

GHG, Water, Air Quality,
Waste & Injury Rate
Disclosures
Calendar Year 2022

The Rambus logo is centered on a dark, square microchip. The chip is set against a background of a complex circuit board with glowing blue lines and dots. The chip itself has a blue border and four small white triangles at its corners. The word "Rambus" is written in a white, italicized, sans-serif font.

Rambus

July 31, 2023

Reporting Period: Jan 1, 2022 to Dec 31, 2022

Company Introduction

Rambus (RMBS) provides industry-leading chips and silicon IP that make data faster and safer. With more than 30 years of advanced semiconductor experience, Rambus is a pioneer in high-performance memory subsystems that solve the bottleneck between memory and processing for data-intensive systems. Whether in the cloud, at the edge or in your hand, real-time and immersive applications depend on data throughput and integrity. Our products and innovations deliver increased bandwidth, capacity and security required to meet the world's data needs and drive ever-greater end-user experience.

We operate in 15 locations worldwide, including engineering facilities, sales and business service sites and corporate offices.

Countries/areas in which you operate

Bulgaria, Canada, Finland, France, India, Netherlands, Republic of Korea, Taiwan, China, United States of America

Reporting Boundaries

Operational Control

Reporting Period: Jan 1, 2022 to Dec 31, 2022

Risks & Opportunities

Rambus currently evaluates water security-related risks as a key component of our broader risk management frameworks which include ISO 9001 and Business Continuity Management System (BCMS). The Board of Directors meets regularly to receive reports from its committees, as well as from management with respect to areas of material risk to the company, including legal, operational, financial and strategic risks. Currently the Rambus ERM program does not explicitly include climate-related risks. Rather, climate risks are considered as an input when relevant and are integrated into the respective management systems.

Rambus follows the standard set forth in the ISO 9001 management system. Under the ISO 9001 system, business units identify risks that could impact their operations and climate-related issues are considered in this process when relevant. Risks are incorporated into the business unit's risk register, managed by the assigned risk owners, and evaluated periodically.

Through the BCMS framework, climate-related issues are considered as integral risk factors that could impact business continuity. Leaders in Operations, HR and Technology Partnerships and Corporate Development ensure business continuity is integrated into Rambus's business strategy and operations while also promoting continual improvement of the BCMS. A cross-functional working groups supports these leaders by reviewing internal and external issues on a regular basis, supporting the implementation of business continuity initiatives, and ensuring the effectiveness of the management systems.

In the coming years, Rambus plans to enhance the ERM program by incorporating climate-related risks into main pillars such as financial, market, brand, operational and compliance risks. We believe that the updated ERM program will allow us to further integrate climate-related risks in the organization and streamline the process of identifying, assessing and managing these risks.

Reporting Period: Jan 1, 2022 to Dec 31, 2022

Governance

The Corporate Governance / Nominating Committee (CGNC)

The CGNC is a board level committee that quarterly reviews Rambus's CSR and ESG policies, programs, initiatives, and reports.

Chief Executive Officer (CEO)

The CEO and CEO's Direct Staff, along with the Corporate Governance / Nominating Committee, have overall responsibility for Rambus's ESG and CSR programs which include assessing water security risks and opportunities and monitoring progress against targets once set. These personnel are responsible for receiving information from the ESG council, integrating relevant information into the strategy and relaying ESG-related information to the Board.

ESG Council

The ESG Council consists of the SVP and General Counsel, SVP of Human Resources (HR), SVP of Global Operations, VP Chief of Staff, and a cross-departmental Advisory Council which includes leadership members from Legal, Facilities/Global Operations and Marketing. Members of the ESG Council meet at least twice annually and their responsibilities include reviewing and approving policies, strategies, climate-related targets and funding activities associated with implementing aspects of our ESG and CSR program. The ESG Council is also responsible for monitoring internal and external trends to identify potential risks that could have a material impact on our ESG program.

CSR/ESG Operational Working Group

The CSR/ESG Committee consists of members from the Legal, Facilities/Global Operations, Marketing, HR and Supply Chain departments. This committee manages and implements the ESG/CSR programs, policies and initiatives, including those related to climate change. This group meets at least twice annually to provide accurate, cogent and concise reporting on our activities. This committee reports to the ESG Council.

Rambus GHG Inventory Calendar Year 2022



Greenhouse Gas Overview

Greenhouse Gas (GHG) emissions calculated using global industry standards, including World Resources Institute (WRI) and World Business Council for Sustainable Development (WBCSD), and in accordance with the GHG Protocol.

Greenhouse Gases

Six greenhouse gases covered by Kyoto Protocol:

- Carbon dioxide (CO₂)
- Methane (CH₄)
- Nitrous oxide (N₂O)
- Hydrofluorocarbons (HFCs)
- Perfluorocarbons (PFCs)
- Sulfur hexafluoride (SF₆)



1 MT CO₂e or 1,000 kgs CO₂e

=

127,532 Smartphones Charged One Time

=

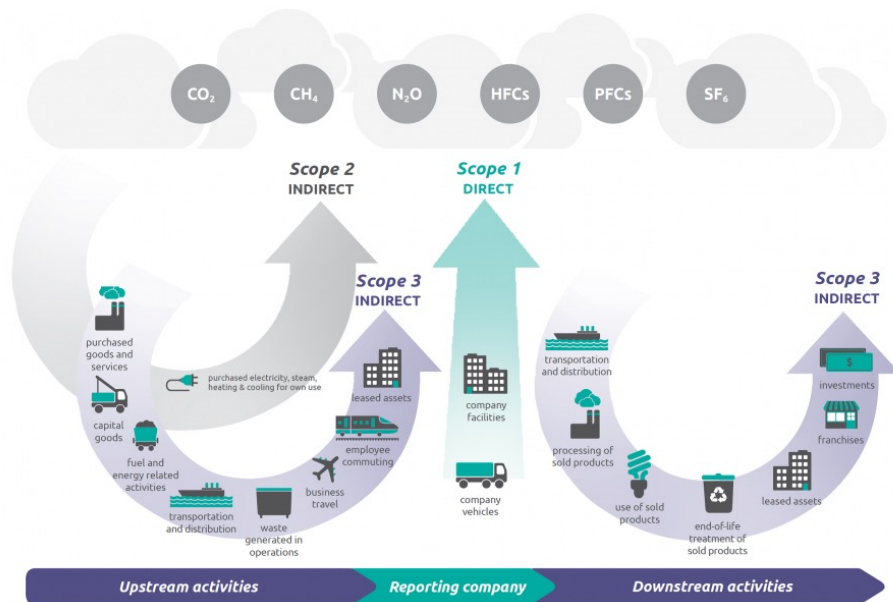
Driving from
New York to Los Angeles

Sources and Scopes of GHG Emissions

Included

Relevant, but Excluded Due to Data Not Available

Not Relevant, Excluded



Scope 1 & 2

Scope 3

Company Energy Use (Natural Gas)

