Cisco 2020 Environment Technical Review

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Introduction

The Environment Technical Review (ETR) provides a comprehensive reference for all Cisco environmental sustainability information. Information is provided either directly in this report or through a hyperlink to other publicly accessible material. This report and information referenced therein should be considered the comprehensive source for Cisco's environmental sustainability reporting.

Because corporate social responsibility (CSR) reporting (1) includes a wide range of environmental, social and corporate governance issues (ESG), and (2) addresses the interests of a broad range of stakeholders—including customers, financial and industry analysts, shareholders and investors, media, advocacy, academia and Cisco employees—Cisco is publishing its CSR information in three formats:

1. The 2020 Corporate Social Responsibility Impact Report (CSR Impact Report) provides summary and highlight information on ESG topics of stakeholder interest.

2. This Environment Technical Review (ETR), is a detailed compendium of all Cisco environment-related information. All environment information in the CSR Impact Report or the online ESG Reporting Hub is included in this ETR.

3. An online ESG Reporting Hub (ESG Hub) contains detailed information and data related to our social and corporate governance ESG pillars, performance, policies and initiatives.

Environmental sustainability reporting frameworks

Based on feedback from stakeholders, especially customers, analysts, shareholders and advocacy organizations, the four reporting frameworks shown in Table 1 were used in preparing this report.

Table 1: Cisco environmental reporting frameworks

GRI Global Reporting Initiative	UN SDG United Nations Sustainable Development Goals
• Economic, environmental, social • Global comparability and quality • 37 topic-specific standards	• 2015: Adopted by United Nations members • Shared blueprint: peace and prosperity, people and the planet, now and future • 17 goals, detailed targets and indicators

SASB Sustainable Accounting Standards Board	TCFD Task Force on Climate-Related Financial Disclosures

• 11 sectors: 77 industry-specific standards
• Topics: 5 Dimensions; 26 Issue Categories
• Cisco
   o Sector – Technology Communications
   o Industry – Hardware
	• Financial impact of climate related risks and opportunities
	• Governance, strategy, risk management, metrics and targets

GRI

Cisco's ESG reporting has been prepared in accordance with the Global Reporting Initiative (GRI) Standards (Core). We have standardized on GRI terminology for the major sections of this report. The GRI standards address non-environment-related topics and that reporting is provided in the CSR Impact Report and ESG Hub.

In organizing the ETR, we've adjusted the GRI topic names slightly to better align to the specifics of Cisco business as shown in Table 2.

Table 2: GRI standards environment topics compared to ETR sections

GRI Topic-Specific Standard	Related ETR section
301: Materials	Products and packaging materials
302: Energy	Energy and GHG emissions
303: Water and Effluents	Water Effluents (Liquid)
304: Biodiversity	Biodiversity (including land use)
305: Emissions	Non-GHG emissions
306: Effluents and Waste	Effluents (Liquid) Solid waste from operations (trash)
307: Environmental Compliance	Environmental sustainability Environmental compliance
308: Supplier Environmental Assessment	Supplier environmental performance

There are two significant differences between our report headings and GRI topics.

- Energy and a subset of emissions—greenhouse gases (GHG)—are grouped under a single heading

- "Waste" refers to operational waste from our labs and offices. It does not include Cisco product manufacturing. Refer to Products and packaging materials for information on Cisco's circular economy initiatives implemented throughout the product life cycle, from product design and manufacturing to service and end-of-life management.

SDG

A cross-reference between Sustainable Development Goals (SDG) and Cisco's environmental initiatives and goals is provided as Appendix VI – United Nations Sustainable Development Goals (SDGs). All environment-related SDGs are listed for clarity and completeness. Like GRI requirements, the UN Sustainable Development Goals address non-environmental topics that are addressed in the CSR Impact Report and the ESG Hub.

SASB

Guidance by the Sustainability Accounting Standards Board (SASB) was used in the preparation of Appendix I – Sustainability Accounting Standards Board (SASB). SASB requirements address more than environment-related issues, but our assessment against all SASB requirements is provided here for convenience.

TCFD

Climate change is a very significant and material issue that continues to receive heightened attention by our stakeholders, especially analysts and other members of the financial community. Cisco's assessment against the guidance provided by the Task Force on Climate-Related Financial Disclosures (TCFD) is provided as Appendix II – Task Force on Climate-related Financial Disclosures.

General

Under this general major heading, sustainability materiality, environmental policies, our environmental management system (EMS) and environment related employee engagement are discussed.

The remaining major sections address environmental topics using the terminology from the GRI Standards as modified per Table 2.

CSR materiality - environment

The environmental sustainability team at Cisco continually evaluates sustainability materiality based on inquiries received daily from stakeholders, including customers, analysts, investors, advocacy and employees. Every two years we complete a full materiality assessment, in partnership with an independent environmental consultancy, to confirm our understanding of global priorities.

Prioritization based on environmental materiality has been stable for more than ten years. Our latest full assessment, completed in FY19, confirmed our environment-related priorities remain:

- Energy and GHG emissions: energy consumption and GHG emissions from our operations, our supply chain and our products.

- Product and packaging materials: circular economy initiatives implemented throughout the product life cycle, from product design and manufacturing to service and end-of-life management

These top two issues are addressed through initiatives with dedicated funding and program structure. Progress is motivated and measured through publicly announced goals and annual performance reporting. Internally, our energy/GHG and circular economy programs have equal visibility, but energy/GHG is ranked higher on our materiality assessment due to the global impact expected from increasing GHG emissions in the Earth's atmosphere.

All environment-related topics are stack ranked in Table 3 based on stakeholder input and our environmental sustainability materiality assessment. We began publishing this stack ranking starting in our 2011 CSR Report (p. F2).

Table 3: Cisco materiality ranking of environment topics

Tier	Environment topic
1	Energy / GHG emissions
	Material use & waste
2	IT solutions for the environment
3	Water
	Biodiversity (including land use)
	Solid waste from operations (trash)
	Effluents (liquid)
	Non-GHG emissions

Cisco also takes action on Tier 3 environmental issues through normal, operational due diligence by the responsible business functions. The order within Tier 3 also indicates a prioritization but recognizes a wider uncertainty band compared to Tiers 1 and 2. Water is ranked highest in Tier 3 because of scarcity in some areas where Cisco maintains operations, but also because of its substantial use in electricity generation. Details of our efforts and performance are provided in the topic-specific sections of this document.

In FY20, we continued to see increasing customer and investor interest in environmental sustainability, as reflected in customer requests for proposals, customer and environmental advocacy surveys, and other inquiries. The scope of environment impact includes our operations, extended operations (supply chain), and products and services.

Stakeholder inquiries, life-cycle assessments (LCA) and key ESG rankings and ratings provide significant insight into materiality and are discussed in the following sections. A sustainability materiality assessment is separately completed for social and corporate governance issues with those results provided in the ESG Reporting Hub.

Our fiscal 2021 sustainability materiality assessment will utilize multiple methods, including big data and direct stakeholder input. A full description of the sustainability materiality assessment process and the current materiality matrix can be found on the ESG Reporting Hub.

Stakeholder inquiries

Cisco's CSR business process is based on our annual sustainability materiality assessment and ongoing stakeholder engagement. In addition to the formal materiality assessment, the environment team independently gathers feedback on emerging issues, the quality and accessibility of our reporting, and our sustainability performance from additional sources including stakeholder inquiries and key rankings and ratings. "Stakeholder inquiries" is the umbrella term we use for questions we receive from a variety of sources, including:

- Customer and partners. The visibility of environmental sustainability continues to increase in customer and partner request for proposal (RFP), supplier qualification, and contract processes.

- Employees

- Financial and industry analysts

- Shareholders and investors

- Sustainability data aggregators, which includes companies like EcoVadis that collect sustainability information for our customers and partners as well as a broad range of organizations that collect and package sustainability information for resale or for their own analysis.

- Environmental advocacy groups

- Academia, including researchers and students

- Media

Environment-related topics form the majority of CSR-related inquiries from customers and partners. These inquiries provide continuous, real-time insight into the environmental issues of interest to different categories of stakeholders.

Life-cycle assessment

Cisco uses life-cycle assessments (LCAs) to estimate the GHG emissions associated with our products, which feeds into our understanding of the environmental impacts of our products through their entire life cycle.

Our LCAs use the five product life-cycle stages defined by the GHG Protocol in the Product Life Cycle Accounting and Reporting Standard, which itself is based on the ISO 14040 standard:

- Material acquisition and pre-processing

- Manufacturing

- Transport (distribution and storage)

- Use

- End-of-life

We continue to see that our products consume the largest proportion of energy and are responsible for the most GHG emissions during the product-use life-cycle phase.

In building our LCA approach, we have used external tools and data sources, including thinkstep GaBi 7.3 and publicly available data sources, such as the International Energy Agency (IEA); the United Kingdom's Department for Business, Energy, and Industrial Strategy; and the Greenhouse Gas Protocol.

In FY19 we began using the Product Attribute to Impact Algorithm (PAIA) tool, which uses a streamlined LCA methodology that relates product attributes such as Printed Wiring Board (PWB) area or product weight to its global warming potential (GWP) impact. Using the PAIA tool, we have reduced our cost and time to complete an LCA and, based on this experience, we continue to use the PAIA tool for LCA work. One limitation of the PAIA is that only our servers and network switches are in scope for the tool. Due to the similarity between the components used in our switches and routers, we are working with the PAIA team to evaluate whether or not the network switch tool could be expanded to include routers. This would allow us to bring a larger share of our products in scope of the PAIA tool.

Table 4 provides a snapshot of percent of GHG emissions by life-cycle phase for a representative sample of Cisco products. The use phase is the leading contributor to our product's GHG emissions ranging from 81% to 95% of total life-cycle emissions. This range of total life-cycle emissions varies depending on weight, material, and power.

Table 4: Breakdown of GHG emissions by life-cycle phase for various Cisco product categories

Cisco device	Life-cycle phase (percent of total emissions)			
	Use	Manufacturing	Transport	End-of-Life
IP Phone[1]	81.5%	19.4%	0.9%	-1.8%
Chassis-based switch[2]	88.0%	5.2%	6.8%	-0.1%
Desktop switch/router	92.4%	6.1%	1.7%	-0.2%
Large chassis router/switch[2]	92.7%	5.6%	2.0%	-0.3%
Chassis-based router[2]	95.2%	3.0%	1.1%	0.6%
Blade-server[1]	91.2%	9.0%	0.1%	-0.3%

[1] FY19 LCA

[2] FY13 or earlier LCA

Our last full life-cycle assessments were completed in FY19 on an IP phone and blade server. The results were similar to previous assessments that showed the use phase dominates product life-cycle GHG emissions.

From a product manufacturing perspective, LCAs also help us understand how the various subassemblies in a given product impact manufacturing phase GHG emissions. Table 5 provides a breakdown of GHG emissions by product component or subassembly for an IP phone and blade-server.

Table 5: IP phone and blade server breakdown of GHG emissions for manufacturing phase

Cisco device	Percent of GHG emissions by product component type							
	Printed wiring board	Integrated circuits	Hard disk drive	Electronics (other)	Packaging	Enclosure materials	Assembly & test	LCD screen
IP Phone	21%	40%	na	14%	2%	17%	4%	2%
Blade-server	46%	24%	22%	5%	2%	<1%	<1%	na

LCAs also provide information on other environmental impacts besides GHG emissions. The extraction and processing of precious metals like copper and gold required to make printed circuit boards (PCBs) and integrated circuits (ICs) are the primary drivers of all categories of environmental impact, including abiotic depletion, which is the decreasing availability of non-living resources like minerals and fossil fuels. Hard-drive manufacturing processes, including washing and cooling of production chemicals, are the primary drivers of blue water consumption and smog formation, respectively.

- Table 6 breaks out LCA environmental impact categories by life-cycle phase for a blade server.
- Table 7 breaks out LCA environmental impact categories by product component or subassembly for the same blade server.

Table 6: Blade server impacts by life-cycle phase

Life-cycle phase environmental impact	Life-cycle phase (percent of total impact)			
	Use	Manufacturing	Transport	End-of-Life
Global warming potential	91%	9%	0%	0%
Primary energy demand	94%	6%	0%	0%

Blue water consumption	79%	21%	0%	0%
Eutrophication potential	77%	21%	1%	0%
Acidification potential	85%	15%	1%	0%
Abiotic depletion	3%	98%	0%	-1%
Smog formation potential	66%	34%	0%	0%

Table 7: Blade server manufacturing environmental impacts by component or subassembly

Manufacturing environmental impact	Printed wiring board	Integrated circuits	Hard disk drive	Electronics (other)	Packaging	Enclosure materials	Assembly & test
Global warming potential	46%	24%	23%	5%	2%	0%	0%
Primary energy demand	52%	34%	1%	7%	5%	0%	0%
Blue water consumption	26%	8%	59%	6%	1%	0%	0%
Eutrophication potential	44%	20%	31%	4%	1%	0%	0%
Acidification potential	38%	26%	26%	9%	1%	0%	0%
Abiotic depletion	39%	51%	0%	9%	0%	0%	0%
Smog formation potential	17%	9%	71%	3%	0%	0%	0%

ESG rankings and ratings

Cisco relies on six key rankings to gain insight into how Environmental topics are prioritized and to evaluate our sustainability reporting and performance, shown in Table 8. We have chosen these rankings based on their public visibility, the transparency of the scoring methodology, and our ability to engage consistently with analysts to discuss their priority topics and our areas for reporting and performance improvement.

Except for Barron's and the Wall Street Journal, which have only reported rankings the last three years, we have maintained this set of benchmarks for more than five years. For example, we've reported to CDP since its inception and to RobecoSAM (DJSI) since at least 2005.

Table 8: Key environment ratings and rankings performance

Key Environment Benchmarks	2016	2017	2018	2019	2020
S&P Dow Jones Indices (DJSI)	World & North America	World & North America	World & North America	World & North America	World & North America
Corporate Knights Global 100 (Release date)	#57	#3	#7	#14	#4
CDP Climate Change	A List	A List	A List	A List	A List
Institute of Public and Environmental Affairs (IPE) Corporate Information Transparency Index (CITI) IT Sector	#11	#12	#7	#2	#2
Barron's Most Sustainable U.S. Companies	-	-	#1	#2	#7
WSJ Management Top 250	-	#9	#13	#5	#6

For information on Cisco's historical CDP Climate Change performance see Table 9. The CDP Climate A List includes companies from around the world that have been identified as leaders in their reporting and actions to reduce greenhouse gas emissions.

