Marvell Technology Group, Ltd. - Climate Change 2019

C0. Introduction

C0.1

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

Marvell is a fabless semiconductor provider of high-performance application-specific standard products. Marvell first revolutionized the digital storage industry by moving information at speeds never thought possible. Today, that same breakthrough innovation remains at the heart of the company's storage, processing, networking, security and connectivity solutions. With leading intellectual property and deep system-level knowledge, Marvell's semiconductor solutions continue to transform the enterprise, cloud, automotive, industrial and consumer markets. The majority of our product portfolio leverages embedded central processing unit technology. We also develop platforms that we define as integrated hardware along with software that incorporates digital computing technologies designed and configured to provide an optimized computing solution. Our broad product portfolio includes devices for data storage, enterprise-class Ethernet data switching, Ethernet physical-layer transceivers ("PHY"), wireless connectivity, Internet-of-Things ("IoT") devices and multimedia solutions. We were incorporated in Bermuda in January 1995. Our fiscal year ends on the Saturday nearest January 31. For example, the fiscal year ended January 30, 2018 is referred to as fiscal 2018. As of January 30, 2018, we had approximately 5000 employees. Our revenue for FY2019 was $2.3B USD. Note: This CDP Report contains forward-looking statements regarding Marvell's environmental policies, procedures and future actions related thereto within the meaning of the federal securities laws that involve risks and uncertainties. Words such as "anticipates," "expects," "intends," "plans," "projects," "believes," "seeks," "estimates," "can," "may," "will," "would" and similar expressions identify such forward-looking statements. These statements are not guarantees of results and should not be considered as an indication of future activity or future performance. Actual events or results may differ materially from those described in this CDP Report due to a number of risks and uncertainties, including, but not limited to: the ability of Marvell to implement its plans with respect to environmental matters in the time frame anticipated or at all; Marvell's reliance on independent foundries and subcontractors for the manufacture, assembly and testing of its products; the impacts and costs associated with changes in environmental regulations; and other risks detailed in Marvell's SEC filings from time to time. For other factors that could cause Marvell's results to vary from expectations, please see the risk factors identified in Marvell's Quarterly Report on Form 10-K for the fiscal year ended February 2, 2019 as filed with the SEC on March 28, 2019, and other factors detailed from time to time in Marvell's filings with the SEC. Marvell undertakes no obligation to revise or publicly update any forward-looking statements.

We are subject to laws and regulations worldwide, which may differ among jurisdictions, affecting our operations in areas including, but not limited to: intellectual property ownership and infringement; tax; import and export requirements; anti-corruption; foreign exchange controls and cash repatriation restrictions; data private requirements; competition; advertising; employment; product regulations; environment, health and safety requirements; and consumer laws. For example, government export regulations apply to the encryption or other features contained in some of our products. If we fail to continue to receive licenses or otherwise comply with these regulations, we may be unable to manufacture the affected products at foreign foundries or ship these products to certain customers, or we may incur penalties or fines. In addition, we are subject to various industry requirements restricting the presence of certain substances in electronic products. Although our management systems are designed to maintain compliance, we cannot assure you that we have been or will be at all times in compliance with such laws and regulations. If we violate or fail to comply with any of them, a range of consequences could result, including fines, import/export restrictions, sales limitations, criminal and civil liabilities or other sanctions. The costs of complying with these laws (including the costs of any investigations, auditing and monitoring) could adversely affect our current or future business.

Our product or manufacturing standards could also be impacted by new or revised environmental rules and regulations or other social initiatives. For instance, the SEC requires disclosures relating to the sourcing of certain minerals from the Democratic Republic of Congo and adjoining countries. Those rules, or similar rules that may be adopted in other jurisdictions, could adversely affect our costs, the availability of minerals used in our products and our relationships with customers and suppliers.

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	Select the number of past reporting years you will be providing emissions data for
Row 1	January 1 2018	December 31 2018	No	<Not Applicable>

C0.3

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

China
India
Israel
Singapore
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?
No

C1.1c

(C1.1c) Why is there no board-level oversight of climate-related issues and what are your plans to change this in the future?

	Primary reason	Board-level oversight of climate-related issues will be introduced within the next two years	Please explain
Row 1	The Vice President of Operations Engineering & Quality oversees the execution of the Business Continuity Process, including analysis of current and potential disasters. If a disaster were to occur, as necessary, he would report the key climate change incidents, mitigation, and actions taken, to the COO, CEO and/or the Board of Directors.	No, we do not currently plan to do so	The Vice President of Operations Engineering & Quality oversees the execution of the Business Continuity Process, including analysis of current and potential disasters. If a disaster were to occur, as necessary, he would report the key climate change incidents, mitigation, and actions taken, to the COO, CEO, and/or the Board of Directors.

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
Other, please specify (Vice President of Operations Engineering & Quality)	Other, please specify (Analysis of current and potential disasters)	As important matters arise

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).

The Vice President of Operations Engineering & Quality oversees the execution of the Business Continuity Process, including analysis of current and potential disasters. If a disaster were to occur, as necessary, he would report the key climate change incidents, mitigation, and actions taken, to the COO, CEO and/or the Board of Directors.

