



Welcome to your CDP Climate Change Questionnaire 2019

C0. Introduction

C0.1

(C0.1) Give a general description and introduction to your organization.

Micron is comprised of a team of visionaries and trailblazers, designing and building advanced semiconductor technologies. From mobile devices to connected automobiles, to supercomputers and cloud servers—our innovative memory and storage solutions are used in things that we depend on and use every day. They are foundational to the technological advancements that are changing how the world uses information. Today, we are a global leader in the semiconductor industry with a track record of innovation and industry advancement that includes over 26,000 patents. Our multinational diversity, manufacturing scale, and broad product portfolio enable us to advance new ideas and develop technologies that can transform what’s possible. Our broad portfolio of silicon-to-semiconductor solutions starts with foundational dynamic random-access memory (DRAM), NAND, and NOR Flash memory and extends to solid state drives, modules, multichip packages, and other semiconductor systems. We work with today’s leading brands and original equipment manufacturers (OEMs) to enable the world’s most innovative computing, consumer, enterprise storage, data center, mobile, embedded and automotive applications. Micron strives to build and operate sustainable world-class facilities around the world that enable excellence in safety, reliability, and cost. Through pollution prevention, reclamation, and recycling efforts, Micron strives to reduce the burden on air, water and land resources. Continuous improvement of our environmental performance is a long-term commitment. Visit micron.com/environment for more information. We take a proactive approach to environmental stewardship, occupational health and safety, and high-quality product standards. An integral part of this mission is a proactive approach to environmental compliance and protection that serves our team members, customers and communities in which we operate. Compliance with applicable environmental regulations is considered a minimum standard. Micron implements additional programs where appropriate to provide greater environmental performance and protection, demonstrating the responsibility it feels towards its local and global communities. Continuous improvement of our environmental performance is a long-term commitment of Micron’s business mission.

C0.2

(C0.2) State the start and end date of the year for which you are reporting data.

	Start date	End date	Indicate if you are providing emissions data for past reporting years
Row 1	January 1, 2018	December 31, 2018	No

C0.3

(C0.3) Select the countries/regions for which you will be supplying data.

- China
- Japan
- Malaysia
- Singapore
- Taiwan, Greater China
- United States of America

C0.4

(C0.4) Select the currency used for all financial information disclosed throughout your response.

- USD

C0.5

(C0.5) Select the option that describes the reporting boundary for which climate-related impacts on your business are being reported. Note that this option should align with your consolidation approach to your Scope 1 and Scope 2 greenhouse gas inventory.

- Operational control

C1. Governance

C1.1

(C1.1) Is there board-level oversight of climate-related issues within your organization?

- Yes

C1.1a

(C1.1a) Identify the position(s) (do not include any names) of the individual(s) on the board with responsibility for climate-related issues.

Position of individual(s)	Please explain
Chief Executive Officer (CEO)	Micron's CEO sits on the Board of Directors and leads executive oversight of Micron's sustainability efforts driven by our Sustainability Council, a team of senior leaders responsible for developing all aspects of sustainability strategy for the company. The Sustainability Council receives oversight and approval from an executive leadership team reporting to the CEO.

Chief Operating Officer (COO)	While not a member of the Board of Directors, our Executive VP of Global Operations (equivalent to Chief Operating Officer) has executive authority and oversight of our corporate Environment, health, and safety function, which has primary responsibility for our operational climate strategy and planning.
Chief Procurement Officer (CPO)	While not a member of the Board of Directors, this individual has oversight of our supply chain sustainability efforts, including expectations that suppliers report on their climate performance.
Chief Sustainability Officer (CSO)	While not a member of the Board of Directors, our VP of Compliance and Sustainability (equivalent to Chief Sustainability Officer) has oversight of our corporate sustainability strategy, including actions related to climate change
Board-level committee	Members of the Board’s Governance and Sustainability Committee – The Governance and Sustainability Committee of Micron’s Board of Directors oversees the company’s development and integration of sustainability efforts, including climate change.

C1.1b

(C1.1b) Provide further details on the board’s oversight of climate-related issues.

Frequency with which climate-related issues are a scheduled agenda item	Governance mechanisms into which climate-related issues are integrated	Please explain
Scheduled – some meetings	<ul style="list-style-type: none"> Reviewing and guiding strategy Reviewing and guiding major plans of action Reviewing and guiding risk management policies Reviewing and guiding annual budgets Setting performance objectives Monitoring implementation and performance of objectives Monitoring and overseeing progress against goals and targets for addressing climate-related issues 	<p>At the direction of Micron’s Chief Executive Officer and President, our Sustainability Council, a team of senior leaders including the Vice President of Sustainability and Compliance, have responsibility for developing all aspects of the company’s sustainability strategy, with oversight and approval from an executive leadership team. Additionally, Micron’s Risk Committee, a team of senior leaders including the CFO, review and guide risk management objectives including climate-related risks. The Sustainability Council and Risk Committee drive our climate strategy and focuses on how we can improve the impact of our operations on the environment. Micron’s sustainability and climate-related strategy, action plans, performance objectives, and progress against goals and targets are presented to the Board’s Governance and Sustainability committee at least annually. Risk management policies and significant risk findings are reported to the Board’s Audit Committee.</p>

C1.2

(C1.2) Provide the highest management-level position(s) or committee(s) with responsibility for climate-related issues.

Name of the position(s) and/or committee(s)	Responsibility	Frequency of reporting to the board on climate-related issues
Chief Sustainability Officer (CSO)	Both assessing and managing climate-related risks and opportunities	Quarterly

C1.2a

(C1.2a) Describe where in the organizational structure this/these position(s) and/or committees lie, what their associated responsibilities are, and how climate-related issues are monitored (do not include the names of individuals).

Micron's Vice President of Compliance and Sustainability chairs our Sustainability Council which was initiated at the direction of the Chief Executive Officer and President. The Sustainability Council is comprised of a team of senior leaders representing the various aspects of sustainability, including supply chain, procurement, sales, and global manufacturing which accounts for the majority of Micron' Scope 1 and Scope 2 GHG emissions. The Sustainability Council is enabling an integrated strategy from technology development through high volume manufacturing to proactively align and execute on environmental initiatives and goals. On a quarterly basis, the Sustainability Council monitors, among other things, climate-related data, and tracks progress towards goals. Additionally, Micron's Risk Committee, which is chaired by the CFO and comprised of a team of senior leaders including the Senior Director of Global Risk and Resilience which enables direct engagement and decision making. The Risk Committee monitors, among other things, climate-related risks identification and progress towards risk reduction. The Sustainability Council and Risk Committee drive our climate strategy and focuses on how we can improve the impact of our operations on the environment.

C1.3

(C1.3) Do you provide incentives for the management of climate-related issues, including the attainment of targets?

Yes

C1.3a

(C1.3a) Provide further details on the incentives provided for the management of climate-related issues (do not include the names of individuals).

Who is entitled to benefit from these incentives?

All employees

Types of incentives

Monetary reward

Activity incentivized

Energy reduction project

Comment

Every Team Member is eligible for monetary and non-monetary recognition for their contribution towards sustainability and climate-related activities.

Who is entitled to benefit from these incentives?

All employees

Types of incentives

Monetary reward

Activity incentivized

Efficiency project

Comment

Every Team Member is eligible for monetary and non-monetary recognition for their contribution towards sustainability and climate-related activities.

Who is entitled to benefit from these incentives?

All employees

Types of incentives

Monetary reward

Activity incentivized

Behavior change related indicator

Comment

Every Team Member is eligible for monetary and non-monetary recognition for their contribution towards sustainability and climate-related activities.

The Micron Global Wellness program promotes healthy lifestyles for all employees, including energy saving tips, water conservation and waste reduction. All employees can participate and get rewarded for program completion.

“Desirable Trash” Award where employees can take home scrap material (i.e., crates, boxes, tools, etc.) that would otherwise be landfilled or incinerated (creating GHG) and capture a picture of how it was put to beneficial use. Team Members vote on the most creative project and the recipient receives the “Desirable Trash” Award.

Who is entitled to benefit from these incentives?

Corporate executive team

Types of incentives

Monetary reward

Activity incentivized

Emissions reduction target

Comment

A component of the company incentive (bonus) pay for Senior executives, and all other employees, is based on our sustainability performance, including climate change.

C2. Risks and opportunities

C2.1

(C2.1) Describe what your organization considers to be short-, medium- and long-term horizons.

	From (years)	To (years)	Comment
Short-term	0	1	Time horizons used for enterprise risk assessment when evaluating likelihood
Medium-term	1	5	Time horizons used for enterprise risk assessment when evaluating likelihood
Long-term	5	10	Time horizons used for enterprise risk assessment when evaluating likelihood

C2.2

(C2.2) Select the option that best describes how your organization's processes for identifying, assessing, and managing climate-related issues are integrated into your overall risk management.

Integrated into multi-disciplinary company-wide risk identification, assessment, and management processes

C2.2a

(C2.2a) Select the options that best describe your organization's frequency and time horizon for identifying and assessing climate-related risks.

