

# WIKIMEDIA FOUNDATION 2020 CARBON FOOTPRINT

July 5, 2021

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# WHAT IS A CARBON FOOTPRINT?



GREENHOUSE  
GAS PROTOCOL

A CO<sub>2</sub> Footprint is a measure of the impact the activities of a company have on the environment translated into the amount of greenhouse gases (GHG) produced by these activities.



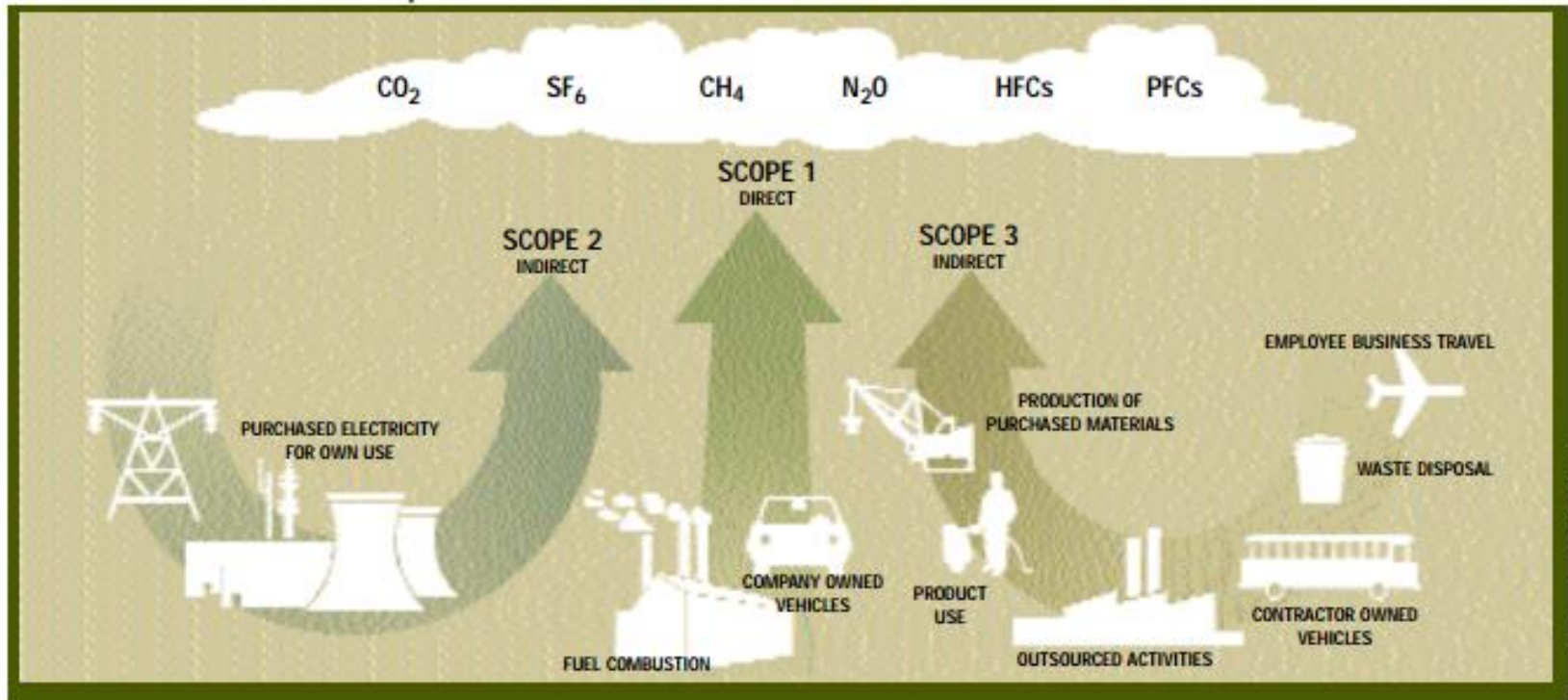
A CO<sub>2</sub> Footprint is considered the “Best Practice” for measuring GHG gases for the following reasons:

It is a standard/generally accepted way of doing things in industry

There is a reliable methodology & preferred procedure for conducting the inventory (GHG Protocol Corporate Standard, and others, based on this Standard.)

It provides a general outline to address a variety of efficiency issues across multiple facilities within organizations.

# CARBON FOOTPRINT METHODOLOGY



A Corporate Accounting and Reporting Standard

# IMPORTANT CHANGES TO DATA SOURCES AND METHODOLOGY FROM 2019 TO 2020

## San Francisco Office

- The 2020 report used estimated 2019 office operations data (energy, water & waste) due to data collection challenges associated with the COVID-19 global pandemic.
- This year, both 2019 and 2020 office data was provided, and the 2019 data inventory and carbon footprint were both updated and restated.

## Data Centers & Servers

- We have allocated a lower 2020 emissions factor to the electricity used at co-location server facilities. This change is based on two things:
  - Over the last year, data center providers have again increased the level of transparency of their environmental metrics, allowing us to more accurately assess their environmental performance.
  - Data center providers have also ramped up their use of renewable energy (through renewable energy project as well as purchased renewable energy credits (RECs), further decarbonizing their energy use.

## Travel – Impact of COVID-19 Global Pandemic

- Due to the COVID-19 global pandemic, virtually all business travel (including Miscellaneous Business, Community Convenings and Internal Staff Convenings) was halted in March 2020 through the end of the year. As a result, travel-related emissions are significantly lower in 2020 than previous years.