Some initiatives that the Vice President of Operations Engineering & Quality led included site reduction and divestments of facilities and relocation of data center functions to Reno, Nevada. These actions were taken with the goal to optimize the following items: facility use, global budgets, Santa Clara's lab reduction, divestment of an entire building, relocation of operations to 2 floors of an Energy Star rated building, and consolidation of the Santa Clara, San Jose, and Irvine facilities.

Risks are managed through Marvell's internal processes such as the Business Continuity Process (BCP). This analysis is performed as part of our day-to-day business processes.

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?
Other, please specify (Operations team)

Types of incentives
Recognition (non-monetary)

Activity incentivized
Efficiency project

Comment
Marvell recognizes the performance of its personnel based on their overall performance. We promote good environmental practices, specifically in the Quality Systems group that monitors such activities.

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	3	This time horizon covers annual corporate goals and updates to the BCP.
Medium-term	3	5	Marvell considers the following in our medium-term BCP updates - reassessing past initiatives, defining new objectives and initiatives, targets, goals, and BCP updates.
Long-term	5	10	Long-term horizons encompass long term process outlooks, which include operating procedures, product development, and future business development.

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.
There are no documented processes for identifying, assessing, and managing climate-related issues

C2.2e

(C2.2e) Why does your organization not have a process in place for identifying, assessing, and managing climate-related risks and opportunities, and do you plan to introduce such a process in the future?

	Primary reason	Please explain
Row 1	Other, please specify (Internal Business Continuity Process is used in the identification and assessment of risks)	Marvell's Business Continuity Process (BCP) is one of the key processes we use to assess the effects of potential risks on the delivery of finished products from contract manufacturers to Marvell and our customers. The BCP supports the Operations area to address unforeseen natural and manmade disasters including those caused by climate change. This process is based on the annual business continuity analysis to evaluate and mitigate the potential risks that may cause disruption to delivery of products throughout the supply chain and to customers. An annual business continuity evaluation requires that all of Marvell's Tier 1 suppliers report a business continuity plan in which the suppliers list potential risks and actions they are planning to take to mitigate these risks. A typical example of actual disaster action/notification was triggered during the occurrence of “Super typhoon Yutu” south of Taipei, Taiwan area, possibly impacting certain Marvell suppliers located around the super typhoon path. Marvell deployed a 3rd party software system called “Supply Risk Solutions” to monitor and alert key personnel during a natural disaster impacting the geographical locations where Marvell Tier 1 suppliers are located. This system allows Tier 1 suppliers to update the disaster impact in real time allowing Marvell to assess the disaster’s impact to its product manufacturing and delivery schedules and provide timely updates to Marvell customers.

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?
No

C2.3b

(C2.3b) Why do you not consider your organization to be exposed to climate-related risks with the potential to have a substantive financial or strategic impact on your business?

	Primary reason	Please explain
Row 1	Risks exist, but none with potential to have a substantive financial or strategic impact on business	Marvell's business continuity strategy minimizes supply chain business interruption in case of a disaster. The BCP is one of the key processes we use to assess the effects of potential risks on the delivery of finished products from contract manufacturers to Marvell and our customers. The BCP supports the Operations area to address unforeseen disasters including those caused by climate change.

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?

No

C2.4b

(C2.4b) Why do you not consider your organization to have climate-related opportunities?

	Primary reason	Please explain
Row 1	Evaluation in progress	Marvell is evaluating substantive climate-related opportunities. However, as part of the BCP process, in 2018, during the Cavium integration into Marvell's supply chain, new assembly & test suppliers were qualified to ensure business continuity. This resulted in the identification of alternate sites to ensure that Marvell meets production capacity, customer demand, and delivery requirements.

C3. Business Strategy

C3.1

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

No

C3.1f

(C3.1f) Why are climate-related issues not integrated into your business objectives and strategy?

The influence of risks on the business is reviewed as part of Marvell's Business Continuity Process (BCP). Each supplier is surveyed annually on their business continuity strategy in case of natural disasters, including their mitigation plans. Marvell strategically reviews supplier loading and may re-distribute supplier loading as part of our business process. Marvell ensures that multiple suppliers with the same capability, equipment and technology are qualified to be an alternate site in case of disasters. In 2018, during the Cavium integration into Marvell's supply chain, new assembly & test suppliers were qualified to ensure business continuity. This resulted in the identification of alternate sites to ensure that Marvell meets production capacity, customer demand, and delivery requirements.

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
1

Targeted % reduction from base year
1

Base year
2018

Start year
2018

Base year emissions covered by target (metric tons CO2e)
1

Target year
2019

Is this a science-based target?
No, and we do not anticipate setting one in the next 2 years

% of target achieved
1

Target status
Underway

Please explain
In 2018, we consolidated two of Cavium's San Jose buildings into the Marvell Santa Clara facilities, thus reducing energy consumption and footprint from these facilities. "1" is being reported as Marvell is still in the process of consolidating facilities and we may provide an updated target and figures in the future.

