CREE INC. - Climate Change 2020

C0. Introduction

C0.1

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

Cree is an innovator of Wolfspeed® power and radio frequency (RF) semiconductors and lighting class LEDs. Cree's Wolfspeed product families include silicon carbide materials, power-switching devices and RF devices targeted for applications such as electric vehicles, fast charging, inverters, power supplies, telecom and military and aerospace. Cree's LED product families include blue and green LED chips, high-brightness LEDs and lighting-class power LEDs targeted for indoor and outdoor lighting, video displays, transportation and specialty lighting applications.

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
Reporting year	January 1 2019	December 31 2019	No	<Not Applicable>

C0.3

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

China
Finland
Germany
India
Japan
Malaysia
Republic of Korea
Sweden
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 chosen approach for consolidating your GHG 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
Director on board	Our CEO, who is also a Board member, is ultimately responsible for climate-related issues impacting the company because he has oversight of departments within Cree, including those that manage climate-related issues (e.g., Environment, Health and Safety, Sustainability, Emergency Management, Product Development, Operations, etc.). More information about our CEO's role with the Board of Directors can be found on our website (http://investor.cree.com/board-directors).

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	Scope of board-level oversight	Please explain
Scheduled – some meetings	Reviewing and guiding strategy Overseeing major capital expenditures, acquisitions and divestitures Other, please specify (Reviewing and guiding sustainability/corporate responsibility strategy)	<Not Applicable>	Our Board of Directors discusses climate change risks as important matters arise because our manufacturing facilities are not located in areas that are typically directly impacted by climate-related events (e.g., tropical storms, droughts, etc.). Indirectly, our Board discusses climate-related opportunities often, as our business, and more specifically our products, are designed to reduce energy usage and therefore, greenhouse gas emissions, which directly affect climate change.

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)	Reporting line	Responsibility	Coverage of responsibility	Frequency of reporting to the board on climate-related issues
Sustainability committee	<Not Applicable>	Both assessing and managing climate-related risks and opportunities	<Not Applicable>	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 group with responsibility for climate-related issues consists of Cree employees from various departments, including Environment, Health and Safety, Corporate Sales and Marketing, Legal, Operations, and Investor Relations. Our Legal and Corporate Sales and Marketing departments report directly to the CEO. Our Environment, Health and Safety department reports to the Operations department, which reports to the CEO. Our Investor Relations group reports to Finance department, which reports to the CEO.

The titles of employees involved in the group include the Global Environment, Health & Safety Director, Environmental Manager, Associate General Counsel, Vice President Corporate Marketing, Senior Vice President and General Manager of Wolfspeed products and Vice President of Investor Relations. The responsibility for climate-related issues lies with this committee because it is multi-disciplinary group that represents all of Cree's business units (LED, power and radio frequency) and provides different perspectives of how climate change could potentially affect Cree's product sales and financial performance, reputation, direct operations and supply chain. On a day to day basis, the individuals of this committee work with their departments to address climate-related issues. For example, our Environment, Health & Safety department is responsible for corporate sustainability initiatives and compliance with health, safety, and environmental regulations.

The group meets annually to review the current state of the world's climate as well as assess Cree's long-term climate-related risks and opportunities. During the meeting, opportunities to reduce the impact to climate from our manufacturing operations and potential risks to major facilities due to climate change. Some of the topics considered include sea level rise flooding, susceptibility to and preparation for high intensity storms, increased rainfall, drought, and water stress and availability. We have also considered raw material sourcing issues and distribution channel impacts that could result from global climate-related impacts. We also discuss areas in which the business can improve on climate-related issues both internally and externally.

C1.3

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

	Provide incentives for the management of climate-related issues	Comment
Row 1	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).

Entitled to incentive	Type of incentive	Activity inventivized	Comment
Management group	Non-monetary reward	Efficiency project	At Cree's Durham facility, incentives are provided to employees for attainment of targets related to production yield. Production yield has a direct correlation to the energy usage and GHG emissions from the facility and impacts our yield goal. Improving yield throughout the production process results in fewer wasted materials, lower usage of GHGs, and reduced costs. Employees were rewarded non-monetary benefits or awards. This incentive program has become part of Cree's culture and day to day activity.
All employees	Monetary reward	Energy reduction project	Cree's research and development employees are responsible for developing energy efficient, long-lasting, and innovative products. Their compensation is tied to continuing to develop these products.
All employees	Non-monetary reward	Behavior change related indicator	Cree's CEO hosts "thank you" events to recognize employees for a job well done on various projects, including environmental related projects. For example, a "thank you" event was held for Cree's waste reduction and recycling initiatives (which affect our Scope 3 GHG emissions) and for employee involvement in developing Cree's sustainability report (which contains information about Cree's GHG emissions and risks and opportunities due to climate change).

C2. Risks and opportunities

C2.1

(C2.1) Does your organization have a process for identifying, assessing, and responding to climate-related risks and opportunities?

Yes

C2.1a

(C2.1a) How does your organization define short-, medium- and long-term time horizons?

	From (years)	To (years)	Comment
Short-term	0	1	Our short-term horizon was chosen to be 0-1 years because our budgets are currently established on a shorter-term time frame.
Medium-term	1	10	Our medium-term horizon was chosen to be 1-10 years based on our anticipated timeline for our recently announced capacity expansion efforts that are planned to be completed in 2024.
Long-term	10	100	Our long-term horizon is not currently aligned with other business practice time horizons.

C2.1b

(C2.1b) How does your organization define substantive financial or strategic impact on your business?

We define a substantive financial or strategic impact as something that will cause significant impact to our business both internally (i.e., our direct operations) or externally (i.e., our upstream and downstream value chain). We use $1 Million USD to establish a threshold for substantive financial impact when determining potential impacts due to climate change.

C2.2

(C2.2) Describe your process(es) for identifying, assessing and responding to climate-related risks and opportunities.

Value chain stage(s) covered

Direct operations

Risk management process

Integrated into multi-disciplinary company-wide risk management process

Frequency of assessment

Annually

Time horizon(s) covered

Short-term
Medium-term
Long-term

Description of process

Risk management at Cree is a process undertaken by all functions within the business, including a review of risks related to financial and market performance, operational performance, emergency preparedness and response, environment, health and safety compliance, among other areas. Cree assesses and prioritizes risks based on impacts to our business and products, our employees, the communities in which we operate, and our customers. Cree also assesses and prioritizes risks based on regulatory impacts. Our Finance, Legal, and Investor Relations departments identify and assess both domestic and international business risks, financial risks, and market risks. These risks, as well as environmental compliance risks, are reviewed as part of financial disclosure requirements (e.g., US SEC Form 10-K). Annually, various

departments including Environment, Health and Safety, Corporate Sales and Marketing, Legal, Operations, and Investor Relations meet to discuss Cree-specific physical and transitional risks and opportunities due to climate change. Potential physical climate change risks to major facilities have been reviewed, including sea level rise flooding, susceptibility to and preparation for high intensity storms, increased rainfall, drought, and water stress and availability. Both company-level and asset level physical and transitional risks have been considered. We have also considered raw material sourcing issues, and distribution channel impacts that could result from global climate-related impacts. We use $1 Million USD to establish a threshold for substantive financial impact when determining potential impacts due to climate change . Cree uses a materiality assessment to review and prioritize sustainability topics, including corporate governance, products, environmental protection (including climate change), social responsibility, and economic performance. Cree's senior management is interviewed to discuss which aspects are most relevant for Cree's future success. We also conduct outreach to external stakeholders (e.g., customers, suppliers) to understand which aspects they believe are most important for Cree's future success. The results from the materiality assessment guide us toward which areas to focus on in the future. Cree's Environment, Health & Safety department is responsible for maintaining our ISO 14001 certifications. Cree's ISO 14001 environmental management systems involve assessing environmental impacts of our manufacturing operations, including those that impact or are impacted by climate change. ISO 14001 defines an environmental aspect as an element of an organization's activities, products, or services that has or may have an impact on the environment. Our significant impacts for each site covered under an ISO 14001 certification are determined using a ranking system. Each environmental aspect (e.g., greenhouse gas emissions, energy usage) is ranked from 0 through 4 based on each of the following criteria: Severity, Magnitude, Probability, Frequency, Controllability, Business Impact and Regulatory. Each aspect receives a total score and the highest scores designate what our significant impacts are, which we focus on in more detail in our environmental management systems. Cree has also established a corporate-wide goal to manage climate-related risks. Cree joined The Climate Group's EP100 initiative, which is a global, collaborative initiative of influential businesses that pledge to double their energy productivity. We met our first EP100 goal for our lighting products in 2017. Cree's new strategic focus is to build a powerhouse semiconductor company around our power and radio frequency products and a new corporate-wide EP100 goal was developed in 2019, where we proposed to double our energy productivity in terms of revenue per MWh of energy consumed in manufacturing.

Value chain stage(s) covered
Upstream

Risk management process
Integrated into multi-disciplinary company-wide risk management process

Frequency of assessment
Annually

Time horizon(s) covered
Short-term
Medium-term
Long-term

Description of process
Annually, various departments including Environment, Health and Safety, Corporate Sales and Marketing, Legal, Operations, and Investor Relations meet to discuss Cree-specific physical and transitional risks and opportunities due to climate change. During our climate-related risk assessments we have considered the affect climate change could have on the suppliers of our raw materials. We rely on global suppliers for raw materials, who depending on their location, may be subject to various supply constraints, including those due to climate change. In an instance where Cree depends on a number of limited source supplier for certain raw materials, components, services and equipment used in the manufacturing of our products, climate change-related risks could affect Cree. For example, chronic drought or flooding could increase political instability in regions of the world that supply critical raw materials, causing business interruption. We use $1 Million USD to establish a threshold for substantive financial impact when determining potential impacts due to climate change. Outside of our annual meeting to assess climate risks and opportunities, Cree also assesses upstream risks by calculating our upstream Scope 3 GHG emissions, which helps us better understand our impact. Our Purchasing division also manages both physical and transitional risks and opportunities in our supply chain. Our dedicated staff, Supplier Code of Conduct, Purchase Order Terms and Conditions, and Responsible Minerals Sourcing Policy help Cree manage potential supply chain risks, including those associated with climate change. Where possible, Cree seeks to obtain goods and services from local suppliers in the locations where Cree conducts business, which helps to reduce our risk of business interruptions when climate-related issues may arise and lowers transportation emission impacts.

Value chain stage(s) covered
Downstream

Risk management process
Integrated into multi-disciplinary company-wide risk management process

Frequency of assessment
Annually

Time horizon(s) covered
Short-term
Medium-term
Long-term

Description of process
Annually, various departments including Environment, Health and Safety, Corporate Sales and Marketing, Legal, Operations, and Investor Relations meet to discuss Cree-specific physical and transitional risks and opportunities due to climate change. During our climate-related risk assessments we have considered the affect climate change could have on our business downstream. We feel that climate change is a potential opportunity for us because our products appeal to the customers who want energy efficient products. However, since climate-related events could cause delays in product distribution, there are commercial risks associated with delivering our products in a timely manner. We use $1 Million USD to establish a threshold for substantive financial impact when determining potential impacts due to climate change. Outside of our annual meeting to assess climate risks and opportunities, Cree also assesses downstream risks by calculating our downstream Scope 3 GHG emissions, which helps us better understand our impact. Our Corporate Sales and Marketing department manages Cree's climate-related transitional risks and opportunities, including those related to our product sales, our reputation, market projections, and consumer preferences. Our Corporate Sales and Marketing department assesses market trends and technology advancements to suggest what our business focus should be. For example, we have recently shifted our strategic focus toward our semiconductor business due to the anticipated increased adoption of energy efficient technologies that use our products (e.g., renewable energy, electric vehicles).