Table 9: Cisco historical CDP Climate Change scores

CDP Year / Cisco FY	Cisco CDP Score Disclosure / Performance	CDP A List	CDP CDLI	CDP CPLI
2005 (CDP1) / FY04	Responded		–	
2006 (CDP2) / FY05	70		–	
2007 (CDP3) / FY06	70		–	
2008 (CDP4) / FY07	96		√	
2009 (CDP5) / FY08	88		√	
2010 (CDP6) / FY09	92 / A		√	√
2011 / FY10	98 / A		√	√
2012 / FY11	96 / B		√	–
2013 / FY12	100 / A		√	√
2014 / FY13	100 / A		√	√
2015 / FY14	100 / A	√	√	#
2016 / FY15	A	√		
2017 / FY16	A	√		
2018 / FY17	A	√		
2019 / FY18	A	√		
2020 / FY19	A	√		

√: on index

–: not on index

#: CPLI transitioned to the A List in 2015; CDLI followed in 2016

CDLI: Carbon Disclosure Leadership Index

CPLI Carbon Performance Leadership Index. Performance scoring and the CPLI began with CDP 2010.

Clean revenue

Each year more stakeholders are asking us to quantify the percent of our yearly revenue that is considered "clean" or "green." Different stakeholders provide differing criteria defining what should be included in this metric. The method provided by Corporate Knights, in their Clean Taxonomy version 3.0, uses the following definition: "Clean revenue measures a company's revenue from all goods and services which have clear environmental and, in a limited number of well-defined cases, social benefits. This includes revenue from clean transition, low-carbon economy and circular economy revenue segments."

Revenue included in our Corporate Knights green revenue calculation includes:

- Products with environmental certifications (e.g. ENERGY STAR, EPEAT)
- Collaboration products such as Webex Meetings, Webex Rooms, Cisco Virtual Office and Meraki Virtual Office.
- Products that have been recycled or refurbished
- Software and services that reduce energy consumption and enable longer product life

Based on Corporate Knights Clean Taxonomy version 3.0, we determined that 58 percent[1] of our FY19 revenue can be considered clean/green. Although this FY19 figure is a year behind our typical

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[1] The FY19 clean revenue percent reported in our FY19 CSR report has been recalculated and restate here using version 3.0 of the Corporate Knights taxonomy. The '2021 Corporate Knights Global 100' survey requests FY19 data.

environmental reporting cycling it is what is requested by Corporate Knights during this (FY20) reporting year.

FTSE's Green Revenue Classification System definition 2.0 defines green revenue as "those that are derived from products and services that have a positive environmental utility: that help prevent, restore and adapt to issues deriving from climate change, natural resource limitations and environmental degradation."

Based on the FTSE classification system, we have determined that 27 percent of our FY19 revenue can be considered green. Revenue included in our FTSE green revenue calculation includes:

- Collaboration products such as Webex Meetings, Webex Rooms, Cisco Virtual Office and Meraki Virtual Office.

- Products that provide private and hybrid cloud solutions for enterprise customers, such as Cisco ONE Enterprise Cloud Suite.

- Products that provide Cisco smart grid solutions, including Cisco Connected Grid Network Management solution which helps utility operations manage converged smart grid communications networks.

- Cloud services such as Cisco Powered cloud services for infrastructure-as-a-service and Cisco Powered Desktop-as-a Service solution.

We believe stakeholders should use caution in comparing companies with a self-reported green/clean revenue number. There are multiple and differing frameworks that are open to interpretation, which makes this reporting difficult to verify. Due to competitive considerations, the categories that make up clean/green revenue are often not aligned with current public financial reporting.

Environmental policy

Cisco has developed a series of policies over the last ten years that guide our environmental efforts. These policies declare our values and inform our decision-making. Our practices are:

- We will eliminate or mitigate our environmental impacts. Cisco accepts responsibility for negative environmental impacts from our operations, extended operations (supply chain), and throughout the life cycle of our products.

- We will implement our environmental policies consistently across all Cisco operations and legal entities worldwide, all extended operations, and all products.

- We will govern our environment-related efforts using an externally certified, ISO 14001, environmental management system.

- We will take a broad approach. The scope of our EMS includes energy and GHG emissions, product and packaging materials, water, biodiversity and land use, solid waste from operations, liquid effluents, and non-GHG emissions.

- We will lead by example. When we ask our suppliers to contribute to our efforts, it will be on the foundation of Cisco's successful action. Our supply chain environmental requirements will be documented, retrievable, and made available through our annual CSR reporting and our report archives.

- We will listen. The Earth's ecosystem is complex and there is much to be learned from our customers, our employees, advocacy groups, academia, and other stakeholders.

- We will identify key analysts and advocacy groups and form strong working relationships. This will help us build a consistent, independent, external measure of our environmental performance.

- We will identify our environmental impact through annual sustainability materiality assessments informed by stakeholder listening. We will follow the precautionary principle in establishing priorities and implementing initiatives.

- We will set unambiguous, public goals to drive improvement and demonstrate accountability. Please refer to Table 10, Cisco current environmental goals, for more detail. A table of past environment goals is in Appendix V.

- We will report annually and publicly our environmental performance, prioritizing full disclosure and the stakeholder perspective.

Environment goals

Our sustainability materiality assessment process incorporates input and feedback from our stakeholders as well as a technical assessment of the global problem and Cisco's contribution to both the problem and the solution. In 2006, we announced our first public goal, for business air travel reduction. Since then, we've understood the importance of public goals for our most material issues, accompanied by a strong governing protocol. Table 10 lists Cisco's current goals for our top 2 material issues in chronological order.

Links in the table's left-hand column direct to the Cisco blog post announcing each goal. Links in the right column direct to pages of this document if we are reporting performance against the goal this year. Table 54 lists past goals with a link and page reference to the CSR Impact Report corresponding to the target year, or completion year if the goal was reached early.

Table 10: Current Cisco environmental goals

Date goal announced	Goal topic	Goal statement (performance table)
September 2017	Energy / GHG	1. Reduce total Cisco Scope 1 and 2 GHG emissions worldwide by 60 percent absolute by FY22 (FY07 baseline). (Table 20) 2. Use electricity generated from renewable sources for at least 85 percent of our global electricity by FY22. (Table 24) Assurance statement
September 2018	Energy / GHG	Improve large rack-mounted-equipment system power efficiency—as measured from the input power from the facility to the board-mounted ASICs, memory and other chip devices—from 77 percent to 87 percent by FY22 (FY16 baseline). (Table 33)
October 2018	Product and packaging materials	Decrease the use of virgin plastic by 20 percent by FY25 (FY18 base year)[1] (Table 36)
December 2018 (p. 19)	Products and packaging materials	Design 100 percent of new Cisco products and packaging to incorporate circular design principles by FY25.
July 2019	Product and packaging materials	1. Reduce all foam used in Cisco product packaging by 75 percent, measured by weight, by FY25 (FY19 base year). (Table 39) 2. Increase product packaging cube efficiency by 50% by FY25 (FY19 base year)[2] 3. 70 percent of Cisco component and manufacturing suppliers by spend will achieve a zero-waste diversion rate at one or more sites by FY25.[3] (Table 17)
August 2019	Energy / GHG	1. 80 percent of Cisco component, manufacturing, and logistics suppliers by spend will have a public, absolute GHG emissions reduction target by FY25.[4] (Table 15) 2. Reduce Cisco supply chain-related Scope 3 GHG emissions by 30 percent absolute by FY30 (FY19 base year).[5] (Table 16)
July 2020	Product and packaging materials	Eliminate all paper documentation included in new product shipments by FY21.[6]

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[1] *The plastics included in this goal make up the majority of Cisco's use. However, it excludes plastics contained in commodity components sourced from suppliers (such as printed circuit boards). Most of these electronic components require the electrical insulating property provided by plastics.*

[2] *This goal language has been slightly modified from that published in FY19, to better align with industry standard terminology. It does not reflect a change in the goal itself. We refined our packaging efficiency efforts to focus on packaging volume rather than volume per weight of product. In doing so, we will both reduce the total amount of packaging used and realize logistics savings.*

[3] *According to current standard definitions used in certification protocols, "zero waste" diversion is defined as a 90 percent or greater overall diversion of solid, nonhazardous wastes from landfill, incineration (waste-to-energy), and the environment. Diversion methods can include reduction, reuse, recycling, and/or compost.*

[4] *Preferably in line with an approved science-based methodology (applying either a 1.5 or well below 2°C reduction scenario). Includes suppliers that set intensity targets that produce an absolute emissions reduction during the target period.*

Cisco has also made public environmental commitments that are outside of our materiality-driven goal process but provide inspiration for attacking difficult problems that aren't well suited for a fixed horizon goal. For example:

- At Davos in January 2018, CEO Chuck Robbins highlighted the importance of 100 percent product return, pledging that Cisco will take back used equipment upon request from any customer, expand tools and incentives to promote that practice, and grow our reuse of equipment through remanufacturing, refurbishment, and repair (Capital Equipment Pledge from World Economic Forum).

- At our RTP campus, we are piloting techniques to achieve water neutrality and zero waste

- Cisco e-scrap recycling partners will maintain a diversion rate to landfill of less than 0.38 percent by weight of all material received.

Cisco's Scope 1 and 2 and Scope 3 (product power efficiency) emission reduction goals have been approved by the Science-Based Targets initiative (SBTi). Our scopes 1 and 2 targets are consistent with reductions required to keep global warming to "Well-below 2°C", per the SBTi target classification.

Environment governance[2]

Corporate Affairs, part of the People and Communities organization (HR), champions Cisco's strategic approach to corporate social responsibility, including environmental sustainability. Corporate Affairs stewards our commitments to sustainability, our performance, and transparency in our public reporting.

The Corporate Affairs environment team is responsible for:

- Setting and stewarding Cisco's sustainability strategy and materiality process

- Engaging with internal and external stakeholders

- Researching and monitoring environment-related issues and trends

- Conducting impact assessments and developing programmatic data-driven insights

- Producing our annual CSR reporting

Business functions also own sustainability priorities. Teams integrate priorities into their business strategy by setting goals, implementing plans, and measuring performance. Some priorities touch multiple functions. In these cases, we establish cross-functional teams to align and implement against our commitments. Governance of our environment program has evolved as sustainability has become better integrated into the business.

Corporate Affairs, reporting to the Chief People Officer, champions Cisco's overall CSR strategy, including environmental sustainability. CSR and environmental sustainability are represented through Tae Yoo, senior vice president of Corporate Affairs, and Francine Katsoudas, executive vice president and Chief People Officer.

Energy/GHG emissions

Three executives sponsor our energy and GHG initiatives. This structure reflects the multipronged nature of the issue affecting operations, extended operations (supply chain), and our products.

- The Executive Vice President, Chief of Operations (COO) is the executive sponsor for all initiatives impacting operations, including Scope 1 and 2 emissions reduction, renewable energy and our response to the annual CDP climate change questionnaire.

[2] Overall CSR governance is discussed in the ESG Reporting Hub.

- The Senior Vice President, Supply Chain Operations is the sponsor of initiatives related to supplier operations' energy efficiency and GHG emissions reduction.

- The Senior Vice President, Hardware Engineering, along with two Cisco Fellows, sponsors product power architecture and product energy efficiency efforts.

Circular economy

In 2018, Cisco launched an enterprise-wide circular economy program. The program extends from how we design, build, and deliver products, to how we value the assets we have and turn them into new products. We also apply Cisco technology to support our customers in their own circular transformations.

Our circular economy initiatives are focused in five major areas:

- Circular design: Design products and packaging with circularity in mind (e.g. design for reuse, repair, recycling, and resource efficiency)

- Circular operations: Reduce consumption and use renewable sources across our value chain

- Circular consumption: Manage our equipment for multiple life cycles and deploy new business models to facilitate this approach

- Circular solutions: Shape and pioneer technology-driven solutions and services to enable circular economy value creation for customers

- Ecosystem leadership: Advance the circular economy through industry innovation, collaboration, and public policy

The program operates under a dedicated program management office under the executive sponsorship of our Senior Vice President of Global Supply Chain Operations. The team runs multiple levels of governance bodies and cross-functional working groups to establish and achieve strategic priorities across the company. These include:

- Circular Economy Executive Change Network: Champions Cisco's holistic circular economy vision; drives engagement and business alignment.

- Operational Leadership Committee: Responsible for making decisions, taking accountability, influencing, and allocating resources for circular economy end-to-end at Cisco.

- Circular Consumption and Circular Design Steering Committees: Responsible for driving strategic initiatives to advance product returns and reuse and product and packaging design, respectively. These committees operate cross-functionally and are responsible for helping to envision the future state, making decisions, taking accountability, influencing, and allocating resources for circular economy within their specific pillar of focus.

- Working Groups: Responsible for initiating, implementing, and managing specific circular economy projects; organized by pillar or strategic priority area.

- Circular Economy Regional Leader Network: Responsible for championing our vision within their regions, facilitating local engagement, and providing business support.

Risk management

The Board of Directors, acting directly and through the [Audit Committee](#), is responsible for oversight of risk management at Cisco, including risks associated with CSR and sustainability. Our enterprise risk management (ERM) process supports the identification, assessment, mitigation and monitoring of risks—including climate—and Cisco's response to those risks. Risks are identified through industry reports, peer benchmarks and executive interviews. Input is prioritized, risk owners are assigned, risk management and mitigation work plans are developed, and metrics measuring the effectiveness of risk management and mitigation actions are tracked and reported.

Design for environment

In the past, we used a Design for Environment (DfE) program which incorporated environmental design principles into our products and manufacturing processes. Our DfE program included both formal requirements (for example, ECMA-TR/370) and best practices developed within our business which led to

fewer raw materials used, less packaging needed, and product refurbishment and recycling becoming more feasible and effective.

Cisco's DfE approach focused on the following areas:

- Energy efficiency (with a goal to improve system power efficiency of large rack-mounted equipment from 77 percent to 87 percent by 2022 (FY16 baseline)

- Reduction of hazardous materials

- Design for upgradability and longevity

- Recycling markings on plastic components (ISO 11469, formerly SPI codes) for ease of sorting during recycling

- Packaging and fulfillment (reduction of materials and package volume as well as logistics impacts)

- Ability to opt out of product accessories not needed (power cords, cables)

- Use of recycled content materials and materials with less environmental impact

- Standardized and modularized components and enclosures, which allow us to reduce use of unique components on each product

- Design for disassembly, repair, and reuse, using easily separable components with similar materials to facilitate recycling and reusable components

We have built on our DfE principles to form a holistic circular design strategy focused on five main areas:

- Material Use

- Standardization and modularization

- Sustainable packaging

- Smart energy consumption

- Design for disassembly, repair, and reuse

Further details on our Circular Design Principles can be found in the Products and packaging materials section of this document.