# SCOPE OF 2020 CARBON FOOTPRINT

## BY ACTIVITY

Scope	Activity	Notes
1	Natural Gas	San Francisco Office - Post Montgomery Center – Total Building Consumption Information prorated for WMF % of total area
1	Refrigerants	San Francisco Office - Post Montgomery Center building is chilled via their Central Plant chilled water cooling system. WMF refrigerants are only used in their 2 heat pumps installed in their server room on their floor. These are small units that were installed in 2012, require only 2.4 lbs. of R410A each and did not require charging in 2020.
2	Electricity	San Francisco Office : Post Montgomery Center - Consumption Information prorated for WMF % of total area. 2020 Data Centers: <ul style="list-style-type: none"> <li>• Ashburn (Equinix)</li> <li>• Dallas (CyrusOne) – PUE 1.6 per recently published <a href="#">Sustainability Report</a></li> <li>• San Francisco (Digital Realty Trust)</li> <li>• Data Center electricity consumption was provided by WMF IT Staff. Data Center PUE was estimated from publicly available information from the hosting companies where available. Where PUE was not available, estimated based upon ‘best in class’ data (Google.)</li> </ul>
2	Steam	San Francisco Office - Post Montgomery Center – Total Building Consumption Information prorated for WMF % of total area
3	Water Usage	
3	WWT*	
3	Waste to landfill	
3	Recycling	
3	eWaste	
3	Commuting	2020 survey responses for mode, distance and % time commuting for ~ 50% of San Francisco-based workforce. Estimates based upon extrapolated data combining 2019 & 2020 responses where additional SF FTEs responded to the survey.
3	Business Travel - Air	2020 Data obtained from WMF Travel Department, categorized by Miscellaneous Business, Community Convenings and Internal Staff Convenings. Air travel was categorized by distance: short-haul, medium-haul & long-haul. Hotel emissions factors include estimates for natural gas, electricity and steam consumption.
3	Business Travel - Lodging	

# ACTIVITY DATA: SAN FRANCISCO OFFICE

Activity	2018	2019	2020	2019-2020 Progress	Progress Since 2018 Baseline
Natural Gas Usage (kWh)	15,541.17	12,068.59	2,601.70	-78.44%	-84.26%
Electricity Usage (kWh)	238,695.34	254,876.94	185,040.59	-27.40%	-22.48%
Steam (btus)	298,098,778.59	292,885,786.29	136,849,013.05	-53.28%	-54.09%
Commuting (km)	594,115	575,651	114,098	-80.18%	-80.80%
Water Usage (m3)	781.83	718.97	272.95	-62.04%	-65.09%
WWT (m3)	781.83	718.97	272.95	-62.04%	-65.09%
eWaste (t)	0.49	0.2	0.05	-75.00%	-89.80%
Waste – MSW (t)	4.34	3.77	1.21	-67.90%	-72.11%
Waste – Recycled (t)	4.62	4.95	1.74	-64.85%	-62.34%
Waste – Compost (t)	4.65	5.4	2.05	-62.04%	-55.91%

Note: During the COVID-19 global pandemic, selected data for the carbon footprint was unavailable and estimates were used instead. Subsequently, actual data was obtained and the results have been restated here.

# ACTIVITY DATA: DATA CENTERS AND WMF SERVER

Activity	2018	2019	2020	2019-2020 Progress	Progress Since 2018 Baseline
Electricity Usage (kWh)	3,211,169.52	3,039,482.28	3,027,478.38	-0.39%	-5.72%
Water Usage (m3)	21,741.86	3,201.64	3,402.39	6.27%	-84.35%
WWT (m3)	21,741.86	3,201.64	3,402.39	6.27%	-84.35%

Note: In 2020 the CyrusOne data center provided additional information about its energy and water use for 2019 and 2018. These numbers have been restated accordingly.

All individual data center information is [available here](#).



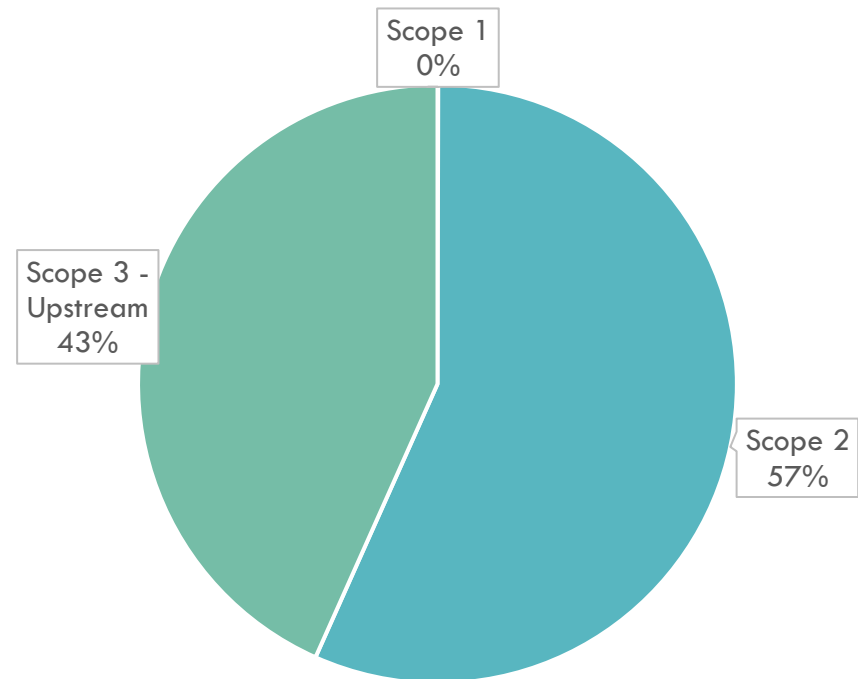
# ACTIVITY DATA: BUSINESS TRAVEL

Event Type	Activity	2018	2019	2020	2019-2020 Progress	Progress Since 2018 Baseline
Internal Staff Convenings	Air Travel (km)	5,459,304	7,666,263	2,897,492	-62.20%	-46.93%
	Hotel Nights (# nights)	632	3,579	1,754	-50.99%	177.53%
Community Convenings	Air Travel (km)	5,703,440	4,935,308	821,989	-83.34%	-85.59%
	Hotel Nights (# nights)	2,874	3,096	360	-88.37%	-87.47%
Miscellaneous Business Travel	Air Travel (km)	N/A	3,563,665	764,670	-78.54%	N/A
	Hotel Nights (# nights)	N/A	1,470	478	-67.48%	N/A

