600,000
Scope 3 - Fuel- and Energy-Related Activities (Location-Based) ²	650,000	550,000	540,000
Scope 3 - Fuel- and Energy-Related Activities (Market-Based) ²	170,000	110,000	89,000
Scope 3 - Upstream Transportation ^{2,3}	60,000	45,000	46,000
Scope 3 - Waste ²	1,200	600	700
Scope 3 - Business Travel ¹	392,557	378,230	337,122
Scope 3 - Employee Commuting ²	395,000	330,000	330,000
Scope 3 - Downstream Transportation ^{2,4}	53,000	100,000	80,000
Scope 3 - Use of Sold Products ^{2,4}	3,874,000	4,371,000	4,274,000
Scope 3 - End of Life of Sold Products ^{2,4}	76,000	85,000	106,000
Scope 3 - Downstream Leased Assets	770	1,690	700
Total - Scope 1, Scope 2, and Scope 3⁵	11,711,000	12,095,000	11,200,000

¹ Included in Carbon Neutral boundary.

² The reported emissions for this category represent an estimate based on broad-based assumptions and have therefore been rounded.

³ The emissions calculations for these categories have been adjusted according to an improved methodology, and now include supplier-specific emission factors derived from CDP Supply Chain responses. This methodology change has been applied to all years reported in this Factsheet.

⁴ As we continue to improve the product life cycle assessments for our devices, the emissions calculations for these categories have undergone a methodology change. This change has been applied to all years reported in this Factsheet.

⁵ Scope 2 Market-Based emissions included in this total. Total rounded to nearest thousand mtCO₂e.

Greenhouse Gas Emissions Normalized by Revenue (mtCO₂e/M\$)

	FY19	FY18	FY17
Scope 1	0.9	0.8	1.0
Scope 2 - Location-Based	28.3	26.7	27.9
Scope 2 - Market-Based	2.2	1.7	1.4
Scope 3 - Business Travel	3.1	3.4	3.5

Energy Use (MWh)

	FY19	FY18	FY17
Total Energy Use	9,227,991	7,748,236	6,718,944
Electricity	8,741,807	7,357,412	6,344,479
Other Fuels⁶	486,184	390,824	374,465
Renewable Energy Usage⁷	8,741,807	7,357,412	6,104,758
Renewable Energy Credits	6,946,075	5,560,711	5,119,876
Power Purchase Agreements	1,795,145	1,796,301	984,464
On-Site Renewable Energy	587	400	418
Percentage of Renewable Electricity⁷	100%	100%	96%

⁶ Other fuels include natural gas, diesel, jet fuel, district heating, and chilled water.

⁷ Represents the value prior to historic benchmarking due to acquisitions and methodology changes.

Carbon Neutrality (mtCO₂e)

	FY19	FY18	FY17
GHG Emissions within Carbon Neutral Boundary^{8,9}	781,345	652,021	573,910
Offsets Purchased	781,345	652,021	573,910
Net GHG Emissions within Carbon Neutral Boundary	0	0	0
Percent of Total GHG Emissions Balanced by Carbon Offsets⁸	100%	100%	100%

⁸ Represents the value prior to historic benchmarking due to acquisitions and methodology changes.

⁹ Carbon Neutral Boundary includes global Scope 1, Scope 2 Market-Based, and Scope 3 business air travel.

Water Metrics (m³)¹⁰

	FY19	FY18	FY17
Water Withdrawals	7,989,771	7,170,880	5,193,841
Water Consumption	4,215,387	3,608,049	1,951,786
Water Discharge	3,774,384	3,562,832	3,242,055

¹⁰ In FY18 we adjusted our water data collection methodology to include more accurate data center withdrawal estimates. FY17 withdrawal estimates were not retroactively adjusted. 50% of the change from FY17 to FY18 is from the methodology adjustment, and the other 50% is from organizational growth. We also began estimating water consumption in FY18, backfilling FY17 using the same estimation methodology.

Waste Generation (metric tons)¹¹

	FY19	FY18	FY17
Landfilled	3,189	1,602	2,047
Recycled	14,368	11,236	17,398
Incinerated	400	342	690
Composted	8,970	5,886	5,924
Hazardous Waste (included in the categories above)	2,205	1,405	2,188
Recycled Hazardous Waste (included in the categories above)	2,198	1,376	2,122

¹¹ Data captured from our largest office campuses.

Through CDP (formerly the Carbon Disclosure Project) we have voluntarily reported our carbon footprint since 2004 and our water footprint since 2012. Please see our CDP submission for more detailed information. The greenhouse gas, energy, and water data in our CDP filings and this report represent 100 percent of Microsoft's global operations and revenue. The data in this factsheet includes the integration of LinkedIn following our acquisition of this group in 2016. To allow meaningful year-over-year comparisons, we have adjusted our data for previous years to reflect this integration.

