2022

Rambus

GHG, Water & Wastewater, Air Quality, Waste Management & Health & Safety Metrics

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)



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Sources and Scopes of GHG Emissions



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GHG Inventory for FY21 and FY22

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

Categories with biggest changes

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

Emissions in FY21 Compared with FY22



Emissions Intensity in FY21 Compared with FY22



2021 2022 ■ GHG Emissions/Revenue (Scope 1 and 2 metric ton CO2e/million \$)

■ GHG Emissions/FTE (Scope 1 and 2/person)

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



644 passenger vehicles driven for one year



365 homes' energy use for one year

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



47,853 tree seedlings grown for 10 years



3,451 acres of US forests in one year

OR

% Contribution to Total by Category

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

Scope 2 Location and Market-based Emissions



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

Renewable Energy Profile

renewable non-renewable 70% 3500000 59% 60% 3000000 Electricity consumption (Kwh) 50% 2500000 of renewable 41% 40% 2000000 30% 1500000 % 20% 1000000 10% 500000 0% 0 2021 2022

- 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

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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.



Purchased Goods & Services Emissions Breakdown





Purchased goods and services was the second largest source of emissions.

2

Total emissions for this category were **48,342 MTCO2e in 2022**.



Contract manufacturing contributed the most to purchased goods emissions followed by administrative and support services.



	Category	Examples	
	Administrative services	Accounting & auditing, consulting, recruiting, etc.	
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Capital Goods Emissions Breakdown



Capital goods was the third largest source of emissions.

Insights-



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



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.



■ 2021 Emissions (mt CO2e) ■ 2022 Emissions (mtCO2e)

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Scope 1+2 Emissions Breakdown



Natural gas and **electricity** were the fourth and fifth largest sources of emissions.

Insights

2

Total emissions for this category were **2,885 MTCO2e in 2022.**



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–



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**.



2021 Emissions (MTCO2e) 2022 Emissions (MTCO2e)

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
Energy use in offices	 Natural Gas Electricity Diesel Generator Refrigerants 	 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.
Business Travel	Air TravelTrain & Public TransportCar Rental, Taxi	 Mix of mileage and spend based data provided Emissions were calculated as per most updates EPA e-Hub Emission Factors
including work from home energy use	 Employee travel to and from work Electricity (at home) Natural Gas (at home) 	• Commute survey results was provided for San Jose, Bangalore, Agoura hills, Chapel Hill, Toronto, Espoo, Vught, and Hillsboro.
Scope 3 Upstream and Downstream Shipping	Shipping from suppliersShipping to customers	 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	Purchased materialsPurchased services	 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	Waste management and disposal	 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	• Upstream transmission and distribution (T&D) losses of electricity used	
Scope 3 Use and processing of sold products	• Energy consumption from use of chips	 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	leppävaara	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
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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	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. 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.
Sufficient amounts of recycled, brackish and/or produced water available for use	Not Very Important	Neutral	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.

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>	<not applicable=""></not>	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>	<not applicable=""></not>	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>	<not applicable=""></not>	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>	<not applicable=""></not>	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>	<not applicable=""></not>	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>	<not applicable=""></not>	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 Program

Rambus generates all its waste through its operations and construction activities, and we responsibly manage and dispose of our chemicals and materials. Rambus' manufacturing operations are outsourced, and therefore, we generate no production waste. We monitor our contract manufacturers' waste management programs to ensure they establish waste reduction targets and meet all regulatory requirements. We reduce the amount of waste we generate by limiting what we procure, segregating our waste streams, and striving to reuse, reclaim, or recycle chemicals and materials to the extent possible. Examples of waste we recycle include glass, paper, metals, wood and furniture. Anything that cannot be recycled or reused is disposed of according to local laws.

The Facilities team identifies those waste reduction or recycling initiatives that will yield significant results. We determine ways to segregate our waste streams further and work with our waste disposal vendors to divert those wastes from landfills. We engage with our employees through various initiatives to educate our workforce on the importance of recycling and reducing waste. Activities promoted include proper bin use, composting, and reducing takeout containers and plastic bottles.

Rambus is fully committed to following international guidelines for disposal of e-waste at all global sites. Where possible devices are donated to staff and community organization.

Rambus generates minimal quantities of hazardous waste. For the hazardous waste we do generate, Rambus follows all local laws and regulations for hazardous waste storage, treatment, and disposal, and all waste is appropriately documented and/or registered. Hazardous waste quantities are tracked, and the waste is segregated where possible for recycling or reclaim opportunities. Hazardous waste is managed by licensed waste disposal vendors, which are audited by Rambus.

Rambus minimizes hazardous waste in our operations by implementing best practices for waste management, including source reduction, recycling, and proper disposal. We are committed to following all local laws and regulations. Continued research and innovation are crucial to identifying safer and more environmentally friendly alternatives to toxic chemicals used in the manufacturing process.

Rambus had no non-compliances issues were reported in 2022.

Rambus aims to achieve a 90% waste diversion rate corporate-wide by 2030.



Waste Management - Metrics

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 Incinerated (%)	0.0	
Non-Hazardous Waste Landfill Diversion Rate (%)	72%	
Hazardous Waste (HW) Generated (Metric Tons)	<0.01	
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.

**Rambus had no non-compliances 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	2.7
OSHA Case Rate - Computer/Electronic Product Mfg	0.9	0.9	1.1
OSHA Case Rate - Technical/Engineering Services	0.7	0.9	0.6
U.S. Lost Work Days Case Rate (per 100 workers)	1.7	1.7	1.7

No non-compliances were reported in 2022.

Thank you

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