C2.2a

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

	Relevance & inclusion	Please explain
Current regulation	Relevant, always included	Annually, various departments including Environment, Health and Safety, Corporate Sales and Marketing, Legal, Operations, and Investor Relations meet to discuss Cree-specific risks and opportunities due to climate change. Current regulation is relevant and has been included in our assessments. However, the current regulation that applies to Cree only requires reporting of greenhouse gas emissions to the US EPA, which is done annually in accordance with such regulation. Our GHG emissions are included in our climate-related risk assessments, specifically when we discuss our risks associated with regulations that could emerge because of the data collected from US EPA's Greenhouse Gas Reporting Program reporting requirements (e.g., carbon taxes, GHG emission threshold regulations). Through calculating emissions for EPA, we also assess our GHG emission impacts and how they compare to our competitors' impacts. The data from US EPA's Greenhouse Gas Reporting Program are available to the public. Having high direct GHG emissions per revenue or production can put us at a reputational risk for stakeholders like customers, investors and organizations that rate/score us based on our ESG performance. Assessing these risks pushes Cree to establish goals. Cree joined the EP100 initiative to double our energy productivity (lumens produced at our facility per electricity consumed in manufacturing) by 2020, which we met in 2017. In 2018, we developed a goal of reducing electricity intensity by 8% by 2020 at our North Carolina facilities. We retired this goal in 2019 to focus on our new corporate-wide EP100 goal, which is to double our energy productivity in terms of revenue per MWh of energy consumed in manufacturing by 2040, using 2017 as our baseline.
Emerging regulation	Relevant, always included	Annually, various departments including Environment, Health and Safety, Corporate Sales and Marketing, Legal, Operations, and Investor Relations meet to discuss Cree-specific risks and opportunities due to climate change. We have considered emerging regulation as both a risk and opportunity in our climate-related risk assessments. For example, we have discussed how regulations assigning a cost of carbon would potentially impact our production costs and operations. We could reduce our Scope 1 GHG emissions and reduce our carbon taxes by adding fluorinated gas abatement and we are currently exploring abatement technologies for our facilities. It would be more difficult to change manufacturing inputs since our products rely on the use of very specific inputs. Changing the types and amounts of gases used in our manufacturing processes could greatly compromise product quality. However, our LED, power, and radio frequency products substantially reduce the amount of customer energy consumption and associated GHGs emitted. If a carbon tax system is established in the future, we will be able to provide energy efficient, less-emissive, and long-lasting products to meet customer needs. Carbon taxes may also enable us to gain new customers seeking products that emit less GHGs to lower their carbon tax payments. Assessing these risks also pushes Cree to establish goals. Cree joined the EP100 initiative to double our energy productivity (lumens produced at our facility per electricity consumed in manufacturing) by 2020, which we met in 2017. In 2018, we developed a new goal of reducing electricity usage per revenue by 8% by 2020 at our North Carolina facilities. We retired this goal in 2019 to focus on our new corporate-wide EP100 goal, which is to double our energy productivity in terms of revenue per MWh of energy consumed in manufacturing by 2040, using 2017 as our baseline.
Technology	Relevant, always included	Annually, various departments including Environment, Health and Safety, Corporate Sales and Marketing, Legal, Operations, and Investor Relations meet to discuss Cree-specific risks and opportunities due to climate change. We consider technology as both a risk and opportunity in our climate-related risk assessments. Through our energy efficient products, our success is tied, in part, to efforts to reduce product energy usage and resulting greenhouse gas emissions, which directly affect climate change. We have considered risks associated with the possibility of other more energy efficient technologies replacing our silicon carbide technology. Our power products enable other energy efficient technologies (e.g., renewable energy, electric vehicles) to develop, and we have discussed the risks associated with energy grid capacity disruptions and policies and/or local utilities slowing the adoption of these technologies.
Legal	Relevant, always included	Annually, various departments including Environment, Health and Safety, Corporate Sales and Marketing, Legal, Operations, and Investor Relations meet to discuss Cree-specific risks and opportunities due to climate change. Outside of our annual climate risks and opportunities meeting, various departments throughout Cree ensure we are maintaining compliance with all laws, including those related to climate change. To date, legal issues have not been a significant climate change risk or opportunity for Cree, however Cree continues to monitor future regulations as discussed in the emerging regulation section (e.g., we have discussed how regulations assigning a cost of carbon would potentially impact our production costs and operations, and have explored new projects to reduce the use of fluorinated gases with high GWPs in our manufacturing processes).
Market	Relevant, always included	Annually, various departments including Environment, Health and Safety, Corporate Sales and Marketing, Legal, Operations, and Investor Relations meet to discuss Cree-specific risks and opportunities due to climate change. We consider market risks in our climate-related risk assessments. The market for energy efficient products affects our business because our products reduce product energy usage and greenhouse gas emissions, which directly affect climate change. Market projections affect us because we are investing in our power division to meet the anticipated demand for technologies that use our power products (e.g., renewable energy, electric vehicles). BloombergNEF estimates there are currently over 7 million passenger EVs on the road and this number will continue to rise. There are risks associated with production planning based on the market for energy efficient technologies. If we project too low then we would not be able to meet demand and lose our competitive advantage. If we project demand to be too high, then we risk investing in unnecessary capital to develop our facilities. We also discuss the risks to our business associated with market saturation of the products we sell.
Reputation	Relevant, always included	Annually, various departments including Environment, Health and Safety, Corporate Sales and Marketing, Legal, Operations, and Investor Relations meet to discuss Cree-specific risks and opportunities due to climate change. We have considered reputation in our climate-related risk assessments because our reputation is directly tied to producing products that reduce product energy usage and greenhouse gas emissions. We have considered risks from climate change and how they would affect customer satisfaction and our external reputation. We also have considered operational risks and how they affect our internal reputation with current and future employees. We also assess our GHG emission impacts and how they compare to our competitors' impacts. The data from US EPA's Greenhouse Gas Reporting Program are available to the public. Having high direct GHG emissions per revenue or production can put us at a reputational risk for stakeholders like customers, investors and organizations that rate/score us based on our ESG performance. Assessing these risks pushes Cree to establish goals. Cree joined the EP100 initiative to double our energy productivity (lumens produced at our facility per electricity consumed in manufacturing) by 2020, which we met in 2017. In 2018, we developed a new goal of reducing electricity usage per revenue by 8% by 2020 at our North Carolina facilities. We retired this goal in 2019 to focus on our new corporate-wide EP100 goal, which is to double our energy productivity in terms of revenue per MWh of energy consumed in manufacturing by 2040, using 2017 as our baseline.
Acute physical	Relevant, always included	Annually, various departments including Environment, Health and Safety, Corporate Sales and Marketing, Legal, Operations, and Investor Relations meet to discuss Cree-specific risks and opportunities due to climate change. We consider acute physical risks in our climate-related scenario analyses. Cree has assessed potential risks to major facilities due to climate change, including flooding from sea level rise, susceptibility to and preparation for high intensity storms, increased rainfall, drought, and water stress and availability. Acute physical risks are also incorporated into Cree's business continuity plan, which takes into consideration potential risks that could cause a significant business interruption.
Chronic physical	Relevant, always included	Annually, various departments including Environment, Health and Safety, Corporate Sales and Marketing, Legal, Operations, and Investor Relations meet to discuss Cree-specific risks and opportunities due to climate change. We consider chronic physical risks in our climate-related scenario analyses. We assess how shifts in climate could affect our facilities and supply chain in the long term. For example, sea level rise could impact the ports used for shipment of raw materials and products around the world, and our offices in vulnerable locations on the coast may need to be relocated. Chronic physical risks are also incorporated into Cree's business continuity plan, which takes into consideration potential risks that could cause a significant business interruption.

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 & Primary climate-related risk driver

Emerging regulation	Carbon pricing mechanisms

Primary potential financial impact

Increased indirect (operating) costs

Climate risk type mapped to traditional financial services industry risk classification
<Not Applicable>

Company-specific description
Regulations assigning a cost of carbon would potentially impact our production costs, but ultimately improve business for energy efficient products.

Time horizon
Long-term

Likelihood
About as likely as not

Magnitude of impact
Medium-high

Are you able to provide a potential financial impact figure?
Yes, a single figure estimate

Potential financial impact figure (currency)
30000000

Potential financial impact figure – minimum (currency)
<Not Applicable>

Potential financial impact figure – maximum (currency)
<Not Applicable>

Explanation of financial impact figure
We estimate that a carbon tax on our Scope 1 and 2 GHG emissions could be around $30 million annually. We chose a dollar amount per ton based on climate-related scenarios that examine the global carbon tax required to keep the rise in average global temperatures within 2 degrees Celsius.

Cost of response to risk
6600000

Description of response and explanation of cost calculation
We could reduce our Scope 1 GHG emissions and reduce our carbon taxes by adding abatement technologies. We are currently exploring options for abatement at our facilities. Changing the types and amounts of fluorinated gases used in our manufacturing processes could compromise product quality. In our operations, we have improved yield for both our LED and power and radio frequency applications which improves production efficiency (e.g., electricity and GHGs used per unit of product). We have an incentive program to increase manufacturing yield, resulting in fewer wasted materials, lower usage of GHGs in the manufacturing process, and reduced costs. Production yield has a direct correlation to GHG emissions from the facility and impacts the goal we set for our EP100 energy productivity target (revenue/ MWh electricity consumed). To further address risks like this, our research and development staff works to develop process improvements, including those that reduce GHG emissions. In 2019, we began planning for a project to eliminate the use of one of our greenhouse gases with a high GWP in one of our manufacturing processes. This project is on track for implementation in the next 12-18 months.

Comment
We estimate about $1-3 million in capital costs for adding on abatement technologies, with an estimated $100,000-300,000 in annual operation costs. Abatement technologies may also result in additional environmental impacts and costs, including increased energy consumption and waste generation. Our incentive program rewards employees based on success rates; during the reporting year, employees were rewarded with non-monetary incentives. Our project to eliminate the use of one of our greenhouse gases with a high GWP in one of our processes is estimated to cost approximately $3,300,000.

Identifier
Risk 2

Where in the value chain does the risk driver occur?
Direct operations

Risk type & Primary climate-related risk driver

Chronic physical	Rising mean temperatures

Primary potential financial impact
Increased indirect (operating) costs

Climate risk type mapped to traditional financial services industry risk classification
<Not Applicable>

Company-specific description
Changes in the outside average temperature could potentially affect our manufacturing process since the control of temperature and humidity in our factories is crucial for product quality.

Time horizon
Long-term

Likelihood
More likely than not

Magnitude of impact
Low

Are you able to provide a potential financial impact figure?
Yes, an estimated range

Potential financial impact figure (currency)
<Not Applicable>

Potential financial impact figure – minimum (currency)

0

Potential financial impact figure – maximum (currency)
100000

Explanation of financial impact figure
We anticipate minimal changes in electricity and natural gas costs due to changes in our outside average temperature ($0-$100,000 annually).

Cost of response to risk
0

Description of response and explanation of cost calculation
Changes in outside temperature could result in needing more chiller capacity and increased operational costs to support the factories conditional requirements. We currently have robust systems in place to control the factory temperature and humidity, even with fluctuating outdoor conditions. For example, in January 2019 we experienced a wide range of temperatures in Durham, NC, USA (where two of our manufacturing facilities are located): the average temperature was 42°F, the highest temperature was 71°F, and the lowest temperature was 17°F.

Comment
The temperature and humidity of the factory requires chiller and boiler operational costs (e.g., maintenance and repair costs, refrigerant purchases), natural gas purchases, and electricity purchases. We do not anticipate additional management costs above what we estimated for financial implications.

Identifier
Risk 3

Where in the value chain does the risk driver occur?
Direct operations

Risk type & Primary climate-related risk driver

Chronic physical	Rising sea levels

Primary potential financial impact
Increased indirect (operating) costs

Climate risk type mapped to traditional financial services industry risk classification
<Not Applicable>

Company-specific description
Sea level rise could impact the ports used for shipment of raw materials and products around the world. Offices in vulnerable locations would need to be moved. Manufacturing facilities are not considered to be at risk in a long-term horizon.

Time horizon
Long-term

Likelihood
More likely than not

Magnitude of impact
Medium

Are you able to provide a potential financial impact figure?
Yes, an estimated range

Potential financial impact figure (currency)
<Not Applicable>

Potential financial impact figure – minimum (currency)
1000000

Potential financial impact figure – maximum (currency)
10000000

Explanation of financial impact figure
We anticipate minimal costs associated with needing to change logistics (potentially 0-10 percent increase in annual transportation costs). However, we anticipate around $1-10 million if vulnerable office locations were impacted and were required to relocate.

Cost of response to risk
0

Description of response and explanation of cost calculation
Sea level rise could cause an increase in costs associated with distribution and costs to move offices. For example, our facility in Hong Kong could potentially be affected because of its proximity to the ocean. We take information such as this into account when selecting locations for our facilities. Cree greatly limits the operation in vulnerable areas of the world and has risk management measures in place to cope with catastrophic events. For example, Cree has a storm plan to prepare for catastrophic weather events, including those due to climate change.

Comment
We do not anticipate additional management costs above what we estimated for financial implications.

Identifier
Risk 4

Where in the value chain does the risk driver occur?
Upstream

Risk type & Primary climate-related risk driver

Market	Other, please specify (raw material scarcity)

Primary potential financial impact
Other, please specify (Business/manufacturing disruption)

Climate risk type mapped to traditional financial services industry risk classification
<Not Applicable>

Company-specific description
Many critical raw materials are sourced from areas of the world vulnerable to political instability as a result of drought and other climate changes.

Time horizon
Long-term

Likelihood
About as likely as not

Magnitude of impact
High

Are you able to provide a potential financial impact figure?
No, we do not have this figure

Potential financial impact figure (currency)
<Not Applicable>

Potential financial impact figure – minimum (currency)
<Not Applicable>

Potential financial impact figure – maximum (currency)
<Not Applicable>

Explanation of financial impact figure
A decrease in the supply of one or more of our raw materials would result in a severe cost to our supply chain and business interruption. Depending on the material, it could stop production.

Cost of response to risk
0

Description of response and explanation of cost calculation
We would potentially need to find other suppliers in this situation. Our dedicated staff, Cree's Supplier Code of Conduct and Responsible Minerals Sourcing Policy help to manage potential risks in our supply chain.

