CREE INC. - Climate Change 2018

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, lighting class LEDs and lighting products. Cree's Wolfspeed product families include silicon carbide (SiC) 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 electronic signs and signals. Cree's LED lighting systems and lamps serve indoor and outdoor applications.

Cree has been recognized as a leading innovator by MIT and Fast Company, but our track record of breakthroughs goes back to the company's founding in 1987. We developed the first commercially-viable blue LEDs and continue to innovate for the future. We've demonstrated over the years that Cree is not just an LED company, a materials company, a power and RF company, or a lighting company, but an innovation company that is constantly developing new technology and creating new markets for our products.

C0.2

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

	Start date	End date	Indicate if you are providing emissions data for past reporting years	Select the number of past reporting years you will be providing emissions data for
Row 1	January 1 2017	December 31 2017	No	<Not Applicable>
Row 2	<Not Applicable>	<Not Applicable>	<Not Applicable>	<Not Applicable>
Row 3	<Not Applicable>	<Not Applicable>	<Not Applicable>	<Not Applicable>
Row 4	<Not Applicable>	<Not Applicable>	<Not Applicable>	<Not Applicable>

C0.3

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

China

United States of America

C0.4

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

USD

C0.5

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

Operational control

C1. Governance

C1.1

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

Yes

C1.1a

(C1.1a) Identify the position(s) of the individual(s) on the board with responsibility for climate-related issues.

Position of individual(s)	Please explain
Board/Executive board	Our CEO and Board member Gregg Lowe 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., environmental health and safety, sustainability, emergency management, product development, etc.). More information about Gregg'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	Please explain
Scheduled – some meetings	Reviewing and guiding strategy	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) Below board-level, provide the highest-level management position(s) or committee(s) with responsibility for climate-related issues.

Name of the position(s) and/or committee(s)	Responsibility	Frequency of reporting to the board on climate-related issues
Risk committee	Both assessing and managing climate-related risks and opportunities	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.

The committee with responsibility for climate-related issues consists of Cree employees from various departments, including Environmental Health and Safety, Corporate Sales and Marketing, Legal, and Security and Emergency Operations. Our Legal and Corporate Sales and Marketing departments report directly to the CEO. Our Environmental Health and Safety department reports to the Operations department. Our Security and Emergency Operations department reports to the Human Resources group. Both Operations and Human Resources report to the CEO.

The titles of employees involved in the committee include the Global Environmental Health & Safety Director, Environmental Manager, Associate General Counsel, Emergency Manager, Vice President of Marketing Communications, and Vice President of Marketing and Public Affairs. 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, lighting, and 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 Emergency Manager is responsible for emergency response preparation and strategies and Cree's business continuity plan. The business continuity plan takes into consideration potential risks including risks from climate change that could cause a significant business interruption. Our Environmental Health & Safety department is responsible for corporate sustainability initiatives and compliance with health, safety, and environmental regulations.

The committee meets annually to review the current state of the world's climate (e.g., current atmospheric CO2 levels) as well as assess Cree's long-term climate-related risks and opportunities using climate-related scenario analyses. During the meeting, potential risks to major facilities due to climate change are reviewed, including sea level rise flooding, susceptibility to and preparation for high intensity storms, increased rainfall, and drought. Also considered are raw material sourcing issues and distribution channel impacts that could result from global climate-related impacts.

C1.3

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

Yes

C1.3a

(C1.3a) Provide further details on the incentives provided for the management of climate-related issues.

Who is entitled to benefit from these incentives?
Management group

Types of incentives
Other non-monetary reward

Activity incentivized
Efficiency project

Comment
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 the goal we set for our EP100 energy productivity target (Lumens produced / kWh electricity consumed). 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.

Who is entitled to benefit from these incentives?
All employees

Types of incentives
Monetary reward

Activity incentivized
Energy reduction project

Comment
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.

C2. Risks and opportunities

C2.1

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

	From (years)	To (years)	Comment
Short-term	0	1	
Medium-term	1	10	
Long-term	10	100	

C2.2

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

C2.2a

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

	Frequency of monitoring	How far into the future are risks considered?	Comment
Row 1	Annually	>6 years	Cree is conscious of the potential negative environmental, social, and economic impacts associated with climate change. Annually, Cree employees from various departments, including Environmental Health and Safety, Corporate Sales and Marketing, Legal, and Security and Emergency Operations meet to discuss the risks and opportunities climate change poses to Cree.

C2.2b

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

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, environmental 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 financial, 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 Environmental Health and Safety, Corporate Sales and Marketing, Legal, and Security and Emergency Operations meet to discuss Cree-specific risks and opportunities due to climate change. Potential risks to major facilities due to climate change are reviewed, including sea level rise flooding, susceptibility to and preparation for high intensity storms, increased rainfall, and drought. Also considered are raw material sourcing issues, and distribution channel impacts that could result from global climate-related impacts. We used $1 Million USD to establish a threshold for substantive financial impact.

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.

C2.2c

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

	Relevance & inclusion	Please explain
Current regulation	Relevant, always included	Current regulation is relevant and included in our assessment. However, the current regulation that applies to Cree only requires reporting of greenhouse gas emissions, which is done annually in accordance with such regulation.
Emerging regulation	Relevant, always included	We consider emerging regulation as both a risk and opportunity in our climate-related risk assessments. For example, we discuss 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 technologies. 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.
Technology	Relevant, always included	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 consider risks associated with the possibility of other more energy efficient technologies replacing ours. Our power products enable other energy efficient and renewable energy technologies (e.g., solar energy, electric vehicles) to develop, and we discuss the risks associated with energy grid capacity disruptions and policies and/or local utilities slowing the adoption of these technologies.
Legal	Relevant, always included	Legal issues have not been a significant climate change risk or opportunity for Cree, except for consideration of future regulation as discussed in the emerging regulation section (e.g., we discuss how regulations assigning a cost of carbon would potentially impact our production costs and operations).
Market	Relevant, always included	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). 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	We consider 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 consider risks from climate change and how they would affect customer satisfaction and our external reputation. We also consider operational risks and how they affect our internal reputation with current and future employees.
Acute physical	Relevant, always included	We consider acute physical risks in our climate-related scenario analyses. Cree assesses 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, and drought. 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	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.
Upstream	Relevant, always included	During our climate-related risk assessments we consider the affect climate change could have on the suppliers of our raw materials. Chronic drought or flooding could increase political instability in regions of the world that supply critical raw materials, causing business interruption.
Downstream	Relevant, always included	During our climate-related risk assessments we consider 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.