Environmental management system

Cisco's ISO 14001 Environmental Management System (EMS) is a global framework that touches all functions and aspects of our CSR program. It relies on individual accountability, management responsibility, measurement of key performance indicators (KPIs), and a continuous improvement philosophy to meet business and environment goals and drive environmental performance.

Cisco's Corporate Environmental Policy outlines Cisco's high-level environmental framework that helps make our EMS so successful, driving continuous improvement of Cisco's environmental performance. Our EMS is certified by TUV SUD America Inc. to the international EMS standard ISO 14001:2015. A copy of our EMS certification is available for download. We have found that an increasing number of our customers request that we have and maintain our EMS certification.

We select Cisco sites for ISO 14001 certification based on criteria including:

- Facility size and lab area

- Building headcount capacity or persons housed

- Primary facility function

These criteria focus on sites with the greatest potential to reduce negative environmental impacts and enhance positive impacts. Once we've selected a site for certification, we evaluate its associated impacts, including corporate functional areas; associated products, activities, or services at that location; and the environmental impacts associated with the generation or use of materials, impacts on air and water, and depletion of natural resources. Using this information, we calculate an environmental score to further help

us prioritize facilities and issues. Each site aligns with Cisco's corporate sustainability priorities, in addition to site-specific goals. Cisco continually assesses existing sites and acquisitions against the certification criteria and incorporates them into the ISO 14001 certification roadmap to meet business and customer needs. Table 11 shows Cisco's global ISO 14001 certified site locations by region.

Table 11: Cisco ISO 14001 certified site locations

Americas	Europe, Middle East, Africa, and Russia (EMEAR)	Asia Pacific, Japan, China, and India (APJCI)
Austin, Texas	Amsterdam, Netherlands	Bangalore, India
Alpharetta, Georgia	Bedfont Lakes, United Kingdom	Beijing, China
Lawrenceville, Georgia	Reading, United Kingdom	Hong Kong, China
Boxborough, Massachusetts	Brussels, Belgium	Shanghai, China
Fulton, Maryland	Dusseldorf, Germany	Singapore, Singapore
Herndon, Virginia	Galway, Ireland	St. Leonards, Australia
Kanata, Canada	Krakow, Poland	N. Sydney, Australia
New York, New York	Netanya, Israel	Tokyo, Japan
Richardson, Texas	Paris, France	
Research Triangle Park, North Carolina	Vimercate, Italy	
San Jose, California		
Toronto, Canada		

Scope and implementation

Cisco's ISO 14001 certified sites are audited annually by TUV SUD America Inc. Sites that were part of an acquisition are included in the scope of our corporate environmental policy and associated environmental initiatives. Therefore, they may become 14001 certified and audited. Table 12 shows our ISO 14001 certification KPIs.

Table 12: Cisco Environment Management System ISO 14001 certification

KPI	FY16	FY17	FY18	FY19	FY20
Number of Cisco sites with ISO 14001 certification	26	30	32	32	31
Percent of real estate portfolio with ISO 14001 certification	>90%[1]	>90%[1]	>90%[1]	>90%[1]	>90%[1]

[1] *We have met our goal of certifying a high percentage of our real estate portfolio. We will maintain >90 percent coverage of sites that meet the certification criteria.*

We use our EMS process to help identify our most significant environmental impacts, evaluate their risks at each Cisco site, and set relevant corporate and local objectives. All ISO 14001 certified sites have environment aspect teams. Each site's team reports on goals, initiatives, and metrics to measure our environmental performance. Local initiatives are aligned to corporate-level programs where possible. Table 13 lists the number and type of aspect teams per region.

Table 13: Environment aspect teams per region

Aspect Teams	Global Teams	Americas	Europe, Middle East, Africa and Russia (EMEAR)	Asia Pacific, Japan, China and India (APJCI)	Total
Waste reduction and recycling		6	7	9	22
E-scrap management[1]	√	13	10	2	25
Energy management[2]	√	0	2	9	11
Green Initiative/ Environmental awareness		7	5	0	12

Wastewater management	1	0	0	1
Total per region	27	24	20	71

[1] *These teams have site-specific activities and goals but also support a corporate-level/global goal.*

[2] *Used at smaller sites, these teams typically include activities around employee engagement, energy management, e-scrap management, waste reduction and recycling, and local "green" activities.*

Cisco's corporate sustainability activities are included in our certified EMS and are part of the internal and external audits we perform annually. This enables us to internally track key corporate environmental performance goals, initiatives, and metrics.

Our EMS aligns closely with our circular economy, GHG emissions, waste and energy management programs and supports the management of our sustainability information. This alignment has helped us automate our sustainability data collection and focus resources on other important tasks, such as evaluating and implementing mitigation projects. Internal EMS audits provide insight into how our environmental processes and commitments have been implemented and how well we are improving our EMS at our certified sites. The frequency of these audits depends on criteria such as site size, operational activities at the site, and the results of previous audits. In a typical three-year period, every site will receive one on-site audit and one virtual audit.

As part of our ISO 14001 certification, we participate in annual audits conducted by a third-party registrar. These audits identify areas of improvement and performance while providing external validation and verification of our EMS processes and programs.

Cisco has piloted virtual external ISO 14001 certification audits with our third-party registrar. For the last three years, at least one of our annual external site audits is done virtually using Cisco technology. This helps decrease Cisco's travel footprint.

In response to the 2020 COVID-19 pandemic, the environmental programs and aspect teams reviewed their activities, metrics and goals to make needed adjustments to align with the March 2020 transition to remote working. Several teams developed innovative ways to engage with employees, while others had to adjust timelines and programs for in-person activities like our company wide Recycle IT Day. The ISO 14001 EMS internal and external audit programs utilized Cisco technology to shift completely to virtual audits. This resulted in a Best Practice to ensure effective 'site' audits where accomplished while teams were not traveling, and only critical employees were allowed on site. The ISO 14001 EMS and associated green programs and activities adapted to the physical distancing requirements dictated by the pandemic and were still able to realize some positive outcomes.

During our internal and external audits in FY20, Cisco received 19 Positive Comments and five Best Practice recognitions on our ISO 14001 certified EMS. The Positive Comments were primarily tied to innovative employee engagement, activities and communication, improving Cisco environmental performance, excellent and meticulous green metrics, exceeding environmental goals and targets, risk management and aligning our day-to-day operations with sustainability in mind. The Best Practices were found across the globe and include:

- Cisco's green product design resulting in the reduction of e-scrap and waste

- A focus on green operational management, actively mitigating environmental risks and impacts

- Emergency response SMOKE TENT program where volunteers were trained on life saving evacuation techniques, e.g. gain better visibility by crawling when an area is filled with smoke

- Detailed and thoughtful reporting and easily accessible and comprehensive metrics in the environmental portion of the FY19 CSR report

- Adapting to the remote and virtual world required given the COVID-19 pandemic. This has led to the creation of an innovative virtual site audit process making them more immersive and value-add

All numeric claims made in this ETR are subject to a multiday, detailed, bottom-up audit conducted by our internal ISO 14001 audit team and part of the annual ISO 14001 internal audit plan. Verification is key to reporting valid data and helps us actively identify needed corrective actions. All environmental claims

made in the 2019 CSR report were successfully audited and verified through Cisco's internal audit process. Cisco's environment-related claims in the 2020 ETR will be audited in FY21.

Environmental compliance

Cisco has incurred no significant fines— defined as more than $10,000—in any of the last five years. Nor have we been subject to nonmonetary sanctions for noncompliance with environmental laws and regulations. Cisco is not aware of any formal grievance filed about environmental impacts.

Cisco closely monitors developing Waste Electrical and Electronic Equipment (WEEE) legislation globally and complies with applicable WEEE regulations. Products are labeled with a crossed-out "wheelie bin" symbol to encourage users to reuse or recycle electronics instead of putting them in the trash. For additional information on our compliance with the WEEE Directive and other takeback and recycling regulations visit WEEE Compliance on Cisco's website.

Environment employee engagement

We encourage employees to be global problem solvers related to environmental sustainability. The actions they choose to take often depend on their experiences, their location, their expertise, and issues they care about. Through digital tools, educational activities, and volunteer opportunities, Cisco helps improve employees' awareness of the many ways to get involved.

Education and awareness

Cisco employees receive many hours of education and awareness per year. One hour of our New Employee Orientation (NEO) is dedicated to sharing information about Cisco's CSR program. We also help employees incorporate environmental design principles into our products, packaging, and solutions.

To further embed environmental practices into our business operations, we offer employee training on our business management system. This training covers our Environment Management System (EMS) and environmental policies. The supply chain human rights training educates employees on how they can help follow through on our human rights commitments. We also provide ad hoc training to employees on topics such as correct waste sorting on campus.

The Cisco Green Team Network (GTN) is a global employee-led team with 12 local chapters and hundreds of members. Cisco GTN envisions a more environmentally sustainable business and world. It's made up of people passionate about educating their fellow employees and making change. Chapters raise awareness of environmental issues, share how to make changes at work and at home, and connect employees with local resources—all while having fun. GTN-sponsored discussions and activities have included the benefits of a plant-based diet, how to plant trees, and tips for composting at home.

Since Cisco GTN was established, the team has:

- Eliminated paper cups from select Cisco buildings in India, Europe, and the U.S.

- Established community gardens in San Jose, California and Bangalore, India

- Developed an urban farm at our Diegem, Belgium, site

- Designed and installed shadow boxes above the landfill, recycling, and composting receptacles in San Jose and RTP cafeterias to help employees quickly and easily sort waste

- Received Cisco's Excellence in Environmental Stewardship award (December 2017)

In addition, Cisco hosts events for employees to learn more about sustainability programs and current opportunities to get involved, such as SustainX, part of our annual Earth Aware campaign. Learning opportunities include:

- Cisco Green. This is a hub on our internal social media site that enables employees to learn about Cisco's environmental sustainability activities. It provides links to programs, information, and other tools.

- Cisco GreenHouse. In 2016, we launched an interactive sustainability web platform for employees hosted by WeSpire. Cisco GreenHouse connects passionate employees who want to find ways to lead

more sustainable lives with likeminded peers all over the world. By the end of FY20, more than 8,000 employees had joined the site and taken 48,000 actions to learn about or be more sustainable.

- SustainX. SustainX is our thought leadership forum on sustainability. In FY20, our fifth annual event was 100% virtual. During this event, we invite internal executives to share what their teams are doing to reduce their environmental impact and external speakers to discuss the innovative ways they are working to improve the environment. In FY20, leading environmentalist and author Paul Hawken shared his "Drawdown" approach to addressing global warming, and a Cisco Fellow explained how our new 8000 Series routers save significant amounts of power and materials.

- Virtual presentations. Cisco Green Teams hosted many Webex presentations for employees to learn more about topics such as living a zero-waste lifestyle, environmental justice, and cleaning local watersheds, as well as a sustainability trivia event. We even gave employees a virtual tour of the new beehives at our Research Triangle Park campus.

- Circular economy newsletter and Webex Teams space. Each quarter, the newsletter highlights circular economy success stories, provides updates on progress towards our public goals, and shares opportunities to collaborate on circular initiatives. Hundreds of employees keep tabs on the latest announcements and events while connecting with others enthusiastic about sustainability.

- Circular Economy webinars and internal website. In fiscal 2020, we hosted two employee webinars on topics related to circular operations and circular design. We launched an internal website and case studies on the Cisco Circular Design Principles.

- Circular Economy working groups. Cisco regularly convenes a variety of extended-team workgroups. These groups include the Circular Design Working Group, the Circular Economy Regional Leader Network, and the Circular Economy Sales Champion Network.

- The Cisco Responsible Sourcing campaign. Launched in fiscal 2020, the campaign is raising internal awareness of our commitment to source products ethically and sustainably. One element of the campaign is our Champions of Sustainability, a recognition program that highlights the people behind responsible sourcing at Cisco across our Supply Chain Operations and Global Procurement Services.

Activities and volunteering

Cisco provides opportunities for employees to volunteer or take part in annual sustainability events. Cisco employees can also volunteer to help with a sustainable business project through our stretch assignment program or create their own green team to advocate for sustainable changes in their location.

- Annual shutdown: Cisco requires employees in North America, and encourages other employees worldwide, to take time off at the end of December. The shutdown gives us an opportunity to power down facilities and unused equipment during a time when much of our workforce is already taking time off. Over the 10-day shutdown beginning in December 2019, Cisco avoided approximately $690,000 in energy costs and 3,400 metric tonne CO_2e of emissions. Employees working in buildings in India, Hong Kong, reduced their electricity consumption by at least 40 percent during the shutdown.

- Stretch assignments: Cisco groups post stretch assignments for employees to get involved in sustainability-related initiatives. Examples of stretch assignments include managing communications for sustainability-related activities, calculating sustainable solutions for our customers, and circular economy projects focused on zero-waste initiatives at our manufacturing sites and embedding our Circular Design Principles into our internal tools and processes.

Given COVID-19 restrictions, employees were not able to participate in annual sustainability events. Once employees are cleared to return to our offices, Cisco will re-institute these programs. Some examples are:

- Recycle IT Day: Employees love Recycle IT Day. Many collect their used electronics year-round and bring them to their local Cisco office on Earth Day in April. Cisco responsibly recycles the equipment using the same vendors we use to recycle Cisco products. In FY19, Cisco collected 422,108 pounds (191 metric tonne) of electronic waste from over 160 sites around the world.

- Earth Aware: While Earth Day is just one day, Cisco extends the celebration with a two-month employee volunteerism and awareness campaign, Earth Aware. During Earth Aware, we invite employees to practice sustainable behaviors like biking to work and properly sorting waste in cafeterias. We also host activities like on-campus farmer's markets and information sessions about Cisco's species

conservation efforts. Earth Aware sparks new ideas and renews dedication to live in more environmentally responsible ways.

- Bike to Work Day (BTWD). As part of the Earth Aware campaign, Cisco sponsors Bike to Work Day activities. While it is a global opportunity, Cisco employees and contractors in San Jose come out in large numbers. They visit Cisco's energizer station, grab bagels and fruit, get free chair massages, use the repair station, and visit with fellow cyclists. In partnership with the Silicon Valley Bike Coalition, Cisco helps remove thousands of cars from the roads in the Bay Area through this event. Also, in the month of May, employees in Bangalore take part in the Zero Emissions Ride.

Supplier environmental performance

Cisco has consolidated its supplier sustainability requirements into a single document linked from the Supply Chain Sustainability web page. The Environmental Stewardship and Circular Economy sections of this document, address environment-related requirements Cisco applies to its supply chain. GHG emissions, water, waste, environmental pollution and public reporting requirements are described.