Company-Owned Vehicles

Electricity Use

Purchased Goods & Services

Capital Goods

Fuel- and Energy-Related Activities

Waste Generated In Operations

Business Travel (Air & Ground)

Employee Commuting

Investments

Upstream Transportation & Distribution

Upstream Leased Assets

Downstream Transportation And Distribution

GHG Inventory for FY21 and FY22

Scope/Category	FY21	FY22	% change
Scope 1 (Natural Gas + Fugitive Emissions + Diesel Generator)	1,546	1,853	20%
<i>Scope 1 (Fleet)</i>	<i>0</i>	<i>0</i>	<i>0%</i>
Scope 2 Location-based (Electricity)	1,111	1,032	(6%)
Scope 2 Market-based (Electricity))	379	285	(25%)
Scope 3	173,435	253,902	46%
<i>Purchased Goods and Services (incl. contract manufacturing)</i>	<i>23,008</i>	<i>62,019</i>	<i>170%</i>
<i>Capital Goods</i>	<i>9,121</i>	<i>4,383</i>	<i>(52%)</i>
<i>Fuel- and Energy- Related Activities Not Included in Scope 1 or Scope 2</i>	<i>146</i>	<i>136</i>	<i>(7%)</i>
<i>Waste Generated in Operations</i>	<i>124</i>	<i>8.9</i>	<i>(93%)</i>
<i>Business Travel</i>	<i>41</i>	<i>521</i>	<i>1,171%</i>
<i>Employee Commuting + WFH energy use</i>	<i>122</i>	<i>76</i>	<i>(38%)</i>
<i>Upstream and Downstream Shipping</i>	<i>658</i>	<i>46.95</i>	<i>(93%)</i>
<i>Use and Processing of Sold Products</i>	<i>140,216</i>	<i>200,387</i>	<i>43%</i>
<i>End of Life Treatment of Sold Products</i>	<i>No Data Available</i>	<i>No Data Available</i>	<i>No Data Available</i>
*TOTAL Emissions are displayed in metric ton CO2e	176,092	270,464	54%

*TOTAL Emissions are displayed in metric ton CO2e

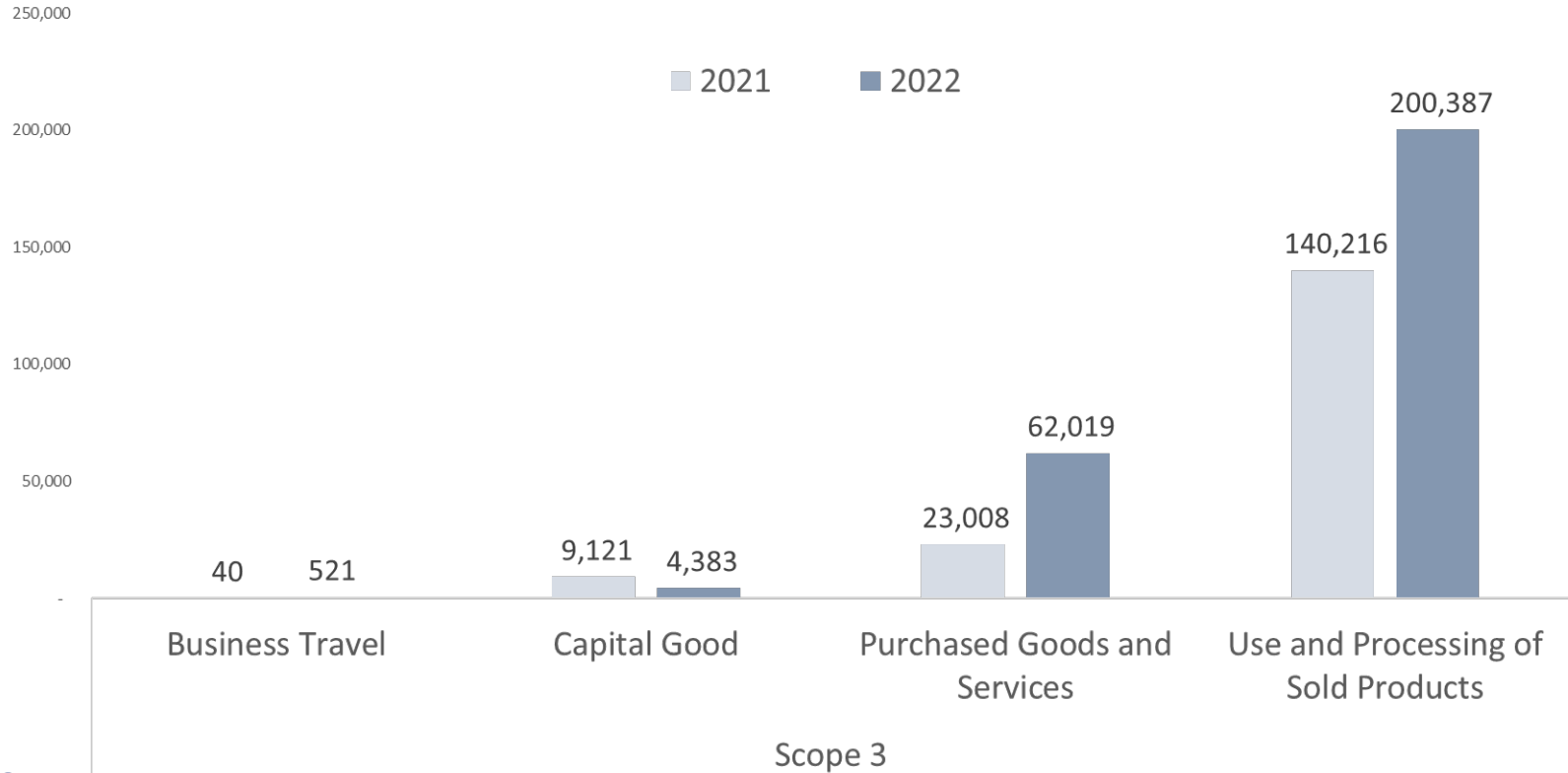
*** Scope 3 categories not included in this table were not relevant for Rambus during the three fiscal years.