	Frequency of monitoring	How far into the future are risks considered?	Comment
Row 1	Annually	>6 years	Enterprise Risk Management (ERM) at Micron is a comprehensive program that uses risk information to

		<p>formulate strategies, processes and decisions that enable the company to achieve its objectives. ERM establishes a unified approach to risk management that helps Micron achieve a shared understanding of risks and make informed business decisions. Micron’s Risk Committee is appointed by our CEO and reports major findings to the Audit Committee of Micron’s Board of Directors. Climate Change Risk and overall Sustainability Risk is reported and managed as part of this process. In 2019, Micron completed the revision of the climate-related risk assessment, which included “business as usual” and 2-degree scenarios for 2020, 2030, and 2040. We intend to review and update these materials on a periodic basis.</p>
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C2.2b

(C2.2b) Provide further details on your organization’s process(es) for identifying and assessing climate-related risks.

Micron uses a standard ERM process to ensure risks, including climate-related risks, can be incorporated into decision-making. The ERM process is aligned with Micron’s Strategic and Business Planning Process to ensure appropriate priorities are set and company strategic objectives are met. This creates a unified approach to identify, assess, prioritize, treat, monitor and report risks across the company. As part of the strategic planning process and day-to-day management of the business, internal and external risks that may affect the achievement of our objectives are identified. Climate-related risks and overall sustainability risks spanning a 2-6 year time period are identified, assessed, prioritized, and managed as part of this ERM process. Information and communication channels are in place to make the organization aware of risks that fall into their area of responsibility.

Micron risk management personnel and subject matter experts assess these risks through their expertise, formal assessments and analysis of business intelligence and trends. Risks and opportunities are then prioritized based upon the overall risk exposure, considered as a function of likelihood (how likely is the risk to occur without treatment) and impact of the occurrence (how impactful is the risk without treatment). Micron leaders are accountable for managing risks affecting their area of responsibility. Risk management personnel are responsible for maintenance and governance of the ERM program, and support the identification, assessment, and reporting of risks to leadership for recommended actions. Each business unit and function communicates identified risks and associated treatments to their leadership teams. The leaders of these functions develop plans and direction for their organization to effectively align the treatment support to the objectives and priorities of the organization. Micron personnel are empowered to make decisions to prioritize risk treatments that are within their span of control. However, all risks are elevated through the ERM process to identify themes across product lines, sites, and assets. This allows prioritization of risks across multiple locations and functions to receive appropriate attention and review by the Risk Committee on a quarterly basis or more frequently as needed. Micron considers substantive financial impact as having the potential for severe and/or irreversible negative impact to

Micron’s assets, credit liquidity, and/or share price. Climate-related risks and opportunities are identified and prioritized by considering the following criteria: business continuity, impact to brand/reputation, relevance to regional operations, alignment with Micron business strategy, impact to communities, and compliance considerations.

Micron routinely monitors greenhouse gas and energy efficiency regulations and policy to understand and evaluate impacts to, and opportunities for, our business, customers, and the communities where we operate.

One example of our risk/opportunity identification and management process includes the risk of enhanced reporting obligations. The likelihood of this occurring and how impactful it would be without treatment is evaluated to determine the inherent risk and then treatment details, including who, what, and when are determined and tracked to closure. The treatments for this example includes monitoring greenhouse gas and energy efficiency regulations and policy to understand and evaluate impacts to, and opportunities for, our business, customers, and the communities where we operate. When applicability is determined, an action plan is developed and monitored through execution.

In 2019, Micron completed a scenario-based climate-related risk assessment initiated in 2018 which included “business as usual” and "2-degree" scenarios for 2020, 2030, and 2040. We intend to review and update these materials on a periodic basis.

C2.2c

(C2.2c) Which of the following risk types are considered in your organization's climate-related risk assessments?

	Relevance & inclusion	Please explain
Current regulation	Relevant, always included	Micron routinely monitors greenhouse gas and energy efficiency regulations and policy to understand and evaluate impacts to, and opportunities for, our business, customers, and the communities where we operate. This is managed through an enterprise wide EHS data management system that identifies and monitors compliance with applicable regulations.
Emerging regulation	Relevant, always included	Our Global Environmental, Health & Safety and Government Affairs organizations monitor emerging legislative and regulatory programs on a global level policy to understand and evaluate impacts to, and opportunities for, our business, customers, and the communities where we operate.
Technology	Relevant, always included	Micron low power devices support sustainability and climate change initiatives in our customer’s supply chain. Failure to meet such spec might contribute to reduced demand for goods.
Legal	Relevant, always included	Micron routinely monitors greenhouse gas and energy efficiency regulations and policy to understand and evaluate impacts to, and opportunities for, our business, customers, and the communities where we operate. This is managed through an enterprise wide EHS

		data management system that identifies and monitors compliance with applicable regulations.
Market	Relevant, always included	Micron routinely monitors market trends in terms of power consumption to understand and evaluate impacts to, and opportunities for, our business and our customers.
Reputation	Relevant, always included	Micron takes our reputation with local communities, our employees, regulators and customers very seriously and reputational consideration is incorporated into our risk criteria.
Acute physical	Relevant, always included	Micron considers risks arising from extreme weather events, such as cyclones, hurricanes, or floods in our business continuity program.
Chronic physical	Relevant, always included	Micron included chronic issue impacts on our facilities, workforce, and communities such as sea level rise, increased temperatures, and changes in water availability in our 2018-19 climate risk assessment.
Upstream	Relevant, always included	All risks identified above cover upstream elements as well. A specific example of identified risk is Supplier carbon pricing risk that has been included in the scenario-based risk assessment to understand how carbon pricing would affect key suppliers
Downstream	Relevant, always included	All risks identified above cover downstream elements as well. A specific example is the Customer scoring of Micron's climate related performance. Customer preference for specific types of components (low-power/low-heat, low embedded carbon).

C2.2d

(C2.2d) Describe your process(es) for managing climate-related risks and opportunities.

Micron risk management personnel and subject matter experts assess these risks through their expertise, formal assessments and analysis of business intelligence and trends. Risks and opportunities are then prioritized based upon the overall risk exposure, considered as a function of likelihood and impact of the occurrence. Micron leaders are accountable for managing risks affecting their area of responsibility. Risk management personnel are responsible for maintenance and governance of the ERM program, and support the identification, assessment, and reporting of risks to leadership for recommended actions. Each business unit and function communicates identified risks and associated treatments to their leadership teams. The leaders of these functions develop plans and direction for their organization to effectively align the treatment support to the objectives and priorities of the organization. Micron personnel are empowered to make decisions to prioritize risk treatments that are within their span of control. However, all risks are elevated through the ERM process to identify themes across product lines, sites, and assets. This allows prioritization of risks across multiple locations and functions to receive appropriate attention and review by the Risk Committee on a quarterly basis or more frequently as needed. Micron considers substantive financial impact as having the potential for severe and/or irreversible negative impact to

Micron's assets, credit liquidity, and/or share price. Climate-related risks and opportunities are identified and prioritized by considering the following criteria: business continuity, impact to brand/reputation, relevance to regional operations, alignment with Micron business strategy, impact to communities, and compliance considerations.

One example of our risk/opportunity identification and management process includes the risk of enhanced reporting obligations and carbon pricing. The likelihood of this occurring and how impactful it would be without treatment is evaluated to determine the inherent risk and then treatment details, including who, what, and when are determined and tracked to closure. The treatments for this example include monitoring greenhouse gas and energy efficiency regulations and policy to understand and evaluate impacts to, and opportunities for, our business, customers, and the communities where we operate. When applicability is determined, an action plan is developed and monitored through execution.

C2.3

(C2.3) Have you identified any inherent climate-related risks with the potential to have a substantive financial or strategic impact on your business?

Yes

C2.3a

(C2.3a) Provide details of risks identified with the potential to have a substantive financial or strategic impact on your business.

Identifier

Risk 1

Where in the value chain does the risk driver occur?

Direct operations

Risk type

Transition risk

Primary climate-related risk driver

Policy and legal: Enhanced emissions-reporting obligations

Type of financial impact

Company- specific description

Micron operates in some countries where carbon taxes and greenhouse gas regulations apply or are under discussion. This could have a cost impact on our operations and may require a carbon conservation plan, an annual report and/or designated personnel.

Time horizon

Medium-term

Likelihood

Likely

Magnitude of impact

Medium

Are you able to provide a potential financial impact figure?

Potential financial impact figure (currency)

Potential financial impact figure – minimum (currency)

Potential financial impact figure – maximum (currency)

Explanation of financial impact figure

Micron realizes that there is potential for financial impact. Potential financial impact is under review as potential carbon taxes have not been sufficiently defined.

Management method

Micron routinely monitors greenhouse gas and energy efficiency regulations and policy to understand and evaluate impacts to, and opportunities for, our business, customers, and the communities where we operate.

Cost of management

0

Comment

Micron routinely monitors greenhouse gas and energy efficiency regulations and policy to understand and evaluate impacts to, and opportunities for, our business, customers, and the communities where we operate.

Management activities are embedded into business-as-usual activities within the business and are therefore not additional.

Identifier

Risk 2

Where in the value chain does the risk driver occur?

Direct operations

Risk type

Physical risk

Primary climate-related risk driver

Acute: Increased severity of extreme weather events such as cyclones and floods

Type of financial impact

Company- specific description

In the past few years intensity and frequency of typhoons have been increasing, particularly in Asian countries where Micron operates. These events have caused temporary power failures and short-term interruptions, but so far impact has been controlled and not considered significant.