Our suppliers are essential partners as we work to improve environmental performance across our supply chain. We hold our suppliers—and their suppliers—to the same high standards we practice through the Supplier Code of Conduct and other responsible sourcing policies. To follow through on our commitments, we conduct due diligence with suppliers and address impacts to protect workers, communities and the environment from harm. Through supplier engagement, we believe in building foundations that can drive positive outcomes for people and ecosystems in our supply chain. Per Table 14, we collaborate extensively with industry groups, peers, suppliers, and other stakeholders to advance responsible, sustainable supply chains across our industry.

Table 14: Supply-chain, environment-focused organizations and initiatives

Organization	Engagement areas
Alliance for Water Stewardship (AWS)	Cisco has adopted AWS International Water Stewardship Standard for evaluating and driving water stewardship in the supply chain.
CDP (formerly Carbon Disclosure Project)	Cisco participates in CDP's disclosure system to report on our efforts and promote public reporting within the supply chain.
Clean Electronics Production Network	We are a full member of CEPN, a multi-stakeholder network with the goal to address workers' exposure to toxic chemicals during electronics manufacturing. We work to develop tools for due diligence and identify best practices to be propagated in the supply chain.
European Partnership for Responsible Minerals (EPRM)	We are a member of EPRM, a multi-stakeholder partnership aimed at increasing the availability of responsibly produced minerals through supporting mine sites, supporting mid- and downstream companies, and strengthening linkages between production and sourcing.
Institute of Public and Environmental Affairs (IPE)	Cisco has an ongoing partnership with IPE to prevent, mitigate, and remediate environmental risks with supplier sites in mainland China.
Responsible Business Alliance (RBA)	Cisco is an original founder and full member of the RBA. We collaborate with peers at the RBA to propagate best practices across the industry and supply chain.
• RBA Chemical Management Taskforce	We promote the adoption and dissemination of tools and resources to improve chemical management practices and protect workers from exposure to chemicals in the electronics supply chain.
• RBA Environmental Sustainability Working Group (ESWG)	We collaborate with peers at the RBA ESWG to develop tools and disseminate resources to build more sustainable supply chains.
• RBA VAP Advisory Council	Cisco participates in RBA's VAP Advisory Council which comprises of member companies who advise RBA leadership regarding the VAP program.
Responsible Minerals Initiative (RMI)	We actively participate and collaborate with peer companies at RMI to address concerns and develop new solutions for responsibly sourcing minerals.

Supplier GHG emissions

Because Cisco has a fully outsourced supply chain, these emissions are captured in our Scope 3 Category 1 Purchased Goods and Services and Category 4 Upstream Transportation and Distribution inventory. Cisco has committed to reduce supply-chain-related Scope 3 GHG emissions by 30 percent absolute by FY30 (FY19 base year). To support Cisco in meeting this goal suppliers are expected to report GHG emissions and energy consumption to CDP on an annual basis.

Our expectations for supplier reporting are:

1. Provide a complete and accurate inventory of corporate-wide Scope 1 and 2 GHG emissions

2. Make the response publicly available via the option provided by CDP

3. Obtain third-party assurance of reported GHG emissions

4. Set an absolute GHG emissions reduction goal and report annual progress against that goal

5. Request suppliers and business partners report to CDP using this same five-step process.

Progress by our suppliers towards meeting these expectations is provided in Appendix III – Supplier environmental engagement and performance. Our active supplier GHG emission reduction goals are shown in Table 10. Performance towards these GHG emissions goals is shown in Table 15 and Table 16 below.

Table 15: Suppliers with public absolute GHG reduction target

KPI	FY19	FY20	Comments
Suppliers with a public absolute GHG reduction target	23%	33%	
Goal: 80 percent of Cisco component, manufacturing, and logistics suppliers by spend will have a public, absolute GHG emissions reduction target by FY25.			

Table 16: Supply-chain-related Scope 3 GHG emissions and reduction goal

KPI	FY19	FY20	Comments
Supply chain GHG emissions: Scope 3, metric tonne CO_2e	1,720,000[1]	*	
Percent progress toward goal.	baseline	*	
Goal: Reduce Cisco supply chain-related Scope 3 GHG emissions by 30 percent absolute by FY30 (FY19 base year).			

[1] *Due to the nature of Scope 3 targets and how emissions are calculated, we have established a standard process to govern any future required adjustments, e.g., due to the availability of new data or improved methodology. While we do not expect any such changes to impact these figures more than 1%, any increase or decrease exceeding this threshold would cause a restatement of the baseline.*

* *Due to the lag between when emissions occur at our suppliers and when they are reported to Cisco through CDP, we will be reporting our FY19 baseline in this report. Progress against this goal will not be available until our 2021 CSR report.*

Supplier material waste

Our focus on developing and promoting a circular economy has driven efforts to better understand how materials are consumed upstream in our supply chain. Cisco has committed that 70 percent of Cisco component and manufacturing suppliers by spend will achieve a zero-waste diversion rate at one or more sites by FY25. To support Cisco in meeting this goal, first-tier manufacturing suppliers are expected to monitor and collect waste diversion data. These requirements include:

• Reporting facility-level data to Cisco as requested

• Striving to achieve a zero-waste diversion rate across each site

In FY20, Cisco continued our partnership with TRUE Zero Waste to support and verify completion of our manufacturing partners' efforts to achieve a zero-waste diversion rate at specific sites and to maximize

their efficiency in the use of resources. We are in the final stages of the TRUE certification process for Cisco operations at partner manufacturing sites in China and Thailand, and plan to kick off similar initiatives at manufacturing partner sites in Mexico and Malaysia in the first half of FY21.

Table 17: Performance toward supplier zero waste goal

KPI	FY19 baseline	FY20	Comments
Suppliers achieving a zero waste diversion metric at one site. Goal: 70 percent of Cisco component and manufacturing suppliers by spend will achieve a zero waste diversion rate at one or more sites by FY25.[1]	21%	23%	

[1] *According to current standard definitions used in certification protocols, "zero waste" diversion is defined as a 90 percent or greater overall diversion of solid, nonhazardous wastes from landfill, incineration (waste-to-energy), and the environment. Diversion methods can include reduction, reuse, recycling, and/or compost.*

Information on solid waste in our operations (Cisco-owned or -leased facilities) is provided in the Solid waste from operations (trash) section below.

Supplier water security

During FY20, we dug further into how we could help to improve environmental vitality of water systems in the areas where our supply chain operates. We conducted a survey to identify the water consumption levels of different commodity types within our supply chain. Leveraging World Resources Institute's Aqueduct tools and the data we collected from suppliers, we were able to identify high water consumption supplier sites operating in water-stressed areas. As a result, we have prioritized suppliers to engage in capability-building in partnership with the Alliance for Water Stewardship in FY21. Our goal is to reduce water-related risks to business and improve the health of water ecosystems long-term.

We also worked to broaden the scope of environmental reporting and transparency to help us better understand the water footprint in our global supply chain. In addition to reporting GHG emissions, we asked supplier sites to complete the CDP water survey during FY20.

Environmental risk management in China

We have an ongoing partnership with Institute of Public and Environmental Affairs (IPE) and conduct a series of activities to prevent and mitigate the environmental risk from our supplier sites in mainland China. We are recognized for our work at IPE and were ranked 2nd in the IT industry for the Corporate Information Transparency Index (CITI) at the end of FY20. See Table 8 for 5 years of our CITI IT industry ranking.

Some of the work we conduct leverages IPE's Blue Map database which identifies existing and historical environmental violations. We work closely with these suppliers to ensure that they remediate any environmental issues and comply with the local environmental law. In addition, Cisco requires suppliers to publish their corrective actions on the IPE website to improve environmental transparency, and get the violations addressed and delisted within the required timeline. In FY20, 50 supplier sites in mainland China remediated environmental violations and were delisted from the IPE Blue Map.

We also work with our manufacturing partners to cascade these expectations to their next-tier suppliers in a program called the Green Supply Chain initiative. By building the capability of suppliers, we can influence better environmental performance and transparency further down in the supply chain. In FY20, 100 percent of our manufacturing partners in mainland China set up programs to manage their suppliers' environmental performance using IPE Blue Map. With direct one-on-one coaching from Cisco, partners became able to identify their suppliers' environmental pollution violations and work with suppliers on remediation. IPE recognized one of Cisco's partners for their focused efforts to launch and scale the program without prior experience. The supplier shared their positive experience of working with Cisco at the IPE Annual Forum so peers, NGOs, government, and other stakeholders could learn from it. These manufacturing partners regularly report to Cisco the environmental violations identified within their supply

chains, how they engage with their suppliers, and how many violations have been resolved. They receive continued guidance from Cisco on driving successful pollution abatement programs.

Environmental reporting and transparency are critical to understanding the environmental impact of our supply chain. This reporting includes making information publicly available on what chemicals are being released to the air, water, and soil, and what pollutants are being transferred to another site for treatment and disposal. Collecting this data also helps us identify environmental conservation initiatives and to set supply chain goals for reducing pollution. To drive this work, Cisco encourages high environmental impact suppliers to disclose energy conservation, water, air, and waste information through the Pollution Release and Transfer Report (PRTR) reporting system on the IPE website. In FY20, 102 supplier sites completed PRTR reporting compared to 60 in FY19. We saw large increases in part by motivating our manufacturing partners to ask their high environmental impact suppliers to complete this reporting.

We are also taking steps to help suppliers address current environmental compliance challenges. In FY20, Cisco organized virtual environmental training seminars with more than 219 attendees from 173 suppliers. The seminars included presentations and how to protect the environment in their daily operations. For manufacturing partners who have struggled with addressing their pollution violations, we hired third-party consultants to identify gaps and coach partners to implement corrective actions onsite for more than four months. After coaching, the facilities were able to successfully mitigate and remediate identified environmental issues and validate closure through IPE's review processes.

Audits and self assessments

We have adopted the RBA's industry standard accountability and assessment tools. These include Self-Assessment Questionnaires (SAQs) and the Validated Assessment Program (VAP). SAQs engage suppliers to assess their conformance to the RBA Code of Conduct and identify any gaps. Using RBA's industry-standard protocol reduces audit fatigue and makes clear the expectations suppliers should perform to. Table 18 show SAQ coverage by supplier type.

Table 18: Self-assessment questionnaire coverage by supplier type

	FY19	FY20
Manufacturing partners	100%	100%
Components suppliers (by spend)	80%	80%
Logistics suppliers	100%	100%

Our comprehensive supplier auditing program helps suppliers build capability and improve their performance. Third-party auditors trained and certified in social and environmental auditing and RBA's VAP protocols conduct audits on site. Auditors walk through production areas, dormitories, and canteens; interview workers and management; and review policy and procedure documentation. More information about VAP standard protocols can be found on the RBA website.

Suppliers share their audit results with Cisco through the RBA-ONLINE platform. We require regular audits of manufacturing partners every two years. And each year, we audit at least 25 percent of component supplier facilities that are deemed high risk according to our risk assessment process.

Environmental responsibility is a key dimension of the Cisco Supplier Code of Conduct. Cisco performs audits on our high-risk suppliers through the RBA Validated Audit Protocol (VAP). Read more about our audit processes and supplier audit results in the ESG Hub. Environment specific audit nonconformances are shown in Table 19.

Table 19: RBA audit nonconformances for FY20, Environment category

	Total Component Suppler	Total Contract Manufacturer	Nonconformances Identified as Priority	Nonconformances Identified as Major	Nonconformances Identified as Minor
Environmental permits and reporting	6	1	0	7	0

Pollution prevention and resource reduction	2	1	0	1	2
Hazardous substances	22	0	0	20	2
Solid waste	3	0	0	3	0
Air emissions	10	1	0	8	3
Materials restrictions	1	0	0	0	1
Water management	5	0	0	3	2
Energy consumption and greenhouse gas emissions	9	0	0	3	6

There were no priority environment audit nonconformances in FY20. We worked with our suppliers to close nonconformances according to RBA timelines and helped suppliers to improve environmental management systems.

Energy and GHG emissions

We are making progress reducing our energy use and GHG emissions through energy efficiency initiatives, investments in renewable energy, engagement with our supply chain partners, and improvements to the efficiency of our products. All of these topics are described below.

Energy and GHG emissions goals

Our current energy and GHG emissions goals are summarized, along with other environmental goals, in Table 10. Past goals are summarized in Appendix V.

We form our GHG emission reduction goals based on internal best practices and expert opinion, including recommendations from the IPCC, SBTi, the U.S. EPA, the IEA, and The 3% Solution report[3] published by the World Wildlife Fund (WWF) and CDP. Cisco has set science-based targets that exceed the rate of decarbonization required to keep global average temperature increase below 2°C compared to pre-industrial temperatures, as described in the Fifth Assessment Report of the IPCC. Our FY22 GHG reduction goal of 60 percent (FY07 baseline) equates to a 4 percent reduction per year.

Cisco typically sets public goals in 5-yr increments that include appropriate funding and expected financial return on investment. We also set internal annual targets that are reviewed on a quarterly basis to ensure annual progress is made against our public goals.

Energy and Scope 1 and 2 GHG emissions

To achieve our Scope 1 and 2 GHG reduction and renewable energy goals, we will:

- Invest more than $45 million between FY18 and FY22 in energy efficiency and renewable energy
- Implement hundreds of energy efficiency and on-site renewable energy projects across our real estate portfolio
- Increase renewable energy procurement through utility green power programs, power purchase agreements (PPAs), and renewable energy certificates (RECs)

Reducing our energy consumption and GHG emissions while enabling a diverse energy supply for our operations helps us stay competitive and benefits the environment. Our overall strategy to accomplish these objectives is to:

- Use our real estate space more efficiently

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[3] The 3% Solution report is named for the annual emissions reduction thought to be needed through 2020 to meet IPCC guidance. According to the IPCC Annex 1, developed countries need to reduce GHG emissions by 25 to 40 percent below 1990 levels by 2020, and by 80 to 95 percent below 1990 levels by 2050. Such a stabilization pathway was said to provide a "reasonable chance" of averting warming beyond 2°C above preindustrial temperature.

- Increase the energy efficiency of our real estate operations

- Generate low-carbon electricity from on-site systems and purchase renewable energy

- Engage our stakeholders, including customers and employees, on our sustainability strategy

Our Scope 2 emissions result almost exclusively from electricity use and represent 94 percent of our Scope 1 and 2 emissions. As a result, implementing projects to reduce our electricity use and increasing our use of renewable electricity are major parts of our energy and GHG reduction strategy. In FY20, our Scope 1 and 2 GHG emissions were 55 percent lower than our FY07 baseline on an absolute basis. See Table 20 for details.