Comment
We have dedicated staff whose compensation is tied to managing potential risks in our supply chain. We do not anticipate additional management costs beyond current salary compensation.

Identifier
Risk 5

Where in the value chain does the risk driver occur?
Downstream

Risk type & Primary climate-related risk driver

Technology	Substitution of existing products and services with lower emissions options

Primary potential financial impact
Decreased revenues due to reduced demand for products and services

Climate risk type mapped to traditional financial services industry risk classification
<Not Applicable>

Company-specific description
The emergence of new technologies that are more efficient than our products and/or market saturation of products could greatly affect our business.

Time horizon
Long-term

Likelihood
Very unlikely

Magnitude of impact
High

Are you able to provide a potential financial impact figure?
No, we do not have this figure

Potential financial impact figure (currency)
<Not Applicable>

Potential financial impact figure – minimum (currency)
<Not Applicable>

Potential financial impact figure – maximum (currency)
<Not Applicable>

Explanation of financial impact figure
We could potentially lose business to competing technologies, which could negatively impact the business.

Cost of response to risk

157900000

Description of response and explanation of cost calculation
We will continue to innovate for the future and develop industry-leading energy efficient products. We are constantly developing new technologies and creating new markets for our products. With our power products, switching losses with our silicon carbide (SiC) Schottky diodes are 80 percent less compared to silicon (Si) diodes. For example, in 2018 we released E-Series™, a new family of SiC semiconductor devices for the electric vehicle and renewable energy markets. The E-Series family is the first commercial family of SiC metal oxide semiconductor field effect transistors (MOSFETs) and diodes to be automotive AEC-Q101 qualified and PPAP capable. The designation makes it the only commercially available family of SiC MOSFETs and diodes that meet high-humidity and automotive qualifications to deliver some of the most reliable and corrosion-resistant components in the power market today. With the new automotive-qualified SiC MOSFET, Wolfspeed becomes the first and only silicon carbide semiconductor manufacturer to offer a complete family of qualified parts to the EV market. In 2019, we introduced the 5th generation (C5D) 1700V SiC Schottky diode, which is optimized for renewable energy, industrial power and electric vehicle charging applications including solar power and wind turbine inverters, off-board chargers and uninterruptible power supply (UPS). Our new Schottky diodes feature essentially no switching losses due to nearly zero reverse recovery and the industry's lowest forward voltage drop. This generates higher efficiencies and systems that are smaller, cooler, faster and lower cost than possible with silicon (Si) bipolar devices. The C5D product family boasts the industry's largest range of current ratings at this voltage.

Comment
The cost of management is reported on an annualized basis. We invest significant resources in research and development ($157.9 million in fiscal year 2019). Research and development costs listed here are for all of Cree's product types (LED, power, and radio frequency).

Identifier
Risk 6

Where in the value chain does the risk driver occur?
Direct operations

Risk type & Primary climate-related risk driver

Technology	Unsuccessful investment in new technologies

Primary potential financial impact
Other, please specify (Reduced support for new technologies)

Climate risk type mapped to traditional financial services industry risk classification
<Not Applicable>

Company-specific description
Local utilities in some of the areas we operate are not adopting policies that promote the economical adoption of renewable energy sources. We also see a risk with utilities not upgrading their grid system to be able to accept and manage renewable energy. Government subsidies for renewable energy are being phased out in the US. These issues affect continued adoption of our technologies.

Time horizon
Medium-term

Likelihood
More likely than not

Magnitude of impact
Medium

Are you able to provide a potential financial impact figure?
Yes, an estimated range

Potential financial impact figure (currency)
<Not Applicable>

Potential financial impact figure – minimum (currency)
1000000

Potential financial impact figure – maximum (currency)
5000000

Explanation of financial impact figure
Switching to renewable energy to supply our manufacturing electricity could result in a decrease in our electricity costs. We estimate that not being able to adopt renewable energy could result in us spending an extra $1-5 million in annual electricity costs. The financial implications for this risk affecting our product sales is currently unknown.

Cost of response to risk
200000

Description of response and explanation of cost calculation
We have dedicated staff to manage our facilities' electricity systems and interactions with local utilities and policy makers.

Comment
We have dedicated staff to manage our facilities' electricity systems and interactions with local utilities and policy makers. We estimate $200,000 annual salary costs for these positions.

Identifier
Risk 7

Where in the value chain does the risk driver occur?
Direct operations

Risk type & Primary climate-related risk driver

Chronic physical	Other, please specify (Water stress/availability)

Primary potential financial impact
Increased indirect (operating) costs

Climate risk type mapped to traditional financial services industry risk classification
<Not Applicable>

Company-specific description
We require ultra-pure water for our manufacturing processes. Water availability and quality issues due to climate change could affect our manufacturing operations and product quality. We have evaluated water stress risks of direct operations using the WRI Aqueduct tool and our manufacturing facilities are not located in areas deemed to have “high” or “extremely high” water stress risk. We continue to operate internal water recycle facilities at our manufacturing sites with the largest water demand. We purchase water directly from the municipality and work closely with them to communicate water demand. Because of all of the above, we identify that some risk exists, but no substantive impact is anticipated.

Time horizon
Long-term

Likelihood
About as likely as not

Magnitude of impact
Low

Are you able to provide a potential financial impact figure?
Yes, a single figure estimate

Potential financial impact figure (currency)
0

Potential financial impact figure – minimum (currency)
<Not Applicable>

Potential financial impact figure – maximum (currency)
<Not Applicable>

Explanation of financial impact figure
We identify that some risk exists, but no substantive impact is anticipated.

Cost of response to risk
0

Description of response and explanation of cost calculation
We have dedicated staff to manage our facilities’ utility and wastewater systems and interactions with local utilities and policy makers. We do not anticipate additional management costs beyond current salary compensation.

Comment
We have dedicated staff to manage our facilities’ utility and wastewater systems and interactions with local utilities and policy makers. We do not anticipate additional management costs beyond current salary compensation.

Identifier
Risk 8

Where in the value chain does the risk driver occur?
Downstream

Risk type & Primary climate-related risk driver

Technology	Other, please specify (slower adoption of technologies due to global issues)

Primary potential financial impact
Other, please specify (slower adoption of technologies due to global issues)

Climate risk type mapped to traditional financial services industry risk classification
<Not Applicable>

Company-specific description
The impact of the global COVID-19 pandemic has certainly affected every aspect of life, including industries such as Cree’s. As impactful as the pandemic has been this year we are hopeful that the impacts are truly short-term, thereby not impacting our medium-term or long-term objectives. Our power and radio frequency products are used in applications such as renewable energy, EVs and EV charging. Highlighting this fact, BloombergNEF’s Electric Vehicle Outlook 2020 Report anticipates global passenger vehicle sales to drop by 23% in 2020. They also reported that EV sales have dropped and global auto sales may not recover to 2019 levels until 2025. However, according to an International Energy Agency 2020 study, EVs are expected to fare better than the overall car market. Since COVID-19 stay at home orders resulted in short-term improvements in global air quality, people have seen the effects of reducing combustion-based transportation first hand, which we foresee as being an opportunity for increasing EV demand in the future.

Time horizon
Short-term

Likelihood
Very 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)
<Not Applicable>

Potential financial impact figure – minimum (currency)
<Not Applicable>

Potential financial impact figure – maximum (currency)
<Not Applicable>

Explanation of financial impact figure
The financial implications for this risk affecting our direct operations or product sales is currently unknown.

Cost of response to risk

Description of response and explanation of cost calculation
Cree continues to invest to ensure its employees are safe from the pandemic at our facilities. As we are in the middle of this pandemic, these costs have not been totaled. During the COVID-19 pandemic, we have continued to operate the company globally. We have a robust business continuity plan that balances employee safety with the ability to get our products to market, run logistics and manage the supply chain from multiple locations with a wide range of suppliers and partners. We remain committed to delivering to our customers, and our sales teams are available to support them as always, along with our dedicated engineering and support staff.

Comment

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?
Downstream

Opportunity type
Energy source

Primary climate-related opportunity driver
Participation in carbon market

Primary potential financial impact
Increased revenues resulting from increased demand for products and services

Company-specific description
Cree may potentially benefit from carbon tax changes because we have always focused our priorities on improving the design and energy efficiency of our products. Our LED, power, and radio frequency products substantially reduce the amount of customer energy consumption and associated GHGs emitted. If a carbon tax system is established in the future, we will be able to provide energy efficient, less-emissive, and long-lasting products to meet customer needs. Carbon taxes may also enable us to gain new customers seeking products that emit less GHGs in order to lower their carbon tax payments.

Time horizon
Long-term

Likelihood
About as likely as not

Magnitude of impact
High

Are you able to provide a potential financial impact figure?
Yes, a single figure estimate

Potential financial impact figure (currency)
2100000000

Potential financial impact figure – minimum (currency)
<Not Applicable>

Potential financial impact figure – maximum (currency)
<Not Applicable>

Explanation of financial impact figure
The potential financial impact is reported on an annualized basis. We expect an increase in demand for our power and radio frequency products. Our power and radio frequency products greatly reduce power loss, resulting in less electricity wasted (and thus fewer GHGs emitted). We anticipate our power and radio frequency revenue to increase from $538 million in FY2019 to about $1.5 billion by FY2024. We also expect our LED business to continue growing and anticipate our LED revenue to steadily increase from $524 million in FY2019 to about $0.6 billion in FY2024.

Cost to realize opportunity
157900000

Strategy to realize opportunity and explanation of cost calculation
Cree's research and development employees are responsible for developing energy efficient, long-lasting, and innovative products. We will continue to innovate for the future and develop industry-leading energy efficient products. We are constantly developing new technologies and creating new markets for our products. Cree's research and development employees' compensation is tied to continuing to develop these products.

Comment
The cost to realize opportunity is reported on an annualized basis. We invest significant resources in research and development ($157.9 million in fiscal year 2019). Research and development costs listed here are for all of Cree's product types (LED, power, and radio frequency).

Identifier
Opp2

Where in the value chain does the opportunity occur?
Downstream

Opportunity type
Resilience

Primary climate-related opportunity driver
Participation in renewable energy programs and adoption of energy-efficiency measures

Primary potential financial impact
Increased revenues resulting from increased demand for products and services

Company-specific description
Cree may potentially benefit from product efficiency programs because we have always focused our priorities on improving the design and energy efficiency of our products. Cree is transparent regarding product efficiency and information about our products' efficiency can be found on our website. Our power products can also be used in renewable energy applications, including solar power systems. Solar power systems designed around Cree's silicon carbide (SiC) power devices offer huge efficiency gains and permit smaller system size, weight and cost.

Time horizon
Medium-term

Likelihood
Likely

Magnitude of impact
High

Are you able to provide a potential financial impact figure?
Yes, a single figure estimate

Potential financial impact figure (currency)
1500000000

Potential financial impact figure – minimum (currency)
<Not Applicable>

Potential financial impact figure – maximum (currency)
<Not Applicable>

Explanation of financial impact figure
The potential financial impact is reported on an annualized basis. We expect an increase in demand for our power and radio frequency products. Our power and radio frequency products greatly reduce power loss, resulting in less electricity wasted (and thus fewer GHGs emitted). We anticipate our power and radio frequency revenue to increase from $538 million in FY2019 to about $1.5 billion by FY2024

Cost to realize opportunity
157900000

Strategy to realize opportunity and explanation of cost calculation
Many of our products are REACH and RoHS compliant. Our operations are ISO 14001, ISO 9001 and/or IATF 16949 certified. We have dedicated staff to ensure that our products and operations meet various regulations and standards.

Comment
The cost to realize opportunity is reported on an annualized basis. We do not anticipate issues with meeting US national product efficiency regulations and standards. We invest significant resources in research and development ($157.9 million in fiscal year 2019). Research and development costs listed here are for all of Cree's product types (LED, power, and radio frequency).

Identifier
Opp3

Where in the value chain does the opportunity occur?
Downstream

Opportunity type
Resilience

Primary climate-related opportunity driver
Other, please specify (Increased revenue through new products and services related to ensuring resiliency)

Primary potential financial impact
Increased revenues resulting from increased demand for products and services

Company-specific description
We see an opportunity to help customers if there is an increase in mean temperature. For lighting applications, not only do Cree LEDs allow our customers to use less energy to produce the same amount light as a traditional lighting source (e.g., fluorescent), they also produce less heat, saving energy on air conditioning.

Time horizon
Medium-term

Likelihood
More likely than not

Magnitude of impact

Medium-high

Are you able to provide a potential financial impact figure?
Yes, a single figure estimate

Potential financial impact figure (currency)
600000000

Potential financial impact figure – minimum (currency)
<Not Applicable>

Potential financial impact figure – maximum (currency)
<Not Applicable>

Explanation of financial impact figure
The potential financial impact is reported on an annualized basis. We expect our LED business to continue growing and anticipate our LED revenue to steadily increase from $524 million in FY2019 to about $0.6 billion in FY2024.

Cost to realize opportunity
157900000

Strategy to realize opportunity and explanation of cost calculation
Cree's research and development employees are responsible for developing energy efficient, long-lasting, and innovative products. We will continue to innovate for the future and develop industry-leading energy efficient products. We are constantly developing new technologies and creating new markets for our products.