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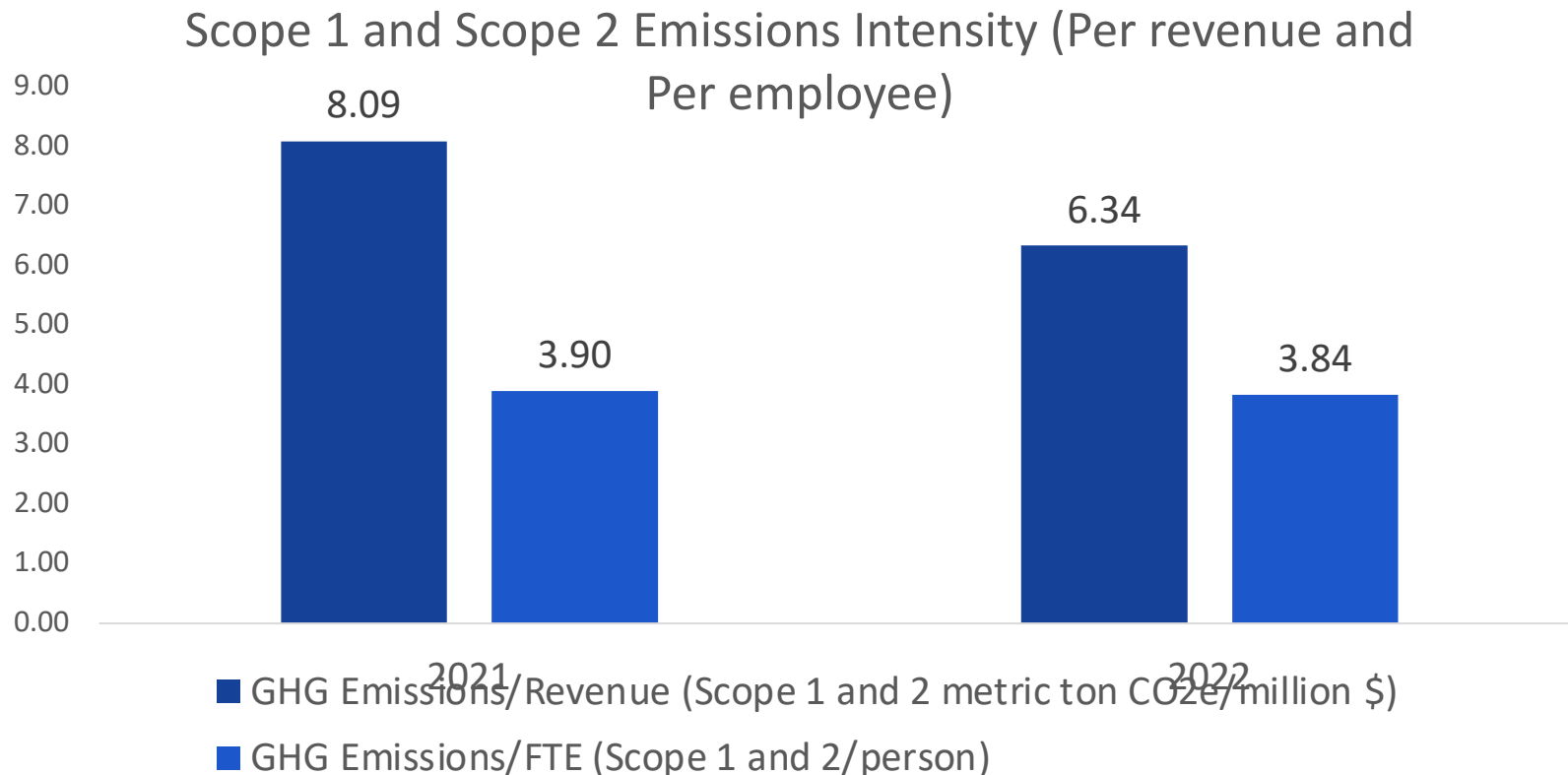
Categories with biggest changes

Scope/Category	FY21	FY22	% change
Scope 1 (Natural Gas + Fugitive Emissions + Diesel Generator)	1,546	1,853	20%
<i>Reasons for change: changes are mainly driven by the increase of natural gas consumption at San Jose headquarters. In 2021, natural gas consumption started in March, while in 2022 full year of consumption was accounted for.</i>			
Scope 3: Purchased Goods and Services (incl. contract manufacturing)	23,008	48,342	110%
<i>Reasons for change: changes are mainly driven by the increase in spend in contract manufacturing</i>			
Scope 3: Business Travel	41	521	1,171%
<i>Reasons for change: significant increases in overall travel spend, particularly air travel.</i>			
Scope 3: Upstream and Downstream Shipping	658	46.95	(93%)
<i>Reasons for change: change in data source. In 2021, spend data was used while in 2022, emissions data from the shipping vendors were used.</i>			
Scope 3: Use and Processing of Sold Products	140,216	200,387	43%
<i>Reasons for change: increases in total number of chip units sold.</i>			

Emissions in FY21 Compared with FY22



Emissions Intensity in FY21 Compared with FY22



Scope 1 + Scope 2 Emissions is 2,885 MT CO₂e, which is equal to...



644 passenger vehicles
driven for one year

OR



365 homes' energy use
for one year

2,885 MT CO₂e can be sequestered by...