C2.2d

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

The Board of Directors has the ultimate oversight responsibility for climate-related risk and opportunity management. Cree manages many types of risks including those associated with business and financial decisions, intellectual property, process safety, security, worker protection, as well as risks associated with climate change. Climate-related risks and opportunities are managed in a multi-disciplinary, company-wide manner.

Our Security and Emergency Operations department is responsible for physical risk management, including emergency response preparation and strategies. Our Operations department also manages physical risks that could affect our direct operations, such as extreme weather events. Both departments are responsible for physical opportunities by working on projects to mitigate possible operational disruptions due to climate change. For example, our Security and Emergency Operations department develops Cree's business continuity plan, which takes into consideration potential risks that could cause a significant business interruption. Our Operations group has systems and equipment in place to be able to protect operations in extreme weather events.

Our Environmental Health & Safety department is responsible for climate-related opportunities, including corporate sustainability initiatives, and climate-related risks, including ensuring compliance with health, safety, and environmental regulations. Ensuring compliance with regulatory requirements, including those targeting climate change, is essential to our corporate-wide operations. Cree maintains an ISO14001 certification which helps continuously improve Cree's environmental management system, which includes climate change considerations. Cree also tracks environmental metrics such as water usage, energy usage, GHG emissions, waste generation, etc. and uses this data to prioritize environmental risks and opportunities.

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 Conflict Minerals 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.

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 and renewable energy technologies that use our products (e.g., solar energy, electric vehicles).

C2.3

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

Yes

C2.3a

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

Identifier

Risk 1

Where in the value chain does the risk driver occur?

Direct operations

Risk type

Transition risk

Primary climate-related risk driver
Policy and legal: Increased pricing of GHG emissions

Type of financial impact driver
Policy and legal: Increased operating costs (e.g., higher compliance costs, increased insurance premiums)

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

Potential financial impact
45000000

Explanation of financial impact
We estimate that a carbon tax on our Scope 1 and 2 GHG emissions would be around $45 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.

Management method
We could reduce our Scope 1 GHG emissions and reduce our carbon taxes by adding abatement technologies. 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 have set for our EP100 energy productivity target (Lumens produced / kWh electricity consumed).

Cost of management
3300000

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.

Identifier
Risk 2

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

Risk type
Physical risk

Primary climate-related risk driver
Chronic: Rising mean temperatures

Type of financial impact driver
Increased operating costs (e.g., inadequate water supply for hydroelectric plants or to cool nuclear and fossil fuel plants)

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

Potential financial impact
100000

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

Management method
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 2017 we experienced a wide range of temperatures in Durham, NC, USA (where two of our factories are located): the average temperature was 46°F, the highest temperature was 76°F, and the lowest temperature was 9°F.

Cost of management
0

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
Physical risk

Primary climate-related risk driver
Chronic: Rising sea levels

Type of financial impact driver
Increased capital costs (e.g., damage to facilities)

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

Potential financial impact
10000000

Explanation of financial impact
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.

Management method
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.

Cost of management
0

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?
Supply chain

Risk type
Transition risk

Primary climate-related risk driver
Market: Other

Type of financial impact driver
Other, please specify (Raw material scarcity)

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

Potential financial impact
0

Explanation of financial impact
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.

Management method
We would potentially need to find other suppliers in this situation. Our dedicated staff, Cree's Supplier Code of Conduct and Conflict Minerals Policy help to manage potential risks in our supply chain.

Cost of management
0

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?
Customer

Risk type
Transition risk

Primary climate-related risk driver
Technology: Substitution of existing products and services with lower emissions options

Type of financial impact driver
Technology: Reduced demand for products and services

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

Potential financial impact
0

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

Management method
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. Moreover, a new strategic focus for Cree is development of lighting automation. Our Cree SmartCast® Technology enables users to cut energy costs up to 70 percent and securely integrate lighting with building management systems. With SmartCast® electronics and software all work together to automatically learn and interact with each other and the building space. Lights turn on when the room is occupied and turn off when the room is empty and automatically dim up or down with the amount of sunlight present.

Cost of management
158500000

Comment
The cost of management is reported on an annualized basis. We invest significant resources in research and development ($158.5 million in fiscal year 2017). Research and development costs listed here are for all of Cree's product types (lighting, LED, power, and radio frequency).

Identifier
Risk 6

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

Risk type
Transition risk

Primary climate-related risk driver
Technology: Unsuccessful investment in new technologies

Type of financial impact driver
Other, please specify (Reduced support for new technologies)

Company- specific description
Local utilities 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 store 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

Potential financial impact
5000000

Explanation of financial impact
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.

Management method
We have dedicated staff to manage our facilities' electricity systems and interactions with local utilities and policy makers.

Cost of management
200000

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.

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?
Customer

Opportunity type
Energy source

Primary climate-related opportunity driver
Participation in carbon market

Type of financial impact driver
Returns on investment in low-emission technology

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, lighting, 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

Potential financial impact
2343000000

Explanation of financial impact
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 by a factor of four by 2022. We also expect our LED business to continue growing and anticipate our LED revenue to steadily increase by 2022.

Strategy to realize opportunity

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.

Cost to realize opportunity
158500000

Comment
The cost to realize opportunity is reported on an annualized basis. We invest significant resources in research and development ($158.5 million in fiscal year 2017). Research and development costs listed here are for all of Cree's product types (lighting, LED, power, and radio frequency).

Identifier
Opp2

Where in the value chain does the opportunity occur?
Customer

Opportunity type
Resilience

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

Type of financial impact driver
Increased revenue through new products and services related to ensuring resiliency

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

Potential financial impact
2343000000

Explanation of financial impact
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 by a factor of four by 2022. We also expect our LED business to continue growing and anticipate our LED revenue to steadily increase by 2022.