Time horizon

Medium-term

Likelihood

Likely

Magnitude of impact

Medium-high

Are you able to provide a potential financial impact figure?

Potential financial impact figure (currency)

Potential financial impact figure – minimum (currency)

Potential financial impact figure – maximum (currency)

Explanation of financial impact figure

Micron realizes that there is potential for financial impact. Potential financial impact has not yet been determined

Management method

Micron routinely monitors conditions and potential impacts to, and opportunities for, our business, customers, and the communities where we operate.

Cost of management

0

Comment

Micron routinely monitors conditions and potential impacts to, and opportunities for, our business, customers, and the communities where we operate.

Management activities are embedded into business-as-usual activities within the business and are therefore not additional.

Identifier

Risk 4

Where in the value chain does the risk driver occur?

Customer

Risk type

Transition risk

Primary climate-related risk driver

Technology: Unsuccessful investment in new technologies

Type of financial impact

Company- specific description

As awareness of sustainability and climate change increases the design of new products with higher performance and reduced environmental impact could be key to maintaining and increasing our customers' portfolio.

Time horizon

Long-term

Likelihood

Likely

Magnitude of impact

Medium-high

Are you able to provide a potential financial impact figure?

No, we do not have this figure

Potential financial impact figure (currency)

Potential financial impact figure – minimum (currency)

Potential financial impact figure – maximum (currency)

Explanation of financial impact figure

Micron realizes that there is potential for financial impact. Potential financial impact has not yet been determined

Management method

Micron routinely monitors conditions and potential impacts to, and opportunities for, our business, customers, and the communities where we operate.

Cost of management

0

Comment

Micron routinely monitors conditions and potential impacts to, and opportunities for, our business, customers, and the communities where we operate.

Management activities are embedded into business-as-usual activities within the business and are therefore not additional.

Identifier

Risk 5

Where in the value chain does the risk driver occur?

Customer

Risk type

Transition risk

Primary climate-related risk driver

Reputation: Increased stakeholder concern or negative stakeholder feedback

Type of financial impact

Company- specific description

Corporate strategies for sustainability and climate change may become critical indicators for customers and investors.

Time horizon

Medium-term

Likelihood

Likely

Magnitude of impact

Medium

Are you able to provide a potential financial impact figure?

No, we do not have this figure

Potential financial impact figure (currency)

Potential financial impact figure – minimum (currency)

Potential financial impact figure – maximum (currency)

Explanation of financial impact figure

Micron realizes that there is potential for financial impact. Potential financial impact has not yet been determined

Management method

Micron routinely monitors conditions and potential impacts to, and opportunities for, our business, customers, and the communities where we operate.

Cost of management

0

Comment

Micron routinely monitors conditions and potential impacts to, and opportunities for, our business, customers, and the communities where we operate.

Management activities are embedded into business-as-usual activities within the business and are therefore not additional.

Identifier

Risk 3

Where in the value chain does the risk driver occur?

Direct operations

Risk type

Physical risk

Primary climate-related risk driver

Chronic: Changes in precipitation patterns and extreme variability in weather patterns

Type of financial impact

Increased operating costs (e.g., higher compliance costs, increased insurance premiums)

Company- specific description

Reduced revenue from decreased production capacity (e.g. employee productivity, equipment degradation, transportation difficulties)

Temperature extremes increase cooling costs which can be nonlinear with temperatures; decrease productivity by contributing to heat-related illnesses, increase equipment degradation, and negatively affect transportation infrastructure

Time horizon

Medium-term

Likelihood

Very likely

Magnitude of impact

Medium-high

Are you able to provide a potential financial impact figure?

No, we do not have this figure

Potential financial impact figure (currency)

Potential financial impact figure – minimum (currency)

Potential financial impact figure – maximum (currency)

Explanation of financial impact figure

Micron realizes that there is potential for financial impact. Potential financial impact has not yet been determined

Management method

Micron routinely monitors conditions and potential impacts to, and opportunities for, our business, customers, and the communities where we operate.

Cost of management

0

Comment

Temperature extremes increase cooling costs which can be nonlinear with temperatures; decrease productivity by contributing to heat-related illnesses, increase equipment degradation, and negatively affect transportation infrastructure. Management activities are embedded into business-as-usual activities within the business and are therefore not additional.

C2.4

(C2.4) Have you identified any climate-related opportunities with the potential to have a substantive financial or strategic impact on your business?

Yes

C2.4a

(C2.4a) Provide details of opportunities identified with the potential to have a substantive financial or strategic impact on your business.

Identifier

Opp1

Where in the value chain does the opportunity occur?

Direct operations

Opportunity type

Energy source

Primary climate-related opportunity driver

Use of new technologies

Type of financial impact

Reduced operational costs (e.g., through use of lowest cost abatement)

Company-specific description

Micron has a year-on-year track record of implementing projects to improve the energy efficiency of our tools and systems by reducing operational costs, besides replacing less efficient equipment with new equipment with higher energy efficiency. Furthermore, a new energy procurement approach is under development to value green energy in our supplier evaluation process.

Time horizon

Short-term

Likelihood

Very likely

Magnitude of impact

Medium-high

Are you able to provide a potential financial impact figure?

Potential financial impact figure (currency)

Potential financial impact figure – minimum (currency)

Potential financial impact figure – maximum (currency)

Explanation of financial impact figure

Micron realizes that there is potential for financial impact. Potential financial impact has not yet been determined

Strategy to realize opportunity

Micron continuously identifies energy saving projects and evaluates cost/benefit to allocate necessary resources (capex).

Cost to realize opportunity

9,565,795

Comment

Micron continuously identifies energy saving projects and evaluates cost/benefit to allocate necessary resources (capex). Cost reported here refers to total cost for implementing energy saving solutions during CY18.

Identifier

Opp2

Where in the value chain does the opportunity occur?

Supply Chain

Opportunity type

Products and services

Primary climate-related opportunity driver

Development and/or expansion of low emission goods and services

Type of financial impact

Increased revenue through demand for lower emissions products and services

Company-specific description

Climate change regulations could increase the demand for energy efficiency products and potentially drive innovation in the design of new products.

Time horizon

Short-term

Likelihood

Likely

Magnitude of impact

High

Are you able to provide a potential financial impact figure?

Potential financial impact figure (currency)

Potential financial impact figure – minimum (currency)

Potential financial impact figure – maximum (currency)

Explanation of financial impact figure

Micron realizes that there is potential for financial impact. Potential financial impact has not yet been determined

Strategy to realize opportunity

Micron routinely monitors market trends in terms of power consumption to understand and evaluate impacts to, and opportunities for, our business and our customers.

Cost to realize opportunity

0

Comment

Micron routinely monitors market trends in terms of power consumption to understand and evaluate impacts to, and opportunities for, our business and our customers. Micron routinely monitors conditions and potential impacts to, and opportunities for, our business, customers, and the communities where we operate. Management activities are embedded into business-as-usual activities within the business and are therefore not additional.

Identifier

Opp3

Where in the value chain does the opportunity occur?

Customer

Opportunity type

Markets

Primary climate-related opportunity driver

Access to new markets

Type of financial impact

Increased revenues through access to new and emerging markets (e.g., partnerships with governments, development banks)

Company-specific description

The design of low power products could create an opportunity to gain new markets and customers
Improvements in our climate change strategy could be reflected in our customer's scorecards and might increase the demand of our products.

Time horizon

Medium-term

Likelihood

Likely

Magnitude of impact

Medium-high

Are you able to provide a potential financial impact figure?

Potential financial impact figure (currency)

Potential financial impact figure – minimum (currency)

Potential financial impact figure – maximum (currency)

Explanation of financial impact figure

Potential financial impact has not yet been determined

Strategy to realize opportunity

Micron routinely monitors market trends in terms of power consumption to understand and evaluate impacts to, and opportunities for, our business and our customers

Cost to realize opportunity

0

Comment

Micron routinely monitors market trends in terms of power consumption to understand and evaluate impacts to, and opportunities for, our business and our customers. Micron routinely monitors conditions and potential impacts to, and opportunities for, our business, customers, and the communities where we operate. Management activities are embedded into business-as-usual activities within the business and are therefore not additional.

C2.5

(C2.5) Describe where and how the identified risks and opportunities have impacted your business.

	Impact	Description
Products and services	Impacted	Energy consumption of our devices is a critical spec. Our low power devices support sustainability and climate change initiatives in our customer’s supply chain.
Supply chain and/or value chain	Not yet impacted	Micron recognizes the potential impact on its supply chain, even though not material. To prevent and reduce the potential negative impact, Micron engages with its customers concerning their requirements and expectations around climate data and goals and takes their input into account while designing our greenhouse gas emissions reduction program. Micron has started to engage in discussion with key suppliers to drive climate-related goals through the supply chain.
Adaptation and mitigation activities	Impacted for some suppliers, facilities, or product lines	Micron has a year-on-year track record of implementing projects to improve the energy efficiency of our tools and systems by reducing operational costs. Furthermore, a new energy procurement approach is under development to value green energy in our evaluation process.
Investment in R&D	Not yet impacted	Micron current investments in RD of low-power products is significant yet and we continuously engage with our customers to meet their expectations in terms of power consumption.