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*	1	71.47
Implementation commenced*	0	0
Implemented*	1	12.51
Not to be implemented	0	0

C4.3b

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

Initiative type
Other, please specify (Electric vehicle fleet)

Description of initiative
<Not Applicable>

Estimated annual CO2e savings (metric tonnes CO2e)
12.51

Scope
Scope 1

Voluntary/Mandatory
Voluntary

Annual monetary savings (unit currency – as specified in C0.4)
0

Investment required (unit currency – as specified in C0.4)
0

Payback period
No payback

Estimated lifetime of the initiative
Ongoing

Comment
As of year 2018, Marvell leased 7 electric vehicles for company fleet. With over 36K miles driven, we estimate a CO2e savings of 12.51 tCO2-e. Because information on the monetary savings, investment required, and payback period are not available, we have inputted either "0" or "No payback."

C4.3c

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

Method	Comment
Financial optimization calculations	As part of the BCP process, Marvell's emissions reduction initiatives are driven by efficiency improvement in its products and facilities. Improving efficiency also reduces our emissions.

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?
No

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 2018

Base year end
December 31 2018

Base year emissions (metric tons CO2e)
1821.37

Comment

Scope 2 (location-based)

Base year start
January 1 2018

Base year end
December 31 2018

Base year emissions (metric tons CO2e)
25083.7

Comment

Scope 2 (market-based)

Base year start

Base year end

Base year emissions (metric tons CO2e)

Comment

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.
Defra Voluntary 2017 Reporting Guidelines
IPCC Guidelines for National Greenhouse Gas Inventories, 2006
The Climate Registry: General Reporting Protocol
The Greenhouse Gas Protocol: A Corporate Accounting and Reporting Standard (Revised Edition)
US EPA Mandatory Greenhouse Gas Reporting Rule

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)
1821.37

Start date
January 1 2018

End date
December 31 2018

Comment

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 have operations where we are able to access electricity supplier emission factors or residual emissions factors, but are unable to report a Scope 2, market-based figure

Comment

C6.3

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

Reporting year

Scope 2, location-based
25083.7

Scope 2, market-based (if applicable)
<Not Applicable>

Start date
January 1 2018

End date
December 31 2018

Comment

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
Small and infrequently used satellite sales offices.

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)
Please select

Explain why this source is excluded
Marvell has small satellite sales offices in various locations globally. These sales offices are typically rented cubes/desks in a small office space. They are infrequently used and collectively make up less than 5% of total square footage and employee headcount, therefore, their Scope 1 and Scope 2 emissions contribution would be nominal given the frequency of use of the cubes/desks. Employees' business travel is captured in our Scope 3 emissions.

C6.5

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

Purchased goods and services

Evaluation status
Relevant, not yet calculated

Metric tonnes CO2e
<Not Applicable>

Emissions calculation methodology
<Not Applicable>

Percentage of emissions calculated using data obtained from suppliers or value chain partners
<Not Applicable>

Explanation
We have not yet been able to collect the data from suppliers needed to make this estimate.

Capital goods

Evaluation status
Relevant, not yet calculated

Metric tonnes CO2e
<Not Applicable>

Emissions calculation methodology
<Not Applicable>

Percentage of emissions calculated using data obtained from suppliers or value chain partners
<Not Applicable>

Explanation
Marvell does not own any manufacturing sites. As a result, all manufacturing is done by 3rd party companies. Few, if any capital goods apply.

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

Evaluation status
Not relevant, explanation provided

Metric tonnes CO2e
<Not Applicable>

Emissions calculation methodology
<Not Applicable>

Percentage of emissions calculated using data obtained from suppliers or value chain partners
<Not Applicable>

Explanation
Marvell does not participate in any fuel or emissions activities outside those included in Scope 1 and Scope 2.

Upstream transportation and distribution

Evaluation status
Relevant, not yet calculated

Metric tonnes CO2e
<Not Applicable>

Emissions calculation methodology
<Not Applicable>

Percentage of emissions calculated using data obtained from suppliers or value chain partners
<Not Applicable>

Explanation
Marvell does not control any upstream activities, since all manufactured products are made by 3rd party companies. The contract manufacturers control all upstream operations, transportation, and distribution.

Waste generated in operations

Evaluation status
Relevant, calculated

Metric tonnes CO2e
344.18

Emissions calculation methodology
Non-Hazardous: Actual waste data only provided for Marvell - Singapore. Estimated for all other locations based on Marvell - Singapore headcount. One month (April 2018) provided for Marvell - Yokneam and used this for estimate of entire year. Hazardous: Actual waste data only provided for Marvell HQ and Marvell - Israel (PTK). No estimates. Only one month of data for Marvell HQ (March 2018). Sources: US Operations: U.S. EPA. Waste Reduction Model (WARM) - Version 14. Last Modified: 13 March 2016. https://www.epa.gov/warm/versions-waste-reduction-model-warm#WARM%20Tool%20V14 Non-US Operations: UK Government. Greenhouse Gas Reporting: Conversion Factors 2018. Last Modified: 18 July 2018. https://www.gov.uk/government/publications/greenhouse-gas-reporting-conversion-factors-2018