# 2020 CARBON FOOTPRINT

## BY SCOPE

Scope	tCO2-eq
Scope 1 <i>(direct)</i>	0.47
Scope 2 <i>(indirect - electricity)</i>	662.39
Scope 3 <i>(indirect – everything else)</i>	506.57
Total	1,169.43



# 2018 – 2020 CARBON FOOTPRINT COMPARISON BY SCOPE (TCO<sub>2</sub>-EQ)

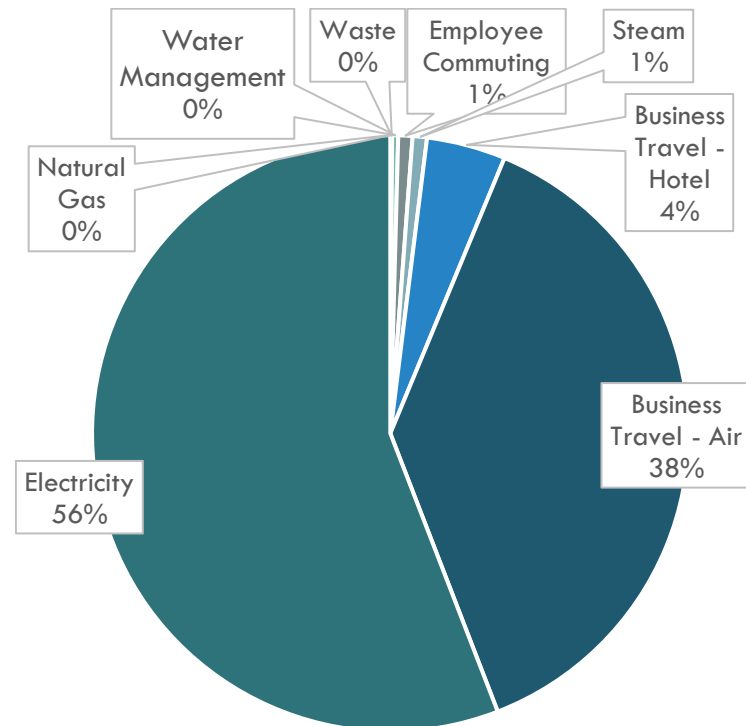
Scope	2018	2019	2020	2019-2020 Progress	Progress Since 2018 Baseline	Notes
1 – direct (natural gas and refrigerants)	2.81	2.18	0.47	-78.44%	-83.27%	
2 – indirect (electricity and steam)	1,388.68	825.44	662.39	-19.75%	-52.30%	Electricity consumption at the San Francisco office decreased by over 27%. CyrusOne has added more renewable energy to its grid-supply in Dallas. However, due to the PUE published by CyrusOne electricity consumption estimates for the site were increased. DigitalReality in SFO has moved its CA sites to completely renewable energy.
3 – indirect (everything else)	1,476.36	1,777.70	506.57	-71.50%	-65.69%	
<b>Total</b>	<b>2,867.86</b>	<b>2,605.32</b>	<b>1,169.43</b>	<b>-55.11%</b>	<b>-59.22%</b>	

Note: During the COVID-19 global pandemic, selected data for the carbon footprint was unavailable and estimates were used instead. Subsequently, actual data was obtained and the results have been restated here. In addition, in 2020 the CyrusOne data center provided additional information about its energy and water use for 2019 and 2018. These numbers have been restated accordingly.

# 2020 CARBON FOOTPRINT

## BY ACTIVITY

Emissions Activity	t CO2-eq	% Contribution
Natural Gas	0.47	0.04%
Waste	0.61	0.05%
Water Management	3.87	0.33%
Employee Commuting	9.01	0.77%
Steam	9.09	0.78%
Business Travel - Hotel	50.10	4.28%
Business Travel - Air	442.98	37.88%
Electricity	653.30	55.86%
<b>Total</b>	<b>1,169.43</b>	<b>100%</b>



# 2018 – 2020 CARBON FOOTPRINT

## COMPARISON BY ACTIVITY (TCO2-EQ)

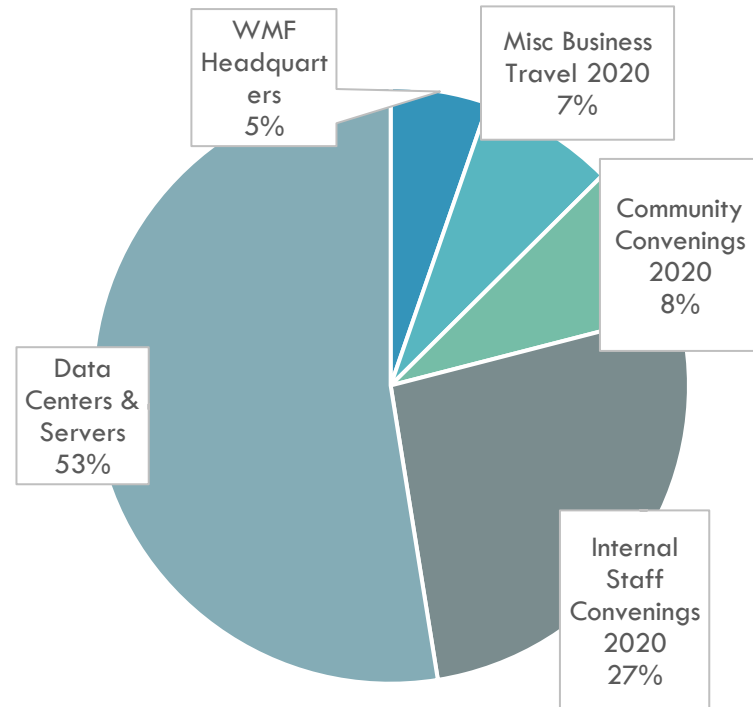
Activity	2018	2019	2020	2019-2020 Progress	Progress Since 2018 Baseline
Natural Gas	2.81	2.18	0.47	-78.44%	-83.27%
Waste	0.58	2.38	0.61	-74.37%	5.17%
Water Management	26.42	4.12	3.87	-6.07%	-85.35%
Employee Commuting	56.22	45.35	9.01	-80.13%	-83.97%
Steam	19.79	19.45	9.09	-53.26%	-54.07%
Business Travel - Hotel	251.52	124.04	50.10	-59.61%	-80.08%
Business Travel - Air	1,122.23	1,601.82	442.98	-72.35%	-60.53%
Electricity	1,388.68	805.99	653.3	-18.94%	-52.96%

Note: During the COVID-19 global pandemic, selected data for the carbon footprint was unavailable and estimates were used instead. Subsequently, actual data was obtained and the results have been restated here. In addition, in 2020 the CyrusOne data center provided additional information about its energy and water use for 2019 and 2018. These numbers have been restated accordingly.