Comment
The cost to realize opportunity is reported on an annualized basis. We invest significant resources in research and development ($157.9 million in fiscal year 2019). Research and development costs listed here are for all of Cree's product types (LED, power, and radio frequency).

Identifier
Opp4

Where in the value chain does the opportunity occur?
Downstream

Opportunity type
Resilience

Primary climate-related opportunity driver
Other, please specify (Increased revenue through new products and services related to ensuring resiliency)

Primary potential financial impact
Increased revenues resulting from increased demand for products and services

Company-specific description
We see changes in precipitation extremes and droughts and how it affects crop yields as a possible opportunity for us. Growing food using LED lighting is becoming increasingly important to feeding the world's rapidly growing population. If more crop production occurs in controlled indoor environments, Cree can provide LEDs to support these horticulture operations. Cree has the broadest portfolio of high-performing white and color LEDs optimized for horticulture lighting. Cree LEDs deliver the industry's highest output and efficiency to enable the replacement of high pressure sodium (HPS) while using less power. Cree's white LEDs deliver the full spectrum of light to mimic natural sunlight, while its color LEDs deliver high PPF in the wavelengths suited for the different stages of plant growth. Our ability to solve problems for customers, by lowering the energy usage and cost of LED-assisted greenhouses, can mean a competitive advantage for growers, especially in areas of the world which are not suitable for growing crops including Europe and other colder climates. Our LEDs will also allow people to grow food in areas which experience shifts in their climate (e.g., changes in rainfall amounts, temperature, etc.) which no longer allow them to successfully grow crops. The ability to grow crops in a more controlled greenhouse environment may also reduce the need for pesticides and other expensive and potentially dangerous chemicals.

Time horizon
Medium-term

Likelihood
More likely than not

Magnitude of impact
High

Are you able to provide a potential financial impact figure?
Yes, a single figure estimate

Potential financial impact figure (currency)
600000000

Potential financial impact figure – minimum (currency)
<Not Applicable>

Potential financial impact figure – maximum (currency)
<Not Applicable>

Explanation of financial impact figure
The potential financial impact is reported on an annualized basis. We expect our LED business to continue growing and anticipate our LED revenue to steadily increase rom $524 million in FY2019 to about $0.6 billion in FY2024

Cost to realize opportunity
157900000

Strategy to realize opportunity and explanation of cost calculation
Cree's research and development employees are responsible for developing energy efficient, long-lasting, and innovative products. We will continue to innovate for the future and develop industry-leading energy efficient products. We are constantly developing new technologies and creating new markets for our products.

Comment
The cost to realize opportunity is reported on an annualized basis. We invest significant resources in research and development ($157.9 million in fiscal year 2019). Research and development costs listed here are for all of Cree's product types (LED, power, and radio frequency).

Identifier
Opp5

Where in the value chain does the opportunity occur?
Downstream

Opportunity type
Products and services

Primary climate-related opportunity driver
Shift in consumer preferences

Primary potential financial impact
Increased revenues resulting from increased demand for products and services

Company-specific description
Cree may benefit from changes in consumer/customer behavior because we have always focused our priorities on improving the design and energy efficiency of our products. We believe that our LED, power, and radio frequency products appeal to the growing number of eco-conscious consumers and commercial customers who want energy efficient, less-emissive, and long-lasting products. We believe we will be able to meet the growing demand for energy efficient products resulting from changes in customer preferences.

Time horizon
Medium-term

Likelihood
Likely

Magnitude of impact
High

Are you able to provide a potential financial impact figure?
Yes, a single figure estimate

Potential financial impact figure (currency)
2100000000

Potential financial impact figure – minimum (currency)
<Not Applicable>

Potential financial impact figure – maximum (currency)
<Not Applicable>

Explanation of financial impact figure
The potential financial impact is reported on an annualized basis. We expect an increase in demand for our power and radio frequency products. Our power and radio frequency products greatly reduce power loss, resulting in less electricity wasted (and thus fewer GHGs emitted). We anticipate our power and radio frequency revenue to increase from $538 million in FY2019 to about $1.5 billion by FY2024. We also expect our LED business to continue growing and anticipate our LED revenue to steadily increase from $524 million in FY2019 to about $0.6 billion in FY2024.

Cost to realize opportunity
157900000

Strategy to realize opportunity and explanation of cost calculation
Cree's research and development employees are responsible for developing energy efficient, long-lasting, and innovative products. We will continue to innovate for the future and develop industry-leading energy efficient products. We are constantly developing new technologies and creating new markets for our products.

Comment
The cost to realize opportunity is reported on an annualized basis. We invest significant resources in research and development ($157.9 million in fiscal year 2019). Research and development costs listed here are for all of Cree's product types (LED, power, and radio frequency).

Identifier
Opp6

Where in the value chain does the opportunity occur?
Downstream

Opportunity type
Resource efficiency

Primary climate-related opportunity driver
Use of more efficient modes of transport

Primary potential financial impact
Increased revenues resulting from increased demand for products and services

Company-specific description
The potential financial impact is reported on an annualized basis. Cree foresees an increased demand for more efficient forms of transportation, including electric vehicles. Many automotive companies are increasingly investing in the electric vehicle market and Cree's power products can be used in electric vehicles. Our Gen3 Silicon Carbide MOSFETs, for example, enable faster, more efficient charging and increase power density of the electric circuits. Our silicon carbide (SiC) products allow electric vehicles to go farther, charge faster, and perform better. In 2018 we released E-Series™, a new family of SiC semiconductor devices for the electric vehicle and renewable energy markets. The E-Series family is the first commercial family of SiC metal oxide semiconductor field effect transistors (MOSFETs) and diodes to be automotive AEC-Q101 qualified and PPAP capable. The designation makes it the only commercially available family of SiC MOSFETs and diodes that meet high-humidity and automotive qualifications to deliver some of the most reliable and corrosion-resistant components in the power market today. With the new automotive-qualified SiC MOSFET, Wolfspeed becomes the first and only silicon carbide semiconductor manufacturer to offer a complete family of qualified parts to the EV market. In 2019, we introduced the 5th generation (C5D) 1700V SiC Schottky diode, which is optimized for renewable energy, industrial power and electric vehicle charging applications including solar power and wind turbine inverters, off-board chargers and uninterruptible power supply (UPS). Our new Schottky diodes feature essentially no switching losses due to nearly zero reverse recovery and the industry's lowest forward voltage drop. This generates higher efficiencies and systems that are smaller, cooler, faster and lower cost than possible with silicon (Si) bipolar devices. The C5D product family boasts the industry's largest range of current ratings at this voltage.

Time horizon
Medium-term

Likelihood
Very likely

Magnitude of impact
High

Are you able to provide a potential financial impact figure?
Yes, a single figure estimate

Potential financial impact figure (currency)
1500000000

Potential financial impact figure – minimum (currency)
<Not Applicable>

Potential financial impact figure – maximum (currency)
<Not Applicable>

Explanation of financial impact figure
We expect an increase in demand for our power and radio frequency products. Our power and radio frequency products greatly reduce power loss, resulting in less electricity wasted (and thus fewer GHGs emitted). The potential financial impact is reported on an annualized basis. We anticipate our power and radio frequency revenue to increase from $538 million in FY2019 to about $1.5 billion by FY2024

Cost to realize opportunity
157900000

Strategy to realize opportunity and explanation of cost calculation
Cree's research and development employees are responsible for developing energy efficient, long-lasting, and innovative products. We will continue to innovate for the future and develop industry-leading energy efficient products. We are constantly developing new technologies and creating new markets for our products.

Comment
The cost to realize opportunity is reported on an annualized basis. We invest significant resources in research and development ($157.9 million in fiscal year 2019). Research and development costs listed here are for all of Cree's product types (LED, power, and radio frequency).

C3. Business Strategy

C3.1

(C3.1) Have climate-related risks and opportunities influenced your organization's strategy and/or financial planning?
Yes, and we have developed a low-carbon transition plan

C3.1a

(C3.1a) Does your organization use climate-related scenario analysis to inform its strategy?
Yes, qualitative

C3.1b

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

Climate-related scenarios and models applied	Details
IRENA	Cree reviewed all climate-related scenarios on this list and eliminated options that heavily relied on carbon sequestration as a technology that is not progressing as rapidly as the scenarios require. Other scenarios were eliminated based on whether they included global carbon taxes. Global carbon taxes are not perceived as being realistic in the next 10 years, which is the timeframe we used during our analysis. Cree used IRENA because we feel that it is a scenario that could reasonably occur in the future and because it promotes energy efficiency measures and increased adoption of renewable energy, which aligns with our business focus and strategy. We assessed our strengths, weaknesses, opportunities, and threats in the IRENA scenario for all Cree operations and our supply chain on a long-term (10 year) timeframe because the IRENA climate-scenario considers CO2 emissions reductions by 2050. Even though IRENA is projected to 2050, the impacts within the next 10 years are significant with existing technologies. The results of Cree's IRENA scenario analysis exercise include: Strengths: The energy efficiency impacts of our current products can help with the energy efficiency needs specified in the IRENA scenario. Developing energy efficient products is part of our everyday culture and what motivates our employees. Our products also allow for the development of other energy efficient products (e.g., renewable energy, electric vehicles). Our research and development drives innovation and speed to market for energy efficient products in the marketplace. Cree is vertically integrated which helps minimizes our supply chain risks. Weaknesses: Our planning processes are typically shorter than the 10 year time frame used in this analysis. Electricity is a large input to our manufacturing process and we currently only purchase renewable energy directly at our Morgan Hill facility, which represents a small amount compared to other Cree's manufacturing sites' electricity usage. Any use of renewable energy at our other facilities is based on our electric utilities' energy mix. Opportunities: Cree's potential for growth stems largely from continued development of products that support increases in energy efficiency including the transition to LED lighting. Cree's power and radio frequency products allow other industries to develop leading energy efficient products in applications such as renewable energy, wireless communication, electric vehicles, and electric vehicle charging. In the IRENA scenario, all these technology changes will be required to reduce CO2 emissions. Regulation in the form of carbon taxes could increase demand for our products, and could offset increases in operational cost from the tax. In our operations, we could diversify our energy supply by implementing renewable energy at our sites to replace our current electricity from non-renewable sources. The increased adoption of energy efficient transportation will require increased electrification and improvements in the world's current energy grid. The current state of our energy grid will not support the large anticipated shift to electric vehicle adoption and we believe that our products can enable improvements in the energy grid. Threats: It is possible that other more energy efficient technologies not yet developed could replace ours, putting our business at risk. If the impacts due to climate change worsen, Cree could experience supply chain disruptions due to extreme weather events and/or climate shifts. Energy grid capacity constraints could affect the adoption of new technologies that use our products. The results from the IRENA analysis reinforce our new strategy toward significant investment in our power and radio frequency division. The market for energy efficient products (i.e., renewable energy, electric vehicles) is expected to expand and our products are more efficient than existing technologies.

C3.1d

(C3.1d) Describe where and how climate-related risks and opportunities have influenced your strategy.