Percentage of emissions calculated using data obtained from suppliers or value chain partners
80

Explanation

Business travel

Evaluation status
Relevant, calculated

Metric tonnes CO2e
7746.65

Emissions calculation methodology
Methodology: Used calculated emissions from travel provider. Compared to two calculation methods using US EPA factors and DFRA factors. Closest to DEFRA factors. US operations only. Source: U.S. EPA. Emission Factors for Greenhouse Gas Inventories. Last Modified: 9 March 2018. https://www.epa.gov/sites/production/files/2018-03/documents/emission-factors_mar_2018_0.pdf

Percentage of emissions calculated using data obtained from suppliers or value chain partners
100

Explanation

Employee commuting

Evaluation status
Relevant, calculated

Metric tonnes CO2e
2118.83

Emissions calculation methodology
Methodology: Estimated using employee home and office zip codes and MetricsTrac calculator. Assumed all Full Time employees for fraction of the year employed. Home base employees removed. Source: U.S. EPA. Emission Factors for Greenhouse Gas Inventories. Last Modified: 9 March 2018. https://www.epa.gov/sites/production/files/2018-03/documents/emission-factors_mar_2018_0.pdf

Percentage of emissions calculated using data obtained from suppliers or value chain partners
0

Explanation

Upstream leased assets

Evaluation status
Not relevant, explanation provided

Metric tonnes CO2e
<Not Applicable>

Emissions calculation methodology
<Not Applicable>

Percentage of emissions calculated using data obtained from suppliers or value chain partners
<Not Applicable>

Explanation
There are no upstream leased assets that are not part of Marvell's Scope 1 and Scope 2 calculations.

Downstream transportation and distribution

Evaluation status
Relevant, calculated

Metric tonnes CO2e
59399.65

Emissions calculation methodology
Marvell was able to obtain all of its shipping records for Marvell 2018. The shipping records included the location of the Marvell warehouse (i.e., origin), the shipping location (i.e., destination), and the weight of the shipment. These parameters were used to calculate shipping emissions using emission factors from USEPA's Emission Factors for Greenhouse Gas Inventories (Table 8), which provides emission factors for transportation type in units of GHGs per ton-mile. The total distance traveled by each package was calculated using the Latitude and Longitude of the origin and destinations.

Percentage of emissions calculated using data obtained from suppliers or value chain partners
100

Explanation
This calculation uses the same data set used for the "Processing of sold products" and "Use of sold products" Scope 3 emissions. Therefore, this ensures a consistent and accurate representation of activities from Marvell.

Processing of sold products

Evaluation status
Relevant, calculated

Metric tonnes CO2e
6.82

Emissions calculation methodology
Marvell's boards and ICs must pass through a welding machine before they can be installed. This process uses approximately 0.0048 kwh per board and 0.000016 kwh per IC. These factors were multiplied by the total number of boards and ICs shipped during the reporting year. Emissions were then allocated to different regions where the products were processed using regional electricity emission factors.

Percentage of emissions calculated using data obtained from suppliers or value chain partners
100

Explanation
This calculation uses the same data set used for the "Downstream transportation and distribution" and "Use of sold products" Scope 3 emissions. Therefore, this ensures a consistent and accurate representation of activities from Marvell.

Use of sold products

Evaluation status
Relevant, calculated

Metric tonnes CO2e
7236136.4

Emissions calculation methodology
A typical IC such as “Octeon” uses approximately 7 watts of power. Assuming the processor is used 24 hours a day for 365 days per year (which may be a slight overestimate), we calculated GHGs using the GHG Protocol tools for energy/electricity use for one processor over a one year time frame. This was then multiplied by the number of products sold to get final values for the reporting year. The total electricity consumption associated with powering all of Marvell’s sold products throughout the year was multiplied by an International Energy Agency (IEA) average emission factor. Although the shipment destination for all of the products is known, the IEA average was used because products may be shipped to other locations by the 3rd party distributor. This GHG value is representative of Marvell semiconductor IC product. This excludes Marvell board products at this time.

Percentage of emissions calculated using data obtained from suppliers or value chain partners
100

Explanation
This calculation uses the same data set used for the “Downstream transportation and distribution” and "Processing of sold products" Scope 3 emissions. Therefore, this ensures a consistent and accurate representation of activities from Marvell.

End of life treatment of sold products

Evaluation status
Relevant, not yet calculated

Metric tonnes CO2e
<Not Applicable>

Emissions calculation methodology
<Not Applicable>

Percentage of emissions calculated using data obtained from suppliers or value chain partners
<Not Applicable>

Explanation
Marvell does not control the end of life treatment of our products because Marvell products are used in the User products built by the original equipment manufacturer who has end of life/usability disposal responsibility. This is out of the operational control of Marvell.

Downstream leased assets

Evaluation status
Not relevant, explanation provided

Metric tonnes CO2e
<Not Applicable>

Emissions calculation methodology
<Not Applicable>

Percentage of emissions calculated using data obtained from suppliers or value chain partners
<Not Applicable>

Explanation
Marvell has no leased downstream assets.