# 2020 CARBON FOOTPRINT

## BY FUNCTIONAL AREA

Functional Area	tCO <sub>2</sub> -e (2020)	% Contribution
San Francisco Office	62.03	5.30%
Misc Business Travel 2020	84.93	7.26%
Community Convenings 2020	98.48	8.42%
Internal Staff Convenings 2020	309.68	26.48%
Data Centers & Servers	614.32	52.53%



# 2018 – 2020 CARBON FOOTPRINT\*

## COMPARISON BY FUNCTIONAL AREA (TCO2-EQ)

Functional Area	2018	2019	2020	2019-2020 Progress	Progress Since 2018 Baseline	Notes
San Francisco Office	138.07	131.28	62.03	-52.75%	-55.07%	The COVID-19 global pandemic curtailed business travel and shut down most in-office work for approximately 75% of the year
Misc Business Travel	NA	371.56	84.92	-77.15%	N/A	
Community Convenings	695.58	536.65	98.48	-81.65%	-85.84%	
Internal Staff Convenings	554.56	817.65	309.68	-62.13%	-44.16%	
Data Centers & Servers	1,334.48	748.19	614.32	-17.89%	-53.97%	Data centers continued their shift to renewable energy sources

Note: During the COVID-19 global pandemic, selected data for the carbon footprint was unavailable and estimates were used instead. Subsequently, actual data was obtained and the results have been restated here. In addition, in 2020 the CyrusOne data center provided additional information about its energy and water use for 2019 and 2018. These numbers have been restated accordingly.

# INTENSITY METRICS FOR SAN FRANCISCO OFFICE

Impact	Methodology	2018	2019	2020
Office-related carbon footprint – how much carbon is generated to keep the San Francisco office running	tCO2-eq of San Francisco office (building + commuting) / # of SF-based employees and contractors	1.70	1.62	0.77

Note: During the COVID-19 global pandemic, selected data at the San Francisco office was unavailable and estimates for 2019 were used instead. Subsequently, actual data was obtained and the results have been restated here.



# KEY TAKE- AWAYS



Carbon emissions associated with **travel** decreased 71.42% from 2019 → 2020 as a result of travel restrictions associated with the COVID-19 global pandemic. On page 18, we dive deeper into these travel impacts.



Carbon emissions associated with **data centers and servers** decreased 17.89% from 2019 to 2020. On page 23, we take a closer look at the factors driving data center decarbonization



While the COVID-19 global pandemic essentially stopped daily commuting for 75% of the year, we look at commuting patterns (pre COVID-19) in more detail on page 37.



# TRAVEL IMPACTS

Internal Staff Convenings  
Community Convenings  
Miscellaneous Business Travel

# TRAVEL: INTERNAL STAFF CONVENINGS

	2018	2019	2020	2019-2020 Progress
Air Travel (km)	5,459,304	7,666,263	2,897,492	-62.20%
Air Travel tCO2-eq	544.77	762.50	288.13	-62.21%
# Hotel Nights*	632	3,579	1,754	-50.99%
Hotel tCO2-eq*	23.83	55.15	21.55	-60.92%
# Events*	19	26	4	-84.62%
N-days* (# days of events)	96	259	14	-94.59%
# Attendees*	N/A	767	326	-57.50%

Note: In 2019, travel data categorization was improved and data collection procedures were updated. As a result, all progress-to-date WMF travel calculations will reference 2019 as the baseline year. 2018 data is provided for historical reference only.

# TRAVEL: COMMUNITY CONVENINGS

	2018	2019	2020	2019-2020 Progress
Air Travel (km)	5,703,440	4,935,308	821,989	-83.34%
Air Travel tCO2-eq	577.34	489.04	80.30	-83.58%
# Hotel Nights*	2,874	3,096	360	-88.37%
Hotel tCO2-eq*	106.52	47.61	18.18	-61.81%
# Events*	7	15	3	-80.00%
N-days* (# days of events)	35	75	13	-82.67%
# Attendees*	N/A	788	97	-87.69%

Note: In 2019, travel data categorization was improved and data collection procedures were updated. As a result, all progress-to-date WMF travel calculations will reference 2019 as the baseline year. 2018 data is provided for historical reference only.

# TRAVEL: MISCELLANEOUS BUSINESS

	2019	2020	2019-2020 Progress
Air Travel (km)	3,563,665	764,670	-78.54%
Air Travel tCO2-eq	350.28	74.56	-78.71%
# Hotel Nights*	1,470	478	-67.48%
Hotel tCO2-eq*	21.28	10.37	-51.27%
# Events*	5	1	-80.00%
N-days* (# days of events)	27	9	-0.80%
# Attendees*	34	3	-91.18%