	Have climate-related risks and opportunities influenced your strategy in this area?	Description of influence
Products and services	Yes	Climate change opportunities have influenced our strategy. Cree was founded upon the premise that our silicon carbide (SiC) based technology for LEDs, power and radio frequency (RF) devices could fundamentally change the efficiency of energy use around the world. Our mission is to lead the innovation and commercialization of SiC and gallium nitride (GaN), liberating designers to invent power and wireless systems for a responsible, energy efficient future. Our power and RF products allow other industries to develop leading energy efficient products in applications such as renewable energy, wireless communication and electric vehicles. Our RF products help enable the transition to 5G, which requires the transmission of more data at faster speeds with greater precision. Smart cities, smart manufacturing, autonomous vehicles and connected transportation can all be realized through the availability of 5G. Our products can achieve the greater bandwidth and efficiency that 5G requires. Horticulture is also one of Cree's strategic LED applications. Growing food using LED lighting is becoming increasingly important to feeding the world's rapidly growing population. Our ability to solve problems for customers, by lowering the energy usage and cost of LED-assisted greenhouses, can mean a competitive advantage for growers, especially in areas of the world which are not suitable for growing crops including Europe and other colder climates. Our LEDs will also allow people to grow food in areas which experience shifts in their climate (e.g., changes in rainfall amounts, temperature, etc.) which no longer allow them to successfully grow crops. We have always focused our priorities on improving the energy efficiency of our products, which in turn have a lower impact on the environment and climate change. The products we produce and sell globally actually result in a net positive impact on climate change. Our LED, power and RF products sold in 2019 will save approximately 350 million MWh and 140 million metric tons CO2e over their estimated lifetimes compared to less efficient alternative products (e.g., silicon-based power products, silicon- or gallium arsenide-based RF products).
Supply chain and/or value chain	Yes	Our climate change risks have influenced our strategy regarding our supply chain. Annually, various departments including Environment, Health and Safety, Corporate Sales and Marketing, Legal, Operations, and Investor Relations meet to discuss Cree-specific physical and transitional risks and opportunities due to climate change. During our climate-related risk assessments we have considered the affect climate change could have on the suppliers of our raw materials. We rely on global suppliers for raw materials, who depending on their location, may be subject to various supply constraints, including those due to climate change. In an instance where Cree depends on a number of limited source supplier for certain raw materials, components, services and equipment used in the manufacturing of our products, climate change-related risks could affect Cree. Outside of our annual meeting to assess climate risks and opportunities, Cree also assesses upstream supply chain risks by calculating our upstream Scope 3 GHG emissions, which helps us better understand our impact. Our Purchasing division manages both physical and transitional risks and opportunities in our supply chain. Our dedicated staff, Supplier Code of Conduct, Purchase Order Terms and Conditions, and Responsible Minerals Sourcing Policy help Cree manage potential supply chain risks, including those associated with climate change. Where possible, Cree seeks to obtain goods and services from local suppliers in the locations where Cree conducts business, which helps to reduce our risk of business interruptions when climate-related issues may arise and lowers transportation emission impacts.
Investment in R&D	Yes	Our climate change opportunities have influenced our strategy regarding our investment in R&D. Climate change is inherently integrated into our business objectives and strategy. Cree is a market-leading innovator of lighting class LEDs and semiconductor products for power and radio frequency applications. Cree was founded upon the premise that our silicon carbide (SiC) based technology for LEDs, power devices, and radio frequency devices could fundamentally change the efficiency of electricity use around the world. We invest significant resources in R&D. Cree's research and development employees are responsible for developing energy efficient, long-lasting, and innovative products. We will continue to innovate for the future and develop industry-leading energy efficient products. We are constantly developing new technologies and creating new markets for our products.
Operations	Yes	Our climate change risks and opportunities have influenced our strategy. We have improved yield by increasing the size of the SiC wafers produced which yields more product per the same amount of input (e.g., electricity and GHGs used in the production process). Our manufacturing departments collect metrics for production and product mix including energy efficiency and product yield. These metrics are then used to fuel internal decisions regarding process operations, product design, sales goals, etc. We have an incentive program to increase manufacturing yield, resulting in fewer wasted materials, lower usage of GHGs in the manufacturing process, and reduced costs. Our business strategy has also enabled Cree to join The Climate Group's EP100 initiative in 2017. Our new strategic focus is to build a powerhouse semiconductor company around our power and RF products and a new corporate-wide EP100 goal was developed in 2019, where we proposed to double our energy productivity in terms of revenue per MWh of energy consumed in manufacturing. The foreseen increased demand for energy efficient technologies like renewable energy and electric vehicles due to their impacts on energy efficiency and climate change, further supports our focus and strategy. In 2019 we announced plans invest up to $720 million in the expansion of our silicon carbide (SiC) capacity, which will generate up to a 30-fold increase in SiC wafer fabrication capacity and 30-fold increase in SiC materials production. We also announced our plans to build a brand new, state-of-the-art, automotive-qualified 200mm-capable wafer fabrication facility in Marcy, New York, complemented by our mega materials factory expansion currently underway at our Durham headquarters. The new fabrication facility will be a bigger, highly-automated factory with greater output capability. Cree also uses a materiality assessment to review and prioritize sustainability objectives. Product innovation (including improvements in energy efficiency) and energy efficiency of operations have been identified as two of the most important aspects by both internal and external stakeholders. Our Environment, Health and Safety department collects environmental metrics and works with other departments, including production and facilities, to ensure regulatory compliance and environmental operational efficiency.

C3.1e

(C3.1e) Describe where and how climate-related risks and opportunities have influenced your financial planning.

	Financial planning elements that have been influenced	Description of influence
Row 1	Revenues Indirect costs Capital expenditures Acquisitions and divestments Access to capital	Revenues: Our identified risks have not impacted our revenue financial planning since our risks are more on a medium-term or long-term time frame. Our climate change opportunities are impacted because we foresee an increase in demand for our power and radio frequency products in the short-, medium-, and long-term. Our power and radio frequency products greatly reduce power loss, resulting in less electricity wasted (and thus fewer GHGs emitted). In 2019, these opportunities have allowed us to bring new products to market, contributing to an increase our power and radio frequency revenue. We anticipate our power and radio frequency revenue could increase from $524 million in FY2019 to about $0.6 billion in FY2024. We also expect our LED business to continue growing and anticipate our LED revenue could increase from $524 million in FY2019 to about $0.6 billion in FY2024. Indirect costs: Our operating costs are currently established in our budgets on a short-term time frame. Our identified risks have not yet greatly impacted our operating cost planning process since our risks are on a medium-term or long-term time frame. Our manufacturing operations heavily rely on the use of electricity. We have not seen major changes in fuel or electricity costs and do not anticipate major changes in the short-term and medium-term. However, in 2018 we developed an intensity electricity reduction goal (electricity per revenue) to address any changes that may occur with electricity costs as we grow our capacity in the future. We retired this goal in 2019 to focus on our new corporate-wide EP100 goal, which is to double our energy productivity in terms of revenue per MWh of energy consumed in manufacturing by 2040, using 2017 as our baseline. Since we foresee an increase in demand for our power and radio frequency products, in 2018 and 2019 we targeted converting the majority of our Wolfspeed power production from 100mm to 150mm substrates. Because we aimed to make the transition in a cost-effective and timely manner, in many cases we relied on contractors for production capacity, logistics support and certain administrative functions including hosting of certain information technology software applications. These added functions affect our operating costs. Capital expenditures: Our opportunities have been factored into our capital expenditures planning, as we foresee an increase in demand for our energy efficient power and radio frequency products and as a result plan to invest in expanding our operations in the short-term. Further investment in our power and radio frequency division requires an increase in capital expenditures. At our existing sites, Cree has increased production capacity by adding new equipment and infrastructure to meet the increased demand for our products. In 2019 we announced plans invest up to $720 million in the expansion of our silicon carbide (SiC) capacity, which will generate up to a 30-fold increase in SiC wafer fabrication capacity and 30-fold increase in SiC materials production to meet the expected market growth by 2024. We also announced our plans to establish a SiC corridor on the East Coast of the United States with the creation of the world's largest SiC fabrication facility. Our plans include building a brand new, state-of-the-art, automotive-qualified 200mm-capable wafer fabrication facility in Marcy, New York, complemented by our mega materials factory expansion currently underway at our Durham headquarters. The new fabrication facility will be a bigger, highly-automated factory with greater output capability. The plan enables 25 percent increased capacity with lower net capital expenditures. Our expansion plan marks Cree's largest investment to date in fueling our Wolfspeed silicon carbide and GaN on silicon carbide business. We have also factored our risks into our capital expenditures planning. Access to capital: Our identified risks have not yet impacted our access to capital since they are on a medium-term or long-term time frame. We anticipate our climate change opportunities to be impacted because we foresee an increase in demand for our energy efficient LED, power and radio frequency products in the short-, medium- and long-term. In 2019 we announced plans invest up to $720 million in the expansion of our silicon carbide (SiC) capacity, which will generate up to a 30-fold increase in SiC wafer fabrication capacity and 30-fold increase in SiC materials production to meet the expected market growth by 2024. We also announced our plans to establish a SiC corridor on the East Coast of the United States with the creation of the world's largest SiC fabrication facility. Our plans include building a brand new, state-of-the-art, automotive-qualified 200mm-capable wafer fabrication facility in Marcy, New York, complemented by our mega materials factory expansion currently underway at our Durham headquarters. The new fabrication facility will be a bigger, highly-automated factory with greater output capability. The plan enables 25 percent increased capacity with lower net capital expenditures.Our expansion plan marks the Cree's largest investment to date in fueling our Wolfspeed silicon carbide and GaN on silicon carbide business. Acquisitions and Divestments: Our identified risks have not yet impacted our acquisitions planning but our climate change opportunities have been impacted in the short-term. We are expanding our power and radio frequency division due to increased demand, and in 2018 we acquired Infineon's RF Power Business for approximately € 345 million. This acquisition allows Cree's wireless market opportunity to expand, especially in terms of positioning our products to enable faster 4G networks and being on the forefront of providing products to transition to 5G. To further our strategy to create a more focused, powerhouse semiconductor company, we divested our Lighting Products business unit in 2019 for approximately $310 million before tax impacts. This transaction provided significant resources to help accelerate the growth of our power and radio frequency division.

C3.1f

(C3.1f) Provide any additional information on how climate-related risks and opportunities have influenced your strategy and financial planning (optional).

All information on how climate-related risks and opportunities have influenced your strategy and financial planning has been captured in question C3.1e.

C4. Targets and performance

C4.1

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

Intensity target

C4.1b

(C4.1b) Provide details of your emissions intensity target(s) and progress made against those target(s).

Target reference number

Int 1

Year target was set

2018

Target coverage

Site/facility

Scope(s) (or Scope 3 category)

Scope 2 (location-based)

Intensity metric

Other, please specify (kWh/Revenue)

Base year
2018

Intensity figure in base year (metric tons CO2e per unit of activity)
265

% of total base year emissions in selected Scope(s) (or Scope 3 category) covered by this intensity figure
80

Target year
2020

Targeted reduction from base year (%)
8

Intensity figure in target year (metric tons CO2e per unit of activity) [auto-calculated]
243.8

% change anticipated in absolute Scope 1+2 emissions
0

% change anticipated in absolute Scope 3 emissions
0

Intensity figure in reporting year (metric tons CO2e per unit of activity)
263

% of target achieved [auto-calculated]
9.43396226415094

Target status in reporting year
Replaced

Is this a science-based target?
No, but we anticipate setting one in the next 2 years

Please explain (including target coverage)
In 2018 we developed an electricity goal to decrease our electricity usage per revenue by 8% at our North Carolina facilities by Q3 and Q4 FY 2020 (January through June 2020). Our goal focuses on North Carolina facilities because they currently represent the largest share of Cree's total global manufacturing electricity usage. Our baseline for the goal is Q1 and Q2 FY 2019 (July through December 2018). This goal was replaced by our new corporate-wide EP100 goal in 2019.

Target reference number
Int 2

Year target was set
2019

Target coverage
Business activity

Scope(s) (or Scope 3 category)
Scope 1+2 (location-based)

Intensity metric
Other, please specify (Revenue/MWh)

Base year
2017

Intensity figure in base year (metric tons CO2e per unit of activity)
1909

% of total base year emissions in selected Scope(s) (or Scope 3 category) covered by this intensity figure
98

Target year
2040

Targeted reduction from base year (%)
0

Intensity figure in target year (metric tons CO2e per unit of activity) [auto-calculated]
1909

% change anticipated in absolute Scope 1+2 emissions
-10

% change anticipated in absolute Scope 3 emissions
0

Intensity figure in reporting year (metric tons CO2e per unit of activity)
2099

% of target achieved [auto-calculated]
<Not Applicable>

Target status in reporting year
New

Is this a science-based target?
No, but we anticipate setting one in the next 2 years

Please explain (including target coverage)

In 2017 Cree joined the EP100 initiative to double our energy productivity (lumens produced at our facility per electricity consumed in manufacturing) by 2020. We met this goal for our lighting products in 2017. In 2018, we developed a goal of reducing electricity intensity by 8% by 2020 at our North Carolina facilities. We retired this goal in 2019 to focus on our new corporate-wide EP100 goal, which is to double our energy productivity in terms of revenue per MWh of energy consumed in manufacturing by 2040, using 2017 as our baseline. Because our goal is output per energy and increasing that metric will result in us achieving our goal (i.e., this is not a reduction goal), we cannot enter a targeted reduction from base year (%) because our progress will show a negative trend, which is not the case. We achieved a metric of 2099 (revenue/MWh) in 2019, which equates to achieving 55% of our target.

C4.2

(C4.2) Did you have any other climate-related targets that were active in the reporting year?

No other climate-related targets

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	2	0
To be implemented*	2	730400
Implementation commenced*	0	0
Implemented*	2	13905600
Not to be implemented	2	1990

C4.3b

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

Initiative category & Initiative type

Energy efficiency in production processes	Other, please specify (Improvements to our CDA, chiller and exhaust systems)

Estimated annual CO2e savings (metric tonnes CO2e)
5600

Scope(s)
Scope 2 (location-based)

Voluntary/Mandatory
Voluntary

Annual monetary savings (unit currency – as specified in C0.4)
600000

Investment required (unit currency – as specified in C0.4)
50000

Payback period
1-3 years

Estimated lifetime of the initiative
1-2 years

Comment
We had multiple energy efficiency projects at our Huizhou, China facility during 2019, including improvements to our CDA, chiller and exhaust systems. The total savings of all projects is reported here.