Franchises

Evaluation status
Not relevant, explanation provided

Metric tonnes CO2e
<Not Applicable>

Emissions calculation methodology
<Not Applicable>

Percentage of emissions calculated using data obtained from suppliers or value chain partners
<Not Applicable>

Explanation
Marvell is not a retailer and does not have franchises.

Investments

Evaluation status
Not relevant, explanation provided

Metric tonnes CO2e
<Not Applicable>

Emissions calculation methodology
<Not Applicable>

Percentage of emissions calculated using data obtained from suppliers or value chain partners
<Not Applicable>

Explanation
Marvell is not a financial company, but rather has employees that help develop our products.

Other (upstream)

Evaluation status

Metric tonnes CO2e
<Not Applicable>

Emissions calculation methodology
<Not Applicable>

Percentage of emissions calculated using data obtained from suppliers or value chain partners
<Not Applicable>

Explanation

Other (downstream)

Evaluation status

Metric tonnes CO2e
<Not Applicable>

Emissions calculation methodology
<Not Applicable>

Percentage of emissions calculated using data obtained from suppliers or value chain partners
<Not Applicable>

Explanation

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
0.011150382

Metric numerator (Gross global combined Scope 1 and 2 emissions)
26905.08

Metric denominator
square foot

Metric denominator: Unit total
2412929

Scope 2 figure used
Location-based

% change from previous year
0

Direction of change
No change

Reason for change
This is our first year of reporting, so we cannot compare to last year.

Intensity figure
5.005596279

Metric numerator (Gross global combined Scope 1 and 2 emissions)
26905.08

Metric denominator
full time equivalent (FTE) employee

Metric denominator: Unit total
5375

Scope 2 figure used
Location-based

% change from previous year
0

Direction of change
No change

Reason for change
This is our first year of reporting, so we cannot compare to last year.

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	1716.22	IPCC Fifth Assessment Report (AR5 – 100 year)
CH4	1.09	IPCC Fifth Assessment Report (AR5 – 100 year)
N2O	0.86	IPCC Fifth Assessment Report (AR5 – 100 year)
HFCs	103.2	IPCC Fifth Assessment Report (AR5 – 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	1628.55
China	86.59
India	0
Israel	106.23
Singapore	0

C7.3

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

By facility

C7.3b

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

Facility	Scope 1 emissions (metric tons CO2e)	Latitude	Longitude
Marvell HQ	1237.79	37.41212	-121.98136
Cavium - Irvine	132.34	33.66969	-117.76604
Cavium - Marlborough	258.42	42.33482	-71.5961
Marvell - Shanghai	86.59	31.137676	121.613358
Marvell - Bangalore	0	12.93703	77.69292
Marvell - Singapore	0	1.33581	103.88723
Marvell - Yokneam	106.23	32.657822	35.099041
Marvell - Israel	0	32.053791	34.791908

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	15851.13		50760.04	0
China	1255.79		1643.7	0
India	383.33		447.81	0
Singapore	1167.97		2335.94	0
Israel	6425.49		8838.37	0

C7.6

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

By facility

C7.6b

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

Facility	Scope 2 location-based emissions (metric tons CO2e)	Scope 2, market-based emissions (metric tons CO2e)
Marvell HQ	12110.83	
Cavium - Irvine	2894.1	
Cavium - Marlborough	846.2	
Marvell - Shanghai	1255.79	
Marvell - Bangalore	383.33	
Marvell - Singapore	1167.97	
Marvell - Yokneam	5331.59	
Marvell - Israel (PTK)	1093.9	

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?

This is our first year of reporting, so we cannot compare to last year

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	No
Consumption of purchased or acquired steam	No
Consumption of purchased or acquired cooling	Yes
Generation of electricity, heat, steam, or cooling	No

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	9423.22	9423.22
Consumption of purchased or acquired electricity	<Not Applicable>	447.81	62234.5	62682.31
Consumption of purchased or acquired heat	<Not Applicable>	<Not Applicable>	<Not Applicable>	<Not Applicable>
Consumption of purchased or acquired steam	<Not Applicable>	<Not Applicable>	<Not Applicable>	<Not Applicable>
Consumption of purchased or acquired cooling	<Not Applicable>	1343.55	0	1343.55
Consumption of self-generated non-fuel renewable energy	<Not Applicable>	<Not Applicable>	<Not Applicable>	<Not Applicable>
Total energy consumption	<Not Applicable>	1791.36	71657.72	73449.08

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	No
Consumption of fuel for the generation of steam	No
Consumption of fuel for the generation of cooling	No
Consumption of fuel for co-generation or tri-generation	No

C8.2c

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

Fuels (excluding feedstocks)
Natural Gas

Heating value
LHV (lower heating value)

Total fuel MWh consumed by the organization
9410.17

MWh fuel consumed for self-generation of electricity
<Not Applicable>

MWh fuel consumed for self-generation of heat
<Not Applicable>

MWh fuel consumed for self-generation of steam
<Not Applicable>

MWh fuel consumed for self-generation of cooling
<Not Applicable>

MWh fuel consumed for self-cogeneration or self-trigeneration
<Not Applicable>

Comment

Fuels (excluding feedstocks)
Diesel

Heating value
LHV (lower heating value)