47,853 tree seedlings
grown for 10 years

OR

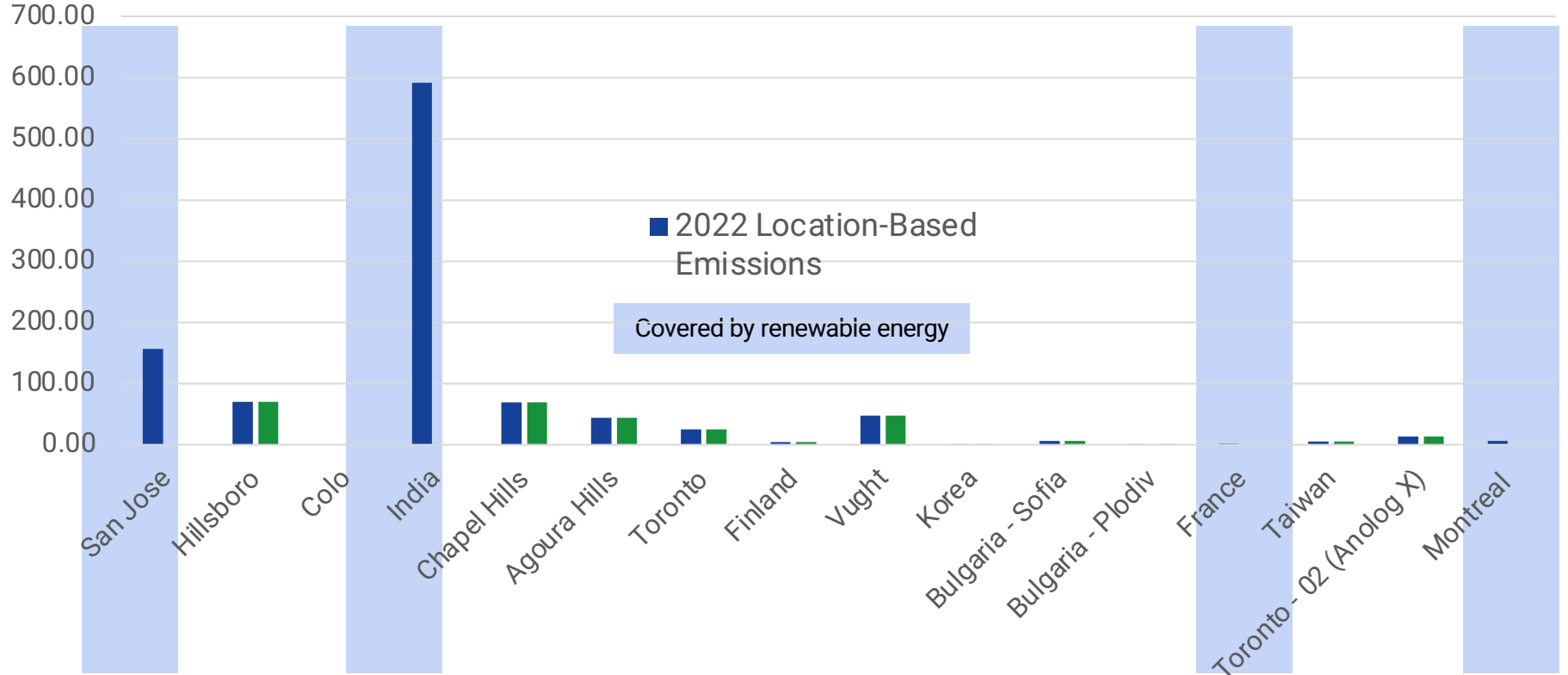


3,451 acres of US
forests in one year

% Contribution to Total by Category

Scope/Category	FY21	FY22
Scope 1 (Natural Gas + Fugitive Emissions + Diesel Generator)	0.9%	0.7%
<i>Scope 1 (Fleet)</i>	-	-
Scope 2 (Electricity)	0.5%	0.4%
Scope 3	98.5%	98.9%
<i>Purchased Goods and Services</i>	13.1%	22.9%
<i>Capital Goods</i>	5.2%	1.6%
<i>Fuel- and Energy- Related Activities Not Included in Scope 1 or Scope 2</i>	0.1%	0.1%
<i>Waste Generated in Operations</i>	0.1%	0.0%
<i>Business Travel</i>	0.0%	0.2%
<i>Employee Commuting + WFH energy use</i>	0.1%	0.0%
<i>Upstream and Downstream Shipping</i>	0.4%	0.0%
<i>Use and Processing of Sold Products</i>	79.6%	74.1%
<i>End of Life Treatment of Sold Products</i>	No Data Available	No Data Available

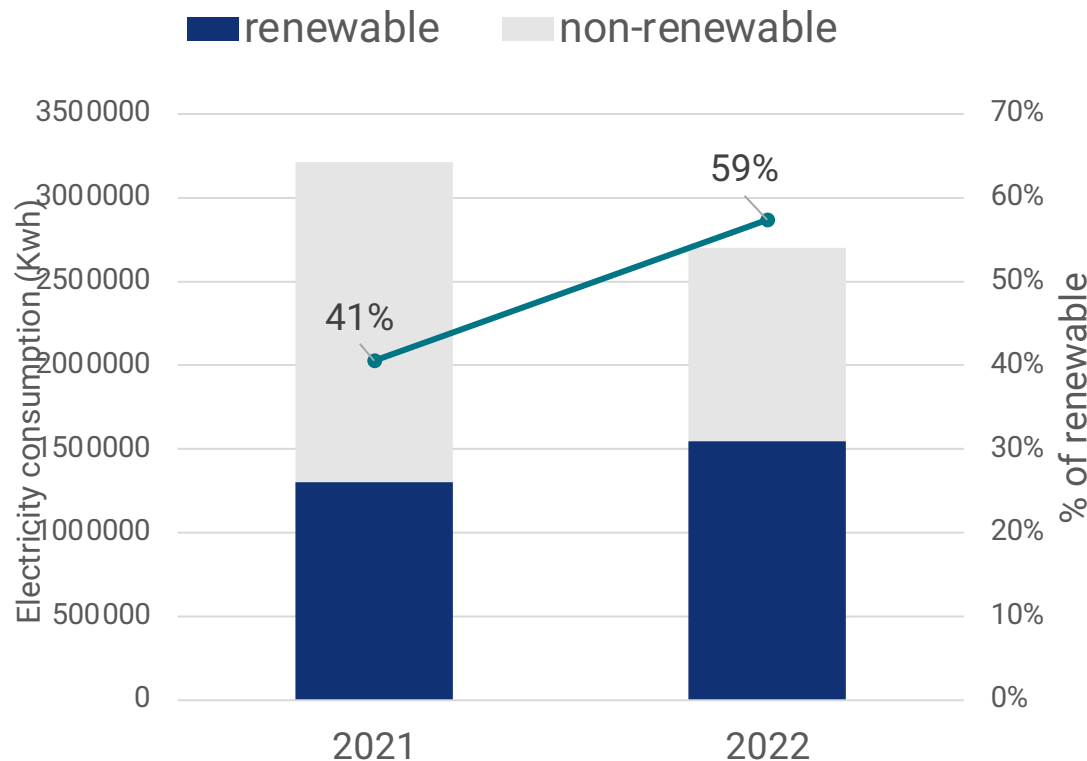
Scope 2 Location and Market-based Emissions