Initiative category & Initiative type

Other, please specify	Other, please specify (sold energy efficient products)

Estimated annual CO2e savings (metric tonnes CO2e)
13000000

Scope(s)
Scope 3

Voluntary/Mandatory
Voluntary

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

Investment required (unit currency – as specified in C0.4)
689000000

Payback period
<1 year

Estimated lifetime of the initiative
Ongoing

Comment
Our LED, power and radio frequency products sold in 2019 will save approximately 350 million MWh and 140 million metric tons CO2e over their estimated lifetimes compared to less efficient alternative products (e.g., silicon-based power products, silicon- or gallium arsenide-based radio frequency products). Since there are no estimated annual monetary savings and different product types will realize energy and GHG savings over different time frames, we cannot accurately choose a payback period. The value reported in estimated annual CO2e savings is the 140 million metric tons CO2e over our products' estimated lifetimes converted to an estimated annualized value.

C4.3c

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

Method	Comment
Compliance with regulatory requirements/standards	Our products are designed to meet or exceed the energy efficiency standards that have been adopted around the world. These standards have helped drive adoption of our products.
Employee engagement	We want to ensure that all employees work in a safe and healthy environment. We also direct our employee efforts and financial support to community engagement events and organizations . Our GHG impact is summarized and presented to manufacturing leadership and on internal communications to employees to promote awareness of Cree's direct and indirect emissions.
Financial optimization calculations	Reductions in energy usage and emissions correlate to money saved for our business.
Dedicated budget for energy efficiency	We have always focused our priorities on improving the design and energy efficiency of our products. We will continue to innovate for the future and develop the most efficient products.
Dedicated budget for low-carbon product R&D	We are constantly developing new technologies and creating new markets for our products.

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
Company-wide

Description of product/Group of products
Cree's LED chips, LED components, LED modules, power products, and radio frequency products are energy efficient.

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

Taxonomy, project or methodology used to classify product(s) as low-carbon or to calculate avoided emissions
Other, please specify (internal product data)

% revenue from low carbon product(s) in the reporting year
100

% of total portfolio value
<Not Applicable>

Asset classes/ product types
<Not Applicable>

Comment
Our LED, power and radio frequency products sold in 2019 will save approximately 350 million MWh and 140 million metric tons CO2e over their estimated lifetimes compared to less efficient alternative products (e.g., silicon-based power products, silicon- or gallium arsenide-based radio frequency products). Compared to conventional technologies, Cree LED products can deliver the same amount of light while using up to 85 to 90 percent less energy. Our power products are also more energy efficient than competing brands. Replacing a Silicon diode with our Silicon Carbide Schottky diode hard-switched insulated-gate bipolar transistor (IGBT) application reduces switching losses in the diode by 80 percent, while switching losses in the IGBT drop 50 percent.

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 2019

Base year end
December 31 2019

Base year emissions (metric tons CO2e)
247202

Comment
We established a new baseline with 2019 emissions because this is the first year we have included all global facilities (owned and leased manufacturing facilities, R&D-only facilities, sales offices and warehouses) in our data for energy consumption and GHG emissions. We also divested our Lighting Products business unit operations in 2019, which are excluded from our 2019 emissions, so that we can establish a new baseline for our LED, power and radio frequency operations.

Scope 2 (location-based)

Base year start
January 1 2019

Base year end
December 31 2019

Base year emissions (metric tons CO2e)
166055

Comment
We established a new baseline with 2019 emissions because this is the first year we have included all global facilities (owned and leased manufacturing facilities, R&D-only facilities, sales offices and warehouses) in our data for energy consumption and GHG emissions. We also divested our Lighting Products business unit operations in 2019, which are excluded from our 2019 emissions, so that we can establish a new baseline for our LED, power and radio frequency operations.

Scope 2 (market-based)

Base year start
January 1 2019

Base year end
December 31 2019

Base year emissions (metric tons CO2e)
83801

Comment
Our market-based Scope 2 emissions currently only include emissions from owned Cree US manufacturing facilities. The market-based value reported does not include market-based Scope 2 emissions from our China manufacturing facility or any leased facility. We also divested our Lighting Products business unit operations in 2019, which are excluded from our 2019 emissions, so that we can establish a new baseline for our LED, power and radio frequency operations.

C5.2

(C5.2) Select the name of the standard, protocol, or methodology you have used to collect activity data and calculate emissions.
Defra Voluntary 2017 Reporting Guidelines
IEA CO2 Emissions from Fuel Combustion
The Greenhouse Gas Protocol: A Corporate Accounting and Reporting Standard (Revised Edition)
US EPA Center for Corporate Climate Leadership: Direct Emissions from Stationary Combustion Sources
US EPA Mandatory Greenhouse Gas Reporting Rule
US EPA Emissions & Generation Resource Integrated Database (eGRID)

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)
247202

Start date
<Not Applicable>

End date
<Not Applicable>

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 are reporting a Scope 2, market-based figure

Comment
Our market-based Scope 2 emissions only include emissions from Cree owned US manufacturing facilities. The market-based value reported does not include market-based Scope 2 emissions from our China facility or any leased facility because we are unable to access their electricity supplier emission factors (i.e., the exact electricity supplier is unknown or the electricity supplier's CO2e emissions are not publicly available).

C6.3

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

Reporting year

Scope 2, location-based
166055

Scope 2, market-based (if applicable)
83801

Start date
<Not Applicable>

End date
<Not Applicable>

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
Lighting Products business unit operations

Relevance of Scope 1 emissions from this source
Emissions excluded due to recent acquisition

Relevance of location-based Scope 2 emissions from this source
Emissions excluded due to recent acquisition

Relevance of market-based Scope 2 emissions from this source (if applicable)
Emissions excluded due to recent acquisition

Explain why this source is excluded
In early 2019, we divested our Lighting Products business unit operations, which included a facility in Racine, Wisconsin and Durham, North Carolina (referred to as the Weck Drive site). Emissions are excluded due to a divestiture in the early part of the reporting year and because we wanted to establish a new baseline for just our LED, power and radio frequency operations in 2019. We chose "Emissions excluded due to recent acquisition above" even though we did not experience any acquisitions because we felt that is the choice closest to why we did not include our Lighting Products business unit operations in our 2019 emissions.

C6.5

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

Purchased goods and services

Evaluation status
Relevant, calculated

Metric tonnes CO2e
1226573

Emissions calculation methodology
Our purchased goods and services emissions were calculated using spend-based Greenhouse Gas Protocol (Quantis) factors.

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

Please explain
Our purchased goods and services emissions were calculated using spend-based Greenhouse Gas Protocol (Quantis) factors.

Capital goods

Evaluation status
Relevant, calculated

Metric tonnes CO2e
269079

Emissions calculation methodology
Our purchased goods and services emissions were calculated using spend-based Greenhouse Gas Protocol (Quantis) factors.

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

Please explain
Our purchased goods and services emissions were calculated using spend-based Greenhouse Gas Protocol (Quantis) factors.

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

Evaluation status
Relevant, calculated

Metric tonnes CO2e
40064

Emissions calculation methodology
The emissions reported here contain emissions from fuel-and-energy related activities from purchased fuel and electricity for all of Cree's global locations (owned and leased manufacturing facilities, R&D-only facilities, sales offices and warehouses). The emissions also include T&D losses for all of Cree's global locations. The emissions due to purchased fuel and electricity were calculated using Cree's actual fuel and electricity amounts and Greenhouse Gas Protocol (Quantis) factors and DEFRA factors, respectively. Cree calculated US facilities' T&D losses using US EPA EGRID factors and international facilities' T&D losses using World Development Indicators data.

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

Please explain
The emissions reported here contain emissions from fuel-and-energy related activities from purchased fuel and electricity for all of Cree's global locations (owned and leased manufacturing facilities, R&D-only facilities, sales offices and warehouses). The emissions also include T&D losses for all of Cree's global locations. The emissions due to purchased fuel and electricity were calculated using Cree's actual fuel and electricity amounts and Greenhouse Gas Protocol (Quantis) factors and DEFRA factors, respectively. Cree calculated US facilities' T&D losses using US EPA EGRID factors and international facilities' T&D losses using World Development Indicators data.

Upstream transportation and distribution

Evaluation status
Relevant, calculated

Metric tonnes CO2e
5534

Emissions calculation methodology
The emissions reported here contain emissions from upstream transportation and distribution of our purchased goods (e.g., raw materials, equipment). We used transportation emission factors from EPA's Center for Corporate Climate Leadership GHG Emission Factors Hub.

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

Please explain
The emissions reported here contain emissions from upstream transportation and distribution of our purchased goods (e.g., raw materials, equipment). We used transportation emission factors from EPA's Center for Corporate Climate Leadership GHG Emission Factors Hub.

Waste generated in operations

Evaluation status
Relevant, calculated

Metric tonnes CO2e
1486

Emissions calculation methodology
The emissions reported here include emissions from the disposal and transportation of all chemical waste and solid waste from Cree's global manufacturing sites. Waste disposal emission factors used were from EcoInvent and EPA Warm. Emission factors for the transportation of waste were from EPA's Center for Corporate Climate Leadership GHG Emission Factors Hub. We found that for disposal methods where waste is recycled, reused or turned into a fuel, the emission factor is negative. Since this was our first year of calculating emissions associated with the raw material manufacturing of these items that become waste, we feel that using a negative emission factor would unfairly represent the emissions. For these reasons, we have assumed an emission factor of 0 for these disposal methods.

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

Please explain
The emissions reported here include emissions from the disposal and transportation of all chemical waste and solid waste from Cree's global manufacturing sites. Waste disposal emission factors used were from EcoInvent and EPA Warm. Emission factors for the transportation of waste were from EPA's Center for Corporate Climate Leadership GHG Emission Factors Hub. We found that for disposal methods where waste is recycled, reused or turned into a fuel, the emission factor is negative. Since this was our first year of calculating emissions associated with the raw material manufacturing of these items that become waste, we feel that using a negative emission factor would unfairly represent the emissions. For these reasons, we have assumed an emission factor of 0 for these disposal methods.

Business travel

Evaluation status
Relevant, calculated

Metric tonnes CO2e
2997

Emissions calculation methodology
We used US EPA's Scope 3 Inventory Guidance to calculate our emissions from business travel. We used emission factors from EPA's Center for Corporate Climate Leadership GHG Emission Factors Hub.

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

Please explain
We used US EPA's Scope 3 Inventory Guidance to calculate our emissions from business travel. We used emission factors from EPA's Center for Corporate Climate Leadership GHG Emission Factors Hub.

Employee commuting

Evaluation status
Relevant, calculated

Metric tonnes CO2e
507

Emissions calculation methodology
We used US EPA's Scope 3 Inventory Guidance to calculate our emissions from employee commuting. We used emission factors from EPA's Center for Corporate Climate Leadership GHG Emission Factors Hub. We also include estimated GHG emissions from employees who are home-based (i.e., do not travel to one of our offices and work from home) using EPA eGRID emission factors.

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

Please explain
We used US EPA's Scope 3 Inventory Guidance to calculate our emissions from employee commuting. We used emission factors from EPA's Center for Corporate Climate Leadership GHG Emission Factors Hub. We also include estimated GHG emissions from employees who are home-based (i.e., do not travel to one of our offices and work from home) using EPA eGRID emission factors.

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>

Please explain
This category is not relevant because we do not have any upstream leased assets.

Downstream transportation and distribution

Evaluation status
Relevant, calculated

Metric tonnes CO2e
1368

Emissions calculation methodology
The emissions reported here contain emissions from downstream transportation and distribution of our sold products. We used transportation emission factors from EPA's Center for Corporate Climate Leadership GHG Emission Factors Hub.

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

Please explain
The emissions reported here contain emissions from downstream transportation and distribution of our sold products. We used transportation emission factors from EPA's Center for Corporate Climate Leadership GHG Emission Factors Hub.

Processing 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>

Please explain
This category is relevant but not yet calculated.

Use of sold products

Evaluation status
Relevant, calculated

Metric tonnes CO2e
218000000

Emissions calculation methodology
The product use emissions include the emissions associated with the energy required to use Cree products sold in 2019 over their estimated lifetimes. The emissions also include T&D losses for the electricity required to use Cree products sold in 2019 over their estimated lifetimes. Although our products are sold and used globally, we used EPA eGRID emission factors to estimate emissions associated with electricity consumed by our products and from T&D losses. For Cree products used in automotive applications, as a worst case assumption (i.e., assuming no vehicles are EVs), gasoline CO2e emissions were calculated using emission factors from EPA's Center for Corporate Climate Leadership GHG Emission Factors Hub.

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

Please explain
The product use emissions include the emissions associated with the energy required to use Cree products sold in 2019 over their estimated lifetimes. The emissions also include T&D losses for the electricity required to use Cree products sold in 2019 over their estimated lifetimes. Although our products are sold and used globally, we used EPA eGRID emission factors to estimate emissions associated with electricity consumed by our products and from T&D losses. For Cree products used in automotive applications, as a worst case assumption (i.e., assuming no vehicles are EVs), gasoline CO2e emissions were calculated using emission factors from EPA's Center for Corporate Climate Leadership GHG Emission Factors Hub.

End of life treatment of sold products

Evaluation status
Relevant, calculated

Metric tonnes CO2e
10

Emissions calculation methodology
Our product end of life emissions are the emissions associated with disposing of our products and packaging sold in 2019 at the end of their life. EPA WARM emission factors were used and as a worst case, we assumed that all products and packaging were disposed of in a landfill.