Strategy to realize opportunity
Many of our LED lighting products are ENERGY STAR certified, which requires that the product meets specific energy efficiency standards. Many of our products are also REACH and RoHS compliant. Our operations are ISO 14001, ISO 9001 and/or ISO/TS 16949 certified. We have dedicated staff to ensure that our products and operations meet various regulations and standards.

Cost to realize opportunity
158500000

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. However, potential building and lighting efficiency requirements that are stricter could require increased investment in research and development. We invest significant resources in research and development ($158.5 million in fiscal year 2017). Research and development costs listed here are for all of Cree's product types (lighting, LED, power, and radio frequency).

Identifier
Opp3

Where in the value chain does the opportunity occur?
Customer

Opportunity type
Resilience

Primary climate-related opportunity driver
Other

Type of financial impact driver
Increased revenue through new products and services related to ensuring resiliency

Company- specific description
We see an opportunity to help customers if there is an increase in mean temperature. Not only do Cree LEDs use less energy to produce the same amount light as a traditional bulb, they also produce less heat, saving energy on air conditioning.

Time horizon
Medium-term

Likelihood
More likely than not

Magnitude of impact
Medium-high

Potential financial impact
1500000000

Explanation of financial impact
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 by 2022.

Strategy to realize opportunity
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.

Cost to realize opportunity
158500000

Comment
The cost to realize opportunity is reported on an annualized basis. We invest significant resources in research and development ($158.5 million in fiscal year 2017). Research and development costs listed here are for all of Cree's product types (lighting, LED, power, and radio frequency).

Identifier
Opp4

Where in the value chain does the opportunity occur?
Customer

Opportunity type
Resilience

Primary climate-related opportunity driver
Other

Type of financial impact driver
Increased revenue through new products and services related to ensuring resiliency

Company- specific description
We see changes in precipitation extremes and droughts and how it affects crop yields as a possible opportunity for us. 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. Built on Cree's high-reliability ceramic package technology, Cree's LEDs deliver excellent R90/L90 lifetimes, even in extreme conditions. (http://www.cree.com/led-components/applications/horticulture).

Time horizon
Medium-term

Likelihood
More likely than not

Magnitude of impact
High

Potential financial impact
800000000

Explanation of financial impact
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 by 2022.

Strategy to realize opportunity
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.

Cost to realize opportunity
158500000

Comment
The cost to realize opportunity is reported on an annualized basis. We invest significant resources in research and development ($158.5 million in fiscal year 2017). Research and development costs listed here are for all of Cree's product types (lighting, LED, power, and radio frequency).

Identifier
Opp5

Where in the value chain does the opportunity occur?
Customer

Opportunity type
Products and services

Primary climate-related opportunity driver
Shift in consumer preferences

Type of financial impact driver
Increased revenue through demand for lower emissions 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, lighting, 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

Potential financial impact
2343000000

Explanation of financial impact
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 by a factor of four by 2022. We also

expect our LED business to continue growing and anticipate our LED revenue to steadily increase by 2022.

Strategy to realize opportunity
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.

Cost to realize opportunity
158500000

Comment
The cost to realize opportunity is reported on an annualized basis. We invest significant resources in research and development ($158.5 million in fiscal year 2017). Research and development costs listed here are for all of Cree's product types (lighting, LED, power, and radio frequency).

Identifier
Opp6

Where in the value chain does the opportunity occur?
Customer

Opportunity type
Resource efficiency

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

Type of financial impact driver
Other, please specify (Increased revenue/demand for products)

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.

Time horizon
Medium-term

Likelihood
Very likely

Magnitude of impact
High

Potential financial impact
850000000

Explanation of financial impact
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 by a factor of four by 2022.

Strategy to realize opportunity
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.

Cost to realize opportunity
158500000

Comment
The cost to realize opportunity is reported on an annualized basis. We invest significant resources in research and development ($158.5 million in fiscal year 2017). Research and development costs listed here are for all of Cree's product types (lighting, LED, power, and radio frequency).

C2.5

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

	Impact	Description
Products and services	Impacted	Our climate change opportunities have positively impacted our business because we believe that our LED, lighting, 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 foresee an increase in demand for our power and radio frequency products in the electric vehicle, renewable energy, telecommunications, industrial, and military/aerospace markets. As a result, we plan to invest in expanding the growth of our technologies to serve these markets.
Supply chain and/or value chain	Not yet impacted	Our identified risks have not yet affected our supply chain and/or value chain, as we expect our risks could affect us more in the long-term. Our identified product opportunities have also not yet impacted our supply chain. We anticipate that a decrease in the supply of one of our raw materials due to climate change would result in a cost to our supply chain and business interruption. Depending on the material, it could have a significant impact.
Adaptation and mitigation activities	Impacted	Cree's climate change risks have impacted our adaptation and mitigation activities. Cree's business continuity plan takes into consideration potential risks that could cause a significant business interruption. 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.
Investment in R&D	Impacted	Our climate change opportunities have positively impacted our business because we believe that our lighting, 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 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	Impacted	Our identified risks have not yet affected our operations, as we expect our risks could affect us more in the long-term. Our opportunities have positively impacted our products because they are planned to meet the increased demand for energy saving applications, including efficient lighting and power modules for renewable energy and electric vehicles. We are in the process of planning an expansion of our operations to meet anticipated demand.
Other, please specify	Please select	