This factsheet also reports both location- and market-based Scope 2 emissions, per the World Resources Institute Greenhouse Gas Protocol Scope 2 guidance. Location-based emissions represent the physical emissions from local energy production, while market-based emissions represent emissions from choices related to electricity supply and products. For Microsoft, market-based emissions take into account more than 9.3 billion kilowatt-hours (kWh) of renewable energy attributes that we purchased as part of our 100 percent renewable energy commitment.

2019 Data Factsheet: Additional Environmental Indicators

Greenhouse Gas Emissions (mtCO₂e)

	FY19	FY18	FY17
Scope 1 - CO ₂	91,057	73,094	73,113
Scope 1 - CH ₄ ¹²	41	32	34
CH4 Emissions - Asia	1	2	3
CH4 Emissions - Europe, Middle East, Africa	24	14	14
CH4 Emissions - Latin America	4	4	5
CH ₄ Emissions - US	11	12	11
Scope 1 - N ₂ O ¹²	238	233	220
Scope 1 - HFCs	22,044	17,071	24,314
Scope 1 - PFC	-	-	-
Scope 1 - SF ₆ ¹³	32	32	-
Scope 1 - Asia	5,559	4,885	8,455
Scope 1 - Europe, Middle East, Africa	60,578	41,876	43,229
Scope 1 - Latin America	3,274	3,557	3,637
Scope 1 - North America	44,001	40,143	42,358
Scope 2 - Location-Based - Asia	691,727	528,277	439,033
Scope 2 - Location-Based - Europe, Middle East, Africa	681,378	518,921	399,061
Scope 2 - Location-Based - Latin America	25,403	23,517	21,012
Scope 2 - Location-Based - North America	2,158,045	1,875,258	1,838,358
Scope 2 - Market-based - ASIA	266,680	174,533	121,930
Scope 2 - Market-based - EMEA	7,463	7,301	14,460
Scope 2 - Market-based - LATAM	632	751	2,096
Scope 2 - Market-based - NORAM	600	744	623
CO2 Intensity - Scope 1 + Scope 2, Location (mtCO ₂ e/MWh)	0.40	0.39	0.42

¹² In FY19 we adjusted how we account for CH₄ and N₂O emissions from our fleet vehicles. This methodology change has been applied to all years reported in this Factsheet.

¹³ In FY18 we began estimating SF₆ leakage at data centers.

Carbon Offsets

	FY19	FY18	FY17
Percent of Total Scope 3 GHG Emissions Balanced by Carbon Offsets	3%	3%	3%
Potential for Carbon Trade Based on Recent Performance	No	No	No

Other Emissions (metric tons)¹⁴

	FY19	FY18	FY17
NO_x Emissions	226	199	203
NO _x Emissions - Asia	5	3	10
NO _x Emissions - Europe, Middle East, Africa	165	156	152
NO _x Emissions - Latin America	13	11	12
NO _x Emissions - North America	44	545	539
SO_x Emissions	10	10	10
SO _x Emissions - Asia	1	1	1
SO _x Emissions - Europe, Middle East, Africa	7	7	7
SO _x Emissions - Latin America	1	1	1
SO _x Emissions - North America	2	26	26
VOC Emissions	204	181	185
VOC Emissions - Asia	4	1	7
VOC Emissions - Europe, Middle East, Africa	156	153	150
VOC Emissions - Latin America	13	10	11
VOC Emissions - North America	32	524	520
PM Emissions	7	5	6
CO Emissions	1,904	1,675	1,723
Ozone Depleting Substances	579	1,116	1,330

¹⁴ In FY19 we adjusted how we account for NO_x, SO_x, VOC, PM, and CO emissions. This methodology change has been applied to all years reported in this Factsheet.

Other Emissions Normalized by Revenue (metric tons/M\$)

	FY19	FY18	FY17
NO_x Emissions	0.0018	0.0018	0.0021
SO_x Emissions	0.00008	0.00009	0.00011
CH₄ Emissions	0.0003	0.0003	0.0004

Electricity Consumption (MWh)

	FY19	FY18	FY17
Total Electricity Consumed	8,741,807	7,357,412	6,344,479
Electricity Consumed - Asia	1,065,980	804,024	682,710
Electricity Consumed - Europe, Middle East, Africa	1,653,362	1,265,584	970,755
Electricity Consumed - Latin America	117,219	107,089	91,029
Electricity Consumed - North America	5,905,246	5,180,715	4,599,985
Non-Renewable Electricity Purchased & Consumed - Asia	-	-	204,937
Non-Renewable Electricity Purchased & Consumed - Europe, Middle East, Africa	-	-	17,391
Non-Renewable Electricity Purchased & Consumed - Latin America	-	-	3,681

Non-Renewable Electricity Purchased & Consumed - North America	-	-	-
Non-Renewable Electricity by Source - Coal	-	-	42,757
Non-Renewable Electricity by Source - Petroleum	-	-	34,073
Non-Renewable Electricity by Source - Natural Gas	-	-	148,692
Non-Renewable Electricity by Source - Nuclear	-	-	487
Electricity Consumption Normalized by Revenue (MWh/M\$)	69	67	66

Renewable Energy Consumption (MWh)