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

Please explain
Our product end of life emissions are the emissions associated with disposing of our products and packaging sold in 2019 at the end of their life. EPA WARM emission factors were used and as a worst case, we assumed that all products and packaging were disposed of in a landfill.

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>

Please explain
This category is not relevant because all of our downstream leased assets are included in our Scope 1 and 2 emissions.

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>

Please explain
This category is not relevant because Cree does not have any 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>

Please explain
This category is not relevant to Cree's business operations because Cree is neither an investor company nor a company that provides financial services.

Other (upstream)

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>

Please explain
This category is not relevant because we do not believe we have any additional upstream activities that would result in GHG emissions.

Other (downstream)

Evaluation status
Relevant, calculated

Metric tonnes CO2e
6679

Emissions calculation methodology
The majority of our products are manufactured at our production facilities located in the US and China. We also use contract manufacturers for certain products and aspects of product fabrication, assembly and packaging. Emissions from our contract manufacturers were calculated using spend-based Greenhouse Gas Protocol (Quantis) factors.

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

Please explain
The majority of our products are manufactured at our production facilities located in the US and China. We also use contract manufacturers for certain products and aspects of product fabrication, assembly and packaging. Emissions from our contract manufacturers were calculated using spend-based Greenhouse Gas Protocol (Quantis) factors.

C-CG6.6

(C-CG6.6) Does your organization assess the life cycle emissions of any of its products or services?

	Assessment of life cycle emissions	Comment
Row 1	No, and we do not plan to start doing so within the next two years	We assess the life cycle emissions of all of products (total) in our Scope 3 emissions but do not plan to perform life cycle assessment for individual products at this time.

C6.7

(C6.7) Are carbon dioxide emissions from biogenic 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

0.00038

Metric numerator (Gross global combined Scope 1 and 2 emissions, metric tons CO2e)

413258

Metric denominator

unit total revenue

Metric denominator: Unit total

1080000000

Scope 2 figure used

Location-based

% change from previous year

31

Direction of change

Increased

Reason for change

Our Scope 1 and 2 emissions per revenue increased in 2019 compared to 2018 because of product mix changes. In 2019 we also started including all global sites (owned and leased manufacturing facilities, R&D only facilities, warehouses and sales offices). In 2018, our scope was only owned manufacturing facilities.

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	13610	IPCC Fourth Assessment Report (AR4 - 100 year)
CH4	64	IPCC Fourth Assessment Report (AR4 - 100 year)
N2O	3445	IPCC Fourth Assessment Report (AR4 - 100 year)
HFCs	11646	IPCC Fourth Assessment Report (AR4 - 100 year)
PFCs	52597	IPCC Fourth Assessment Report (AR4 - 100 year)
SF6	131877	IPCC Fourth Assessment Report (AR4 - 100 year)
NF3	3959	IPCC Fourth Assessment Report (AR4 - 100 year)
Other, please specify (Heat Transfer Fluids (HTF))	28602	IPCC Fourth Assessment Report (AR4 - 100 year)
Other, please specify (Refrigerants)	1401	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	247024
China	88
China, Hong Kong Special Administrative Region	47
Finland	12
Germany	9
India	2
Japan	3
Malaysia	2
Republic of Korea	2
Sweden	10
Taiwan, Greater China	5

C7.3

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

By business division
By facility
By activity

C7.3a

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

Business division	Scope 1 emissions (metric ton CO2e)
LED	97174
Power and RF	150029

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
Durham, NC, USA	104162	35.899478	-78.842384
RTP, NC, USA	125059	35.916052	-78.872103
Morgan Hill, CA, USA	17484	37.144353	-121.653201
Huizhou, China	67	23.012883	114.348197
Durham (warehouse), NC, USA	143	35.926622	-78.851328
Albany, NY, USA	18	42.690401	-73.832215
Fayetteville, AR, USA	147	36.042318	-94.168059
Mesa, AZ, USA	12	33.384033	-111.809181
Shanghai, China	10	31.233199	121.383499
Shenzhen, China	8	22.533077	114.069196
Beijing, China	3	39.994741	116.404222
Hong Kong	47	22.427915	114.210908
Munich, Germany	9	48.284908	11.5627
Kista, Sweden	10	59.403996	17.948059
Oulu, Finland	12	65.050092	25.586842
Tokyo, Japan	3	35.655863	139.75668
Suwon, South Korea	2	37.270794	127.068162
Penang, Malaysia	2	5.336597	100.292554
Taipei, Taiwan	5	25.008056	121.483988
Gurgaon, India	2	28.425027	77.068393

C7.3c

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

Activity	Scope 1 emissions (metric tons CO2e)
Manufacturing	246918
Offices (including R&D-only facilities and sales offices)	142
Warehouses	143

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 for in Scope 2 market-based approach (MWh)
United States of America	114939	83801	316518	133927
China	50251	0	69873	0
China, Hong Kong Special Administrative Region	601	0	835	0
Germany	75	0	172	0
Sweden	4	0	197	0
Finland	55	0	226	0
Japan	22	0	48	0
Republic of Korea	17	0	30	0
Malaysia	13	0	20	0
Taiwan, Greater China	48	0	85	0
India	31	0	45	0

C7.6

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

By business division
By facility
By activity

C7.6a

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

Business division	Scope 2, location-based (metric tons CO2e)	Scope 2, market-based (metric tons CO2e)
LED	135152	0
Power and RF	30903	0

C7.6b

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

Facility	Scope 2, location-based (metric tons CO2e)	Scope 2, market-based (metric tons CO2e)
Durham, NC, USA	98855	72665
RTP, NC, USA	14634	10757
Morgan Hill, CA, USA	0	0
Huizhou, China	49968	0
Durham (warehouse), NC, USA	516	379
Albany, NY, USA	57	0
Fayetteville, AR, USA	791	0
Mesa, AZ, USA	87	0
Shanghai, China	139	0
Shenzhen, China	108	0
Beijing, China	35	0
Hong Kong	601	0
Munich, Germany	75	0
Kista, Sweden	4	0
Oulu, Finland	55	0
Tokyo, Japan	22	0
Suwon, South Korea	17	0
Penang, Malaysia	13	0
Taipei, Taiwan	48	0
Gurgaon, India	31	0

C7.6c

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

Activity	Scope 2, location-based (metric tons CO2e)	Scope 2, market-based (metric tons CO2e)
Manufacturing	164248	0
Offices (including R&D-only facilities and sales offices)	1291	0
Warehouses	516	0

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?

Decreased

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	387	Decreased	0.09	We acquired Infineon's RF Power Business in 2018, which includes our Morgan Hill, CA, USA facility. The Morgan Hill facility purchases its electricity from renewable sources, saving an estimated 387 metric tons CO2e in 2019 compared to if the facility had bought all electricity from non-renewable resources (using the EPA eGRID2018 California State Output Emission Rate).
Other emissions reduction activities	5600	Decreased	1.36	We had multiple energy efficiency projects at our Huizhou, China facility during 2019, including improvements to our CDA, chiller and exhaust systems.
Divestment	6691	Decreased	1.62	In 2019, we divested our Lighting Products business unit operations, which included a facility in Racine, Wisconsin and Durham, North Carolina (referred to as the Weck Drive site). The emissions reported are the 2018 Scope 1 and 2 emissions for those facilities.
Acquisitions	0	No change	0	No acquisition activities in 2019.
Mergers	0	No change	0	We did not undergo any mergers in 2019.
Change in output	6641	Decreased	0.2	Cree's usage of fuel and fluorinated gases in its manufacturing processes changed in 2019 compared to 2018 due to changes in output and product mix.
Change in methodology	847	Decreased	0.2	For our owned manufacturing facilities located in North Carolina that have been reported in CDP Climate Change previously, we used updated eGRID 2018 factors for 2019 data. In 2018, we used eGRID 2016 factors for 2018 data. The reduction reported here was calculated using 2019 North Carolina electricity use and eGRID 2018 factors versus eGRID 2016 factors.
Change in boundary	3030	Increased	0.73	We began including all global facilities (owned and leased manufacturing facilities, R&D only facilities, sales offices and warehouses) in our 2019 emissions. 2018 emissions only included owned manufacturing facilities.
Change in physical operating conditions	0	No change	0	We did not change our physical operating conditions in 2019.
Unidentified	0	No change	0	We have not identified any unidentified reasons for any change in our GHG emissions.
Other	0	No change	0	We have not identified other reasons for any change in our GHG emissions.

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

C-CG7.10

(C-CG7.10) How do your total Scope 3 emissions for the reporting year compare to those of the previous reporting year?

Decreased

C-CG7.10a

(C-CG7.10a) For each Scope 3 category calculated in C6.5, specify how your emissions compare to the previous year and identify the reason for any change.

Purchased goods and services

Direction of change

First year of reporting this category

Primary reason for change

<Not Applicable>

Change in emissions in this category (metric tons CO2e)

<Not Applicable>

% change in emissions in this category

<Not Applicable>

Please explain

<Not Applicable>

Capital goods

Direction of change
First year of reporting this category

Primary reason for change
<Not Applicable>

Change in emissions in this category (metric tons CO2e)
<Not Applicable>

% change in emissions in this category
<Not Applicable>

Please explain
<Not Applicable>

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

Direction of change
Increased

Primary reason for change
Change in boundary

Change in emissions in this category (metric tons CO2e)
31403

% change in emissions in this category
262

Please explain
In 2018, we only estimated emissions from transmission and distribution losses for our owned manufacturing facilities. In 2019, we were able to calculate emissions from fuel and electricity as well as transmission and distribution losses. Our 2019 emissions include fuel-and-energy related activities from purchased fuel and electricity for all of Cree's global locations (owned and leased manufacturing facilities, R&D only facilities, sales offices and warehouses). The emissions also include T&D losses for all of Cree's global locations.

Upstream transportation and distribution

Direction of change
First year of reporting this category

Primary reason for change
<Not Applicable>

Change in emissions in this category (metric tons CO2e)
<Not Applicable>

% change in emissions in this category
<Not Applicable>

Please explain
<Not Applicable>

Waste generated in operations

Direction of change
Decreased

Primary reason for change
Divestment

Change in emissions in this category (metric tons CO2e)
177

% change in emissions in this category
10.6

Please explain
In 2019, we divested our Lighting Products business unit operations, which included a facility in Racine, Wisconsin and Durham, North Carolina (referred to as the Weck Drive site). We also had differences in waste disposal amounts and disposal methods at our currently owned sites.

Business travel

Direction of change
Decreased

Primary reason for change
Change in boundary

Change in emissions in this category (metric tons CO2e)
425

% change in emissions in this category
12.4

Please explain
In 2019, we divested our Lighting Products business unit operations, which included a facility in Racine, Wisconsin and Durham, North Carolina (referred to as the Weck Drive site). Our total number of employees decreased when we divested our Lighting Products business unit operations.

Employee commuting

Direction of change
Increased

Primary reason for change
Change in boundary

Change in emissions in this category (metric tons CO2e)
250

% change in emissions in this category
97.3

Please explain
In the past we have only included US-based employees in our employee commuting estimates. In 2019 we estimated employee commuting emissions for all Cree global employees and also included emissions from employees who are home-based (i.e., do not travel to and from our offices).

Downstream transportation and distribution

Direction of change
Decreased

Primary reason for change
Divestment

Change in emissions in this category (metric tons CO2e)
32915

% change in emissions in this category
96

Please explain
In 2019, we divested our Lighting Products business unit operations which changed our downstream transportation and distribution shipments.

Use of sold products

Direction of change
Decreased

Primary reason for change
Divestment

Change in emissions in this category (metric tons CO2e)
2000000

% change in emissions in this category
0.9

Please explain
In 2019, we divested our Lighting Products business unit operations which changed our product mix.

End-of-life treatment of sold products

Direction of change
Decreased

Primary reason for change
Divestment

Change in emissions in this category (metric tons CO2e)
1022

% change in emissions in this category
99

Please explain
In 2019, we divested our Lighting Products business unit operations which changed our product mix.