C2.6

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

	Relevance	Description
Revenues	Impacted	Our identified risks have not impacted our revenue financial planning since they are on a long-term time frame. Our climate change opportunities are impacted because we foresee 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 could increase from $221 million in FY2017 to about $850 million by FY2022. We also expect our LED business to continue growing and anticipate our LED revenue could increase from $550 million in FY2017 to about $800 million by FY2022.
Operating costs	Not yet impacted	Our operating costs are currently established in our budgets on a short-term time frame. Our identified risks have not yet impacted our operating cost planning since our risks are on a long-term time frame. Our manufacturing operations heavily rely on the use of electricity. We have not seen major changes in electricity costs and do not anticipate major changes in the short-term and medium-term.
Capital expenditures / capital allocation	Impacted	Our identified risks have not yet impacted our capital expenditures/capital allocation planning, but our climate change opportunities have been impacted. We foresee an increase in demand for our power and radio frequency products and as a result plan to invest in expanding our operations. Further investment in our power and radio frequency division will require 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.
Acquisitions and divestments	Impacted	Our identified risks have not yet impacted our acquisitions planning but our climate change opportunities have been impacted. We are expanding our power and radio frequency division due to increased demand, and in 2017 we began the process of acquiring Infineon's RF Power Business (finalized in March 2018). 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. In 2017, Cree also announced a joint venture with San'an Optoelectronics (Cree Venture LED) to produce and deliver high market performing, mid-power lighting class LEDs to expanding markets. This venture allows Cree to serve the broader needs of the general illumination (indoor and outdoor lighting), horticultural and other evolving LED markets.
Access to capital	Not yet impacted	Our identified risks have not yet impacted our access to capital since they are on a long-term time frame. We anticipate our climate change opportunities to be impacted because we foresee an increase in demand for our energy efficient lighting, LED, power and radio frequency products.
Assets	Impacted	Our identified risks have not yet impacted our assets, but our opportunities have been impacted. There is expected growth in our power and radio frequency division, and in 2017 we began the process of acquiring Infineon's RF Power Business (finalized in March 2018). 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. At our existing sites, Cree has increased production capacity by adding new equipment and infrastructure to meet the increased demand for these products.
Liabilities	Impacted	Our identified risks have not yet impacted our liabilities, but our opportunities have been impacted. There is expected growth in our power and radio frequency division, and in 2017 we began the process of acquiring Infineon's RF Power Business (finalized in March 2018). 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. At our existing sites, Cree has increased production capacity by adding new equipment and infrastructure to meet the increased demand for these products.
Other	Please select	

C3. Business Strategy

C3.1

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

Yes

C3.1a

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

Yes, qualitative

C3.1c

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

Our products:

Climate change is inherently integrated into our business objectives and strategy. Cree is a market-leading innovator of lighting class LEDs, LED lighting, and semiconductor products for power and radio frequency applications. Cree was founded upon the premise that our silicon carbide based technology for LEDs, power devices, and radio frequency devices could fundamentally change the efficiency of electricity use around the world.

Our strategy for the LED and lighting businesses is to make energy-wasting traditional lighting technologies obsolete through the use of energy efficient, environmentally friendly LED lighting. A new strategic focus for Cree is the development of lighting automation. Our Cree SmartCast® Technology enables users to cut energy costs up to 70 percent and securely integrate lighting with building management systems. Within each SmartCast® enabled luminaire, integrated sensors, cutting-edge electronics and software all work together to automatically learn and interact with each other and the building space. Embedded sensors continually detect and share data on room occupancy and ambient light to fine-tune the building's environment and energy-saving strategies in real time. Data flows automatically and transparently. Lights turn on when the room is occupied and turn off when the room is empty and automatically dim up or down with the amount of sunlight present.

For our power and radio frequency business, our mission is to lead the innovation and commercialization of silicon carbide and gallium nitride, 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, electric vehicles, and electric vehicle charging. For example, in 2017 our power division developed the industry's first power module that passed the harsh environment qualification test for simultaneous high-humidity, high-temperature and high-voltage conditions. This reliability benchmark enables system designers to use this device in outdoor applications such as transportation, wind, solar and other renewables where extreme environmental conditions have historically challenged safe device operation. In 2017 our power division also introduced a new silicon carbide power device that enables the reduction of electric vehicle drive-train inverter losses by 78 percent based on EPA combined city/highway mileage standards. This efficiency improvement offers designers new options in terms of range, battery usage and vehicle design.

We have always focused our priorities on improving the design and energy efficiency of our products, and we believe that our products appeal to the growing number of eco-conscious consumers who want energy efficient, long-lasting products, which in turn have a lower impact on the environment and climate change. Our products help our customers to significantly reduce their energy consumption and GHG emissions. Notwithstanding that Cree's manufacturing operations contribute to climate change, the LED, lighting, power and radio frequency products we produce and sell globally actually result in a net positive impact on climate change. Our lighting, LED, power and radio frequency products sold in 2017 will save approximately 420 million MWh and 210 million metric tons CO2e over their estimated lifetimes compared to less efficient alternative products (i.e., non-LED lighting fixtures, silicon-based power products, silicon- or gallium arsenide-based radio frequency products).

Our operations:

In our operations, we have improved yield for both our LED and power and radio frequency applications by increasing the size of the silicon carbide wafers produced which yields more product per the same amount of input (e.g., electricity and GHGs used in the production process). Internally, manufacturing departments collect metrics for production and product mix including energy efficiency, product yield and total lumens sold. 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, which is a global, collaborative initiative of influential businesses that pledge to double their energy productivity. Since 2009, we have increased our energy productivity in terms of lumens sold per kWh of electricity consumed in manufacturing by a factor of 10, and have a target of doubling our energy productivity again by 2020 (using 2014 as a baseline). We met our EP100 goal in 2017, three years ahead of schedule. We are currently working on developing a new target.

The foreseen increased demand for energy efficient technologies like renewable energy and electric vehicles due to their impacts on

energy efficiency, the environment and climate change, further supports our focus and strategy toward investment in our energy efficient products, including our power and radio frequency division. During 2017 we began the process of acquiring Infineon's RF Power Business (finalized in March 2018). 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. At our existing sites, Cree has increased production capacity by adding new equipment and infrastructure to meet the increased demand for our power and radio frequency products.

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 environmental health and safety department collects environmental performance metrics and works with other departments, including production and facilities, to ensure regulatory compliance and environmental operational efficiency.

C3.1d

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

Climate-related scenarios	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 uses 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 assess 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 timeframe used in this analysis. Electricity is a large input to our manufacturing process and we currently do not purchase renewable energy directly. Any use of renewable energy 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 have the opportunity to 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 newly adopted 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. For example, our power components enable electric vehicles to go nearly 10 percent farther on a single charge.