Total fuel MWh consumed by the organization
12.21

MWh fuel consumed for self-generation of electricity
<Not Applicable>

MWh fuel consumed for self-generation of heat
<Not Applicable>

MWh fuel consumed for self-generation of steam
<Not Applicable>

MWh fuel consumed for self-generation of cooling
<Not Applicable>

MWh fuel consumed for self-cogeneration or self-trigeneration
<Not Applicable>

Comment

Fuels (excluding feedstocks)
Propane Liquid

Heating value
LHV (lower heating value)

Total fuel MWh consumed by the organization
0.84

MWh fuel consumed for self-generation of electricity
<Not Applicable>

MWh fuel consumed for self-generation of heat
<Not Applicable>

MWh fuel consumed for self-generation of steam
<Not Applicable>

MWh fuel consumed for self-generation of cooling
<Not Applicable>

MWh fuel consumed for self-cogeneration or self-trigeneration
<Not Applicable>

Comment

C8.2d

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

Diesel

Emission factor
10.21

Unit
kg CO2 per million Btu

Emission factor source
U.S. EPA. Emission Factors for Greenhouse Gas Inventories. Last Modified: 9 March 2018. https://www.epa.gov/sites/production/files/2018-03/documents/emission-factors_mar_2018_0.pdf Factors were also used for CH4 and N2O. Additional factors used for non-US operations.

Comment

Natural Gas

Emission factor
53.06

Unit
kg CO2 per million Btu

Emission factor source
U.S. EPA. Emission Factors for Greenhouse Gas Inventories. Last Modified: 9 March 2018. https://www.epa.gov/sites/production/files/2018-03/documents/emission-factors_mar_2018_0.pdf Factors were also used for CH4 and N2O. Additional factors used for non-US operations.

Comment

Propane Liquid

Emission factor
5.72

Unit
kg CO2 per million Btu

Emission factor source
U.S. EPA. Emission Factors for Greenhouse Gas Inventories. Last Modified: 9 March 2018. https://www.epa.gov/sites/production/files/2018-03/documents/emission-factors_mar_2018_0.pdf Factors were also used for CH4 and N2O. Additional factors used for non-US operations.

Comment

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
<Not Applicable>

Region of consumption of low-carbon electricity, heat, steam or cooling
<Not Applicable>

MWh consumed associated with low-carbon electricity, heat, steam or cooling
<Not Applicable>

Emission factor (in units of metric tons CO2e per MWh)
<Not Applicable>

Comment

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	No third-party verification or assurance
Scope 2 (location-based or market-based)	No third-party verification or assurance
Scope 3	No third-party verification or assurance

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, but we are actively considering verifying within the next two years

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, and we do not anticipate being regulated in the next three years

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

Yes, other partners in the value chain

C12.1a

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

Type of engagement
Compliance & onboarding

Details of engagement
Included climate change in supplier selection / management mechanism

% of suppliers by number
100

% total procurement spend (direct and indirect)
100

% Scope 3 emissions as reported in C6.5
1

Rationale for the coverage of your engagement
We actively engage with all suppliers to participate and comply with RBA requirements, as RBA keeps track of many standards that our sector should be following. For example, it keeps track of whether or not respondents comply with the use of Conflict Minerals. We perform periodic audits to ensure their participation is active and in compliance with environmental issues, including their business continuity programs, to mitigate climate change impacts.

Impact of engagement, including measures of success
We engaged these suppliers in processing IC and boards products. Suppliers are required to utilize RoHS-REACH compliant materials. Success means that Marvell's product passes the material compliance evaluation test, i.e. Suppliers that manufacture Marvell's processors are passing RoHS-REACH compliance certification. For example, in 2018, all of our suppliers achieved RoHS or REACH compliance. This means that components were produced with chemicals that are below set thresholds according to RoHS-REACH standards. By complying with these standards, Marvell's suppliers are producing components that minimize the release of harmful material into the environment. As a result, no energy is expanded for environmental clean-up of EU restricted substances, resulting in a reduction of their GHG emissions. We define our success measures by products meeting these requirements. Customer satisfaction for products that are compliant with regulations and achieve highest standards of product quality is a priority for Marvell. Suppliers that meet these KPIs are considered successful. Suppliers that are not able to meet these standards and regulations are deprioritized. Product qualification allows Marvell to produce a more environmentally/green product for shipment to our customers.