Operations	Impacted for some suppliers, facilities, or product lines	In the past few years intensity and frequency of typhoons have been increasing, particularly in Asian countries where Micron operates. These events have caused temporary power failures and short-term interruptions, but impact has been controlled and considered not significant
Other, please specify	Not impacted	No additional impacts have been identified.

C2.6

(C2.6) Describe where and how the identified risks and opportunities have been factored into your financial planning process.

	Relevance	Description
Revenues	Not yet impacted	Revenues might be impacted if we are not able to meet customers' expectations in terms of power consumption of our products and customers' expectations in terms of supply chain engagement
Operating costs	Not yet impacted	Micron operates in some countries where carbon taxes and greenhouse gas regulations apply or are under discussion. Potential financial impact has not yet been determined.
Capital expenditures / capital allocation	Impacted	Micron continuously identifies energy saving projects and evaluates cost/benefit to allocate necessary resources (capex). Potential financial impact of identified risks and opportunities has not yet been determined.
Acquisitions and divestments	Not yet impacted	Over the past few years, acquisitions have significantly impacted Micron's GHG footprint, which will be considered in our integrated strategy from technology development through high volume manufacturing to proactively align and execute on environmental initiatives and goals.
Access to capital	Not yet impacted	Investors are increasingly focused on Environment, Social, and Governance metrics, including ones pertaining to climate change. Most are currently unsure about how to incorporate ESG into their investment decision-making, but this is rapidly evolving and they are increasingly requesting information about our climate-related risks and performance
Assets	Not yet impacted	Our scenario analysis has identified and quantified potential financial risks to the company from the effects of temperature extremes, storms, and other climate-related events on our capital assets.
Liabilities	We have not identified any risks or opportunities	There are media reports of reduced interest rates on debt based on company sustainability performance (including performance managing climate emissions and risks). Potential

		financial impacts of these opportunities have not yet been determined.
Other	We have not identified any risks or opportunities	Please refer to the above risks and opportunities

C3. Business Strategy

C3.1

(C3.1) Are climate-related issues integrated into your business strategy?

Yes

C3.1a

(C3.1a) Does your organization use climate-related scenario analysis to inform your business strategy?

Yes, quantitative

C3.1c

(C3.1c) Explain how climate-related issues are integrated into your business objectives and strategy.

Micron’s Sustainability Council and Risk Committee were initiated at the direction of the Chief Executive Officer and President. The Sustainability Council is chaired by the Vice President of Compliance and Sustainability and is comprised of a team of senior leaders representing the various aspects of sustainability, including global manufacturing which accounts for the majority of Micron’ Scope 1 and Scope 2 GHG emissions. The Sustainability Council is enabling an integrated strategy from technology development through high volume manufacturing to proactive align and execute on environmental initiatives and goals, including climate-related issues. On a quarterly basis, the Sustainability Council monitors, among other things, climate-related data, and tracks progress towards goals. Additionally, Micron’s Risk Committee is chaired by the CFO and comprised of a team of senior leaders including the Senior Director of Global Risk and Resilience which enables direct engagement and decision making. The Risk Committee monitors, among other things, climate-related risks and identification and progress towards risk reduction. The Sustainability Council and Risk Committee drive our climate strategy and focuses on how we can improve the impact of our operations on the environment.

Many customers use sustainability as one of the criteria to evaluate Micron’s overall performance as part of their own management of supply chain and reputation risks, looking at transparency, risk management, environmental and social performance, responsible sourcing and other related topics. Customers include this information in

supplier performance evaluations and purchasing decisions, alongside quality, delivery, technology, service and price. In 2018, sustainability became a fully integrated sales performance metric at Micron. Our sales team leaders, account managers and sustainability leaders work closely with our customers to share information about our sustainability efforts and performance, drive action and build trust.

C3.1d

(C3.1d) Provide details of your organization’s use of climate-related scenario analysis.

Climate-related scenarios	Details
2DS	Micron has conducted an analysis of value at risk to the organization under a “business as usual” and a “2 degree C” scenario, using econometric modeling, facility valuations, and potential climate-related impacts to model potential financial impacts of climate change in 2020, 2030, and 2040.

C4. Targets and performance

C4.1

(C4.1) Did you have an emissions target that was active in the reporting year?

Absolute target

C4.1a

(C4.1a) Provide details of your absolute emissions target(s) and progress made against those targets.

Target reference number

Abs 1

Scope

Scope 1+2 (location-based)

% emissions in Scope

58

Targeted % reduction from base year

10

Base year

2016

Start year

2017

Base year emissions covered by target (metric tons CO2e)

2,983,829

Target year

2022

Is this a science-based target?

No, but we anticipate setting one in the next 2 years

% of target achieved

50

Target status

Underway

Please explain

Energy saving target, including fuel and purchased energy (electricity, steam, cooling). % emissions in scope and base year emissions are calculated as total Scope 2 (location based) and Scope 1 from fuel consumption (all energy related sources). Micron defined a multi-year goal to achieve at least 10% energy savings (measured in KWh saved compared to 2016 baseline year energy use) by 2022. With additional projects implemented in CY2018, we achieved a cumulative 5% energy savings compared to CY2016 baseline , corresponding to 50% of the target.

C4.2

(C4.2) Provide details of other key climate-related targets not already reported in question C4.1/a/b.

C4.3

(C4.3) Did you have emissions reduction initiatives that were active within the reporting year? Note that this can include those in the planning and/or implementation phases.

Yes

C4.3a

(C4.3a) Identify the total number of initiatives at each stage of development, and for those in the implementation stages, the estimated CO2e savings.

	Number of initiatives	Total estimated annual CO2e savings in metric tonnes CO2e (only for rows marked *)
Under investigation	0	0
To be implemented*	36	11,929

Implementation commenced*	62	11,420
Implemented*	68	17,825
Not to be implemented	4	0

C4.3b

(C4.3b) Provide details on the initiatives implemented in the reporting year in the table below.

Initiative type

Energy efficiency: Building services

Description of initiative

Building controls

Estimated annual CO2e savings (metric tonnes CO2e)

1,731

Scope

Scope 2 (location-based)

Voluntary/Mandatory

Voluntary

Annual monetary savings (unit currency – as specified in C0.4)

293,374

Investment required (unit currency – as specified in C0.4)

216,020

Payback period

<1 year

Estimated lifetime of the initiative

6-10 years

Comment

Exhaust system optimization and leak reduction

Initiative type

Energy efficiency: Building services

Description of initiative

HVAC

Estimated annual CO₂e savings (metric tonnes CO₂e)

5,238

Scope

Scope 2 (location-based)

Voluntary/Mandatory

Voluntary

Annual monetary savings (unit currency – as specified in C0.4)

699,314

Investment required (unit currency – as specified in C0.4)

856,632

Payback period

<1 year

Estimated lifetime of the initiative

6-10 years

Comment

Combination of projects on HVAC optimization/upgrade to high efficiency: pressure optimization, make up air unit improvement, exhaust balance/optimization

Initiative type

Energy efficiency: Building services

Description of initiative

Lighting

Estimated annual CO₂e savings (metric tonnes CO₂e)

1,255

Scope

Scope 2 (location-based)

Voluntary/Mandatory

Voluntary

Annual monetary savings (unit currency – as specified in C0.4)

425,335

Investment required (unit currency – as specified in C0.4)

592,303

Payback period

<1 year

Estimated lifetime of the initiative

6-10 years

Comment

Replaced lighting from Fluorescent to LED light, installation of light sensors

Initiative type

Energy efficiency: Building services

Description of initiative

Motors and drives

Estimated annual CO2e savings (metric tonnes CO2e)

2,270

Scope

Scope 2 (location-based)

Voluntary/Mandatory

Voluntary

Annual monetary savings (unit currency – as specified in C0.4)

643,743

Investment required (unit currency – as specified in C0.4)

886,186

Payback period

<1 year

Estimated lifetime of the initiative

6-10 years

Comment

Mechanical upgrades to higher efficiency motors, implementation of advanced control strategies, and optimization. Retrofitting variable speed drives to pumps.

Initiative type

Energy efficiency: Processes

Description of initiative

Compressed air

Estimated annual CO2e savings (metric tonnes CO2e)

3,208

Scope

Scope 2 (location-based)

Voluntary/Mandatory

Voluntary

Annual monetary savings (unit currency – as specified in C0.4)

516,072

Investment required (unit currency – as specified in C0.4)

323,480

Payback period

<1 year

Estimated lifetime of the initiative

6-10 years

Comment

Compressed Air system optimization: leak reduction, consumption optimization.