Market-based emissions account for renewable energy while location-based emissions does not.

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Renewable Energy Profile

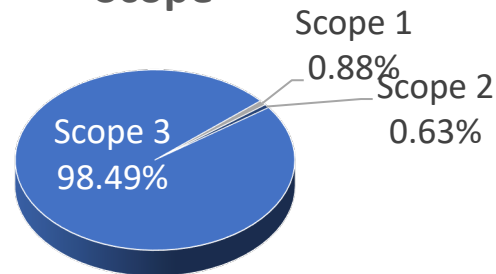


- In 2022, electricity from renewable sources represented **59%** of total electricity consumption, up from 41% in 2021.
- Sites that are already using/purchasing renewable electricity include: **San Jose, India, France and Montreal**

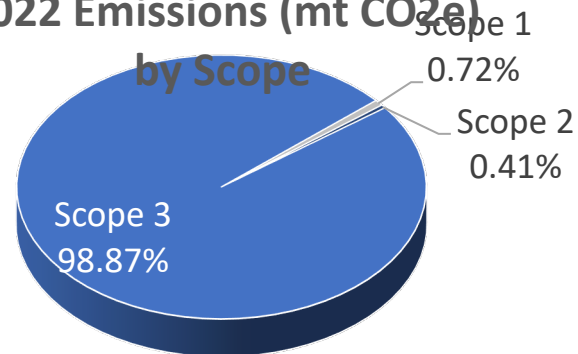
Emissions by Scope

- In both 2021 and 2022, Scope 3 was the largest source of emissions.
 - In 2021, Scope 3 emissions contributed to 98.5% of Rambus footprint.
 - In 2022, Scope 3 emissions contributed to 98.9% of Rambus footprint.
- **Use and processing of sold products** is the largest source of emissions in both 2021 and 2022.

2021 Emissions (mt CO₂e) by Scope



2022 Emissions (mt CO₂e) by Scope

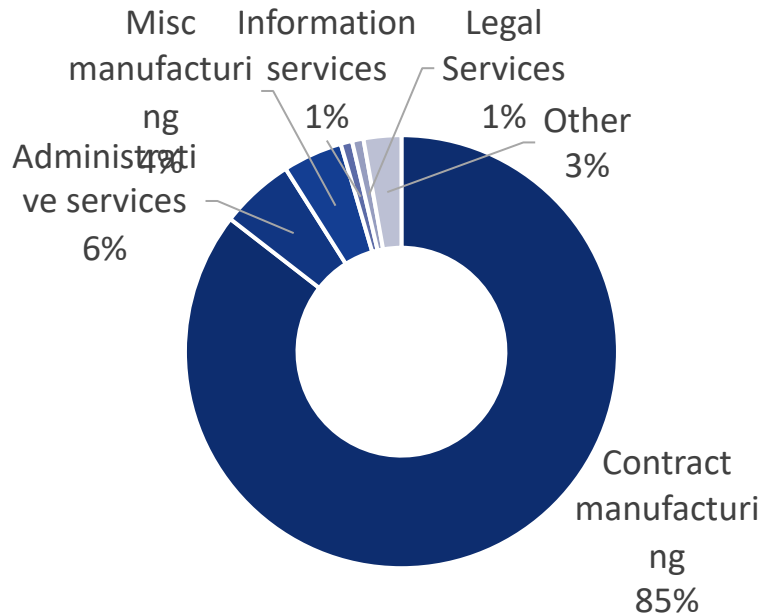


Purchased Goods & Services Emissions Breakdown



Insights

- 1** **Purchased goods and services** was the second largest source of emissions.
- 2** Total emissions for this category were **48,342 MTCO₂e** in 2022.
- 3** **Contract manufacturing** contributed the most to **purchased goods emissions** followed by administrative and support services.



Category	Examples
Administrative services	Accounting & auditing, consulting, recruiting, etc.
Information services	Data processing, internet publishing, and other information services