## Notes:

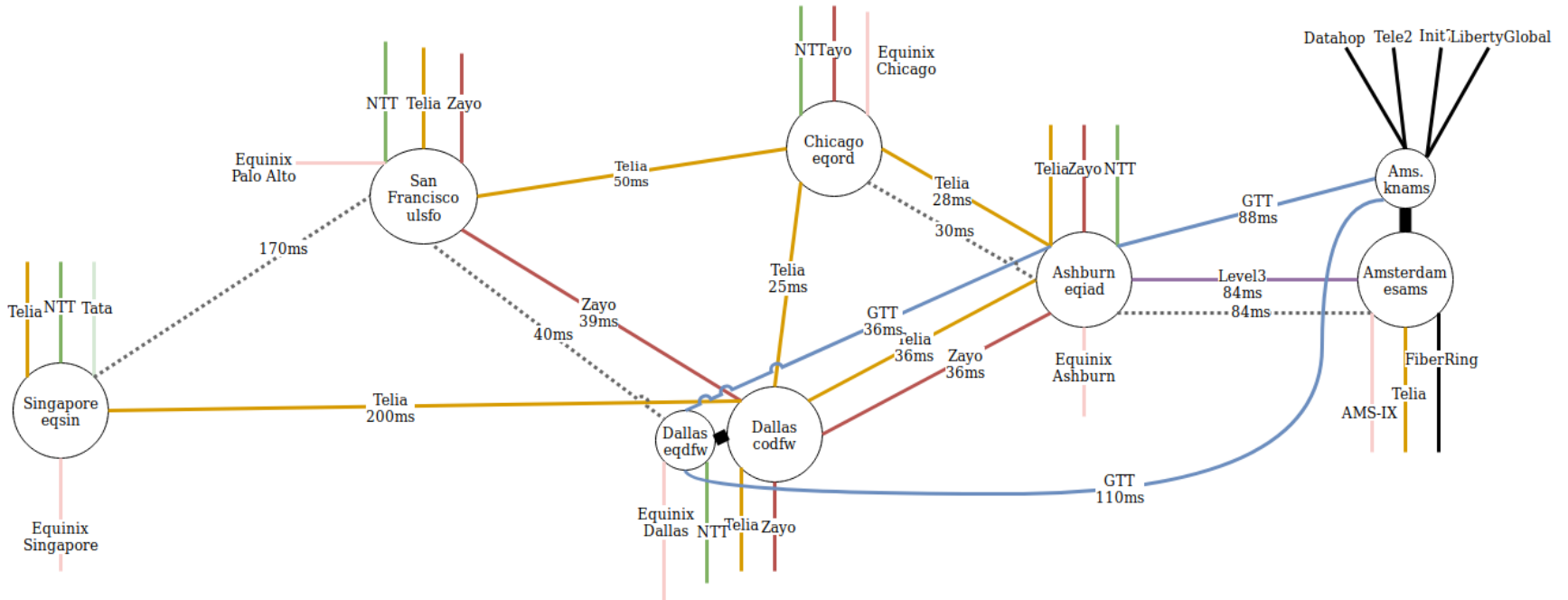
- Miscellaneous Business Travel was included as part of Community Convenings in 2018 and separated in 2019, with full data tracking in 2020.
- Some miscellaneous business travel is associated with a specific event (such as attending the Mobile World Congress or the Internet Freedom Festival). These are tracked in the highlighted rows above. However, most miscellaneous business travel is not associated with a specific event (e.g. 1355 out of 1,470 total hotel nights in 2019). As a result, readers should use caution in using # events, N-days, and # attendees to generate intensity metrics.

# TRAVEL INTENSITY METRICS

Event Type	Methodology	2018	2019	2020	2019-2020 Progress
Internal Convening	tCO2-eq of travel (air travel + hotels)/ # of event attendees	3.21	1.07	0.95	-43.54%
	tCO2-eq of travel (air travel + hotels)/ # of events	29.93	31.45	77.42	146.18%
	tCO2-eq of travel (air travel + hotels)/ # of event days	5.92	3.16	22.12	286.86%
Community Convening	tCO2-eq of travel (air travel + hotels)/ # of event attendees	N/A	0.68	1.02	-28.30%
	tCO2-eq of travel (air travel + hotels)/ # of events	97.69	35.78	32.83	-57.18%
	tCO2-eq of travel (air travel + hotels)/ # of event days	19.54	7.16	7.58	-46.36%

## Notes:

- In 2019, travel data categorization was improved and data collection procedures were updated. As a result, all progress-to-date WMF travel calculations will reference 2019 as the baseline year. 2018 data is provided for historical reference only.
- The “All Hands Meeting” held between January 26<sup>th</sup> – February 1<sup>st</sup>, 2020, in San Francisco required significant travel for many attendees. Shortly after the event, the COVID-19 global pandemic halted virtually all travel for the remainder of the year, leaving the All Hands Meeting as the prime driver of the 2020 Internal Convening intensity metric.



# DATA CENTERS

2020 Review and Analysis

# DATA CENTER TRENDS

From 2019 to 2020, WMF's data centers and server reported:

- 6.07% increase in water consumption (associated with higher electricity consumption, not higher water intensity)
- 17.89% decrease in carbon emissions

**Data centers are rapidly improving their performance (and being more transparent about their progress) in three key areas:**

## Expanding access to renewables

Grid mix is improving  
Flexibility to add renewable options outside of the grid

## Increasing focus on water consumption

Explicit move to waterless cooling

## Overall efficiency improvements

Building efficiency improvements  
Equipment efficiency improvements

**The data center industry continues to make improvements in energy efficient operations. More information on WMF's data centers can be found [here](#).**



Server	Provider	PUE			Estimated H2O Consumption (m3)			Average Estimated Total Facility Po Consumption (kWh)			Carbon (tCO2-eq)		
		2018	2019	2020	2018	2019	2020	2018	2019	2020	2018	2019	2020
Eqiad (Application Services)	Equinix (Virginia, USA)	1.58	1.4	1.4	3,309.57	2,972.64	3,164.28	1,821,449.28	1,636,017.60	1,741,488	677.42	166.57	163.20
Codfw (Application Services)	CyrusOne (Texas, USA)	1.6	1.6	1.6	2,187.62	0.00	0.00	1,203,974.40	1,220,793.60	1,096,051	556.13	389.59	437.32
Esams (Caching)	IronMountain (Haarlam, Netherlands)	1.2	1.2	1.2	133.70	139.43	144.96	73,584.00	76,737.60	79,786	43.89	0.15	0.15
Ulsfo (Caching)	DigitalRealty (California, USA)	1.12	1.12	1.12	16.01	0.00	0.00	33,358.08	32,376.96	34,634	24.85	6.06	0.00
Eqsin (Caching)	Equinix (Singapore)	1.58	1.4	1.4	85.51	83.34	86.91	47,058.72	45,867.36	47,830	22.34	7.68	7.75
Eqord (Networking)	Equinix (Illinois, USA)	1.58	1.4	1.4	5.03	2.23	2.23	2,768.16	1,226.40	1,226	1.58	0.19	0.18
Eqdfw (Networking)	Equinix (Texas, USA)	1.58	1.4	1.4	5.03	2.23	2.23	2,768.16	1,226.40	1,226	1.28	0.15	0.14
Knams (Networking)	Interxion (Amsterdam, Netherlands)	1.11	1.11	1.11	3.53	1.77	1.77	1,944.72	972.36	972	1.16	0.00	0.001