Table 20: Summary of Scope 1 and 2 GHG emissions[1]

KPI	FY07 baseline	FY16	FY17	FY18	FY19	FY20	Comments
Total GHG emissions: Scope 1, metric tonne CO_2e	48,311	53,123	41,926	41,171	41,181	39,223	
Total GHG emissions: Scope 2 (location-based), metric tonne CO_2e	448,950	731,662	744,929	666,708	651,331	607,969	"Location-based" is used consistent with GHG Protocol and does not include renewable energy purchases.
Total GHG emissions: Scope 2 (market-based), metric tonne CO_2e	402,422	247,933	223,558	205,141	187,428	163,636	"Market-based" is used consistent with GHG Protocol and includes renewable energy purchases.
Scope 1 and 2 emissions (Market-based) intensity, metric tonne CO_2e per million dollars of revenue	12.9	6.1	5.4	5.0	4.4	4.1	Market-based intensity is a measure of operational efficiency commonly used by many Cisco stakeholders.
Scope 2 emissions from primary data, percent	96.4%	98.1%	98.0%	98.2%	97.5%	97.7%	
Total GHG emissions: Scope 1 and 2 (market-based), metric tonne CO_2e	450,733	301,057	265,484	246,312	228,610	202,859	
Percent progress against FY22 reduction goal[2] Goal: Reduce total Cisco Scope 1 and 2 GHG emissions worldwide by 60 percent absolute by FY22 (FY07 baseline)	baseline	-33.2%	-41.1%	-45.4%	-49.3%	-55.0%	Results are based on Scope 2 GHG Protocol methodology released in 2015. Cisco's current GHG reduction goal was announced in September 2017.

[1] *Our reporting policy for environmental metrics is to show the baseline year, data for the past five completed years, the goal, and progress against the goal.*

[2] *Scope 2 emissions for all years have been adjusted to reflect the GHG Protocol's new Scope 2 guidance. This new guidance was released in 2015 and had material impacts on Cisco's current and Scope 2 figures calculated prior to 2015.*

Cisco uses the GHG Protocol Corporate Accounting and Reporting Standard as the basis for our Scope 1 and 2 calculations. We report Scope 1 and 2 emissions based on operations over which we have operational control. Calculations are based on site-specific data for fuel consumed and utilities purchased, applying published emissions factors and global warming potentials (GWPs). See Table 21 for details.

Table 21: Electricity emissions factors[1]

KPI	FY07 baseline	FY16	FY17	FY18	FY19	FY20	Comments
IEA world average emission factor, g CO_2e per kWh	507.1	536.0	506.0	491.8	487.5	480.9	Latest factors used for our current FY20 report from IEA, RE-DISS, and EPA GHG Emissions Factors Hub. Prior years used the latest factors available at time of prior-year reporting. See footnotes for emission factor and GWP sources.[2]
Cisco global average electricity emission factor (location-based), g CO_2e per kWh	437.9	448.2	447.1	407.9	404.7	391.4	
Cisco major data center average electricity emission factor (location-based), g CO_2e per kWh	394.7	419.4	419.5	353.9	353.6	334.4	
Cisco global average electricity emission factor (market-based), g CO_2e per kWh	392.5	152.8	134.5	125.5	116.5	105.3	

[1] Our reporting policy for environmental metrics is to show the baseline year, data for the past five completed years, the goal, and progress against the goal.

[2] Cisco used emission factors from the following databases for its FY20 GHG inventory: 2020 IEA Electricity Information Database 2018 IEA factors, 2019 EU Residual Mix Factors from RE-DISS, Center for Corporate Climate Leadership GHG Emission Factors Hub (modified March 9, 2020). 2020 country-specific emission factors for Australia, Brazil, Canada, India, and United Kingdom provided from those countries' governments. 100-year GWPs from IPCC Fourth Assessment Report (AR4), 2007.

The EPA Center for Corporate Climate Leadership provides additional program guidance. Of the seven GHGs covered by the GHG Protocol (CO2, CH4, N2O, HFCs, PFCs, SF6, and NF3), four (CO2, CH4, N2O, and HFCs) are applicable to our operations. We do not have biogenic carbon emissions.

We report market- and location-based Scope 2 emissions in accordance with the GHG Protocol's Scope 2 guidance. Each year, an independent third party provides a limited assurance review of our Scope 1 and 2 GHG inventory. This limited assurance review is provided in accordance with the ISO 14064-3 International Standard and is published as part of our CDP submittal. The assurance statement is available for download here.

Historical Scope 1 and 2 emissions data in Table 22 may vary from previous publicly reported values, either in the most recent CDP survey or our previous CSR report. This is due to updated reporting guidance, emissions factors, adjustments for acquisitions or divestitures, or correction of errors found during review.

Table 22: Summary of Scope 1 and 2 energy usage

KPI	FY07 baseline	FY16	FY17	FY18	FY19	FY20	Comments
Energy generated, GWh	0	2.5	2.6	2.6	2.2	2.4	Cisco uses all the energy generated by its onsite solar PV systems and does not sell any energy.
Energy usage, GWh	1,239	1,850	1,831	1,815	1,788	1,718	
Indirect energy usage, GWh	1,025	1,641	1,656	1,637	1.612	1.556	Electricity is the only indirect energy source used by Cisco—we do not purchase any heating, cooling, or steam.
Direct energy usage, GWh	213	209	176	178	177	162	Direct energy consumption is the sum of Cisco's natural gas, propane, and diesel usage for heating and backup power

						generation and regular gasoline and diesel fuel used in Cisco's fleet.
Electricity usage, GWh	1,025	1,641	1,656	1,637	1,612	1,556	
Natural gas usage, GWh	135	94	90	90	93	79	
Stationary diesel usage, GWh	18	33	15	21	20	36	Stationary diesel is typically used for backup power generation.
Propane usage, GWh	0.8	0.2	2	2	2	0.8	
Transportation fuel usage (combined gasoline and diesel fuel), GWh	59	73	68	65	62	46.3	Transportation fuel includes regular gasoline and diesel fuel used in Cisco's fleet.
Energy use per unit of revenue, GWh of energy consumed per billion dollars in revenue	35.5	37.6	37.2	36.8	34.5	34.8	

The Cisco workplace

We continue to optimize our real estate portfolio while reducing energy use and GHG emissions. Our solutions integrate leadership engagement, change management, design, procurement, policy, and technology to transform the workplace experience. For example, our activity-based workspaces can accommodate more employees than a traditional office layout, substantially reducing space and land requirements and associated environmental impacts.

New buildings and renovation projects include energy efficiency requirements such as standards for LED lighting and efficient air conditioning. We have changed our workplace occupancy model from individual to group assignment, giving our employees flexibility and choice while increasing the utilization of our assets. In addition, with our flexible work policy and mobile technology solutions, employees can work from any Cisco office, as well as from home, a customer site, or even a coffee shop.

Energy efficiency in our buildings, labs, and data centers

Our Global Energy Management and Sustainability (GEMS) team leads all energy and sustainability initiatives across our 19 million square feet of global real estate. The team currently manages the $45 million, five-year global EnergyOps program. EnergyOps aims to implement hundreds of efficiency and renewable energy projects every year through FY22. The GEMS team includes Cisco employees and contracted energy managers who have the following primary responsibilities:

- Managing Cisco's global annual utility budget and contracts
- Identifying and implementing demand- and supply-side energy solutions, such as energy efficiency upgrades and on-site renewable energy projects
- Embedding sustainability and efficiency criteria into our building, lab, and data center design standards
- Exploring and evaluating options for higher efficiency in all of Cisco's real estate projects
- Engaging employees to participate in resource conservation

In FY20, the GEMS team enabled Cisco to avoid approximately 19.3 GWh of energy consumption and 8,600 metric tonne CO_2e by investing $8.7 million to implement 44 energy efficiency projects. This does not include our renewable energy purchases or on-site renewable energy generation. We estimate that the over 440 energy efficiency and on-site renewable energy projects we have implemented since FY16 have avoided approximately 142 GWh of energy and 62,000 metric tonne CO_2e. This program has also allowed us to make our operations more efficient and increase the amount of renewable electricity we buy, directly contributing to the achievement of the FY17 sustainability goals and the creation of our FY22 goals.

Table 23 shows the energy savings associated with the GHG reduction projects we implemented between FY16 and FY20. Projects the GEMS team implemented globally in FY20 include:

- Updating lighting controls and using LED technologies to increase lighting efficiency

- Installing and upgrading waterside economization technologies to improve free cooling utilization

- Balancing airflow and improving hot and cold aisle containment within our labs

- Recommissioning and optimizing major mechanical equipment and control systems to improve energy efficiency of our heating and cooling systems

- Participating in emergency energy demand response programs in both Texas and California

- Continuing an employee engagement campaign to promote, educate, and incentivize employees to conserve energy

Table 23: Energy and GHG emissions reduction projects[1]

KPI	FY16	FY17	FY18	FY19	FY20
Number of projects implemented	103	103	145	48	44
Annual energy avoided, GWh/yr	31.2	40.1	32.4	19.4	19.3
Total estimated annual CO_2e savings, metric tonne CO_2e /yr	12,400	23,600	10,300	7,100	8,550

[1] Does not include renewable energy purchases

Labs and data centers

Approximately 80 percent of our operational electricity is used to power and cool equipment in our labs and data centers. Increasing the energy efficiency of these spaces is our greatest opportunity to reduce Cisco's operational GHG emissions and energy costs. We can do this by focusing on efficiency in the design of our labs and practicing smart approaches to utilization and power management.

Our Global Lab Specification includes efficiency standards for new, high-density labs and retrofits. Our standards mandate airflow management in all new labs globally and recommend it for renovation projects. EnergyOps projects, as well as projects initiated by lab managers, also help us improve existing airflow management, ventilation, cooling, and other building infrastructure systems.

To reduce electricity usage in our labs and data centers, we use smart power distribution units to monitor our lab equipment. We increase server utilization by using virtual machines. Our Cisco Customer Experience labs use a check-in, check-out system of automation pods to allow lab employees to set up configurations virtually and then release equipment when they are finished with it. This system maximizes the number of people who can use the equipment, minimizes the amount of equipment physically needed in each lab, and reduces the amount of energy used collectively by our labs. When a lab team moves to a different lab, users remove unused or old equipment, thereby saving space, power, and cooling.

Our data center efficiency strategy focuses on design, utilization, and power management. Our data centers in RTP, North Carolina, and Allen, Texas, were designed to achieve a power usage effectiveness (PUE) of 1.41 and 1.35 at full load, respectively. Both centers have achieved Leadership in Energy and Environmental Design (LEED) New Construction (NC) Gold Certification (v2.2) from the U.S. Green Building Council for incorporating numerous sustainable design features. Examples of efficiency retrofits we completed in our labs and data centers over the last several years include:

- Balancing airflow and improving hot and cold aisle containment

- Replacing electric-resistance heaters with more efficient heat pumps in our backup generators

- Retrofitting existing Computer Room Air Handling units with EC fans to allow more efficient variable fan speed

- Installing mixed-mode waterside economizers to allow greater utilization of free cooling throughout the year

We have also increased efficiency by migrating IT loads into key locations. By consolidating our footprint, we've reduced our square footage costs and our overall electricity use. Since July 2013, we have reduced data center square footage by over 25 percent.

GHG emissions from outsourced IT

Refer to a later section, Scope 3 category 1: purchased goods and services, for a discussion of outsourced IT GHG emissions.

Green building standards

We have integrated green building standards into our real estate since our first LEED-certified building was built in 2009. By the end of FY20, 18 Cisco facilities were LEED-certified, with 13 rated Gold or Platinum. These facilities represent over 2.5 million square feet of LEED-certified space, which is about 13 percent of Cisco's global real estate portfolio.

We also incorporate principles of green building standards into our standard workplace design, even if we're not planning for LEED certification. These standards make our spaces more comfortable for our occupants while reducing our buildings' environmental impact.

Renewable energy

Generating and purchasing low-carbon electricity is a key component of our GHG reduction strategy. We prefer on-site power projects where possible, but off-site power is often the better option due to factors such as location, budget, and space constraints. While we do use unbundled renewable energy certificates (RECs) today to help meet our renewable energy goal, we continue to engage utilities and renewable energy providers to expand both our on-site and off-site renewable energy activities so we can help support the development of new renewable energy systems in locations where we operate. We identify and evaluate potential projects in the following order:

1. On-site power opportunities

2. Green power contracts with utilities

3. Off-site power opportunities

4. RECs

Onsite renewable power

We have 2.9 MW of onsite solar PV installations in Texas, Massachusetts, North Carolina and India that produce an average 3.2 million kWh of electricity, avoiding 1,200 metric tonne CO_2e each year over the projected 25-year life of the systems. We continue to look for new onsite renewable opportunities and are currently planning to add two new onsite solar projects in Raleigh, NC and India over the next 12 months.

Purchasing renewable electricity

Purchasing electricity generated from renewable or other low-carbon sources is a key component of our GHG reduction strategy. We summarize our global renewable electricity purchases in Table 24. We have purchased renewable electricity in the U.S. and Europe since FY06 by buying RECs and entering into green power contracts with various electricity suppliers.

We are actively exploring how to increase the percentage of renewable energy obtained from utility contracts and PPAs. We engage with green power providers and buyers through the Renewable Energy Buyers Alliance (REBA) and also participate in the EPA's Green Power Partnership, where we are consistently ranked highly in their Green Power Top Partner Rankings.

In April 2020, Cisco completed a 10 MW virtual PPA to purchase power from the Mesquite Star wind farm, a 419-megawatt (MW) wind farm in Texas. Cisco's portion of the project provides approximately 40 percent of the electricity we use annually at our data centers in Richardson and Allen, Texas. See blog for details.

We have expanded our renewable electricity purchases in India to include both long-term by buying RECs and entering into green power contracts with various electricity suppliers. In 2018, Cisco signed two solar power purchase agreements (PPAs) that will collectively deliver 85,000 megawatt-hours of clean, renewable electricity every year to the local electric grid where our Bangalore campus is located. These agreements provide nearly 40% of the electricity we need to power our Bangalore campus. For more information, read our blog on the project.

Other renewable energy accomplishments in FY20 include:

- Purchased 100 percent of the electricity used at Cisco facilities in the U.S., Belgium, Denmark, France, Germany, Ireland, Italy, and the United Kingdom from renewable sources.

- Partnered with multiple companies to sign a 10 MW virtual PPA from a large wind farm in Texas. Construction began in May 2019 and we started receiving power from the system in April 2020. See the blog for details.