Capital Goods Emissions Breakdown



Insights

1

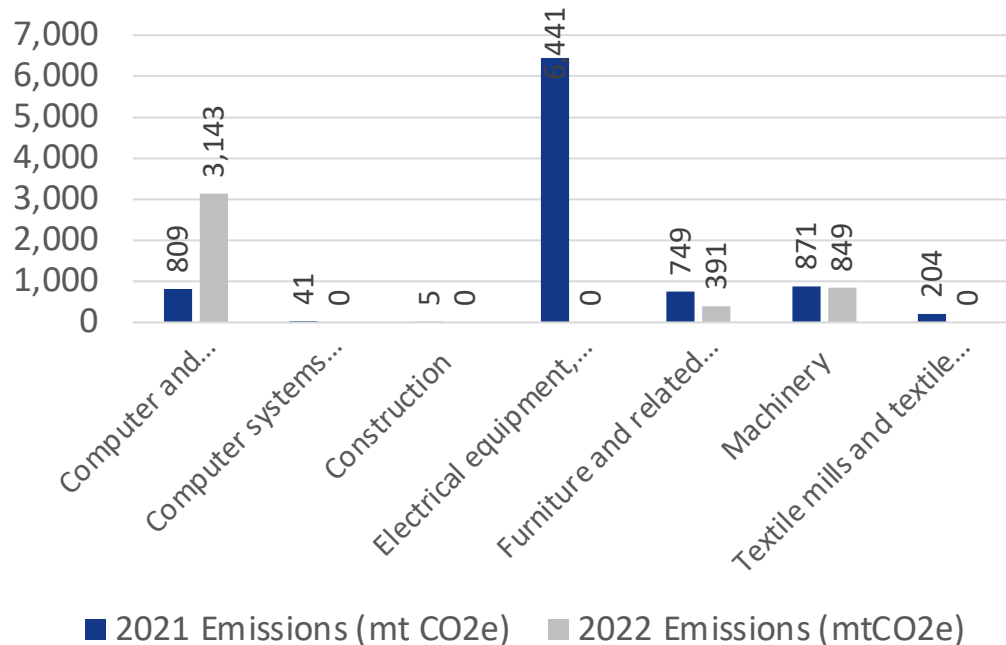
Capital goods was the third largest source of emissions.

2

Total emissions for this category were **4,383 MTCO₂e** in 2022.

3

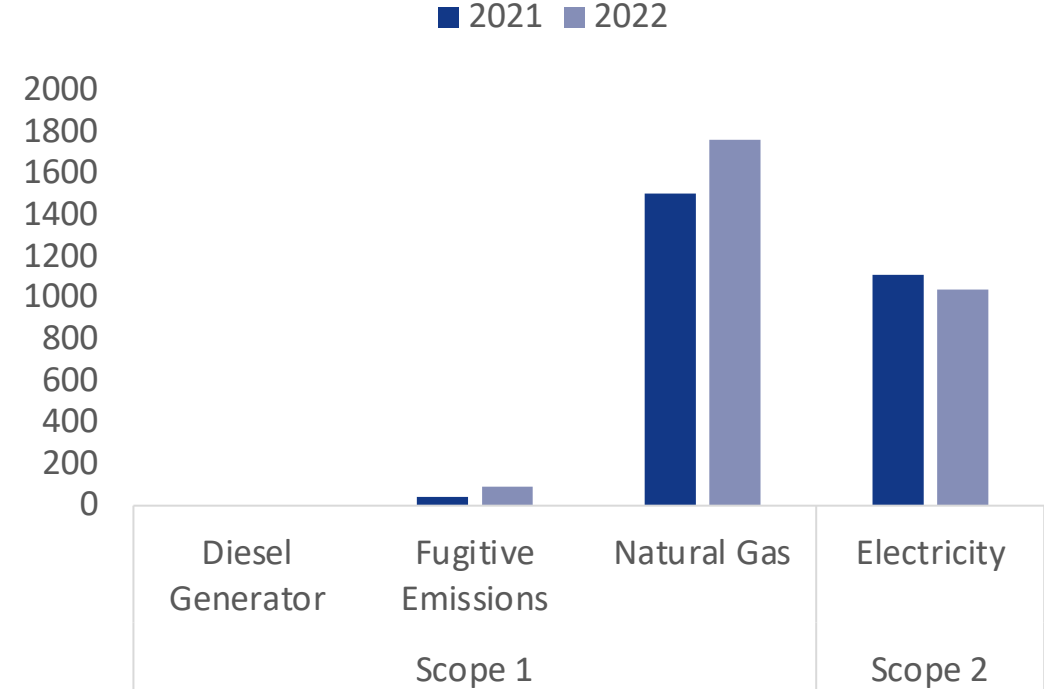
Capital goods emissions decreased an overall **52% from FY21 to FY22**, mainly attributed to depletion of the *Electrical equipment, appliances and components* category in 2022.



Scope 1+2 Emissions Breakdown

— Insights —

- 1 **Natural gas** and **electricity** were the fourth and fifth largest sources of emissions.
- 2 Total emissions for this category were **2,885 MTCO2e** in 2022.
- 3 Scope 1+2 emissions increased an overall **9% from FY21 to FY22**, mainly attributed to *the increase in natural gas consumption* in 2022.



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Business Travel Emissions Breakdown



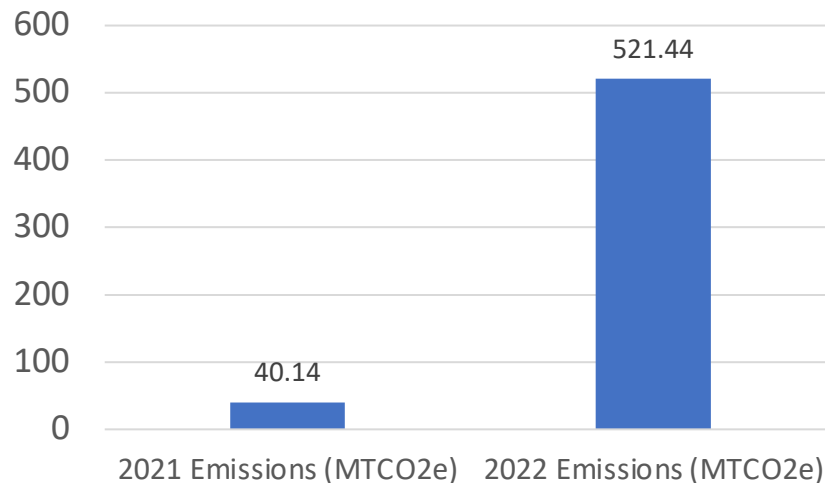
Insights

1

Business travel had the largest percentage increase of GHG emissions at **1,119%**.

2

Emissions from business travel includes **air travel, hotel, car rental, and business meals**.