Initiative type

Energy efficiency: Processes

Description of initiative

Cooling technology

Estimated annual CO2e savings (metric tonnes CO2e)

1,290

Scope

Scope 2 (location-based)

Voluntary/Mandatory

Voluntary

Annual monetary savings (unit currency – as specified in C0.4)

277,029

Investment required (unit currency – as specified in C0.4)

1,665,063

Payback period

<1 year

Estimated lifetime of the initiative

6-10 years

Comment

Use of free cooling during winter season

Initiative type

Energy efficiency: Processes

Description of initiative

Machine replacement

Estimated annual CO2e savings (metric tonnes CO2e)

1,249

Scope

Scope 2 (location-based)

Voluntary/Mandatory

Voluntary

Annual monetary savings (unit currency – as specified in C0.4)

557,899

Investment required (unit currency – as specified in C0.4)

1,541,124

Payback period

<1 year

Estimated lifetime of the initiative

11-15 years

Comment

Replacement of old equipment with high efficiency systems: chillers, pumps, motors, fans

Initiative type

Energy efficiency: Processes

Description of initiative

Process optimization

Estimated annual CO2e savings (metric tonnes CO2e)

11,466

Scope

Scope 2 (location-based)

Voluntary/Mandatory

Voluntary

Annual monetary savings (unit currency – as specified in C0.4)

2,424,917

Investment required (unit currency – as specified in C0.4)

3,474,628

Payback period

<1 year

Estimated lifetime of the initiative

6-10 years

Comment

Combination of projects - Mechanical upgrades, implementation of advanced control strategies, and optimization. Optimization of utilities consumption (power, CDA, heat)

Initiative type

Low-carbon energy installation

Description of initiative

Solar PV

Estimated annual CO2e savings (metric tonnes CO2e)

48

Scope

Scope 2 (market-based)

Voluntary/Mandatory

Voluntary

Annual monetary savings (unit currency – as specified in C0.4)

9,208

Investment required (unit currency – as specified in C0.4)

10,358

Payback period

<1 year

Estimated lifetime of the initiative

6-10 years

Comment

Solar Panel installed to reduce administrative building grid power consumption.

C4.3c

(C4.3c) What methods do you use to drive investment in emissions reduction activities?

Method	Comment
--------	---------

Lower return on investment (ROI) specification	Implemented the projects with a ROI<=1 year.
Other	Benchmarking on energy consumption in the industry sector

C4.5

(C4.5) Do you classify any of your existing goods and/or services as low-carbon products or do they enable a third party to avoid GHG emissions?

Yes

C4.5a

(C4.5a) Provide details of your products and/or services that you classify as low-carbon products or that enable a third party to avoid GHG emissions.

Level of aggregation

Group of products

Description of product/Group of products

Low power products designed to reduce power requirement to our customers' applications

Are these low-carbon product(s) or do they enable avoided emissions?

Low-carbon product and avoided emissions

Taxonomy, project or methodology used to classify product(s) as low-carbon or to calculate avoided emissions

Other, please specify

Low power consumption vs other products

% revenue from low carbon product(s) in the reporting year

65

Comment

Products for the mobile market requires optimized power efficient solutions. DDR4 and future compute solutions drive for more efficient workload management compared with previous technology. Energy efficiency is a key competitive advantage to our products and will continue to be an integral part of the R&D, design and manufacture of our core products.

C5. Emissions methodology

C5.1

(C5.1) Provide your base year and base year emissions (Scopes 1 and 2).

Scope 1

Base year start

January 1, 2016

Base year end

December 31, 2016

Base year emissions (metric tons CO₂e)

2,614,336

Comment

Base year 2016 was recalculated last year and reported in CDP2018 response.

Scope 2 (location-based)

Base year start

January 1, 2016

Base year end

December 31, 2016

Base year emissions (metric tons CO₂e)

2,545,881

Comment

Base year 2016 was recalculated last year and reported in CDP2018 response.

Scope 2 (market-based)

Base year start

January 1, 2016

Base year end

December 31, 2016

Base year emissions (metric tons CO₂e)

3,101,750

Comment

Base year 2016 was recalculated last year and reported in CDP2018 response.

C5.2

(C5.2) Select the name of the standard, protocol, or methodology you have used to collect activity data and calculate Scope 1 and Scope 2 emissions.

IPCC Guidelines for National Greenhouse Gas Inventories, 2006

The Greenhouse Gas Protocol: A Corporate Accounting and Reporting Standard (Revised Edition)

C6. Emissions data

C6.1

(C6.1) What were your organization's gross global Scope 1 emissions in metric tons CO₂e?

Reporting year

Gross global Scope 1 emissions (metric tons CO₂e)

2,945,735

Start date

January 1, 2018

End date

December 31, 2018

Comment

Micron Scope 1 emissions include: process GHG gases (PFC, HFC, SF₆, NF₃, N₂O), Heat Transfer Fluid, stationary fuel combustion, mobile fuel combustion (owned vehicles) and refrigerant leaks.

C6.2

(C6.2) Describe your organization's approach to reporting Scope 2 emissions.

Row 1

Scope 2, location-based

We are reporting a Scope 2, location-based figure

Scope 2, market-based

We are reporting a Scope 2, market-based figure

Comment

We are reporting both location-based and market based figures.

Location-based calculated by using the most recent factors published by relevant agencies for each location/country.

Market-based calculated using Supplier specific emission rates where

applicable/available.

Whenever the market-based factor is not available we considered the location-based EF for the calculation of equivalent CO2 emissions.

C6.3

(C6.3) What were your organization's gross global Scope 2 emissions in metric tons CO2e?

Reporting year

Scope 2, location-based

2,672,875

Scope 2, market-based (if applicable)

3,177,990

Start date

January 1, 2018

End date

December 31, 2018

Comment

Micron Scope 2 emissions include: purchased electricity, purchased steam, purchased cooling .

C6.4

(C6.4) Are there any sources (e.g. facilities, specific GHGs, activities, geographies, etc.) of Scope 1 and Scope 2 emissions that are within your selected reporting boundary which are not included in your disclosure?

Yes

C6.4a

(C6.4a) Provide details of the sources of Scope 1 and Scope 2 emissions that are within your selected reporting boundary which are not included in your disclosure.

Source

Non-manufacturing locations: sales offices and design centers, in multiple countries

Relevance of Scope 1 emissions from this source

Emissions are not relevant

Relevance of location-based Scope 2 emissions from this source

Emissions are not relevant

Relevance of market-based Scope 2 emissions from this source (if applicable)

Emissions are not relevant

Explain why this source is excluded

Sales and design offices in America, Asia and Europe have multiple locations even within the same country as leased space and it is difficult to collect data.

The most significant GHG source would be electricity consumption and our estimate is approximately 1% of Scope 2 emissions location-based and market-based.

C6.5

(C6.5) Account for your organization's Scope 3 emissions, disclosing and explaining any exclusions.

Purchased goods and services

Evaluation status

Relevant, calculated

Metric tonnes CO₂e

2,228,508

Emissions calculation methodology

Micron used Environmentally Extended Economic Input Output (EEIO) analysis based on its annual supplier & procurement spend data. The spend data was mapped to corresponding industry sectors and then multiplied by cradle-to-gate emission factors for the sector to provide an estimated carbon emissions associated with the extraction, production and transport of purchased goods and services acquired or purchased by Micron in the reported year CY2018. Supplier spend activity that was already included in Scope 1 or 2 (such as electricity purchases) and other Scope 3 categories (such as business travel) that could be further defined to a GHGP Scope 3 category were removed from the Purchased Goods & Services category to prevent double counting. This may represent an under- or over-reporting of emissions in certain supplier categories and specific suppliers based on available spend data due to the nature of cost and accrual accounting. We anticipate improving the methodology and availability data in the future which will impact our year-on-year reporting and trends over time.

Percentage of emissions calculated using data obtained from suppliers or value chain partners

0

Explanation

Used industry average emission factors by commodity category to calculate total emissions

Capital goods

Evaluation status

Relevant, calculated

Metric tonnes CO2e

1,865,518

Emissions calculation methodology

Micron used Environmentally Extended Economic Input Output (EEIO) analysis based on its annual supplier & procurement spend data. The spend data was mapped to corresponding industry sectors and then multiplied by cradle-to-gate emission factors for the sector to provide an estimated carbon emissions associated with the extraction, production and transport of capital goods purchased by Micron in the reported year CY2018.

This may represent an under- or over-reporting of emissions in certain supplier categories and specific suppliers based on available spend data due to the nature of cost and accrual accounting. We anticipate improving the methodology and availability data in the future which will impact our year-on-year reporting and trends over time.

Percentage of emissions calculated using data obtained from suppliers or value chain partners

0

Explanation

Used industry average emission factors by commodity category to calculate total emissions

Fuel-and-energy-related activities (not included in Scope 1 or 2)

Evaluation status

Relevant, calculated

Metric tonnes CO2e

868,265

Emissions calculation methodology

This category includes upstream emissions from purchased fuels and electricity, including generation, transmission & distribution (T&D) and any other losses. Emissions due to fuel and energy related activities are calculated using actual fuel and electricity consumption for CY2018 along with UK DEFRA emission factors (revision 2017).

Percentage of emissions calculated using data obtained from suppliers or value chain partners

0

Explanation

Emissions are calculated with published emission factors due to lack of specific emissions data from power/fuel suppliers.

Upstream transportation and distribution

Evaluation status

Relevant, calculated

Metric tonnes CO2e

131,882

Emissions calculation methodology

Included upstream transportation of: purchased goods, capital goods, transfer of products/materials between Micron sites. Carrier provided emissions reports, SAP reports provided activity data (by carrier, category, and total kg). Then used carrier reports to calculate a "CO2 emissions modifier" (kg / CO2 Emissions). CO2 Modifier then applied to total kg shipping data to generate estimated CO2 emissions calculations. For this reporting year CY2018, emissions from outbound logistics services (reported as downstream transportation/distribution previously) have been included in this upstream category because outbound services are also purchased by Micron (GHG Protocol guideline for Corporate Value Chain, page 44)

Percentage of emissions calculated using data obtained from suppliers or value chain partners

30

Explanation

Estimate was necessary due to lack of specific route/distance data.