- Continued participation in Duke Energy's Green Rider program to purchase about 10 percent of the electricity used at our RTP campus from 10 MW of solar projects located in North Carolina

- Continued participation in Austin Energy's Green Choice program to purchase 100 percent of the electricity used at our facilities in Austin, Texas, from local wind power systems

Table 24: Electricity from low-carbon sources (renewables)

KPI	FY07 baseline	FY15	FY16	FY17	FY18	FY19	FY20
Electricity from renewable sources, GWh	110	1,167	1,264	1,324	1,344	1,344	1,292
Percent progress against renewable energy goal Goal: Use electricity generated from renewable sources for 85 percent of our global electricity by FY22	11%	71%	77%	80%	82%	83%	83%

Electricity usage from renewable sources by region:							
EMEAR (Europe, Middle East, Africa, and Russia)	31%	48%	44%	49%	62%	65%	63%
India	0%	2%	33%	45%	49%	52%	60%
United States	10%	97%	100%	100%	100%	100%	100%

Scope 3 GHG emissions

Cisco measures our environmental footprint across our supply chain to prioritize areas for improvement. Scope 3 emissions cover a broad range of activities across Cisco's supply chain, operations, products, and solutions. Below we discuss the most significant areas of impact. For a complete table of our Scope 3 emissions as reported to CDP, see Appendix IV. Additional Scope 3 emissions information is available in our response to CDP Question 6.5 of our 2020 CDP Investor Survey response.

Scope 3 reduction strategy

Our Scope 3 focus areas are reducing emissions related to product energy use and in our supply chain operations by:

- Increasing product power efficiency through continual engineering improvements

- Integrating carbon accounting metrics into our supply chain operations to optimize transport and materials in the manufacturing of our products, and increase energy efficiency in our extended operations

- Collaborating with manufacturing, component, and logistics suppliers to manage and report GHG reduction targets, influencing improvements in performance year over year (see Supplier environmental performance section for more details)

Scope 3 supply chain operations

Cisco and the broader electronics industry rely on suppliers worldwide to provide components, assemble, test, and ultimately ship products to our end customers. As a result, supply chain emissions make up a significant proportion of Cisco's GHG footprint. To help us understand critical impacts in our supply chain, we use recognized global frameworks and industry standards for accountability and reporting.

As a member of the CDP Supply Chain Program, we request that all of our direct suppliers—with whom we have a significant business relationship—report their carbon impacts to CDP. Table 52 in Appendix III provides the percent of our manufacturing, component, and logistics suppliers, by spend, that report their Scope 1 and Scope 2 GHG emissions to CDP. Furthermore, Scope 3 category 1 and category 4 GHG emissions are included in the boundary for our Supply Chain related Scope 3 absolute GHG emissions goal.

Scope 3 category 1: purchased goods and services

This Scope 3 category is included in our supply chain absolute reduction goal. The boundary incorporates the allocated GHG emissions of our Tier 1 and Tier 2 manufacturing, component and warehouse suppliers. Emissions are allocated based on Cisco's financial share of the supplier's reported global Scope 1 and Scope 2 GHG emissions. The majority of emissions are related to the electricity consumption used to manufacture sub-components and complete final testing for our products.

To reduce Scope 3 category 1 emissions, we have set an absolute GHG reduction goal for our supply chain as shown in Table 16.

Table 25: Supplier adoption of absolute GHG reduction goals

Supply chain GHG emissions	FY19	FY20
Suppliers, by spend, with a public, absolute GHG reduction target	23%	33%
Goal: 80 percent of Cisco component, manufacturing, and logistics suppliers by spend will have a public, absolute GHG emissions reduction target by FY25.[*]		

* *Preferably in line with an approved science-based methodology (applying either a 1.5°C or well below 2°C reduction scenario). Includes suppliers that set intensity targets that produce an absolute emissions reduction during the target period.*

GHG emissions from outsourced IT – DCaaS, IaaS, SaaS and PaaS

IT services come in several forms: on premise, co-located data center as a service (DCaaS), infrastructure as a service (IaaS), platform as a service (PaaS), and software as a service (SaaS). As part of our annual GHG emissions reporting, we calculate the on-premise emissions of Cisco-managed data centers. However, we are shifting more IT services into co-located data center facilities or the cloud (as-a-service providers). In 2019, our Chief Information Officer confirmed this shift to outsourced IT. As part of this transition to cloud resources, Cisco is targeting a 30 percent reduction in the number of Cisco on-premise data centers within the next five years. When IT services move from on-premise to co-located DCaaS facilities and remain in our operational control, the GHG emissions accounting remain in our Scope 2. When IT services move from on-premise facilities to the cloud, operational control is relinquished and GHG emissions accounting shifts, from our Scope 2 to Scope 3 (IaaS, SaaS and PaaS).

This year is the first year we calculated our GHG emissions from these types of outsourced IT. Due to data availability these estimates were calculated for FY19. The methodology for calculating DCaaS GHG emissions can be straight forward. Where possible, we used publicly reported revenue, GHG emissions reported to CDP and our spend with each partner to estimate our portion of emissions. In the cases where annual revenue and carbon emissions information was not available, we used a carbon intensity average and our spend with the provider to estimate our portion of emissions.

We classify our use of IaaS, PaaS and SaaS products as purchased goods and services (Scope 3). We have estimated our GHG emissions for our use of IaaS and PaaS services using the Greenhouse Gas Protocol guidance for calculating Scope 3 emissions (version 1.0). For our IaaS calculation, we used facility-level data provided by our partners. If this wasn't available, we allocated our portion of our partner's scope 2 emissions. To do this calculation, we used publicly reported revenue, GHG emissions reported to CDP and our spend with each partner.

There is difficulty aligning these 3 sources as they all cover a slightly different time period, but we believe that we are in the correct order of magnitude. Our emissions for DCaaS, IaaS and PaaS can be found in Table 26.

Table 26: GHG emissions from outsourced IT services (IaaS, SaaS, PaaS).

KPI	FY19	FY20	Comments
Scope 2 GHG emissions from outsourced IT - DCaaS (Location-Based), metric tonne CO_2e	37,125	TBD[1]	
Scope 3 GHG emissions from outsourced IT – IaaS and PaaS (Market-Based), metric tonne CO_2e	4,194	TBD[1]	SaaS is not included in our FY19 estimate

[1] *FY20 emissions calculation is dependent on receipt FY20 CDP supply chain data and will be reported when data is available.*

Scope 3 category 4: upstream transportation and distribution

This Scope 3 category is included in our supply chain absolute reduction goal; see Table 16. The boundary incorporates the GHG emissions from transportation and distribution services directly purchased by Cisco over the reporting year. The majority of emissions are related to the air transportation used to deliver products and services within our manufacturing and distribution networks.

Downstream transportation emissions, paid by Cisco, are included in Category 4 Upstream Transportation and Distribution (in accordance with the GHG Protocol).

Scope 3 category 6: business travel

Cisco closed its last travel goal in 2017. Our two travel goals are listed in Appendix V. We continue to report travel emissions as part of our Scope 3 CDP reporting, summarized in Appendix IV – FY20 Scope 3 emissions. Due to the impacts of COVID-19 on corporate travel our scope 3 business travel emissions are approximately 40 percent less than we would have expected during a normal year.

Scope 3 category 7: employee commuting

Cisco used our latest employee commuting survey completed in FY18 to estimate the emissions produced from employees commuting to work in FY20. Our Scope 3 emissions from employee commuting decreased significantly from FY19 to FY20 due to our mandatory work from home policy during the COVID-19 pandemic. Table 27 summarizes our associated Scope 3 commuting emissions.

Table 27: Scope 3 emissions from employee commuting

KPI	FY16	FY17	FY18	FY19	FY20	Comments
Scope 3 GHG emissions from employee commuting, metric tonne CO_2e	91,586	80,506	81,394	79,735	47,973	Our FY18, FY19 figures were externally verified. FY20 data is not being verified due to the impacts from COVID-19 pandemic.

Flexible work practices

In addition to the collaboration tools we make widely available to our employees, several Cisco network technologies also permit flexible working environments (for example, working from home or remotely). These include Cisco Virtual Office and Cisco OfficeExtend. Cisco Virtual Office provides wired and wireless voice, data, and video service for an employee's home or for small commercial offices, using Cisco integrated services routers (ISRs) and IP phones. Cisco OfficeExtend is an even simpler solution. It's a remote wireless access point in the employee's home that provides the same highly secure communications to a wireless local area network (WLAN) controller at the connected Cisco campus.

Many employees also use Cisco's AnyConnect Secure Mobility Client to connect to our enterprise network, enabling them to work from any device, at any time, in any location. Although working remotely does not directly reduce air travel, it helps our employees become more proficient in using collaborative technologies, which is especially important for a global technology company.

Transportation services

We provide a variety of transportation services to our employees to help them commute, move around our campus locations and adjoining communities, and maintain their vehicles. Cisco also maintains over 500 ports available for employees and guests at our headquarters in San Jose. Globally, Cisco has over 380 stations with more than 680 charging ports (Table 28).

Table 28: Cisco locations with EV charging

United States	Outside the United States
Irvine, California	Salzburg, Austria
Pleasanton, California	Vienna, Austria
Rancho Cordova, California	Diegem, Belgium
San Francisco, California	Ottawa, Canada
San Jose, California	Toronto, Canada
Lawrenceville, Georgia	Hangzhou, China
Fulton, Maryland	Hefei, China
Boxborough, Massachusetts	Suzhou, China
Research Triangle Park, North Carolina	San Jose, Costa Rica
Malvern, Pennsylvania	Prague, Czech Republic
Richardson, Texas	Espoo, Finland
San Antonio, Texas	Paris, France
	Lyon, France
	Berlin, Germany
	Budapest, Hungary
	Bangalore, India
	Rome, Italy
	Vimercate, Italy
	Lysaker, Norway
	Krakow, Poland
	Bucharest, Romania
	Madrid, Spain
	Stockholm, Sweden
	Bedfont Lakes, United Kingdom
	Chandlers Ford, United Kingdom
	Green Park, United Kingdom

Cisco includes the electricity used to charge employee EVs in our Scope 2 emissions reported as shown in Table 22.

Cisco also maintains a fleet of company cars for our employees in Europe and has been working to reduce the GHG emissions associated with this fleet over the last five years (Table 29). We have set a limit on the allowable CO2 emissions of newly purchased vehicles and promote EVs when possible. The current limit we set is 151 g/km for diesel cars, and 160 g/km for gasoline cars (WLTP). We expect to further reduce these limits over time, as the automobile industry continues to release more fuel-efficient and less polluting vehicles, as well as an increased number of full electric vehicles.

Table 29: Percentage EVs in Cisco company cars

Year	FY16	FY17	FY18	FY19	FY20
Total fleet size	6,100	5,950	5,440	4,772	4,620
Number of electric vehicles	334	420	469	540	773
Percentage of electric vehicles	5.5%	7.1%	8.6%	11.3%	15.7%

Scope 3 category 11: use of sold products (product energy efficiency)

Cisco calculates our Scope 3 use of sold products GHG emissions based on the Greenhouse Gas Protocol guidance for calculating Scope 3 emissions (version 1.0). Our use of sold products are classified as direct use-phase emissions as our products directly consume energy during their use. We use equation 1 to estimate the total CO_2e from the use of our sold products. Because our products have varying expected lifetimes, we assume a conservative average of 5 years. In actuality, it could be anywhere from 2-15 years depending on the product type. To account for the previous 4 years of product energy consumption, we include those previous yearly estimates in our current yearly estimate.

$$\sum energy\ consumed\ per\ use\ (kWh)\ x\ number\ sold\ in\ Fiscal\ Year\ x\ expected\ lifetime\ x\ emission\ factor\ (\frac{kg\ CO_2e}{kWh}) \quad (1)$$

Table 30 provides the GHG emissions from the use of sold products. Electricity and GHG emissions decreased in FY20 due to manufacturing restrictions due to COVID-19. About 80 percent of these emissions were calculated using primary data.

Table 30: Total estimated electricity and GHG emissions from use of sold products.

KPI	FY17	FY18	FY19	FY20
Electricity from use of sold products, TWh	49.8	49.2	49.0	46.4
Scope 3 GHG emissions from use of sold products metric tonne CO_2e	26,423,996	25,653,819	24,929,174	23,271,302

To better calculate this number, we are creating a database to track our product energy consumption. Our goal is to automate this process to allow for easier energy use calculations and more consistent data year over year. By the end of FY21, we plan to have our initial database ready to help calculate our GHG emissions from use of sold products.

We estimate that Cisco is responsible for around 6% of the electricity consumed by the Information and Communications Technology (ICT) sector. This estimate is based on research published in 2018 by Jens Malmodin and Dag Lunden which estimated that in 2015 the ICT sector consumed 805 TWh.[4] This same study also found that electricity consumption by the ICT industry has not grown exponentially as once predicted, but has remained roughly flat due to continued focus on product energy efficiency. This finding was supported by further research finding that global data center usage only grew from about 194 TWh in 2010 to 205 TWh in 2018.[5] This assumption allows us to derive our estimate of 6% by assuming the ICT sector still consumes roughly 805 TWh.

Table 31: Cisco product categories by power consumption and product revenue

Year	% Total power	% Total product revenue
Infrastructure	92.2%	75.4%
Applications	6.3%	15.9%
Security	1.5%	8.8%
Other products	0%	0.4%

Stakeholder engagement and standards development

Cisco engages with governments, regulatory agencies, and standards development organizations to monitor and influence the development of emerging product energy efficiency requirements and standards. Product energy efficiency standards can promote innovation by being performance-based, by taking into account product functionality, and by relying on objective criteria, real-world data, and system-level efficiency. Predictable requirements enable companies to focus on the environmental issues most relevant to them.

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[4] J. Malmodin and D. Lunden. "The Energy and Carbon Footprint of the Global ICT and E&M Sectors 2010–2015" (2018)

[5] E. Masanet, A. Shehabi, N. Lei, S. Smith, J. Koomey. "Recalibrating global data center energy-use estimates" (Science Magazine, 2020)

Many eco-design standards and regulations generally apply to a single point of energy conversion in the power supply at the front end of the total system. Cisco supports the idea of studying energy consumption more broadly. This systems approach should result in a fair and correct way to promote energy efficiencies in tomorrow's networks. One standard that embodies this approach is the Alliance for Telecommunications Industry Solutions (ATIS) Telecommunications Energy Efficiency Ratio (TEER). This measurement method covers all power conversion and power distribution from the front end of the system to the data wire plug, including application-specific integrated circuits (ASICs).

The ATIS TEER standards created a framework for measuring product energy usage that takes product functionality into account. They use real-world loads to determine energy efficiency across the entire product. This is important because it allows companies like Cisco to compare energy-usage design improvements from one product generation to the next, and it helps consumers make better-informed purchasing decisions. The ATIS TEER standards have been incorporated into the Network Equipment Building System (NEBS) design guidelines applied to telecommunications equipment in the U.S. NEBS is the most common set of safety, spatial, and environmental design guidelines applied to telecommunications equipment. Compliance with these guidelines is an industry (but not a legal) requirement. Table 32 lists organizations Cisco works with on energy efficiency.