Note: In 2020, the CyrusOne data center released additional information about their energy and water use in 2018 and 2019. Those changes were incorporated into this report and the results have been restated here.

# DATA CENTER INTENSITY METRICS

	2018	2019	2020
tCO <sub>2</sub> e total for Scope 1, Scope 2 and Scope 3 emissions	2,867.86	2,605.32	1169.44
tCO <sub>2</sub> e of data center emissions / on all Wikimedia projects, including Wikipedia***	1,334.48	748.19	614.32
Kg CO <sub>2</sub> -eq/million page views	5.63	3.05	2.29
kWh of data center / on all Wikimedia projects, including Wikipedia	3,211,169.52	3,039,482.28	3,027,478.38
kWh/million page views	13.55	12.41	11.26

Note: In 2020 the CyrusOne data center provided additional information about its energy and water use for 2019 and 2018. These numbers have been restated accordingly.

# CYRUSONE

SERVER: CODFW  
LOCATION: TEXAS, USA  
SUSTAINABILITY REPORT

## Alignment with Reporting Standards

- GRI, TCFD, SASB

## Metrics and Targets

- Zero Carbon by 2040 | Net Positive Water in High Stress Regions | Preserve Habitat Networks | Power Usage Effectiveness (PUE) and Carbon Usage Effectiveness (CUE)

## Renewable Energy Strategy

- Currently, 18.2% (grid + purchased renewables)

## Metric: Carbon Intensity

- 0.3 MTCO<sub>2</sub>e/ft<sup>2</sup> (includes Scope 1, 2 & Scope 3)

## PUE

- Goal: Industry-competitive PUE without consuming water |
- Average PUE 1.60

## Energy Intensity

- 0.77 MWh/ft<sup>2</sup>

## Water Reduction Targets

- Zero Water Consumption Cooling | CyrusOne operates ten data centers with a WUE of 1.1 or less | Saving A Billion Gallons a Year = A billion gallons would fill two 8 oz. servings of water for every person on earth | When we achieve our Zero Carbon by 2040 target with renewable power, we will consume effectively no water in our electricity supply chain.

# EQUINIX

SERVER: EQIAD  
LOCATION: VIRGINIA, USA  
SUSTAINABILITY SITE

## Alignment with Reporting Standards

- GRI, CDP, S&P Global SAM, GRESB, EcoVadis, SASB, TCFD and Accounting for Sustainability (A4S)

## Metrics and Targets

- 2030 EU Climate-Neutral | Reach 100% clean & renewable | Design for the environment (green-buildings) | Reduce resource use | Increasing Transparency

## Renewable Energy Strategy

- 100% renewable energy goal.
- Renewable energy coverage vs. electricity usage in 2020 was: Americas: 2,440 GWh out of 2,620 GWh (93%)

## Metric: Carbon Intensity

- 2020: 64 mtCO<sub>2</sub>e per million USD

## PUE

- 1.51 Average Annual PUE

## Energy Intensity

- 2020: 258 GWh electricity per sq. ft

## Water Reduction Targets

- None published

# DIGITAL REALTY

SERVER: ULSFO  
LOCATION: CALIFORNIA,  
USA

SUSTAINABILITY SITE

## Alignment with Reporting Standards

- DP, GRESB, S&P Global SAM, SASB, TCFD

## Metrics and Targets

- Science-Based Target Initiative (SBTi) | United Nations Sustainable Development Goals (UN SDG)

## Renewable Energy Strategy

- N. CALIFORNIA UTILITY: Renewable Energy Supply Contracted: 2019 | Long-term goal of making 100% renewable energy available to customers

## Metric: Carbon Intensity

- 2.13 MtCO<sub>2</sub>e/occupied kW

## PUE

- Continuous improvement in PUE | Colocation PUE reduction goal of 10% by 2022 (against 2017 baseline)

## Energy Intensity

- Not available

## Water Reduction Targets

- 2019 agreement with Nalco Water, a global leader in water management technologies and expertise, to expand efforts to optimize water use through reduction, reuse and recycle projects

# IRON MOUNTAIN

SERVER: ESAMS  
LOCATION: HAARLEM,  
NETHERLANDS  
SUSTAINABILITY SITE

## Alignment with Reporting Standards

- Global Reporting Initiative (GRI), Sustainability Accounting Standards Board (SASB), Task Force on Climate Related Financial Disclosures (TCFD), and the United Nations Sustainable Development Goals (SDGs)

## Metrics and Targets

- 2019: announced achievement of Science-Based Target 6 years early, reducing absolute emissions 25% from 2016 baseline. Achieved 62% by 2020.
- New Goal: by 2025, reduction of 25% of GHG emissions from Scope 1 & 2 energy sources from 2019 baseline

## Renewable Energy Strategy

- By 2040, 100% clean electricity in data centers.
- Going beyond RE100 commitment of 100% renewable electricity.
- We will use the Google methodology for matching site by site electricity use with local clean power generation every hour, every day to achieve 24/7 clean power.