Waste generated in operations

Evaluation status

Relevant, calculated

Metric tonnes CO2e

15,430

Emissions calculation methodology

Calculated CO2 emissions based on tonnage of CY2018 hazardous and non-hazardous waste sent to incineration (with and without energy recovery), recycle, landfill, composting, chemical treatment. Sources of emission factors: "Waste Sector_GHG Protocol version 5, 2013" - tab "Thermal Treatment" and DEFRA Waste disposal (2018)

Percentage of emissions calculated using data obtained from suppliers or value chain partners

0

Explanation

Waste Generated in Operations. Calculation was necessary due to lack of specific waste suppliers data

Business travel

Evaluation status

Relevant, calculated

Metric tonnes CO2e

30,876

Emissions calculation methodology

Emissions from business travel (including flights , hotel, and car rentals) are calculated using actual data that is tracked and reported by Micron's travel agencies based on actual CY2018 business travels data. GHG emissions are then calculated by using EPA emission factors.

Percentage of emissions calculated using data obtained from suppliers or value chain partners

100

Explanation

Emission calculations provided by travel service provider, including emissions from flights (short, medium, long distance), hotel and rental car

Employee commuting

Evaluation status

Relevant, calculated

Metric tonnes CO₂e

1,952

Emissions calculation methodology

For this category, we calculated total GHG emissions from the commuter buses used by our employees in Singapore, Japan, Taiwan and China. Calculation based on total km/year and type of fuel/transportation by using the World Resources Institute (2015) - GHG Protocol tool for mobile combustion. Version 2.6.

Percentage of emissions calculated using data obtained from suppliers or value chain partners

50

Explanation

Transportation vendors provided distance/fuel consumption data. When not available, total distance was calculated based on scheduled run/day and itinerary

Upstream leased assets

Evaluation status

Not relevant, explanation provided

Explanation

Micron does not have relevant leased asset for the reporting year

Downstream transportation and distribution

Evaluation status

Not relevant, explanation provided

Explanation

In completing a Scope 3 screening and inventory, we have determined that emissions from outbound logistics services (reported as downstream transportation/distribution previously) have to be included in the "Upstream transportation and distribution" category because outbound services are paid by Micron (GHG Protocol guideline for Corporate Value Chain, page 44). Total emissions from distribution and transportation upstream and downstream are then reported in "Upstream transportation and distribution" .

Processing of sold products

Evaluation status

Not relevant, explanation provided

Explanation

As per WBCSD/WRI Greenhouse Gas Protocol (GHGP), "If the eventual end use of sold intermediate products may be unknown, companies may disclose and justify the exclusion of downstream emissions from categories 9, 10, 11, and 12 in the report. " In completing a scope 3 screening and inventory, we have determined that our sold products should be classified as 'intermediate products' per the GHGP because Micron does not sell any finished/ final products and it is very difficult to estimate the end-use of our products given the range of application types and products which use memory and storage. Thus, we have determined that categories 9, 10,11 and 12 are not relevant for Micron.

Use of sold products

Evaluation status

Not relevant, explanation provided

Explanation

As per WBCSD/WRI Greenhouse Gas Protocol (GHGP), "If the eventual end use of sold intermediate products may be unknown, companies may disclose and justify the exclusion of downstream emissions from categories 9, 10, 11, and 12 in the report. " In completing a scope 3 screening and inventory, we have determined that our sold products should be classified as 'intermediate products' per the GHGP because Micron does not sell any finished/ final products and it is very difficult to estimate the end-use of our products given the range of application types and products which use memory and storage. Thus, we have determined that categories 9, 10,11 and 12 are not relevant for Micron.

End of life treatment of sold products

Evaluation status

Not relevant, explanation provided

Explanation

As per WBCSD/WRI Greenhouse Gas Protocol (GHGP), "If the eventual end use of sold intermediate products may be unknown, companies may disclose and justify the

exclusion of downstream emissions from categories 9, 10, 11, and 12 in the report. " In completing a scope 3 screening and inventory, we have determined that our sold products should be classified as 'intermediate products' per the GHGP because Micron does not sell any finished/ final products and it is very difficult to estimate the end-use of our products given the range of application types and products which use memory and storage. Thus, we have determined that categories 9, 10,11 and 12 are not relevant for Micron.

Downstream leased assets

Evaluation status

Not relevant, explanation provided

Explanation

Micron does not lease assets to others - not applicable

Franchises

Evaluation status

Not relevant, explanation provided

Explanation

Micron does not have franchises - not applicable

Investments

Evaluation status

Not relevant, explanation provided

Explanation

Not applicable for the reporting year

Other (upstream)

Evaluation status

Not relevant, explanation provided

Explanation

No additional upstream categories besides what reported above

Other (downstream)

Evaluation status

Not relevant, explanation provided

Explanation

No additional downstream categories besides what reported above

C6.7

(C6.7) Are carbon dioxide emissions from biologically sequestered carbon relevant to your organization?

No

C6.10

(C6.10) Describe your gross global combined Scope 1 and 2 emissions for the reporting year in metric tons CO₂e per unit currency total revenue and provide any additional intensity metrics that are appropriate to your business operations.

Intensity figure

0.000188

Metric numerator (Gross global combined Scope 1 and 2 emissions)

5,618,610

Metric denominator

unit total revenue

Metric denominator: Unit total

29,892,307,397

Scope 2 figure used

Location-based

% change from previous year

15

Direction of change

Decreased

Reason for change

Unit measure: metric tons CO₂e/\$ revenue

Regardless the increase of gross Scope 1+2 in CY18 compared to CY17, this intensity indicator has decreased thanks to the significant increase in revenue for calendar year 2018 compared to calendar year 2017, as a combination of positive impact of the capacity expansion and increasingly favorable market conditions.

C7. Emissions breakdowns

C7.1

(C7.1) Does your organization break down its Scope 1 emissions by greenhouse gas type?

Yes

C7.1a

(C7.1a) Break down your total gross global Scope 1 emissions by greenhouse gas type and provide the source of each used greenhouse warming potential (GWP).

Greenhouse gas	Scope 1 emissions (metric tons of CO2e)	GWP Reference
CO2	438,822	IPCC Fourth Assessment Report (AR4 - 100 year)
PFCs	1,288,960	IPCC Fourth Assessment Report (AR4 - 100 year)
Other, please specify Heat Transfer Fluid (HTF)	613,251	IPCC Fourth Assessment Report (AR4 - 100 year)
HFCs	31,241	IPCC Fourth Assessment Report (AR4 - 100 year)
NF3	312,609	IPCC Fourth Assessment Report (AR4 - 100 year)
SF6	49,328	IPCC Fourth Assessment Report (AR4 - 100 year)
CH4	485	IPCC Fourth Assessment Report (AR4 - 100 year)
N2O	211,039	IPCC Fourth Assessment Report (AR4 - 100 year)

C7.2

(C7.2) Break down your total gross global Scope 1 emissions by country/region.

Country/Region	Scope 1 emissions (metric tons CO2e)
United States of America	654,551
Singapore	1,085,276
Taiwan, Greater China	289,216
Japan	875,807
China	39,363
Malaysia	1,522

C7.3

(C7.3) Indicate which gross global Scope 1 emissions breakdowns you are able to provide.

By activity

C7.3c

(C7.3c) Break down your total gross global Scope 1 emissions by business activity.

Activity	Scope 1 emissions (metric tons CO2e)
Manufacturing process	1,861,215
Combustion	440,028
Refrigeration/Cooling	644,492

C7.5

(C7.5) Break down your total gross global Scope 2 emissions by country/region.

Country/Region	Scope 2, location-based (metric tons CO2e)	Scope 2, market-based (metric tons CO2e)	Purchased and consumed electricity, heat, steam or cooling (MWh)	Purchased and consumed low-carbon electricity, heat, steam or cooling accounted in market-based approach (MWh)
United States of America	389,554	501,116	1,240,181	0
Singapore	722,011	722,011	1,814,317	0
Taiwan, Greater China	1,123,877	1,510,698	2,070,014	0
Japan	208,691	215,423	420,747	0
China	193,019	193,019	210,835	0
Malaysia	35,723	35,723	51,473	0

C7.6

(C7.6) Indicate which gross global Scope 2 emissions breakdowns you are able to provide.

By business division

C7.6a

(C7.6a) Break down your total gross global Scope 2 emissions by business division.

Business division	Scope 2, location-based emissions (metric tons CO2e)	Scope 2, market-based emissions (metric tons CO2e)
Wafer fabrication	2,312,671	2,822,529

Assembly and Test	360,204	355,460
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C7.9

(C7.9) How do your gross global emissions (Scope 1 and 2 combined) for the reporting year compare to those of the previous reporting year?

Increased

C7.9a

(C7.9a) Identify the reasons for any change in your gross global emissions (Scope 1 and 2 combined) and for each of them specify how your emissions compare to the previous year.