Other (downstream)

Direction of change
First year of reporting this category

Primary reason for change
<Not Applicable>

Change in emissions in this category (metric tons CO2e)
<Not Applicable>

% change in emissions in this category
<Not Applicable>

Please explain
<Not Applicable>

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 undertook this energy-related activity in the reporting year
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	No
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 (renewable and non-renewable) MWh
Consumption of fuel (excluding feedstock)	LHV (lower heating value)	0	74988	74988
Consumption of purchased or acquired electricity	<Not Applicable>	64563	323486	388048
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>	<Not Applicable>	<Not Applicable>	<Not Applicable>
Consumption of self-generated non-fuel renewable energy	<Not Applicable>	<Not Applicable>	<Not Applicable>	<Not Applicable>
Total energy consumption	<Not Applicable>	64563	398473	463036

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)

Diesel

Heating value

LHV (lower heating value)

Total fuel MWh consumed by the organization

231

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>

Emission factor
74.21

Unit
kg CO2e per million Btu

Emissions factor source
US EPA Mandatory Greenhouse Gas Reporting Regulations - 40 CFR 98 Subpart C, Table C-1 and C-2

Comment

Fuels (excluding feedstocks)
Motor Gasoline

Heating value
LHV (lower heating value)

Total fuel MWh consumed by the organization
221

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>

Emission factor
70.47

Unit
kg CO2e per million Btu

Emissions factor source
US EPA Mandatory Greenhouse Gas Reporting Regulations - 40 CFR 98 Subpart C, Table C-1 and C-2

Comment

Fuels (excluding feedstocks)
Natural Gas

Heating value
LHV (lower heating value)

Total fuel MWh consumed by the organization
74416

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>

Emission factor
53.11

Unit
kg CO2e per million Btu

Emissions factor source
US EPA Mandatory Greenhouse Gas Reporting Regulations - 40 CFR 98 Subpart C, Table C-1 and C-2

Comment

Fuels (excluding feedstocks)
Propane Gas

Heating value
LHV (lower heating value)

Total fuel MWh consumed by the organization
119

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>

Emission factor
61.71

Unit
kg CO2e per million Btu

Emissions factor source
US EPA Mandatory Greenhouse Gas Reporting Regulations - 40 CFR 98 Subpart C, Table C-1 and C-2

Comment

C8.2e

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

Sourcing method
Other, please specify (Grid mix of renewable and carbon-free electricity)

Low-carbon technology type
Other, please specify (Solar, Wind, Hydropower, Nuclear)

Country/region of consumption of low-carbon electricity, heat, steam or cooling
Other, please specify (North Carolina, USA)

MWh consumed accounted for at a zero emission factor
0

Comment
We use local utility electricity mix data and other country-specific information to estimate the amount of renewable and carbon-free (nuclear) electricity we purchase. Our market-based emissions only includes owned manufacturing facilities in the US our North Carolina manufacturing facilities' market-based emissions are based on the local utility's publicly available energy generation and GHG emissions data.

Sourcing method
Other, please specify (Third-party company supplies renewable energy through the local utility's grid)

Low-carbon technology type
Other, please specify (Solar, Wind, Hydropower)

Country/region of consumption of low-carbon electricity, heat, steam or cooling
Other, please specify (California, USA)

MWh consumed accounted for at a zero emission factor
2023.7

Comment
According to information from our utility, all the electricity purchased at our Morgan Hill, CA, USA facility comes from renewable sources (a third-party company supplies renewable energy through the local utility's grid).

C-CG8.5

(C-CG8.5) Does your organization measure the efficiency of any of its products or services?

	Measurement of product/service efficiency	Comment
Row 1	Yes	

C-CG8.5a

(C-CG8.5a) Provide details of the metrics used to measure the efficiency of your organization's products or services.

Category of product or service
Other, please specify (LED, power and radio frequency products)

Product or service (optional)
LED, power and radio frequency products

% of revenue from this product or service in the reporting year
100

Efficiency figure in the reporting year
140000000

Metric numerator
tCO2e

Metric denominator
Not applicable

Comment
Our LED, power and radio frequency products sold in 2019 will save approximately 350 million MWh and 140 million metric tons CO2e over their estimated lifetimes compared to less efficient alternative products (e.g., silicon-based power products, silicon- or gallium arsenide-based radio frequency products).

C9. Additional metrics

C9.1

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

C-CE9.6/C-CG9.6/C-CH9.6/C-CN9.6/C-CO9.6/C-EU9.6/C-MM9.6/C-OG9.6/C-RE9.6/C-ST9.6/C-TO9.6/C-TS9.6

(C-CE9.6/C-CG9.6/C-CH9.6/C-CN9.6/C-CO9.6/C-EU9.6/C-MM9.6/C-OG9.6/C-RE9.6/C-ST9.6/C-TO9.6/C-TS9.6) Does your organization invest in research and development (R&D) of low-carbon products or services related to your sector activities?

	Investment in low-carbon R&D	Comment
Row 1	Yes	Cree's research and development employees are responsible for developing energy efficient, long-lasting, and innovative products. We will continue to innovate for the future and develop industry-leading energy efficient products. We are constantly developing new technologies and creating new markets for our products. We invest significant resources in research and development ($157.9 million in fiscal year 2019).

C-CG9.6a

(C-CG9.6a) Provide details of your organization's investments in low-carbon R&D for capital goods products and services over the last three years.

Technology area
Other energy efficient products or efficiency drivers

Stage of development in the reporting year
Large scale commercial deployment

Average % of total R&D investment over the last 3 years
81 - 100%

R&D investment figure in the reporting year (optional)
1579000

Comment
Cree's research and development employees are responsible for developing energy efficient, long-lasting, and innovative products. We will continue to innovate for the future and develop industry-leading energy efficient products. We are constantly developing new technologies and creating new markets for our products. We invest significant resources in research and development ($157.9 million in fiscal year 2019).

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	Third-party verification or assurance process in place

C10.1a

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

Verification or assurance cycle in place
Annual process

Status in the current reporting year
Complete

Type of verification or assurance
Limited assurance

Attach the statement
Cree_Trinity Assurance Statement_CY2019_FINAL 20200825.pdf

Page/ section reference
Pages 1-3 (all pages)

Relevant standard
ISAE3000

Proportion of reported emissions verified (%)
99

C10.1b

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

Scope 2 approach
Scope 2 location-based

Verification or assurance cycle in place
Annual process

Status in the current reporting year
Complete

Type of verification or assurance
Limited assurance

Attach the statement
Cree_Trinity Assurance Statement_CY2019_FINAL 20200825.pdf

Page/ section reference
Pages 1-3 (all pages)

Relevant standard
ISAE3000

Proportion of reported emissions verified (%)
99

C10.1c

(C10.1c) Provide further details of the verification/assurance undertaken for your Scope 3 emissions and attach the relevant statements.

Scope 3 category
Scope 3: Waste generated in operations

Verification or assurance cycle in place
Annual process

Status in the current reporting year
Complete

Type of verification or assurance
Limited assurance

Attach the statement
Cree_Trinity Assurance Statement_CY2019_FINAL 20200825.pdf

Page/section reference
Pages 1-3 (all pages)

Relevant standard
ISAE3000

Proportion of reported emissions verified (%)
70

Scope 3 category
Scope 3: Upstream transportation and distribution

Verification or assurance cycle in place
Annual process

Status in the current reporting year
Complete

Type of verification or assurance
Limited assurance

Attach the statement
Cree_Trinity Assurance Statement_CY2019_FINAL 20200825.pdf

Page/section reference
Pages 1-3 (all pages)

Relevant standard
ISAE3000

Proportion of reported emissions verified (%)
70

Scope 3 category
Scope 3: Downstream transportation and distribution

Verification or assurance cycle in place
Annual process

Status in the current reporting year
Complete

Type of verification or assurance
Limited assurance

Attach the statement
Cree_Trinity Assurance Statement_CY2019_FINAL 20200825.pdf

Page/section reference
Pages 1-3 (all pages)

Relevant standard
ISAE3000

Proportion of reported emissions verified (%)
70

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?
Yes

C10.2a

(C10.2a) Which data points within your CDP disclosure have been verified, and which verification standards were used?

Disclosure module verification relates to	Data verified	Verification standard	Please explain
C8. Energy	Energy consumption	ISAE 3000	Refer to the attached Assurance Statement. We received limited assurance of our total energy consumption (MWh) data Cree_Trinity Assurance Statement_CY2019_FINAL 20200825.pdf

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 customers

Yes, other partners in the value chain

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

% of customer - related Scope 3 emissions as reported in C6.5
99

Portfolio coverage (total or outstanding)
<Not Applicable>

Please explain the rationale for selecting this group of customers and scope of engagement
All Cree customers can view information about our products and operations on our website, which is publicly available. Information regarding the energy efficiency of our products can be found throughout our website (www.cree.com and www.wolfspeed.com). Further information about our products' energy efficiency, REACH and RoHS declarations and how to dispose of our products at the end of their lives is communicated to our customers on our Product Sustainability page (http://www.cree.com/about/sustainability/environment/product-sustainability). Information about Cree's carbon footprint and climate change risks and opportunities can be found in the Energy and GHG Emissions section of our Sustainability Reports, TCFD reports and our CDP Climate Change surveys (https://www.cree.com/about/sustainability/sustainability-reporting).

Impact of engagement, including measures of success
To better inform our customers, we are committed to transparency of our GHG emissions and climate strategy. Being transparent about our products and operations helps maintain positive relationships and develop new relationships with our customers.

Type of engagement
Other, please specify (Customer surveys)

Details of engagement
Other, please specify (Responding to customer surveys)

% of customers by number
25

% of customer - related Scope 3 emissions as reported in C6.5
0

Portfolio coverage (total or outstanding)
<Not Applicable>

Please explain the rationale for selecting this group of customers and scope of engagement
Many of our customers request that we fill out surveys, which often contain questions about our environmental performance (Cree's Scope 1 and 2 emissions). Cree also engages with customers about climate-related information through annual completion of CDP Climate Change and CDP Supply Chain.

Impact of engagement, including measures of success
Being transparent about our products and operations when completing customer surveys helps maintain positive relationships with our customers. The percent of Scope 3 emissions as reported in C6.5 is reported as 0 because at this time we are not able to allocate emissions based on exact products sold to the customers that request us to fill out environmental performance surveys.

C12.1d

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

All interested parties (e.g., customers, investors, community members) can view information about our products and operations on our website, which is publicly available. Information regarding the energy efficiency of our products can be found throughout our website (www.cree.com and www.wolfspeed.com). Information about our products' energy efficiency, REACH and RoHS declarations, and how to dispose of our products at the end of their lives is communicated on our Product Sustainability page (http://www.cree.com/about/sustainability/environment/product-sustainability). Information about Cree's carbon footprint and climate change risks and opportunities can be found in the Energy and GHG Emissions section of our Sustainability Reports, TCFD reports and our CDP Climate Change surveys (https://www.cree.com/about/sustainability/sustainability-reporting). Cree also engages with investors and customers about climate-related information through annual completion of CDP Climate Change and CDP Supply Chain.

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?
No

C12.3g

(C12.3g) Why do you not engage with policy makers on climate-related issues?

Our mission is to lead the innovation and commercialization of SiC and gallium nitride (GaN), liberating designers to invent power and wireless systems for a responsible, energy efficient future. Our power and radio frequency division has grown into a world-renowned commercial supplier of the fastest, most efficient semiconductor components ever available, enabling greater efficiency and performance, smaller systems and lower costs. Cree's power and radio frequency products allow other industries to develop leading energy efficient products in applications such as renewable energy, wireless communication and electric vehicles. We have not engaged with policy makers on climate-related issues as they relate to our power and radio frequency products, which is our new strategic focus. We choose to engage with other organizations, such as PowerAmerica and The Semiconductor Industry Association, for example, instead of directly engaging with policy makers.

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
Underway – previous year attached

Attach the document
2019_TCFD_Report.pdf

Page/Section reference
Pages 1-2 (all pages)

Content elements
Governance
Strategy
Risks & opportunities
Emissions figures
Emission targets
Other metrics

Comment
We have published a separate TCFD report.

Publication
In voluntary sustainability report

Status
Underway – previous year attached

Attach the document
Cree_Wolfspeed_Sustainability_Report_2019.pdf

Page/Section reference
Pages 3, 38-42, 53-55, 57-58

Content elements
Governance
Strategy
Risks & opportunities
Emissions figures
Emission targets
Other metrics

Comment
Our annual sustainability report contains various climate change-related information.

Publication
In voluntary communications

Status
Complete

Attach the document
Environmental Training.pdf

Page/Section reference
Pages 1-4 (all pages)

Content elements
Emissions figures
Emission targets

Comment
We provide environmental training to our employees, which includes information about energy and GHG emissions. The training attached is an example of training we provide and only contains the information relevant to this survey. All pages of the training are not included in this attachment for confidentiality reasons.

Publication
In other regulatory filings

Status
Complete

Attach the document
2019 EPA GHG Report.pdf

Page/Section reference
Pages 1-17 (all pages)

Content elements
Emissions figures

Comment
We annually report our Scope 1 GHG emissions from semiconductor manufacturing for our facilities subject to the US EPA Mandatory Greenhouse Gas Reporting Rule

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Publication
In voluntary sustainability report

Status
Underway – previous year attached

Attach the document
2019_Data_Report.pdf

Page/Section reference
Pages 2-4

Content elements
Emissions figures

Comment
Our annual sustainability data report contains various climate change-related data.

C15. 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.

C15.1

(C15.1) Provide details for the person that has signed off (approved) your CDP climate change response.

	Job title	Corresponding job category
Row 1	President and CEO	Chief Executive Officer (CEO)

SC. Supply chain module

SC0.0

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

Cree is an innovator of Wolfspeed® power and radio frequency (RF) semiconductors and lighting class LEDs. In addition to providing energy efficient products, we strive to reduce GHG emissions and improve energy efficiency at all Cree sites. To better inform our customers, we are committed to the transparency of our GHG emissions and climate change strategy.

SC0.1

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

	Annual Revenue
Row 1	1080000000