GHG Impact Equivalences



CY22: 270,464 MT CO₂e



30 million gallons
of gasoline consumed



693 million miles driven by a
passenger vehicle



33 billion smartphones
charged



34 thousand homes' energy use
for one year

Emission Sources & Methodology

Scope/Category	Sources of Emissions	Methodology & Estimations
Scope 1 & 2 Energy use in offices	<ul style="list-style-type: none"> Natural Gas Electricity Diesel Generator Refrigerants 	<ul style="list-style-type: none"> Actual electricity consumption data was provided for San Jose, Oregon, India, Chapel Hills, Agoura Hills, Toronto, Finland, Vught, Korea, Bulgaria – Sofia, Bulgaria – Plodiv, France, Taiwan and Toronto - Analog x. Only San Jose has natural gas consumption. Only Chapel Hill had diesel consumption used in generator. Refrigerant data was provided for India, Vught and San Jose. Average capacity was used based on equipment type. Emissions were calculated as per most updates EPA e-Hub Emission Factors for US locations and IEA Emissions Factors for international.
Scope 3 Business Travel	<ul style="list-style-type: none"> Air Travel Train & Public Transport Car Rental, Taxi 	<ul style="list-style-type: none"> Mix of mileage and spend based data provided Emissions were calculated as per most updates EPA e-Hub Emission Factors
Scope 3 Commuting, including work from home energy use	<ul style="list-style-type: none"> Employee travel to and from work Electricity (at home) Natural Gas (at home) 	<ul style="list-style-type: none"> Commute survey results was provided for San Jose, Bangalore, Agoura hills, Chapel Hill, Toronto, Espoo, Vught, and Hillsboro.
Scope 3 Upstream and Downstream Shipping	<ul style="list-style-type: none"> Shipping from suppliers Shipping to customers 	<ul style="list-style-type: none"> Shipping emissions was provided by the vendors for 2022 Assume all spend is attributed to upstream shipping and downstream shipping is negligible.

Emission Sources & Methodology (Cont.)

Category	Sources of Emissions	Methodology & Estimations
Scope 3 Purchased goods and services & Capital goods	<ul style="list-style-type: none"> Purchased materials Purchased services 	<ul style="list-style-type: none"> Spend data was provided for purchased materials and services. Emissions calculated using US EPA's Supply Chain GHG Emission Factors for US Industries and Commodities.
Scope 3 Waste generated in operations	<ul style="list-style-type: none"> Waste management and disposal 	<ul style="list-style-type: none"> Actual consumption data was provided for landfill, recycling and composting for each location. Emissions were calculated based on type of waste and disposal method.
Scope 3 Fuel- and Energy-Related Activities	<ul style="list-style-type: none"> Upstream transmission and distribution (T&D) losses of electricity used 	<ul style="list-style-type: none"> T&D loss % in the each of the region is used where the facility is located. T&D losses induced emissions per kwh from International Energy Agency (IEA) is used for international locations based on the country.
Scope 3 Use and processing of sold products	<ul style="list-style-type: none"> Energy consumption from use of chips 	<ul style="list-style-type: none"> 0.75 Watt is assumed for all chips Systems are assumed to run 24 hours everyday Average US electricity emission factor is used

Water & Waste Water Disclosure



Rambus Leased Locations

Facility reference number	Country/Area	River basin	Latitude	Longitude	Located in area with water stress	% of Total Sites	Total Water Withdrawal (megaliters)	Adapted Water Management Plan
1	India, Bangalore	Cauvery River	12.932559	77.603578	Extremely High	0.32	0.54	Not Applicable
2	USA, CA, San Jose	Coyote (Tuolumne River)	37.4211738	-121.9639186	Low-Medium	0.32	0.69	Not Applicable
3	USA, CA, Agoura Hills	Colorado River	34.1457577	-118.7834736	Extremely High	0.03	0.02	Not Applicable
4	USA, OR, Hillsboro	Upper Tualatin River	45.527844	-122.8821053	Low	0.02	0.02	Not Applicable
5	USA, NC, Chapel Hill	Cane Creek Reservoir	35.9312163	-79.0326489	High	0.06	0.05	Not Applicable
6	CA, Toronto	Lake Ontario	43.7648586	-79.4121017	High	0.08	0.07	Not Applicable
7	CA, Montreal	St Lawrence River	45.5021793	-73.5582672	Low	0.02	0.01	Not Applicable
8	FI, Espoo	Ieppävaara	60.2150493	24.8148853	Low	0.02	0.06	Not Applicable
9	NL, Vught	Rhine River	51.6508744	5.3036108	High	0.05	0.08	Not Applicable
10	FR, Aix-en-Provence	Arc river	43.4811398	5.3664406	High	0.03	<0.00	Not Applicable

Water quality and water quantity to the success of your business.

	Direct Use Importance	Indirect Use Importance	Comments
Sufficient amounts of good quality freshwater available for use	Neutral	Important	<p>Rambus does not have manufacturing operations, so water quality is not a high risk to Rambus business operations. However, our wafer manufacturing suppliers do require a high quality and quantity of water for operations.</p> <p>Future water dependency would also differ for direct and indirect operations, with the latter presenting more of a risk to processor manufacturing, and therefore business revenue.</p>
Sufficient amounts of recycled, brackish and/or produced water available for use	Not Very Important	Neutral	<p>Rambus does use recycled and grey water, but it is mainly for irrigation and water basin recharge and not business operations. In 2022, a significant percentage of our suppliers reported having water recycling for their operations.</p>

Water quality and water quantity to the success of our business.