	Change in emissions (metric tons CO2e)	Direction of change	Emissions value (percentage)	Please explain calculation
Change in renewable energy consumption	0	No change	0	Not applicable for CY2018
Other emissions reduction activities	27,755	Decreased	0.5	CO2 emissions avoided from energy saving projects implemented during CY18 (reported in 4.3b). % change = [(total CO2 emissions avoided from energy savings projects in CY18)/(CY17 Scope1+2 location-based as reported in CDP2018)]*100
Divestment	0	No change	0	Reported last year for CY2017, but not applicable for CY2018
Acquisitions	0	No change	0	Reported last year for CY2017, but not applicable for CY2018
Mergers	0	No change	0	Not applicable for CY2018
Change in output	346,919	Increased	6.5	Increased production output at existing manufacturing sites in addition to the startup of a new manufacturing site in CY2018. Emission Value % = (CY18 emissions of the new startup + emissions from increased output at existing sites)/(Scope 1+Scope 2 location-based CY2017 as reported in CDP2018)*100

Change in methodology	0	No change	0	Reported last year for CY2017, but not applicable for CY2018
Change in boundary	0	No change	0	Not applicable for CY2018
Change in physical operating conditions	0	No change	0	Not applicable for CY2018
Unidentified				
Other				

C7.9b

(C7.9b) Are your emissions performance calculations in C7.9 and C7.9a based on a location-based Scope 2 emissions figure or a market-based Scope 2 emissions figure?

Location-based

C8. Energy

C8.1

(C8.1) What percentage of your total operational spend in the reporting year was on energy?

More than 0% but less than or equal to 5%

C8.2

(C8.2) Select which energy-related activities your organization has undertaken.

	Indicate whether your organization undertakes this energy-related activity
Consumption of fuel (excluding feedstocks)	Yes
Consumption of purchased or acquired electricity	Yes
Consumption of purchased or acquired heat	
Consumption of purchased or acquired steam	Yes
Consumption of purchased or acquired cooling	Yes

Generation of electricity, heat, steam, or cooling	Yes
--	-----

C8.2a

(C8.2a) Report your organization’s energy consumption totals (excluding feedstocks) in MWh.

	Heating value	MWh from renewable sources	MWh from non-renewable sources	Total MWh
Consumption of fuel (excluding feedstock)	LHV (lower heating value)	0	2,143,649	2,143,649
Consumption of purchased or acquired electricity		0	5,612,231	5,612,231
Consumption of purchased or acquired steam		0	82,522	82,522
Consumption of purchased or acquired cooling		0	112,814	112,814
Consumption of self-generated non-fuel renewable energy		45.7		45.7
Total energy consumption		45.7	7,951,216	7,951,262

C8.2b

(C8.2b) Select the applications of your organization’s consumption of fuel.

	Indicate whether your organization undertakes this fuel application
Consumption of fuel for the generation of electricity	No
Consumption of fuel for the generation of heat	Yes
Consumption of fuel for the generation of steam	Yes
Consumption of fuel for the generation of cooling	No
Consumption of fuel for co-generation or tri-generation	Yes

C8.2c

(C8.2c) State how much fuel in MWh your organization has consumed (excluding feedstocks) by fuel type.

Fuels (excluding feedstocks)

Diesel

Heating value

LHV (lower heating value)

Total fuel MWh consumed by the organization

10,858

MWh fuel consumed for self-generation of heat

1,507

MWh fuel consumed for self-generation of steam

87

MWh fuel consumed for self-cogeneration or self-trigeneration

9,264

Comment

Source of energy conversion factors: 2006 IPCC Guidelines for National Greenhouse Gas Inventories., Volume 2, Table 1.2

Fuels (excluding feedstocks)

Natural Gas

Heating value

LHV (lower heating value)

Total fuel MWh consumed by the organization

2,127,775

MWh fuel consumed for self-generation of heat

724,939

MWh fuel consumed for self-generation of steam

275,382

MWh fuel consumed for self-cogeneration or self-trigeneration

1,127,454

Comment

Source of energy conversion factors: 2006 IPCC Guidelines for National Greenhouse Gas Inventories., Volume 2, Table 1.2

Fuels (excluding feedstocks)

Propane Liquid

Heating value

LHV (lower heating value)

Total fuel MWh consumed by the organization

5,016

MWh fuel consumed for self-generation of heat

5,016

MWh fuel consumed for self-generation of steam

0

MWh fuel consumed for self-cogeneration or self-trigeneration

0

Comment

Source of energy conversion factors: 2006 IPCC Guidelines for National Greenhouse Gas Inventories., Volume 2, Table 1.2

C8.2d

(C8.2d) List the average emission factors of the fuels reported in C8.2c.

Diesel

Emission factor

74,349

Unit

metric tons CO₂e per GJ

Emission factor source

IPCC 2006, Volume 2, Table 2.3 - Default Emission Factor for CO₂, CH₄ and N₂O for the relevant fuel.

Emission factor in CO₂ equivalent has been calculated as a sum of default emission factors: CO₂ emission factor + CH₄ emission factor (default value) + N₂O emission factor (default value)

Comment

Unit measure translated from the original unit measure in the Table 2.3 that is "Kg per TJ"

Natural Gas

Emission factor

56,256

Unit

metric tons CO2e per GJ

Emission factor source

IPCC 2006, Volume 2, Table 2.3 - Default Emission Factor for CO2, CH4 and N2O for the relevant fuel.

Emission factor in CO2 equivalent has been calculated as a sum of default emission factors: CO2 emission factor + CH4 emission factor (default value) + N2O emission factor (default value)

Comment

Unit measure translated from the original unit measure in the Table 2.3 that is "Kg per TJ"

Propane Liquid

Emission factor

63,152

Unit

metric tons CO2e per GJ

Emission factor source

IPCC 2006, Volume 2, Table 2.3 - Default Emission Factor for CO2, CH4 and N2O for the relevant fuel.

Emission factor in CO2 equivalent has been calculated as a sum of default emission factors: CO2 emission factor + CH4 emission factor (default value) + N2O emission factor (default value)

Comment

Unit measure translated from the original unit measure in the Table 2.3 that is "Kg per TJ"

C8.2e

(C8.2e) Provide details on the electricity, heat, steam, and cooling your organization has generated and consumed in the reporting year.

	Total Gross generation (MWh)	Generation that is consumed by the organization (MWh)	Gross generation from renewable sources (MWh)	Generation from renewable sources that is consumed by the organization (MWh)
Electricity	540,844	540,844	45.7	45.7
Heat	0	0	0	0
Steam	226,234	226,234	0	0

Cooling	571,472	571,472	0	0
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C8.2f

(C8.2f) Provide details on the electricity, heat, steam and/or cooling amounts that were accounted for at a low-carbon emission factor in the market-based Scope 2 figure reported in C6.3.

Basis for applying a low-carbon emission factor

No purchases or generation of low-carbon electricity, heat, steam or cooling accounted with a low-carbon emission factor

Low-carbon technology type

Region of consumption of low-carbon electricity, heat, steam or cooling

MWh consumed associated with low-carbon electricity, heat, steam or cooling

Emission factor (in units of metric tons CO₂e per MWh)

Comment

Micron generated electricity from a Micron-owned solar panel installation in Singapore (total CY18 reported in 8.2e) and electricity generated was consumed by Micron for admin building lighting (otherwise using grid power), then positively impacting Micron Scope 2 emissions. We did not purchase from another company any energy at low-carbon emission factor included in Scope 2 figure during the reporting year.

C9. Additional metrics

C9.1

(C9.1) Provide any additional climate-related metrics relevant to your business.

C10. Verification

C10.1

(C10.1) Indicate the verification/assurance status that applies to your reported emissions.

	Verification/assurance status
Scope 1	Third-party verification or assurance process in place
Scope 2 (location-based or market-based)	Third-party verification or assurance process in place
Scope 3	No third-party verification or assurance

C10.1a

(C10.1a) Provide further details of the verification/assurance undertaken for your Scope 1 and/or Scope 2 emissions and attach the relevant statements.

Scope

Scope 1

Verification or assurance cycle in place

Annual process

Status in the current reporting year

Underway but not complete for reporting year-previous statement of process attached

Type of verification or assurance

Third party verification/assurance underway

Attach the statement

 Fab16_CY2017_ISO 14064-3-2006 GHGEV 1415 Cert (2018-8-15).pdf

 Fab11_CY2017台灣美光晶圓一廠查證聲明書_F11C .pdf

 Fab11_CY2017台灣美光晶圓一廠查證聲明書_F11A+B .pdf

Page/ section reference

Attached 3 documents, related to 2 different manufacturing locations in Taiwan All pages of attached documents are relevant to verify GHG emissions in scope and standard used by third party. Attached certificates for CY17 data verification (CY18 certificates not available yet)

Relevant standard

ISO14064-3

Proportion of reported emissions verified (%)

9

Scope

Scope 2 location-based

Verification or assurance cycle in place

Annual process

Status in the current reporting year

Underway but not complete for reporting year-previous statement of process attached

Type of verification or assurance

Third party verification/assurance underway

Attach the statement

 Fab16_CY2017_ISO 14064-3-2006 GHGEV 1415 Cert (2018-8-15).pdf

 Fab11_CY2017台灣美光晶圓一廠查證聲明書_F11C .pdf

 Fab11_CY2017台灣美光晶圓一廠查證聲明書_F11A+B .pdf

Page/ section reference

Attached 3 documents, related to 2 different manufacturing locations in Taiwan All pages of attached documents are relevant to verify GHG emissions in scope and standard used by third party. Attached certificates for CY17 data verification (CY18 certificates not available yet)

Relevant standard

ISO14064-3

Proportion of reported emissions verified (%)

40

C10.2

(C10.2) Do you verify any climate-related information reported in your CDP disclosure other than the emissions figures reported in C6.1, C6.3, and C6.5?