## Metric: Carbon Intensity

- 0.0023 tCO<sub>2</sub>-eq/ft<sup>2</sup>

## PUE

- Not published

## Energy Intensity

- 0.0160 MWh/sq ft

## Water Reduction Targets

- 0.025 m<sup>3</sup>/sq ft

# EQUINIX

SERVER: EQSIN  
LOCATION: SINGAPORE  
SUSTAINABILITY SITE

## Alignment with Reporting Standards

- GRI, CDP, S&P Global SAM, GRESB, EcoVadis, SASB, TCFD, SDGs and Accounting for Sustainability (A4S)

## Metrics and Targets

- 2030 EU Climate-Neutral | Reach 100% clean & renewable | Design for the environment (green-buildings) | Reduce resource use | Increasing Transparency

## Renewable Energy Strategy

- 100% renewable energy goal. Renewable energy coverage vs. our electricity usage in 2020 was: Asia-Pacific: 1,020 GWh out of 1,380 GWh (74%)

## Metric: Carbon Intensity

- 64 mtCO<sub>2</sub>e per million USD

## PUE

- 1.51 Average Annual PUE

## Energy Intensity

- 258 GWh electricity per sq. ft

## Water Reduction Targets

- None published

# EQUINIX

SERVER: EQORD  
LOCATION: ILLINOIS, USA  
SUSTAINABILITY SITE

## Alignment with Reporting Standards

- GRI, CDP, S&P Global SAM, GRESB, EcoVadis, SASB, TCFD, SDGs and Accounting for Sustainability (A4S)

## Metrics and Targets

- 2030 EU Climate-Neutral | Reach 100% clean & renewable | Design for the environment (green-buildings) | Reduce resource use | Increasing Transparency

## Renewable Energy Strategy

- 100% renewable energy goal. Renewable energy coverage vs. our electricity usage in 2020 was: Americas: 2,440 GWh out of 2,620 GWh (93%)

## Metric: Carbon Intensity

- 64 mtCO<sub>2</sub>e per million USD

## PUE

- 1.51 Average Annual PUE

## Energy Intensity

- 258 GWh electricity per sq. ft

## Water Reduction Targets

- None published



# INTERXION

SERVER: KNAMS  
LOCATION: AMSTERDAM,  
NETHERLANDS  
SUSTAINABILITY SITE

## Alignment with Reporting Standards

- None published

## Metrics and Targets

- None published

## Renewable Energy Strategy

- 100% certified renewable energy and employ a phased modular architecture to optimize power usage effectiveness (PUE). Committed to the use of free cooling and ground water cooling, “but never at the expense of reliability and availability”

## Metric: Carbon Intensity

- None published

## PUE

- None published

## Energy Intensity

- None published

## Water Reduction Targets

- None published

# RENEWABLE ENERGY: SINGAPORE

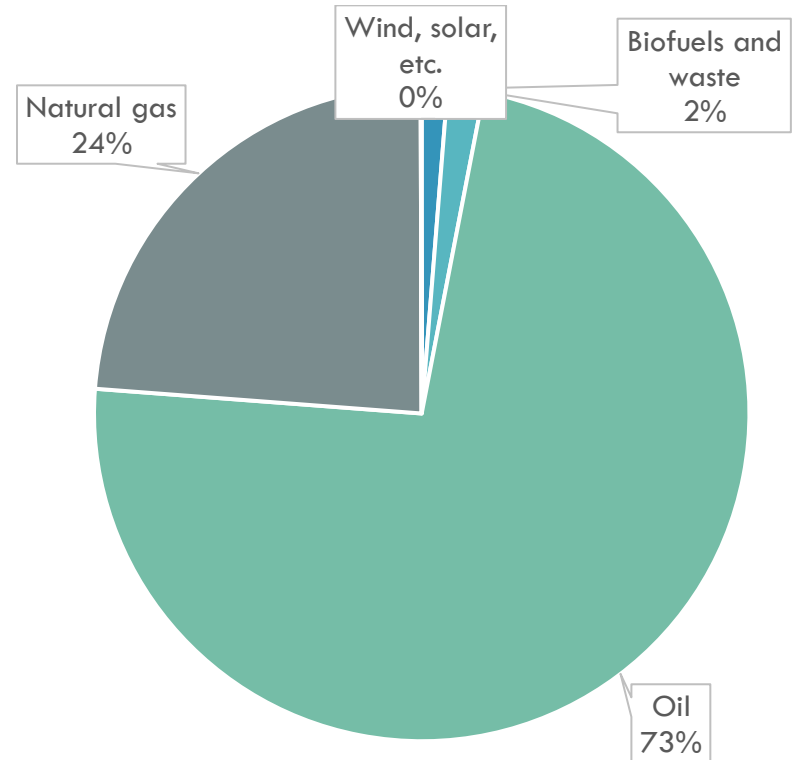
Generation in Singapore is almost entirely fueled by natural gas: in 2019 almost 96% of its electricity was generated in this way. In the fourth quarter of 2019 total solar PV capacity was 353 MW, increasing to 388 MW in Q2 2020. The majority of the capacity comes from utility-scale solar PV, with residential PV making up just 13.5 MW of the total installed capacity.

As a land-constrained country, Singapore has to be innovative and creative to make the most of its limited space for electricity generation. With this in mind, Singapore has announced a target of 1.5 GW of solar by 2025 and 2 GW solar by 2030. The solar target is expected to be met by both rooftop and utility-scale floating solar.