Table 32: Energy efficiency initiatives and organizations with whom Cisco actively engages

Organization	Engagement Areas
Alliance for Telecommunications Industry Solutions (ATIS)	Cisco is an active member of ATIS and engages with other member organizations to develop standards relevant to the telecommunications industry. Last year, we submitted a draft to update ATIS-0600015 (Servers and server blades) and bring the IT in line with other energy efficiency standards
European Commission Joint Research Center, Codes of Conduct	Cisco is a signatory and active member of the EU Code of Conduct on Energy Consumption of Broadband Communication Equipment. Aspirational goals are provided to reduce energy consumption of broadband communication equipment without hampering fast-technological developments and service provided.
Electronic Product Environmental Assessment Tool—EPEAT	Cisco has engaged with IEEE and NSF International in the development of server standards for energy efficiency. Cisco is an advisory committee team member and active member of the EPEAT program for servers and is contributing to both the Common Criteria (NSF 487) and Sustainable Network Equipment specifications.
European Telecommunications Standards Institute (ETSI)	Cisco is engaged with ETSI in the development of standards for energy efficiency. We lead the ETSI server standard EN303470, which defines the active efficiency metrics and idle measurements for 2- and 4-socket servers and where high temperature testing are being defined. Cisco also leads DEN/EE-EEPS47-2 on the verification of compliance with the requirement on the secure data deletion functionality, including instructions on how to use the functionality, the techniques used and the supported secure data deletion standard(s).
International Telecommunication Union (ITU) (worldwide)	Cisco is a contributor to the ITU-T SG5 Study Group while holding a Vice-chairman position on the management team.
U.S. Department of Energy (DOE), Environmental Protection Agency (EPA)	Cisco has been working with the EPA to define ENERGY STAR standards for networking equipment: SNE, LNE, telephony equipment, and servers. Cisco has also worked with Lawrence Berkeley National Laboratory, the EPA/DOE technical arm; Navigant; the National Resources Defense Council (NRDC); and Ecova on measurement methodologies and metrics. Cisco most recently provided feedback expand the product scope for the LNE specification.

Improving product energy efficiency

Improving product energy efficiency addresses two key challenges for Cisco. First, to achieve the projected product performance specifications for the next five to ten years, Cisco products need an architecture with "energy scalability". This is one that can provide energy-efficient service for variable traffic types, traffic demands, customer usage, and installs. Second, product use is our largest, Scope 3

GHG emissions source. To address these challenges, Cisco is investing in five primary product energy efficiency engineering initiatives. These initiatives were chosen because they enable the largest impact on improving our products' energy consumption.

- *Power initiative*: We are improving the efficiency of our products from plug to port and set a product power efficiency goal in early FY18. This goal is to improve large rack-mounted- equipment system power efficiency—as measured from the input power from the facility to the board-mounted ASICs, memory, and other chip devices—from 77 percent to 87 percent by FY22 (FY16 baseline). Read more about this goal in our goal announcement blog post. Progress toward this goal is shown in Table 33. To achieve this power efficiency goal we are reducing resistance – the hindrance of the flow of electrons – in our Printed Circuit Boards (PCBs) and other components through the use of better conductive materials. By reducing the overall resistance, we can decrease the energy lost as heat, increasing the overall system level efficiency and reducing the amount of heat that needs to be exhausted from the system.

- *Thermal initiative*: Commonly used forced air-cooling systems have limitations in cooling higher powered next-generation products. As such, we are exploring alternative methods of cooling such as liquid or refrigerant cooling, which will reduce power used by the products dedicated to cooling. Currently, liquid and refrigerant cooling is technically feasible, but implementation is dependent on customers upgrading their facilities to integrate properly with these cooling methods. Where appropriate we advocate for the use of liquid or refrigerant cooling, but until these methods are more widely adopted, we continue to develop advanced thermal techniques and optimize traditional forced air cooling to remove heat from our products.

- *High-speed interconnects and ASIC initiatives*: High-speed silicon-to-silicon or optics-to-silicon interconnects are an integral part of routing and switching systems. As throughput (or bandwidth) requirements increase, the interconnects can consume a significant portion of the total system power. Through advancements in optics, we can deliver increased bandwidth using the same or less power compared with earlier generation interconnects. Previous generation ASIC packet processing technology designs consumed large amounts of power. The Cisco Silicon One ASIC architecture, a complete redesign, has allowed the ASIC to be twice as efficient than previous ASIC technologies while enabling a move from Gbps to Tbps capacity with a single ASIC. For more information on how the Silicon ONE is reducing energy, read our blog here.

- *Customer facilities initiative*: We are working with customers to reduce the amount of energy required to operate IT facilities with power solutions that increase the efficiency of overhead power, avoid step-down transformers, and provide integrated cooling strategies. These end-to-end solutions reduce hardware requirements and energy consumption while providing a more integrated method for managing IT infrastructures. Our customers are constrained by the total amount of electricity that can be delivered to a given data center. Because of this, every watt counts and delivering electricity to our products in the most efficient way is becoming an even higher priority. Currently, data centers are using 208 or 239VAC or 48/60VDC inputs, while the most efficient input voltage is 277VAC or 380VDC. There has been low adoption of the 380VDC input voltage due to concerns over safety. To alleviate these safety concerns we are working with customers to design and implement fault managed power systems which can be integrated into connected building applications and reduce the cost of building out of future electrical infrastructure. To reduce energy consumption at facilities even more, we have proposed an improved cooling system with a smart HVAC system. The paper can be found in Technical Disclosure Commons here.

- *Power Supply Initiative*: Power supplies play a critical role in managing product energy efficiencies, as they are the first step where energy is lost. To overcome this loss, we are working to offer more energy-efficient options for power supplies, giving customers the option of platinum or titanium 80+ rated power supplies whenever possible. This provides cost-sensitive customers the option of selecting lower-rated power supplies, such as gold or silver, while allowing customers concerned about reducing their total energy use to select the higher-rated supplies. Over 50% of the new power supplies designs we developed last year were tested for a rating of platinum and above. This initiative also includes developing power supplies with wide-ranging AC and DC inputs that support AC/HVAC/HVDC for 200-277VAC or 240/380VDC. These designs allow us to support both AC and DC with legacy low input AC voltages or higher voltages that have higher efficiencies. Once customers begin to switch to 380VDC, we will develop power supplies that are optimized for this input voltage. For external power supplies, we ship products that are DOE6 compliant, aligning with the latest U.S. energy efficiency standards.

When we evaluate product energy efficiency, we consider the power performance of the entire system. We measure the percent efficiency as electricity passes through each component or function. This can

include, for example, the external power supply units (PSU), intermediate bus converter (IBC), point of load (POL), and ASIC, memory, or other chips.

Table 33: Product power efficiency improvements (large rack-mounted-equipment)

KPI	FY16	FY17	FY18	FY19	FY20
System power efficiency (percent) Goal: Improve large rack-mounted-equipment system power efficiency—as measured from the input power from the facility to the board-mounted ASICs, memory and other chip devices— from 77 to 87 percent by FY22 (FY16 baseline).	77% baseline	80%	82%	85%	85%

Reducing product energy consumption

Increasing energy efficiency is key to Cisco's strategy for managing the total amount of energy used by our products, but it is only one part. Cisco produces a wide variety of products ranging in size from access points (APs) to large networking equipment (LNE). This means we must take a multifaceted approach to managing energy consumption.

Our products fall into three categories in which we report revenue: Infrastructure Platforms, Applications, and Security. Each product segment requires a different approach. Switching, routing and optical networking falls under the Infrastructure category and these products make up the backbone of the network and consume the most energy. The total energy footprint of each of our products is determined mainly by which components we use. As components, such as the ASICs, CPUs, PHYs, and DIMMs, continue to consume more energy, our products will, too. To counter this energy increase, we're utilizing the below design techniques to reduce energy consumption.

- Reduced the process geometry of our ASICs which reduces the energy consumption and also allowed us to combine multiple chips into one, improving energy efficiency even more.

- Utilize Automatic Voltage Scaling (AVS) which allows us to adjust the processor voltage and core frequency, decreasing the energy consumption.

- Migrated from legacy synchronous DRAM and SRAM to DDR4 and Serdes based high density memories like HMC and HMB and improving memory architecture with hybrid queuing and ingress VOQ to improve energy consumption.

- Utilize fan speed controls that are based on component temperature and altitude as opposed to inlet-based temperatures.

- Modules can be classified as normal or high power and depending on what is installed, the fans speeds can be adjusted to fit the profile installed to save energy.

- Unused line cards or ports are powered-off to reduce energy consumption.

Our wireless portfolio, which includes APs, also falls under this segment. These products are primarily powered through PoE, making energy consumption a high priority. Each product must fit into the desired PoE standard, ranging from the 802.3af standard of max power at 15.4W to the 802.3bt max power rating of 90W. Products are also designed with an option to reduce usage of certain features, such as link speed, number of spatial streams available and USB availability to reduce power when these features aren't needed. Further design improvements include the following:

- Products are designed with Field-Effect Transistors (FETs) instead of diodes in our PoE system. This can reduce the power draw and on an 802.3at powered device can save about 0.75W.

- Utilize automatic rate shifting for power savings through optimizing the amount of power internal buses use when communicating between components.

Products falling under our IoT segment are essentially hardened versions of our switches, routers and access points that are deployed in environmentally uncontrolled environments. They may be installed in remote areas, with little power available so it's essential that they're designed to minimize energy consumption and usage of high failure components such as fans. We released the IR1101, with a focus on reducing energy consumption as a pilot and then utilizing these techniques on our next generation

hardened switches and APs whenever possible. These design improvements resulted in a 45% reduction in power over the previous generation of router. Design improvements are listed below.

- Utilize front end power supplies that have an efficiency greater than 90%.
- Reduce the number of stages where voltage is reduced, improving system efficiency.
- Use a lower powered CPU at a reduced clock frequency.
- Reduce number of LEDs and the brightness for remaining ones to reduce energy consumption.

Compute products as a whole have continued to increase their energy use each year and our rack, blade and node servers have followed this industry trend. The key drivers to this increase are processing power, use of persistent memory, accelerators such as GPUs and FPGAs and denser packaging (e.g. expanded storage and IO devices packaged into the same form factor. As the system power increases, the servers also must use higher performing fans to support this increased power density trend.

Cisco's compute products are Energy Star and EPEAT certified, and compliant with EU Directive 2019/424. The technology innovations that enable our compute products to comply with these standards are:

- Architecture consolidation of data and management into a single fabric to reduce number of IO devices, switches and redundant management components that consume energy.
- Dynamic power rebalancing between high and low customers to eliminate stranded power allocations to improve efficiency of available power.
- Hardware layer is abstracted to enable policy-based management. This allows users to easily push BIOS policies optimized for energy efficiency to their entire install base regardless of form factor, version or processor architecture.
- Optimized fan design with policies biased towards low power operation and a use of a variable fan speed algorithm which includes component temperature and power consumption to optimize fan speed selection. This eliminates unnecessary overcooling and wasted fan power.

Our collaboration portfolio is made up primarily of our IP Phones, headset and telepresence products. Like APs, IP Phones can spend an even greater amount of their lifetime not in use. It's critical for these products to be designed to efficiently power up for use, then switch into a standby mode to minimize their energy footprint. It is also a priority for our IP Phones to be designed to meet ENERGY STAR standards. Our headsets allow customers to integrate with our collaboration applications, while providing energy efficient features such as battery management and Bluetooth-power optimization reducing energy consumption and ultimately, providing longer call times between charges. With each new generation of IP Phone and headset, we're also improving the design with the following:

- Integrating the latest, most efficient silicon with our audio processing and call-control software
- Developing intelligent power-management features that selectively enable power to only those functions needed for each use case.
- Adopting the latest Bluetooth/Wi-Fi standards that transmit only as much antenna power as needed to maintain a stable wireless link.

Telepresence products help customers reduce their GHG emissions from business air travel and commuting. When designing these products, we prioritize efficient switching between product use and standby modes. Future generations will also support three modes to minimize energy consumption: off, standby, and networked standby. Products can then be set to transition to either of the two standby modes if no input signals are detected for a predetermined time. Each generation of video endpoints is capable of supporting more features such as higher screen resolution, increased camera/video resolution and transmission rates and various sensors. While the newer generation products may use more power, we are improving the energy efficiency by using the latest ASIC, display and monitor technology.

Our security portfolio is made up of physical and cloud-based product offerings. Similar to our infrastructure platforms, energy consumption is determined by component selection. Each generation of products uses more energy, but bps/W ratios are also increasing. This offsets the additional energy increase.

Scope 3 category 12: end-of-use treatment of sold products (end-of-life)

This Scope 3 category is not included in our supply chain absolute reduction goal. The boundary incorporates the allocated Scope 1 and Scope 2 GHG emissions of our Tier 1 recycling partners. We do not include embedded emissions related to reuse or recycling of Cisco products. Further details can be found in the Product end-of-use section of this document.

IT solutions for the environment

We are making progress in managing GHG emissions in our own operations, in our supply chain, and at other phases of the product life cycle. Our products and services also offer opportunities through the "enabling effect."[6]

The enabling effect happens when technology helps lower emissions in other industries. For example, high-definition videoconferencing can be used in place of face-to-face interaction to avoid air travel. Energy monitoring and control of IP-enabled devices can reduce buildings' energy consumption.

Cisco sponsored and contributed to the first SMART 2020 report in 2009. The report identified opportunities for the ICT sector to develop and apply network technologies to reduce total GHG emissions by 15 percent. The report continues to be a seminal work and guides industry strategy. Considering the ICT sector was projected to be responsible for only 3 percent of global emissions in 2020, this represents a substantial positive impact. Potential reductions are concentrated in the areas of transportation, buildings, power/energy, and industry.

Reducing GHG emissions from business air travel and teleworking

Remote collaboration technologies (Table 34) help Cisco and our clients reduce emissions from air travel and commuting. These technologies include Webex Teams®, Cisco TelePresence®, Cisco Webex®, Cisco Unified Communications, and Cisco Jabber® collaboration solutions. Beyond reducing emissions, these technologies also increase employee productivity, promote work-life balance, and help us build customer relationships.