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

Scope
Scope 2 (location-based)

% emissions in Scope
100

% reduction from baseline year
100

Metric
Other, please specify (lumens per kilowatt hour (kWh))

Base year
2014

Start year
2009

Normalized baseline year emissions covered by target (metric tons CO2e)
329

Target year
2020

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

% achieved (emissions)
100

Target status
Retired

Please explain
This target was also reported in our 2017 CDP Climate Change response. The Climate Group's EP100 initiative is global, collaborative initiative of influential businesses that pledge to double their energy productivity. Since 2009, we have increased our energy productivity in terms of lumens sold per electricity consumed in manufacturing by a factor of 10. Our EP100 goal is to double our energy productivity by 2020 using 2014 as our baseline year. Cree achieved its 2020 EP100 goal by the end of 2017. We are working to develop a new target. The question above for percent reduction from baseline year is reported as 100 percent, but our metric is not reported in terms of a reduction. Because we are trying to improve our energy productivity, an increase in the lumens sold per electricity consumed value means we are making successful progress toward the target. The 100 percent value represents that we had a 100 percent increase in our energy productivity (i.e., we doubled our metric of lumens sold per kWh electricity consumed in manufacturing). The normalized baseline year emissions covered by target is reported in terms of our metric of lumens sold per kWh, not metric tons CO2e. Our percent change anticipated in absolute Scope 1+2 emissions is reported as the change in Cree's Scope 1 and 2 emissions from 2014 (the base year chosen for our EP100 goal) to 2017. Our percent change anticipated in absolute Scope 3 emissions is reported as 0 because 2017 was the first year we estimated Scope 3 emissions.

% change anticipated in absolute Scope 1+2 emissions
19

% change anticipated in absolute Scope 3 emissions
0

C4.2

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

C4.3

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

Yes

C4.3a

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

	Number of projects	Total estimated annual CO2e savings in metric tonnes CO2e (only for rows marked *)
Under investigation	1	30000
To be implemented*	2	1690
Implementation commenced*	0	0
Implemented*	5	16805108
Not to be implemented	3	644

C4.3b

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

Activity type
Process emissions reductions

Description of activity
Changes in operations

Estimated annual CO2e savings (metric tonnes CO2e)
4026

Scope
Scope 1

Voluntary/Mandatory
Voluntary

Annual monetary savings (unit currency – as specified in CC0.4)
21185

Investment required (unit currency – as specified in CC0.4)
0

Payback period
<1 year

Estimated lifetime of the initiative
1-2 years

Comment
In 2017 we optimized the operation of certain equipment used for a process with the goal of reducing the duration of the process, while still producing the intended output. A lower run time means less fluorinated GHGs are used. These savings represent those in 2017. The project is continuing into next year and additional savings are expected.

Activity type
Process emissions reductions

Description of activity

Changes in operations

Estimated annual CO2e savings (metric tonnes CO2e)
391

Scope
Scope 1

Voluntary/Mandatory
Voluntary

Annual monetary savings (unit currency – as specified in CC0.4)
667

Investment required (unit currency – as specified in CC0.4)
0

Payback period
<1 year

Estimated lifetime of the initiative
1-2 years

Comment
In 2017 we optimized the operation of certain equipment used for a process with the goal of reducing the duration and frequency of the process, while still producing the intended output. A lower run time and fewer process runs means less fluorinated GHGs are used. These savings represent those in 2017. The project is continuing into next year and additional savings are expected.

Activity type
Energy efficiency: Building services

Description of activity
Lighting

Estimated annual CO2e savings (metric tonnes CO2e)
691

Scope
Scope 2 (location-based)

Voluntary/Mandatory
Voluntary

Annual monetary savings (unit currency – as specified in CC0.4)
160000

Investment required (unit currency – as specified in CC0.4)
459000

Payback period
1-3 years

Estimated lifetime of the initiative
Ongoing

Comment
In 2017 we continued switching from traditional lighting to LED lighting in our manufacturing and office buildings. Cree began installing LED bulbs and lighting fixtures in our manufacturing and office buildings in 2009 have been continuously installing additional LED products at all owned and key leased locations. For our three North Carolina campuses, the project is estimated to result in savings of 475,000 watts (a 49% reduction per light fixture replaced) and roughly $160,000 in reduced energy costs and $7,500 in reduced maintenance costs per year. More information about the initiative can be found on our corporate website: http://lighting.cree.com/applications/case-studies/cree

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Activity type
Energy efficiency: Building services

Description of activity
Other, please specify (On-site energy audit)

Estimated annual CO2e savings (metric tonnes CO2e)
0

Scope
Scope 2 (location-based)

Voluntary/Mandatory
Voluntary

Annual monetary savings (unit currency – as specified in CC0.4)
0

Investment required (unit currency – as specified in CC0.4)
0

Payback period
<1 year

Estimated lifetime of the initiative
<1 year

Comment
Our electric utility and third-party energy audit specialists aided with an energy audit at our main manufacturing site in Durham, NC and helped us identify potential energy saving projects. A number of projects are planned to be implemented next year.

Activity type
Other, please specify (Sold energy efficient products)

Description of activity
<Not Applicable>

Estimated annual CO2e savings (metric tonnes CO2e)
16800000

Scope
Scope 3

Voluntary/Mandatory
Voluntary

Annual monetary savings (unit currency – as specified in CC0.4)
0

Investment required (unit currency – as specified in CC0.4)
1038428000

Payback period
<1 year

Estimated lifetime of the initiative
Ongoing

Comment
Our lighting, LED, power and radio frequency products sold in 2017 will save approximately 420 million MWh and 210 million metric tons CO2e over their estimated lifetimes compared to less efficient alternative products (i.e., non-LED lighting fixtures, 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 210 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 that directly promote the increased adoption of energy-efficient LED lighting and energy-efficient technologies (e.g., constructing energy efficient Habitat for Humanity homes). The company's GHG impact is summarized and presented to manufacturing leadership, and on internal communications to all 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.
Partnering with governments on technology development	In 2013, Cree received a $2.3 million investment from the US Department of Energy to develop a modular design for LED lights to link together multiple units to fit larger areas, use less raw material, and reduce manufacturing costs while ensuring high lighting quality and efficiency.