Comment

C12.1b

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

Type of engagement
Education/information sharing

Details of engagement
Share information about your products and relevant certification schemes (i.e. Energy STAR)

% of customers by number
100

% Scope 3 emissions as reported in C6.5
1

Please explain the rationale for selecting this group of customers and scope of engagement
We engage with our customers through the Responsibility Business Alliance (RBA), an organization of which Marvell is a member. RBA's responsibility is to assist companies in collecting information on their corporate activities and their supply chain activities. This responsibility is also part of Marvell's standard operations. The RBA environmental platform allows Marvell and its suppliers to share their initiatives, including corporate and social responsibility metrics, as well as environmental metrics, with its valued customers that request Marvell to submit completed questionnaires to the RBA. This involves discussion of Marvell's extensive compliance program aimed to meet various US and global regulations focused on minimizing impact to the environment and climate change. The following are some of the regulations and legislation that Marvell's compliance program is based upon: Dodd-Frank Conflict Minerals Legislation; European Union Directives: on waste electrical and electronic equipment (WEEE Directive), on the restriction of the use of certain hazardous substances in electrical and electronic equipment (RoHS Directive), and on improving the protection of human health and the environment through the better and earlier identification of the intrinsic properties of chemical substances by the four processes of REACH, namely the registration, evaluation, authorization and restriction of chemicals. Another effort as part of this program to reduce waste and minimize negative impact to the environment and climate change is the responsible scrapping of Marvell's non-useable products and electronic equipment. Scrap materials are disposed of through certified contractors that participate in responsible recycling programs. This ensures that Marvell's scrapped proprietary products are responsibly scrapped and any precious metals reclaimed are reimbursed back to Marvell. This program includes all Marvell discarded or scrapped products and non-useable electronic office equipment, i.e. computers, cables, monitors, etc. and ensures that they are responsibly disposed of in compliance to local laws and regulations.

Impact of engagement, including measures of success
Engagement with customers on environmental compliance requirements are prioritized to ensure that Marvell products meet and exceed industry and specific customer requirements. Marvell's RBA annual SAQ and environmental surveys are accessible to Marvell customers upon request, where Marvell's corporate and associated facilities information can be reviewed. Impacts from these engagements in 2017 found that all of our suppliers achieved compliance including RoHS-REACH, where components are produced with chemicals that are below set thresholds according to EU standards. By complying with these standards, our customers received 100% RoHS/REACH compliant products. Marvell and its suppliers are producing components that are actively reducing their GHG emissions by minimizing the release of harmful material into the environment. As a result, customers receive the benefit of purchasing environmentally/green products. In addition, RBA also requests information regarding waste and water. With continuous product testing, Marvell is able to track compliance to EU RoHS-REACH requirements and are reported to our customers who request us to respond. We define our success based upon customer acceptance of Marvell RoHS-REACH product certification and after reviewing Marvell's data in RBA's reporting system. Marvell considers it a success when our customers request us to respond their request for RoHS-REACH certification and RBA access to our report, this customers are more likely to work with us on efficiencies and buy our products, as opposed to customers that to not require information.

C12.1c

(C12.1c) Give details of your climate-related engagement strategy with other partners in the value chain.

Marvell reaches out to its own employees (other partners in the value chain) through Marvell's internal Intranet where we include notes on how Marvell is working to be more sustainable and efficient in its own practices. We also include tips on how to conserve energy and natural resources, such as remembering to turn off lights, limiting water usage, and implementing more sustainable practices not only at work, but at home as well.

Our employees are involved in our annual Earth Day activities. During the company's Earth Day activity last year, booths were set up that introduced and encouraged employees to ride bicycles going to and from work, explained the benefits of solar panel installations, and discussed how to reduce adding more trash to landfills. Organic produce samples were brought in and presented to those interested, encouraging employees to plant these samples to reduce water use on their homes. Marvell encourages employees to participate in the annual Bike to Work Day, where a designated station is set up on the edge of Marvell's property to give water to bikers.

Additional engagements with our employees include the availability of paper recycle bins in our facilities, encouragement of double-sided printing and e-reading options, participation in an annual Spring-cleaning event for waste disposal in the workplace, swapping non-essential travel for video conferencing, and offering options for bike storage, ride-share, and carpool information.

Marvell considers our contractors and general vendors important partners in the value chain as part of our commitment set by our Supplier Code of Conduct. The code outlines that we engage with them to ensure they are able to adhere to best practices in environmental protection, which includes climate change-related engagements.

An important partner in Marvell's value chain is our partners in the investment community. As part of our Environmental, Health and Safety Policy, Marvell is committed to regularly communicating our environmental performance to stakeholders, and we encourage them to join in our initiatives such as the annual Silicon Valley Bike to Work Day, where we proudly host an "energizer station" by providing refreshments and encouragement to all who participate in the event.

Other partners in Marvell's value chain include Component Manufacturers (suppliers to our suppliers) where we engage by using RoHS/REACH and a third party tool to verify that all suppliers are in compliance with RoHS/REACH standards. Our strategy for engagement with component manufacturers is based upon whether or not the manufacturer is 100% compliant with RoHS/REACH. Companies that are compliant with RoHS/REACH will be prioritized over companies that are not 100% compliant (Example, companies that have products that are only 95% RoHS/REACH compliant, or unavailable, will not be selected as a manufacturer for Marvell). Measure of success is determined by the amount of component manufacturers that are 100% compliant with RoHS/REACH. If the percentage drops, then Marvell does not consider engagement a success and will require redevelopment or new iterations of products that are manufactured for Marvell.