	FY19	FY18	FY17
Renewable Energy Purchased & Consumed - Asia	1,065,980	804,024	466,243
Renewable Energy Purchased & Consumed - Europe, Middle East, Africa	1,653,362	1,265,584	941,343
Renewable Energy Purchased & Consumed - Latin America	117,219	107,089	85,935
Renewable Energy Purchased & Consumed - North America	5,905,246	5,180,715	4,611,239
Renewable Energy Purchased & Consumed - Wind	7,739,389	6,919,377	6,004,378
Renewable Energy Purchased & Consumed - Landfill Gas	-	-	-
Renewable Energy Purchased & Consumed - Biomass	2,347	47,129	61,029
Renewable Energy Purchased & Consumed - Hydro	309,873	186,434	33,174
Renewable Energy Purchased & Consumed - Geothermal	461,586	72,000	-
Renewable Energy Purchased & Consumed - Solar	228,612	132,472	6,177

Other Energy Consumption (MWh)¹⁵

	FY19	FY18	FY17
Total Non-Renewable Energy Purchased & Consumed	486,184	390,824	374,465
Non-Renewable Energy Purchased & Consumed - Asia	14,947	14,079	29,107
Non-Renewable Energy Purchased & Consumed - Europe, Middle East, Africa	277,692	180,811	182,086
Non-Renewable Energy Purchased & Consumed - Latin America	11,470	12,579	13,202
Non-Renewable Energy Purchased & Consumed - NorAm	182,075	183,354	150,069
Non-Renewable Energy Purchased & Consumed - Coal	-	-	-
Non-Renewable Energy Purchased & Consumed - Natural Gas	196,528	110,863	107,687
Non-Renewable Energy Purchased & Consumed - Crude Oil/Diesel	134,530	130,926	139,027
Non-Renewable Energy Purchased & Consumed - LPG/Propane/Jet Fuel	47,437	50,378	43,402
Non-Renewable Energy Purchased & Consumed - Gasoline	42,751	33,669	34,679
Non-Renewable Energy Purchased & Consumed - Chilled Water	52,937	52,775	30,121
Non-Renewable Energy Purchased & Consumed - Hot Water/Steam	12,002	12,213	19,549
Scope 3 - Category 3 (Transmission and Distribution Losses)	730,000	600,000	510,000
Scope 3 - Category 13 (Downstream Leased Assets)	1,900	4,100	1,700

¹⁵ Non-electricity

Water (m³)¹⁶

	FY19	FY18	FY17
Total Water Withdrawals	7,989,771	7,170,880	5,193,841
Water Withdrawals - Municipal Supply	7,560,349	6,743,602	4,977,049
Water Withdrawals - Surface Water	-	-	-
Water Withdrawals - Ground Water	34,495	29,140	16,517
Water Withdrawals - Salt/Brackish water	-	-	-
Water Withdrawals - Rain water	104,148	103,550	90,622
Water Withdrawals - Process Water	290,780	294,589	109,653
Water Withdrawals - Asia	1,439,011	1,244,256	972,666
Water Withdrawals - Europe, Middle East, Africa	1,115,078	850,909	710,744
Water Withdrawals - Latin America	113,885	114,575	93,291
Water Withdrawals - North America	5,321,796	4,961,141	3,417,140
Total Water Consumption	4,215,387	3,608,049	1,951,786
Water Consumption - Municipal supply	4,017,102	3,410,302	1,813,899
Water Consumption - Surface Water	-	-	-
Water Consumption - Ground Water	3,449	4,020	2,927
Water Consumption - Salt/Brackish water	-	-	-
Water Consumption - Rain Water	30,042	29,833	25,308
Water Consumption - Process Water	164,793	163,893	109,653
Water Consumption - ASIA	791,756	617,291	421,525
Water Consumption - EMEA	524,027	383,178	189,636
Water Consumption - LATAM	70,546	66,374	26,577
Water Consumption - NorAm	2,829,058	2,541,206	1,314,048
Total Water Discharges - Municipal Treatment	3,774,384	3,562,832	3,242,055
Water Discharges - Asia	647,255	626,965	551,142
Water Discharges - Europe, Middle East, Africa	591,051	467,731	521,107
Water Discharges - Latin America	43,339	48,201	66,714
Water Discharges - North America	2,492,738	2,419,934	2,103,092

¹⁶ For more information on our water data, please see our CDP Water response at www.cdp.net.

Verification

	FY19	FY18	FY17
Scope 1 GHG Emissions	Yes	Yes	Yes
Scope 2 - Location-Based GHG Emissions	Yes	Yes	Yes
Scope 2 - Market-Based GHG Emissions	Yes	Yes	Yes
Scope 3 - Business Air Travel GHG Emissions	Yes	Yes	Yes
Scope 3 - GHG Emissions from All Categories	Yes	No	No

Total Energy Consumed	Yes	Yes	Yes
Total Electricity Consumed	Yes	Yes	Yes
Total Renewable Electricity Consumed	Yes	Yes	Yes
Total Offsets Purchased	Yes	Yes	Yes
Total Water Withdrawals	Yes	Yes	Yes