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, LED bulbs, LED lighting fixtures, 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

80

Comment

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 2015

Base year end
December 31 2015

Base year emissions (metric tons CO2e)
149545

Comment

Scope 2 (location-based)

Base year start
January 1 2015

Base year end
December 2 2015

Base year emissions (metric tons CO2e)
176776

Comment

Scope 2 (market-based)

Base year start
January 1 2017

Base year end
December 2 2017

Base year emissions (metric tons CO2e)
134024

Comment
Our market-based Scope 2 emissions only include emissions from Cree US facilities. The market-based value reported does not include market-based Scope 2 emissions from our China facility.

C5.2

(C5.2) Select the name of the standard, protocol, or methodology you have used to collect activity data and calculate Scope 1 and Scope 2 emissions.
The Greenhouse Gas Protocol: A Corporate Accounting and Reporting Standard (Revised Edition)
US EPA Mandatory Greenhouse Gas Reporting Rule
Other, please specify (EPA eGRID and supplier factors)

C5.2a

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

All Scope 1 emissions were calculated using the US EPA Mandatory Greenhouse Gas Reporting Rule. Location-based Scope 2 emissions for our US facilities were calculated using factors from the US EPA Emissions & Generation Resource Integrated Database (eGRID). Location-based Scope 2 emissions for our China facility were calculated using GHG Protocol factors (Emission Factors from Cross-Sector Tools, electricity emission factors for China). Our market-based emission factors were derived from our US facilities' electric utilities' publicly available electricity generation and CO2e emissions data.

C6. Emissions data

C6.1

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

Row 1

Gross global Scope 1 emissions (metric tons CO2e)
214202

End-year of reporting period
<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

C6.3

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

Row 1

Scope 2, location-based
160159

Scope 2, market-based (if applicable)
129102

End-year of reporting period
<Not Applicable>

Comment
Our location-based Scope 2 emissions reported here include emissionf from all of Cree's global manufacturing facilities. Our market-based Scope 2 emissions only include emissions from Cree US facilities. The market-based value reported does not include market-based Scope 2 emissions from our China facility.

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

Sales offices

Relevance of Scope 1 emissions from this source

Emissions are not relevant

Relevance of location-based Scope 2 emissions from this source

Emissions are relevant but not yet calculated

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

Emissions are relevant but not yet calculated

Explain why the source is excluded

Cree's sales offices are not included in Scope 2 emission calculations. Scope 2 emissions estimates just include emissions from primary manufacturing operations.

Source

Usage of refrigerants

Relevance of Scope 1 emissions from this source

Emissions are relevant and calculated, but not disclosed

Relevance of location-based Scope 2 emissions from this source

Emissions are not relevant

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

Emissions are not relevant

Explain why the source is excluded

We do not include emissions from the usage of refrigerants. We follow EPA's GHGRP requirements, which do not include the calculation of refrigerant emissions. We estimate that emissions from usage of refrigerants is less than 1 percent of our total Scope 1 emissions.

C6.5

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

Purchased goods and services

Evaluation status
Relevant, not yet calculated

Metric tonnes CO2e
0

Emissions calculation methodology
Scope 3 emissions from purchased goods and services have not yet been calculated.

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

Explanation

Capital goods

Evaluation status
Relevant, not yet calculated

Metric tonnes CO2e
0

Emissions calculation methodology
Scope 3 emissions from capital goods have not yet been calculated.

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

Explanation

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

Evaluation status
Not relevant, calculated

Metric tonnes CO2e
8101

Emissions calculation methodology
The emissions reported here represent the emissions associated with electricity transmission and distribution losses for Cree's global manufacturing sites. Cree calculated US facilities' transmission and distribution losses using US EPA eGRID transmission and distribution loss factors. Cree calculated the China facility’s transmission and distribution losses using World Development Indicators transmission and distribution loss factors.

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

Explanation

Upstream transportation and distribution

Evaluation status
Relevant, not yet calculated

Metric tonnes CO2e
0

Emissions calculation methodology
Scope 3 emissions from upstream transportation and distribution have not yet been calculated.

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

Explanation

Waste generated in operations

Evaluation status
Relevant, calculated

Metric tonnes CO2e
1519

Emissions calculation methodology
The emissions reported here include emissions from the transportation and disposal of chemical waste and solid waste from Cree's global manufacturing sites. Cree used emission factors for the transportation of waste from EPA's Center for Corporate Climate Leadership GHG Emission Factors Hub. Cree used waste disposal emission factors from EcoInvent and EPA's Waste Reduction Model (WARM). In the EPA WARM database, for the disposal methods where waste is recycled, reused or turned into a fuel, the emission factor is negative. Since we are not yet 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 our 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

Explanation

Business travel

Evaluation status
Relevant, calculated

Metric tonnes CO2e
2925

Emissions calculation methodology
We used emission factors from EPA's Center for Corporate Climate Leadership GHG Emission Factors Hub to calculate our emissions from business travel. The 2017 emissions for business travel includes all Cree employees except for Asia employees.

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

Explanation

Employee commuting

Evaluation status
Relevant, not yet calculated

Metric tonnes CO2e
0

Emissions calculation methodology
Scope 3 emissions from employee commuting have not yet been calculated.

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

Explanation

Upstream leased assets

Evaluation status
Not relevant, explanation provided

Metric tonnes CO2e
0

Emissions calculation methodology
This category is not relevant.

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

Explanation
This category is not relevant because Cree does not have any upstream leased assets.

Downstream transportation and distribution

Evaluation status
Relevant, calculated

Metric tonnes CO2e
40896

Emissions calculation methodology
The emissions reported here are from downstream transportation and distribution of our sold products. Cree 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

Explanation

Processing of sold products

Evaluation status
Relevant, not yet calculated

Metric tonnes CO2e
0

Emissions calculation methodology
Scope 3 emissions from the processing of our sold products have not yet been calculated.

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

Explanation

Use of sold products

Evaluation status
Relevant, calculated

Metric tonnes CO2e
215000000

Emissions calculation methodology
The product use emissions include the emissions associated with the energy required to use Cree products sold in 2017 over their 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. For Cree products used in non-electric automotive applications, 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

Explanation

End of life treatment of sold products

Evaluation status
Relevant, calculated

Metric tonnes CO2e
1004

Emissions calculation methodology
Our product end of life emissions are the emissions associated with disposing of our products and packaging sold in 2017 at the end of their life. EPA Waste Reduction Model (WARM) emission factors were used and as a worst case, we assumed that all products and packaging were sent to landfill.