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
Other

C12.3b

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

No

C12.3e

(C12.3e) Provide details of the other engagement activities that you undertake.

i) Method of engagement: Marvell reports to the Responsible Business Alliance (RBA) supplier modules on an annual basis. Marvell became a member of IPC, an association connecting electronics industries and American Society Quality (ASQ), a global industry knowledge network that links the best ideas, tools, and experts. ASQ has the reputation and reach to bring together the diverse quality champions who are transforming our world. Our engagement in these organizations include attending conferences and meetings. Some of the points we discuss in order to reduce GHG emissions include packing materials (i.e. materials used, amount of materials used), shipping methods, and energy efficiency of manufacturing and energy efficiency of products.

ii) Topic of engagement: RBA is an organization whose responsibility is to assist companies with collecting information on their corporate activities and their supply chain activities. RBA's environmental platform allows Marvell and its suppliers to share their initiatives, including corporate and social responsibility metrics, as well as environmental metrics, with its valued customers. IPC often works with the EPA to address environmental issues associated with the manufacturing of electronics products. ASQ is a quality organization that believes that quality is inherently tied to social responsibility. ASQ was selected by the American National Standards Institute (ANSI) to administer and develop the U.S. position on a new international social responsibility standard.

iii) Nature of engagement: Marvell is a member of the RBA and completes the annual supplier reports on corporate, social, and environmental compliance and initiatives. RBA's platform allows Marvell to review and influence its top tier supply chain to submit annual reports on corporate, social, and environmental compliance and activities related to climate change. Marvell is also a member of the IPC and ASQ, both of which provide integral connections and information on industry initiatives related to corporate social and environmental activities especially climate change impact.

iv) Actions being advocated: RBA acts as an association that works with regulatory agencies to better inform its members about required and voluntary reporting requirements and provide advice to regulators on industry concerns about existing or developing regulations. IPC often works with the EPA to address environmental issues associated with the manufacturing of electronics products. ASQ is working to improve environmental and social practices of companies by providing a forum for community of people passionate about quality who make our world work better. Marvell supports these actions through our engagement as a member company of the RBA, IPC and ASQ

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?

By joining the Responsible Business Alliance (RBA), a dynamic industry association consisting of over 140 leading companies, Marvell commits to work with its suppliers to improve the front lines of the manufacturing process – the lives, rights and working environment of the people building electronic products we can't imagine our lives without.

Through our membership with the RBA, we believe we can promote higher environmental, social and governance standards across the industry in partnership with our customers and peers and align our approach with industry-wide best practices.

RBA members support the RBA Code of Conduct (RBA Code) that establishes standards for labor, health & safety, environmental practices, and ethics and management systems. Marvell is committed to adopting and implementing the RBA Code, internally at Marvell and externally with our supply chain partners. With a goal to create a responsible supply chain, Marvell aims to work alongside our supply chain to ensure our partners are aligned and in compliance with the RBA Code.

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
No publications with information about our response to climate-related issues and GHG emissions performance

Status
<Not Applicable>

Attach the document
<Not Applicable>

Page/Section reference
<Not Applicable>

Content elements
<Not Applicable>

Comment

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	Senior VP of Quality and Engineering	Other, please specify (Senior VP of Quality and Engineering)

SC. Supply chain module

SC0.0

(SC0.0) If you would like to do so, please provide a separate introduction to this module.

SC0.1

(SC0.1) What is your company's annual revenue for the stated reporting period?

	Annual Revenue
Row 1	

SC0.2

(SC0.2) Do you have an ISIN for your company that you would be willing to share with CDP?

No

SC1.1

(SC1.1) Allocate your emissions to your customers listed below according to the goods or services you have sold them in this reporting period.

SC1.2

(SC1.2) Where published information has been used in completing SC1.1, please provide a reference(s).

SC1.3

(SC1.3) What are the challenges in allocating emissions to different customers, and what would help you to overcome these challenges?

Allocation challenges	Please explain what would help you overcome these challenges

SC1.4

(SC1.4) Do you plan to develop your capabilities to allocate emissions to your customers in the future?

Please select

SC2.1

(SC2.1) Please propose any mutually beneficial climate-related projects you could collaborate on with specific CDP Supply Chain members.

SC2.2

(SC2.2) Have requests or initiatives by CDP Supply Chain members prompted your organization to take organizational-level emissions reduction initiatives?

Please select

SC3.1

(SC3.1) Do you want to enroll in the 2019-2020 CDP Action Exchange initiative?

Please select

SC3.2

(SC3.2) Is your company a participating supplier in CDP's 2018-2019 Action Exchange initiative?

Please select

SC4.1

(SC4.1) Are you providing product level data for your organization's goods or services?

Please select

Submit your response

In which language are you submitting your response?

English

Please confirm how your response should be handled by CDP

	Public or Non-Public Submission	I am submitting to	Are you ready to submit the additional Supply Chain Questions?
I am submitting my response	Public	Investors Customers	Yes, submit Supply Chain Questions now

Please confirm below

I have read and accept the applicable Terms