	% of sites/ facilities/operations	Comments
Water withdrawals – total volumes	76-99	In 2022, Rambus continued to lease our office spaces from real estate owners or property management agencies. We collect water data from these parties, or in some cases, directly from utility providers if the account is managed by Rambus. Some smaller-sized facilities do not receive water withdraw data.
Water withdrawals – volumes by source	76-99	Rambus reviews water risk data annually and aims to recycle / recapture rainwater at our high water stressed location in Bangalore, India.
Water withdrawals quality	76-99	We were advised by CDP that total water discharges should equal total withdraws based on our usage model (typical office building)
Water discharges – total volumes	Not Relevant	Not applicable based on leased facilities and non-manufacturing operations
Water discharges – volumes by destination	Not Relevant	Not applicable based on leased facilities and non-manufacturing operations
Water discharges – volumes by treatment method	Not Relevant	Not applicable based on leased facilities and non-manufacturing operations
Water discharge quality – by standard effluent parameters	Not Relevant	Not applicable based on leased facilities and non-manufacturing operations
Water discharge quality – temperature	Not Relevant	Not applicable based on leased facilities and non-manufacturing operations
Water consumption – total volume	76-99	Since we assume our water discharges equal withdrawals, with no known net consumption, we assume the percentage measured/monitored of consumption equals the % of withdrawals and discharges usage model (typical office building)
Water recycled/reused	0	In 2022, Rambus continued to lease our office spaces from real estate owners or property management agencies in multi-tenant buildings.
The provision of fully-functioning, safely managed WASH services to all workers	Not Relevant	Not applicable based on leased facilities and non-manufacturing operations

Water withdrawn, discharged, and consumed across all your operations

	Volume	Compared to previous Year	Comments
Total Withdrawals	1.61	About the Same	Office use remained low due to COVID
Total Discharges	1.61	About the Same	Office use remained low due to COVID
Total Consumption	0.0	About the Same	Advised withdrawal equals discharges
Total Water Withdrawals from areas with High water stress	0.8	About the Same	Office use remained low due to COVID

Water withdrawn from areas with water stress and provide the proportion

Withdrawals are from areas with water stress	% withdrawn from areas with water stress	Comparison with previous reporting year	Identification tool	Comments
Yes	26-50	About the same	WRI Aqueduct	Each year, Rambus uploads our office locations into the WRI Aqueduct tool to identify sites in high water stress regions. Rambus chose the WRI Aqueduct tool for our annual water risk assessments because it considers the current, near, and far future risks for our sites and key manufacturing suppliers. In addition to “overall risk” it provides several specific types of water risks – e.g., quality, quantity, basin stress. For 2022, overall high or extremely high risk site is Bangalore, India.

Total water withdrawal data by source

	Relevance	Volume (megaliters/year)	Comparison with previous reporting year	Comments
Fresh surface water, including rainwater, water from wetlands, rivers, and lakes	Not relevant	<Not Applicable>	<Not Applicable>	To the best of our knowledge, all water used at Rambus facilities in 2022 was from municipal sources, or captured rain water. Currently, no changes to future expected trends are anticipated.
Brackish surface water/Seawater	Not relevant	<Not Applicable>	<Not Applicable>	To the best of our knowledge, all water used at Rambus facilities in 2022 was from municipal sources, or captured rain water. Currently, no changes to future expected trends are anticipated.
Groundwater – renewable	Not relevant	<Not Applicable>	<Not Applicable>	To the best of our knowledge, all water used at Rambus facilities in 2022 was from municipal sources, or captured rain water. Currently, no changes to future expected trends are anticipated.
Groundwater – non-renewable	Not relevant	<Not Applicable>	<Not Applicable>	To the best of our knowledge, all water used at Rambus facilities in 2022 was from municipal sources, or captured rain water. Currently, no changes to future expected trends are anticipated.
Produced/Entrained water	Not relevant	<Not Applicable>	<Not Applicable>	To the best of our knowledge, all water used at Rambus facilities in 2022 was from municipal sources, or captured rain water. Currently, no changes to future expected trends are anticipated.
Third party sources	Not relevant	<Not Applicable>	<Not Applicable>	To the best of our knowledge, all water used at Rambus facilities in 2022 was from municipal sources, or captured rain water. Currently, no changes to future expected trends are anticipated.

Water withdrawn from areas with water stress and provide the proportion

Revenue	Total water withdrawal volume (megaliters)	Total water withdrawal efficiency	Anticipated forward trend
454,800,000	1.61	282,484,472	Water use and efficiency trend likely to increase due to business growth and return to office operations.

Air Quality



Air Emission

Description	Volume	Comments
Nitrogen Oxides (NOx) emissions	N/A	No sources of emission to report.
Sulphur Oxides (SOx) emissions	N/A	No sources of emission to report.
Volatile Organic Compounds (VOC) emissions	N/A	No sources of emission to report.
Particulate Matter (PM) emissions	N/A	No sources of emission to report.
Perfluorinated Compounds	N/A	No sources of emission to report.
Ozone-depleting Substances (ODS)	N/A	No sources of emission to report.
Hazardous Air Pollutants (HAPS)	N/A	No sources of emission to report.

No non-compliances were reported in 2022.

Waste Management



Waste Management

Waste Category	Volume	Comments
Non-Hazardous Waste Generated (metric Tons)	32.24	
Non-Hazardous Waste Recycled (metric Tons)	23.25	
Non-Hazardous Waste Landfilled (metric tons)	8.99	
Non-Hazardous Waste Landfill Diversion Rate (%)	72%	
Hazardous Waste (HW) Generated (Metric Tons)	5.29	
Hazardous Waste Recycled/Reused (metric tons)	0	
Hazardous Waste Treated Off-Site (metric tons)	0	
Hazardous Waste Incinerated (metric tons)	0	
Hazardous Waste Landfilled (metric tons)	5.29	
Total Waste Generated (metric tons)	37.53	
Total Waste Generated per Revenue (metric ton/\$)	0.08	
Contract Manufacturing Hazardous Waste Generated (metric tons)	TBD	

Rambus is fully committed to following international guidelines for disposal of e-waste at all global sites.
No non-compliance issues were reported in 2022.

Health & Safety Well Being – Injury Rates



Well Being – Rambus Injury Rates

Well-Being	2020	2021	2022
Worldwide Injury and Illness Case Rate (per 100 workers)	0	0	0.2
Rambus U.S. Injury and Illness Case Rates (per 100 workers)	0	0	0.1
OSHA Case Rate - Private Industry	2.7	2.7	TBD
OSHA Case Rate - Computer/Electronic Product Mfg	0.9	0.9	TBD
OSHA Case Rate - Technical/Engineering Services	0.7	0.9	TBD
U.S. Lost Work Days Case Rate (per 100 workers)	1.7	1.7	TBD

No non-compliances were reported in 2022.

Thank you