Source:

<https://www.iea.org/reports/electricity-market-report-december-2020/2020-regional-focus-southeast-asia>

IEA 2018 Singapore electricity grid supply-mix



# RENEWABLE ENERGY: NETHERLANDS - TENNET

In the Netherlands TenneT is the sole grid operator  
The EU's 2030 Energy Objectives:

At least a 40% reduction in greenhouse gas emissions (from 1990 levels);

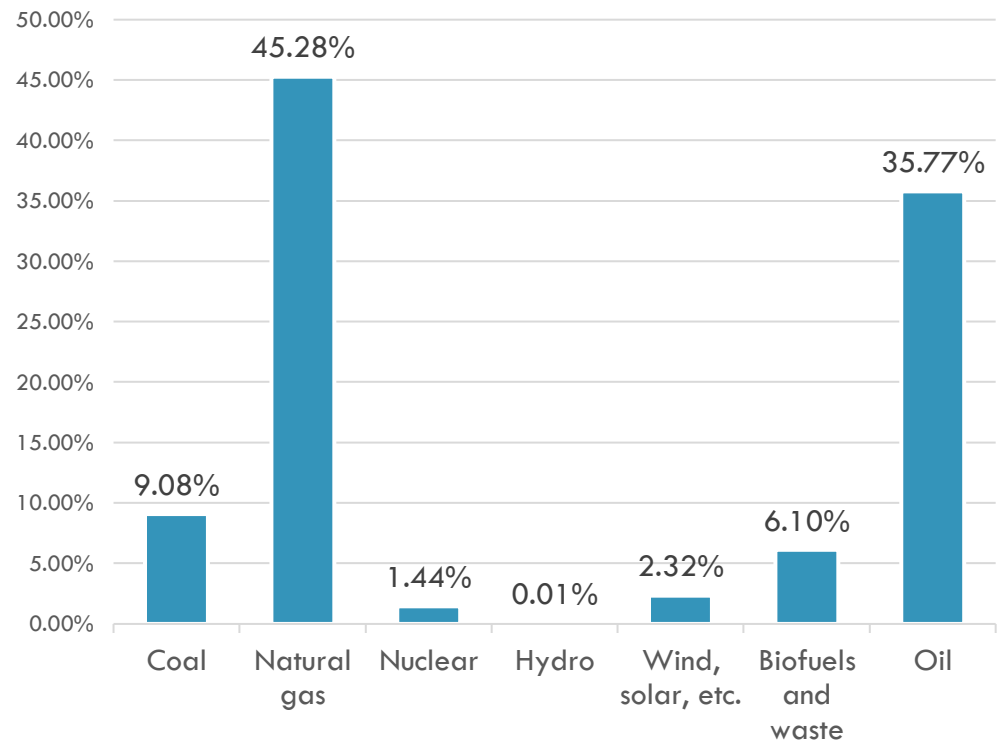
At least 27% share for renewable energy;

At least 27% improvement in energy efficiency

(Source: TenneT Holding B.V. Integrated Annual Report 2018\*)

\* Awaiting updated 2020 report

IEA 2019 Netherland electricity grid supply-mix



# ASSUMPTIONS & LIMITATIONS

2018-2020

Data Center emissions do not include Scope 1 diesel combustion from back-up generators.

- In areas with unreliable grids, data centers may rely disproportionately on back-up generators.

Emissions do not include embedded carbon relating to facility construction.

- Data Center co-location sites in VA may have different embedded carbon due to the conversion of abandoned warehouses and factory sites being used for this new purpose/function/business vs. new construction.

# COMMUTING

Commuting patterns  
and the impact of a  
remote workforce and  
the COVID-19 global  
pandemic

# COMMUTING MODES AT SAN FRANCISCO OFFICE

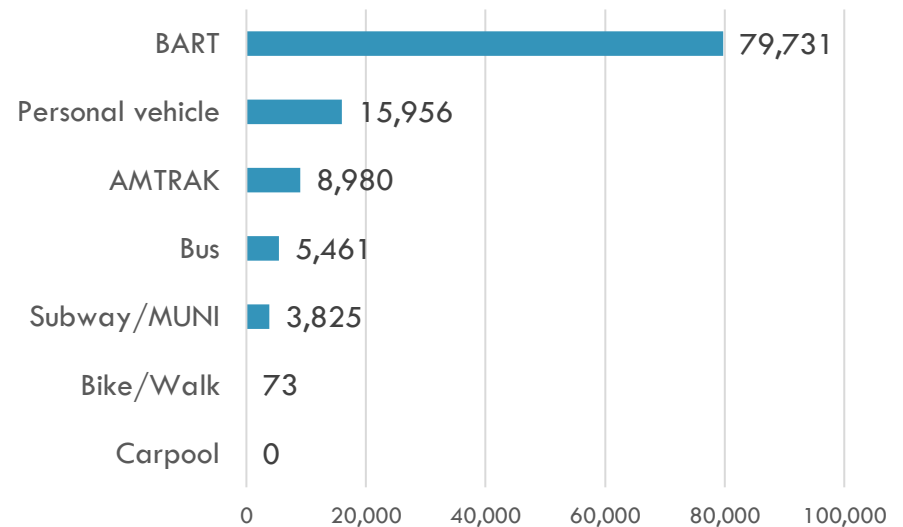
## BY TOTAL DISTANCE COMMUTED

Mode	Pre-lockdown distance traveled (person*km)	% of total distance traveled	Total tCO2-eq	Mode
BART	79,731	69.92%	4.58	BART
AMTRAK	8,980	7.88%	0.64	AMTRAK
Personal vehicle	15,956	13.99%	3.37	Personal vehicle
Bus	5,461	4.79%	0.18	Bus
Bike/Walk	73	0.06%	0	Bike/Walk
Subway/MUNI	3,825	3.35%	0.24	Subway/MUNI

In the first quarter of 2020, the average 1-way commute was 24 km (15 miles). In April virtually all commuting stopped for the remainder of the year due to the COVID-19 global pandemic.

For that first quarter of the year, the average employee at the San Francisco office traveled 1,297 km (806 miles) for commuting.

*Note: commuting patterns were estimated based on ~50% survey response participation. Because participants vary from year to year, different modes (e.g. Amtrak, carpooling) don't appear every year. This is an area for data quality improvement in the future.*



# MAKING SENSE OF THE NUMBERS

The COVID-19 global pandemic had a tremendous impact on the organization's overall carbon footprint, impacting emissions associated with:

- Office activities (52.75% decrease from 2019 to 2020)
- Business travel (32.89% decrease from 2019 to 2020)

Data center emissions continue to decline (17.89% decrease) as a result of a transition to renewable energy sources and improvements in efficiency.

Commuting continues to play a small role (0.76%) in WMF's overall carbon footprint, the average employee in the San Francisco Office still averages more than 3,200 miles each year in commuting (extrapolated from January – March 2020 to account for the COVID-19 global pandemic).