No, we do not verify any other climate-related information reported in our CDP disclosure

C11. Carbon pricing

C11.1

(C11.1) Are any of your operations or activities regulated by a carbon pricing system (i.e. ETS, Cap & Trade or Carbon Tax)?

No, but we anticipate being regulated in the next three years

C11.1d

(C11.1d) What is your strategy for complying with the systems in which you participate or anticipate participating?

Singapore has published a Carbon Tax Regulation that applies to Micron manufacturing sites there.

Proposed GHG Monitoring plan has been submitted to the Environmental Agency for review.

Actual application of the rule will start in 2020 and will refer to CY2019 emissions.

Affected Micron sites started an assessment since the proposed rule was disclosed and evaluated cost impact and possible reduction solutions.

C11.2

(C11.2) Has your organization originated or purchased any project-based carbon credits within the reporting period?

No

C11.3

(C11.3) Does your organization use an internal price on carbon?

No, and we do not currently anticipate doing so in the next two years

C12. Engagement

C12.1

(C12.1) Do you engage with your value chain on climate-related issues?

Yes, our suppliers

Yes, our customers

C12.1a

(C12.1a) Provide details of your climate-related supplier engagement strategy.

Type of engagement

Compliance & onboarding

Details of engagement

Climate change is integrated into supplier evaluation processes

Other, please specify

Environmental programs and goals

% of suppliers by number

75

% total procurement spend (direct and indirect)

60

% Scope 3 emissions as reported in C6.5

82

Rationale for the coverage of your engagement

Micron uses a segmentation model to determine supplier priority and annual supplier management planning effort. Segmentation utilizes market constraints, spend, type of supplier, location and supply risk to calculate the segmentation status.

Micron submits a sourcing compliance expectation assessment to high risk/strategic/developing suppliers, which includes review of the suppliers programs focused on greenhouse gas emission.

For those suppliers identified as High Risk from the Sourcing Compliance assessment, will receive a supplier audit, which would include identification of improvement opportunities and corrective action plans.

Scope 3 % includes emissions reported in 6.5 for the categories: purchased goods/services, Capital goods, upstream transportation/distribution.

Impact of engagement, including measures of success

Micron Purchase Order Terms and Conditions, reference Micron's SQRD – Supplier Quality Requirements Document, which contains the expectation that all suppliers demonstrate commitment and conformance to the requirements outlined under the Supplier Responsibility section of the Micron Supplier Expectations website.

New Suppliers that directly support Manufacturing are required to go through a new supplier qualification process before added to Micron's approved vendors. The Supplier is requested to respond to Micron's Sourcing Compliance Assessment, which includes a review of the suppliers programs focused on greenhouse gas emissions. Any new supplier added to Micron's approved vendors, receives Micron's Supplier Responsibility document, which indicates they are expected to provide evidence of their compliance toward: Carbon Disclosure Project.

During 2018, Micron included Risk and Compliance, which includes Supplier Responsibilities and Expectations, as a scoring element on Supplier Business Reviews and Scorecards. The score provides visibility to those areas that need improvement and development. Included in the score is Micron's Supplier Responsibility and Expectation on line training course credit, which is required to be taken by the supplier.

Comment

Micron implemented software system to facilitate and manage supplier responses and data last year. This will continue to improve the coverage, analysis and processes that have been put into place. Also, Micron continues to be a member of RBA, pushes Micron Code of Conduct and Supplier Expectations to its supply base. During 2018, Micron manufacturing locations received 100% on RBA audits, which incorporates on site Supplier audits

EcoVadis granted Micron a Gold Recognition Level in the category Manufacture of electronic components and boards.

C12.1b

(C12.1b) Give details of your climate-related engagement strategy with your customers.

Type of engagement

Education/information sharing

Details of engagement

Run an engagement campaign to education customers about your climate change performance and strategy

% of customers by number

90

% Scope 3 emissions as reported in C6.5

0

Please explain the rationale for selecting this group of customers and scope of engagement

We routinely meet with our customers to understand how we are performing from their perspective. Cross-functional teams review the outcomes of those conversations, as well as written customer requirement documents, and assess opportunities for improvement. A monthly meeting of executives and senior leaders drives accountability for the improvements we undertake in response to key customer expectations and requirements.

We are also developing tools to dive deeper into our customer and investor expectations to improve stakeholder engagement.

Additionally, we engage in several industry organizations alongside our customers, building industry consensus across a range of social and environmental issues specific to our industry – such as conflict minerals, supply chain labor standards and climate-related matters.

Scope 3 % is zero - emissions from the use of our products in the final applications is not relevant (refer to 6.5 for explanation)

Impact of engagement, including measures of success

We recognize that the energy demand of our products contributes to the global environmental impact of technology. This is why we partner with our customers to deliver memory solutions that meet tightening requirements and expectations for energy efficiency. Our System Power Calculator is an online tool available to our customers to help them estimate memory power requirements when making important system and architecture and design decisions. This information helps our customers make choices that can influence the overall energy footprint of the end devices our products enable.

Type of engagement

Collaboration & innovation

Details of engagement

Other – please provide information in column 5

% of customers by number

90

% Scope 3 emissions as reported in C6.5

3

Please explain the rationale for selecting this group of customers and scope of engagement

We work closely with our business to business customers to design, manufacture, sell, and transport the most energy-efficient products possible, and are constantly innovating to improve product energy use. This includes engaging with customers in our design labs; continuously improving the efficiency of our packaging, transportation, and logistics; and understanding and acting on evolving customer expectations and needs regarding product energy efficiency; as well as providing information about our efficient products noted under "Education/information sharing."

Scope 3 % includes emissions from the category "Upstream transportation/distribution" that we impact by interacting with our customers to reduce returns by selecting the appropriate package.

Impact of engagement, including measures of success

Energy efficiency is a key product specification for the vast majority of Micron customers.

Micron products typically improve energy efficiency by 10% from one generation to the next.

C12.3

(C12.3) Do you engage in activities that could either directly or indirectly influence public policy on climate-related issues through any of the following?

Trade associations

C12.3b

(C12.3b) Are you on the board of any trade associations or do you provide funding beyond membership?

Yes

C12.3c

(C12.3c) Enter the details of those trade associations that are likely to take a position on climate change legislation.

Trade association

SIA - Semiconductor Industry Association at all relevant regions (US, Europe, Asia)

Is your position on climate change consistent with theirs?

Consistent

Please explain the trade association's position

The Semiconductor Industry Association (SIA) represents the semiconductor industry. Although the industry contributes only a very small amount of GHG emissions, SIA and its members have been engaged in ongoing efforts to reduce these emissions. SIA and its members have participated in the efforts of the World Semiconductor Council (WSC) to voluntarily reduce emissions of PFCs. The global industry committed to a 10 percent reduction from a baseline year, and in 2011 the industry announced that the actual reduction was 32 percent in absolute emissions. The post 2010 goal is to reduce 30% of the unit emission by 2020.

How have you influenced, or are you attempting to influence their position?

Micron participates to periodic meetings with all members and supports the action by providing required data and information for the impact assessment. Furthermore, Micron has been sharing annual greenhouse gas inventory with the association.

C12.3f

(C12.3f) What processes do you have in place to ensure that all of your direct and indirect activities that influence policy are consistent with your overall climate change strategy?

Micron has established an Environmental Policy Committee to review upcoming potential environmental issues and obligations (regulatory and from interested parties) and evaluate the company response within the relevant regional industry association to align with the company strategy.

This committee includes senior members of the key functions: the VP Compliance & Sustainability, Legal Department, Government Affairs, Global EHS, Supply Chain and Product Compliance.

Members have periodic meetings to review upcoming issues, assess the potential impact and define strategy to prevent and reduce any associated risks.

C12.4

(C12.4) Have you published information about your organization's response to climate change and GHG emissions performance for this reporting year in places other than in your CDP response? If so, please attach the publication(s).

Publication

In voluntary sustainability report

Status

Complete

Attach the document

Y

 sustainability_report_2019.pdf

Page/Section reference

2019 Sustainability report publicly available at <https://www.micron.com/about/our-commitment/operating-thoughtfully/sustainability>
Environment section including GHG emission performance - pages 17-28

Content elements

- Governance
- Strategy
- Risks & opportunities
- Emissions figures
- Emission targets
- Other metrics

Comment

Other metrics: water, energy, waste

C14. Signoff

C-FI

(C-FI) Use this field to provide any additional information or context that you feel is relevant to your organization's response. Please note that this field is optional and is not scored.

C14.1

(C14.1) Provide details for the person that has signed off (approved) your CDP climate change response.

	Job title	Corresponding job category
Row 1	VP of Compliance and Sustainability	Chief Sustainability Officer (CSO)