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

Explanation

Downstream leased assets

Evaluation status
Relevant, not yet calculated

Metric tonnes CO2e
0

Emissions calculation methodology
Scope 3 emissions from downstream leased assets have not yet been calculated.

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

Explanation

Franchises

Evaluation status
Not relevant, explanation provided

Metric tonnes CO2e
0

Emissions calculation methodology
This category is not relevant.

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

Explanation
This category is not relevant because Cree does not have any franchises.

Investments

Evaluation status
Not relevant, explanation provided

Metric tonnes CO2e
0

Emissions calculation methodology
This category is not relevant to Cree's business operations.

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

Explanation
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
Relevant, not yet calculated

Metric tonnes CO2e
0

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. Scope 3 emissions from contract manufacturers have not yet been calculated.

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

Explanation

Other (downstream)

Evaluation status
Relevant, not yet calculated

Metric tonnes CO2e
0

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. Scope 3 emissions from contract manufacturers have not yet been calculated.

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

Explanation

C6.7

(C6.7) Are carbon dioxide emissions from biologically sequestered carbon relevant to your organization?
No

C6.10

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

Intensity figure
122.07

Metric numerator (Gross global combined Scope 1 and 2 emissions)
374361

Metric denominator
unit of production

Metric denominator: Unit total
3067

Scope 2 figure used
Location-based

% change from previous year
1.7

Direction of change
Decreased

Reason for change
Our metric of Scope 1 and 2 CO2e per production metric has decreased in 2017 from 2016 due to product and yield improvements. Cree's Scope 2 GHG emissions decreased in 2017 even though electricity usage increased. Cree used EPA eGRID emission factors in the calculation, and the subregion mix of fuels used to create the electricity results in less CO2e compared to previous EPA eGRID factors.

C7. Emissions breakdowns

C7.1

(C7.1) Does your organization have greenhouse gas emissions other than carbon dioxide?

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	16182	IPCC Fourth Assessment Report (AR4 - 100 year)
CH4	45	IPCC Fourth Assessment Report (AR4 - 100 year)
N2O	3092	IPCC Fourth Assessment Report (AR4 - 100 year)
HFCs	14232	IPCC Fourth Assessment Report (AR4 - 100 year)
PFCs	49567	IPCC Fourth Assessment Report (AR4 - 100 year)
SF6	115798	IPCC Fourth Assessment Report (AR4 - 100 year)
NF3	4577	IPCC Fourth Assessment Report (AR4 - 100 year)
Other, please specify (Heat Transfer Fluids (HTFs))	10709	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	213201
China	1001

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)
Lighting	13819
LED	99613
Power and RF	100770

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	111699	35.899478	-78.842384
RTP, NC, USA	98984	35.916052	-78.872103
Alston Ave, NC, USA	44	35.922733	-78.887207
Weck Drive, NC, USA	56	35.930621	-78.850817
Racine, WI, USA	2418	42.717436	-87.898713
Huizhou, China	1001	23.012883	114.348197

C7.3c

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

Activity	Scope 1 emissions (metric tons CO2e)
Manufacturing	214202

C7.5

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

Country/Region	Scope 2, location-based (metric tons CO2e)	Scope 2, market-based (metric tons CO2e)	Purchased and consumed electricity, heat, steam or cooling (MWh)	Purchased and consumed low-carbon electricity, heat, steam or cooling accounted in market-based approach (MWh)
United States of America	107644	129102	377354	0
China	52515	0	79450	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 emissions (metric tons CO2e)	Scope 2, market-based emissions (metric tons CO2e)
Lighting	16073	0
LED	121441	0
Power and RF	22645	0

C7.6b

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

Facility	Scope 2 location-based emissions (metric tons CO2e)	Scope 2, market-based emissions (metric tons CO2e)
Durham, NC, USA	88963	106847
RTP, NC, USA	13117	15754
Alston Ave, NC, USA	529	635
Weck Drive, NC, USA	222	267
Racine, WI, USA	4813	5599
Huizhou, China	52515	0

C7.6c

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

Activity	Scope 2, location-based emissions (metric tons CO2e)	Scope 2, market-based emissions (metric tons CO2e)
Manufacturing	160159	129102

C7.9

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

Increased

C7.9a

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

	Change in emissions (metric tons CO2e)	Direction of change	Emissions value (percentage)	Please explain calculation
Change in renewable energy consumption	0	No change	0	We did not purchase renewable energy directly in 2017.
Other emissions reduction activities	4417	Decreased	1	Cree reduced the use of gases with higher GWP in some processes by reducing the run time and frequency in equipment that uses f-GHGs, resulting in a decrease in Scope 1 emissions.
Divestment	0	No change	0	No change
Acquisitions	0	No change	0	We did not acquire any companies in the reporting year. The acquisition of Infineon's RF Power Business was finalized in March 2018 and is not included in 2017 emission estimates.
Mergers	0	No change	0	We did not undergo any mergers in the reporting year
Change in output	32321	Increased	9	Cree's usage of greenhouse gases in its manufacturing processes changed in 2017 compared to 2016 due to changes in output and product mix. We were able to reduce the use of gases with higher GWP in some processes by reducing the run time and frequency in equipment that uses f-GHGs. However, our usage of certain gases increased in 2017, causing our total Scope 1 emissions to increase.
Change in methodology	0	No change	0	No change
Change in boundary	0	No change	0	No change
Change in physical operating conditions	0	No change	0	No change
Unidentified	0	No change	0	No change
Other	16909	Decreased	5	Our Scope 2 emissions decreased in 2017 due to new lower eGRID emission factors, indicating lower CO2e emissions from electricity production in the US.

C7.9b

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

Location-based

C8. Energy

C8.1

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

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

C8.2

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

	Indicate whether your organization undertakes this energy-related activity
Consumption of fuel (excluding feedstocks)	Yes
Consumption of purchased or acquired electricity	Yes
Consumption of purchased or acquired heat	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 MWh
Consumption of fuel (excluding feedstock)	LHV (lower heating value)	0	89226	89226
Consumption of purchased or acquired electricity	<Not Applicable>	0	367578	367578
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>	0	456804	456804

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 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)
Fuel Oil Number 2

Heating value
LHV (lower heating value)

Total fuel MWh consumed by the organization
247

MWh fuel consumed for the 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>

Fuels (excluding feedstocks)
Natural Gas

Heating value
LHV (lower heating value)

Total fuel MWh consumed by the organization
88814

MWh fuel consumed for the 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>

Fuels (excluding feedstocks)
Gas Oil

Heating value
LHV (lower heating value)

Total fuel MWh consumed by the organization
165

MWh fuel consumed for the 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>

C8.2d

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

Fuel Oil Number 2

Emission factor
74.21

Unit
kg CO2e per million Btu

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

Comment

Gas Oil

Emission factor
70.47

Unit
kg CO2e per million Btu

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

Comment

Natural Gas

Emission factor
53.11

Unit
kg CO2e per million Btu

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

Comment

C8.2f

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

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

Low-carbon technology type
<Not Applicable>

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

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

Comment

C9. Additional metrics

C9.1

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

C10. Verification

C10.1

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

	Verification/assurance status
Scope 1	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 and/or Scope 2 emissions and attach the relevant statements.

Scope
Scope 1

Verification or assurance cycle in place
Annual process

Status in the current reporting year
Complete

Type of verification or assurance
Limited assurance

Attach the statement
Cree 2018 Scope 1-2 GHG Verification Statement.pdf

Page/ section reference
Pages 1-2 of the attached verification statement letter.

Relevant standard
ISO14064-3

Proportion of reported emissions verified (%)
98

Scope
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 2018 Scope 1-2 GHG Verification Statement.pdf
Cree 2018 Scope 1-2 GHG Verification Statement.pdf

Page/ section reference
Pages 1-2 of the attached verification statement letter.

Relevant standard
ISO14064-3

Proportion of reported emissions verified (%)
88

C10.1b

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

Scope
Scope 3- at least one applicable category

Verification or assurance cycle in place
Annual process

Status in the current reporting year
Complete

Attach the statement
Cree 2018 Scope 3 GHG Verification Statement.pdf

Page/section reference
Pages 1-2 of the attached verification statement letter.

Relevant standard
ISO14064-3

C10.2

(C10.2) Do you verify any climate-related information reported in your CDP disclosure other than the emissions figures reported in C6.1, C6.3, and C6.5?
No, we do not verify any other climate-related information reported in our CDP disclosure

C11. Carbon pricing

C11.1

(C11.1) Are any of your operations or activities regulated by a carbon pricing system (i.e. ETS, Cap & Trade or Carbon Tax)?
No, 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)

Size of engagement

100

% Scope 3 emissions as reported in C6.5

99

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). Many of Cree's lighting products qualify for ENERGY STAR, and this information is made available to prospective customers via our product information and the ENERGY STAR web site. Many Cree lighting products also are qualified by the Design Lights Consortium (DLC) to specified energy efficiency criteria. This information is available via our product information and the DLC web site. Information about our products' energy efficiency, REACH and RoHS declarations, the results of selected Cree LED lighting life cycle assessments, 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) LED Lighting customers can calculate and analyze their savings by switching to Cree LED lighting products on our Payback calculator page (http://lighting.cree.com/resources/payback-calculator/). Information about Cree's carbon footprint and climate change risks and opportunities can be found on our Energy and GHG Emissions page (http://www.cree.com/about/sustainability/environment/emissions)

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 (Responding to customer surveys)

Details of engagement

<Not Applicable>

Size of engagement

25

% Scope 3 emissions as reported in C6.5

0

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.

C12.1c

(C12.1c) 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). Information about our products' energy efficiency (ENERGY STAR and DLC), REACH and RoHS declarations, the results of selected Cree LED lighting life cycle assessments, 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). LED Lighting customers can calculate and analyze their savings by switching to Cree LED lighting products on our Payback calculator page (http://lighting.cree.com/resources/payback-calculator/). Information about Cree's carbon footprint and climate change risks and opportunities can be found on our Energy and GHG Emissions page (http://www.cree.com/about/sustainability/environment/emissions). 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?

Direct engagement with policy makers

Trade associations

C12.3a

(C12.3a) On what issues have you been engaging directly with policy makers?

Focus of legislation	Corporate position	Details of engagement	Proposed legislative solution
Energy efficiency	Support	Cree engages with members of the US Senate Energy and Natural Resources Committee, the US House Energy and Commerce Committee, as well as individual members of congress and their staffs to influence and help develop effective energy efficiency legislation and policies.	Cree's proposed legislative solution includes developing comprehensive energy efficiency legislation in both the US House and Senate.

C12.3b

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

Yes

C12.3c

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

Trade association
Alliance to Save Energy

Is your position on climate change consistent with theirs?
Consistent

Please explain the trade association's position
Alliance to Save Energy is a non-profit coalition of business, government, environmental and consumer leaders advocating for enhanced energy efficiency across all sectors of the economy. Alliance to Save Energy supports energy efficiency legislation which directly affects GHG and other air emissions.

How have you, or are you attempting to, influence the position?
Cree holds a Director position on the Alliance to Save Energy board. Through Alliance to Save Energy, Cree engages in legislative policy development discussions in order to influence energy efficiency legislation.

C12.3f

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

Cree's centralized management of all industry and government relations activities ensures that all direct and indirect activities that influence policy are consistent with our climate change strategy. All government relations and public affairs activities are directed by Cree's Vice President of Corporate Marketing and Public Affairs, and is consistent with our stated strategy to encourage energy efficiency. Cree's engagement with policymakers and trade organizations has the specific goal of influencing energy efficiency standards.

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 other regulatory filings

Status
Complete

Attach the document
2017 Cree EPA GHG Report Submissions.pdf

Content elements
Emissions figures

Publication
In voluntary communications

Status
Complete

Attach the document
2017 Cree Energy & GHG Emissions Website Page.pdf

Content elements
Risks & opportunities
Emissions figures
Emission targets

C14. Signoff

C-FI

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

C14.1

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

	Job title	Corresponding job category
Row 1	Gregg Lowe, Chief Executive Officer (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, lighting class LEDs and lighting products. 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	1473000000

SC0.2

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

No

SC1.1