Table 34: Remote collaboration technology solutions

Technology solution	
Immersive videoconferencing	We have more than 5800 multipurpose TelePresence rooms, an additional 200 fully immersive TelePresence rooms and over 1000 Webex Teams Boards, deployed in our offices worldwide.
Small office/Personal video conferencing	The Cisco Workplace is Cisco's shared office space solution. Many small, flexible-use rooms for one to two people have Webex Pro, DX80, IP Phones or MX00 videoconferencing units installed.
	We've deployed over 88,000 IP Phones and over 17,000 personal Cisco TelePresence devices (Webex Pro, DX80, etc.) worldwide to help enable our shared office space solution.
Desktop/Devices videoconferencing	Webex Meetings, Webex Teams are available to all Cisco employees using Cisco-assigned laptops.
	- In FY20, we logged over 1.7M Webex meetings per month consisting of both voice and video meetings, supporting over 7.3 M attendees per month.
	- On Webex teams in FY20, we had over 122K monthly active users exchange 150M messages and share over 3.6M files monthly.
	- There are over 92,000 deployments of Soft Clients, where employee can forward phone calls through their computer eliminating the need all together to be near a communication device.
	- Cisco Jabber, Cisco Webex Meetings and Cisco Webex Teams is interoperable on smart phones with over 67,000 devices

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[6] See the SMART 2020 report published by GeSI for a more detailed explanation of the enabling effect.

	registered, providing flexibility to communicate in even more locations.
Home/remote office videoconferencing	Through our Cisco Virtual Office (CVO) hardware and Cisco AnyConnect VPN, employees had more flexibility to either work from home or any other location with network access. In FY20, we supported over 29,000 CVO units and over 106 K Cisco AnyConnect VPN users worldwide.

Replacing business air travel with remote collaboration requires more than just technology. Our business processes, management practices, and culture have also had to adapt. As experience with collaborative technologies increases, within Cisco and among our customers and partners, remote interactions have gone from being the exception to standard practice.

Hosting and attending Webex meetings with other employees or with customers, partners, and other stakeholders has become as common as using the telephone. We use Cisco TelePresence, Jabber, and Webex for virtual company meetings, executive operational reviews, and department all-hands meetings.

In addition, about one-third of our annual global ISO 14001 site audits are performed using Cisco remote collaboration solutions. This real-world experience guides product development and helps with the rollout of supporting management practices. Because adoption of remote collaboration technologies has matured, we are no longer tracking adoption metrics included in our previous CSR reports.

Products and packaging materials

Product and packaging goals

Cisco has set new goals and committed the necessary resources to meaningfully reduce our environmental impact and contribute to a circular economy. See Table 10 for a complete list of our current product and packaging goals. Our progress on these goals is reported in tables in this Products and packaging materials section that are also listed in Table 10.

At the World Economic Forum in 2018 as part of the Platform for Accelerating the Circular Economy (PACE) initiative, Cisco made a 100-percent product-return pledge. Product return is a foundational element of the circular economy. The Product return sections detail the various elements of our efforts to increase product return from our customers and drive higher rates of reuse according to circular economy principles.

Stakeholder engagement for the circular economy

Cisco engages with a variety of organizations, including governments, standards development organizations, and nonprofits, to collaborate and influence on circular economy and related topics. Through our involvement, we share with and learn from peers, work to help bring clarity and consistency to the global marketplace, create predictable requirements that enable companies to focus on the environmental issues most relevant to their business, and address opportunities or challenges that cannot be solved alone. Table 35 highlights several circular economy initiatives and organizations in which Cisco participated in FY20.

Table 35: Circular economy-related initiatives and organizations in which Cisco participates

Organization	Engagement Areas
CDP IT Industry Collaboration Group	Cisco reports annually to CDP, a not-for-profit organization that runs the global disclosure system for investors, companies, cities, states and regions to manage their environmental impacts. Cisco engages with CDP and a group of peer technology companies through the IT Industry Collaboration Group to set clear expectations and provide joint training for our suppliers.
CENELEC	Cisco is actively working with CENELEC, a European standards organization, on standards for circular design.
Circular Electronics Partnership (CEP)	Cisco is an active participant in a multi-stakeholder collaboration with seven organizations (GeSI, Green Electronics Council, ITU, PACE, Responsible Business

	Alliance, World Economic Forum, WBSCD) and peer companies to establish a shared vision and roadmap for a circular electronics value chain.
Digital Europe	Cisco is a member of Digital Europe, a trade association representing digitally transforming industries in Europe and is leading industry input to the EU ICT impact study and the EU Circular Economy Action Plan.
Ellen MacArthur Foundation (EMF)	Cisco was a founding partner of EMF, and we continue to leverage member connections, trainings, and shared learnings as a Member of EMF.
European Telecommunications Standards Institute (ETSI)	Cisco actively engages with ETSI, a European Standards Organization (ESO) that is a recognized standards body dealing with telecommunications, broadcasting and other electronic communications networks and services. Cisco engages in material efficiency standards related to mandates from the European Commission, and is leading the work on secure data deletion and on energy metrics for servers.
International Telecommunication Union (ITU) (worldwide)	Cisco is a contributor to the ITU-T SG5 WP2 Lead Study Group on ICT and climate change. On circular economy aspects, we co-edited the standard "ITU-T L.1023: Assessment method for circular scoring."
Partnership to Reuse, Refill, Replace Single-Use Plastics (PR3)	Cisco is a technology sponsor of PR3, a cross-industry initiative with the goal of replacing single-use packaging by making reuse systems globally scalable, and economically, socially and environmentally preferable for consumers and the whole value chain.
Platform for Accelerating the Circular Economy (PACE) Capital Equipment Coalition (part of the World Economic Forum)	Cisco is an active member of the Capital Equipment Coalition, an affiliated project of PACE, which shares and publishes best practices as well as progress toward the pledges each member made in January 2018.
Product Attribute to Impact Algorithm (PAIA)	Cisco is part of a multi-stakeholder consortium of ICT companies using shared industry-standard inputs in the PAIA platform—a joint initiative of MIT and Quantis — that provides a streamlined methodology for ICT product environmental footprinting.
Responsible Business Alliance (RBA)	Cisco is an original founder and full member of the RBA. We collaborate with peers at the RBA to propagate best practices across the industry and supply chain, including those related to circular economy.
Reverse Logistics Association (RLA)	Cisco serves on the Advisory Board and is a Diamond member of the RLA, a global trade association for the returns and reverse logistics industry.

Circular design

Circular design is fundamental to our ability to implement a circular economy, both now and in the future. Our circular design strategy spans five focus areas, which address our most material impacts. In FY20, guided this framework, we developed Circular Design Principles, allowing us to make progress toward several of our product and packaging goals.

1. Material selection – Incorporate recycled content into our products, reduce the use of non-renewable materials, and reduce exposure to resource scarcity risks as part of material selection.

2. Standardization and modularization – Standardize and modularize components and enclosures to simplify our supply chain and enable reuse, repair, remanufacturing, and recycling.

3. Sustainable packaging – Use recycled and renewable packaging materials, reduce foam and plastic use, move toward fiber-based designs, and increase packaging efficiency.

4. Smart energy consumption – Improve product energy efficiency through activity-based and power management features.

5. Design for disassembly, repair, and reuse – Design products with easily separable components that use similar materials to facilitate reuse, repair, remanufacturing, and recycling.

We are embedding these Circular Design Principles into standard design tools and processes, and developing a product-scoring methodology to measure progress toward our circular design principles goal. Per Table 10, we have set a goal to design 100 percent of new Cisco products and packaging to incorporate circular design principles by FY25. We will report our progress against this goal in our FY21 CSR reporting.

In FY20, we held eight workshops globally with stakeholders from across our design community, including Cisco employees from supply chain, engineering, and product management. These workshops increased awareness of our circular design strategy, sparked innovative new design ideas, and grew the community of advocates advancing circular design in their business units. We also established a Circular Design Steering Committee and launched a Circular Design Working Group, which meets regularly to share case studies, discuss best practices, and stay updated on key initiatives.

To increase awareness and understanding of our circular design strategy, we developed an interactive, gamified training course targeted at our design community. In this course, launching in FY21, employees will make a series of design decisions to "build" virtual Cisco products and learn about the Circular Design Principles as they go.

Our Circular Design Principles are increasingly being incorporated into the design of new products, making those products more durable, environmentally friendly, and easier to reuse through multiple life cycles. In FY20, we launched our first products with closed-loop plastic. Another example is our IR1101 router, which employs a highly modular and expandable hardware design to extend product lifetime. Customers have the flexibility to add or upgrade components as their needs and technologies evolve. The updated design also reduced the idle power by 45% from the previous generation.

Product materials

Recycled material content

Like many companies, Cisco uses plastic in both our products and packaging. Plastic has many advantages, from its technical properties to its low cost and light weight, the latter helping to reduce emissions from transport. However, plastic in products and especially packaging presents sustainability challenges if the product or packaging is not properly dispositioned.

Where technically feasible, we will design plastic out of our products and packaging to reduce the total use of plastic material. Where it is not viable to design out plastic, we will increase the use of recycled plastic to reduce the use of virgin material and associated drilling for oil. Driving increased demand for recycled plastic helps making recycled materials a more economically viable option for more companies.

In FY20, we launched select models of the IP phone 8800 series and the Webex Room Kit Plus using 100 percent post-consumer recycled (PCR) plastic resin. These products are the first to carry a new closed-loop plastic label Cisco has created to differentiate products made with recycled plastic sourced from industrial recyclers including our own. And by using PCR resin, we will reduce the carbon footprint of these plastic components by as much as 95 percent. Since the plastic components in these few products account for more than 15 percent of Cisco's total direct plastic procurement, full implementation in manufacturing will have a significant impact toward achieving our goal to reduce virgin-plastic use by 20 percent by 2025. Progress toward meeting this goal is shown in Table 36.

Table 36: Progress toward meeting our virgin-plastics goal

KPI	FY18	FY19	FY20	Comments
Total plastic consumption, metric tonne	6,175	not reported	4,563	
Percent reduction in use of virgin plastic Goal: Decrease use of virgin plastics by 20 percent by FY25 (FY18 base year)[1]	baseline	not reported	-26%	

[1] *Plastics contained in commodity components sourced from suppliers, such as printed circuit boards, are excluded. Most of these components require the electrical insulating property provided by plastic.*

The production of the 8800-series and WebEx Room Kit products was delayed due to COVID-19, but will take full effect in FY21. COVID-19-related impacts beginning in March 2020 through the July end of Cisco's fiscal year largely drove the indicated 26% virgin-plastic reduction in FY20. Given this extenuating circumstance, we do not consider the goal to be met and continue to drive reduction efforts in FY21.

Eliminating paper from new product shipments

In July 2020, we announced a goal to eliminate all paper documentation that is included in new product shipments by the end of FY21. (See Table 10) For many of Cisco's hardware products and software solutions, a significant amount of paper is shipped in the form of licenses, manuals, and compliance documentation. Eliminating these paper shipments and moving to electronic delivery represents an opportunity to reduce waste, cost, and GHG emissions while streamlining the supply chain and enhancing the customer experience. We will report our progress against this goal in our FY21 CSR reporting.

Materials of concern

As a global supplier of network equipment, we conform to applicable material regulations for product, packaging, and battery materials. We're committed to reducing the impact of the materials used in our products and in our supply chain. We developed our Controlled Substances Specification to fulfill global environmental regulations. The purpose of this specification is to share Cisco's substance use and reporting requirements with component suppliers and manufacturing partners. It outlines controlled substances and any conditions of use, regulatory restrictions, substances to be reported and phased out, and substances under study for potential inclusion. We restrict more than 230 hazardous substances and 38 previously allowed substance exemptions. In addition, we are evaluating more than 20 additional substance groups for potential future restrictions beyond 2021 calendar year due to global trends and customer priorities.

For additional information on materials-related regulations, visit Cisco's Materials webpage. To obtain to-date product-level information such as a CE Declaration of Conformity, visit our self-service Product Approvals Status (PAS) tool[7].

The following sections cover a number of materials that, while currently not prohibited for use in our industry, we are working to reduce or substitute in our products where possible.

Halogenated flame retardants

Nonregulated halogenated flame retardants (HFRs) can be found in PCBs and plastic parts. We have worked with manufacturing partners, industry standards technical committees, and academia to validate proposed alternatives to HFRs. Cisco continues to identify when and where, if technically possible, to phase out nonregulated HFRs.

Some of the actions we have taken include:

- Qualifying additional halogen-free PCB laminate materials and increasing their use in new products

- Eliminating, from thousands of Cisco-designed plastic parts, the HFRs found in resin compounds

- Performing material assessments and identifying areas within our business with the greatest opportunity to move to HFR-free materials

Polyvinyl chloride

Polyvinyl chloride (PVC) is a nonregulated substance found in cable insulation. Cisco worked on the iNEMI PVC Alternatives Project to reduce PVC content in cable insulation. This work focused on understanding the environmental trade-offs of standard, halogen-free, and bio-based cable jacketing. Cisco will continue to research alternate materials and apply them to new products where we can maintain quality and performance requirements.

Batteries

Batteries in Cisco products are generally used to maintain information in volatile memory when a device is powered off at the switch or plug. Products with batteries are designed so that the batteries can be easily located, removed and properly dispositioned for recycling. We use product labels to indicate if a product contains a battery. This label alerts our recyclers to remove a battery before further processing.

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[7] Cisco.com registration is required. Register here. Note: This tool is only accessible using Internet Explorer and Mozilla Firefox.

Product life-cycle management

Central to the concept of a circular economy is maintaining physical assets at their highest and best use for as long as possible. As Cisco transforms to become a software and features-driven business, we must not lose sight of the importance of our hardware in enabling those solutions.

We continue to make progress toward our PACE pledge (above), as well as our broader circular economy vision, building on close to two decades of programs to facilitate product returns for reuse and recycling, offer comprehensive service and repair, and remanufacture used equipment for sale through Cisco Refresh. Our strategy focuses on improving the customer experience to drive increased product returns at end-of-use, expanding business and as-a-service models to facilitate return and reuse, and improving product design to facilitate reuse and recycling. The programs covered in this section aim to extend the useful life of our hardware and are organized by product life cycle stage—from use, to return to reuse and end-of-life.

Use

After design, the use phase of our products is the first key step as we incorporate our circular economy approach into the life-cycle management of our equipment. Cisco's Global Service Supply Chain organization delivers and supports customer and partner hardware Return Material Authorizations (RMAs). Smart Net Total Care is Cisco's service offering to support Cisco equipment in customer facilities, offering return and replacement at varying service levels depending on the customer and location in the network.

We are constantly optimizing our network and inventory levels as parts are used, customers deploy new products, and old hardware becomes obsolete. To maximize products' useful life, we replace, recover, and refurbish equipment and components as necessary through an extensive logistics, warehouse, planning, and repair operations network. Each device is repaired and repeatedly tested to ensure compliance with the latest manufacturing specifications. Product energy consumption (above) is also a key customer metric in the use phase of Cisco products.

End of use

Returns

End-of-use is not end-of-life. Enabling multiple lifecycles for our products and the components inside them has long been a Cisco priority. We operate multiple programs to promote customer product return and to then remanufacture, refurbish, and reuse at the product, component or material level, as appropriate. Our various return programs are designed to support the needs of customers and partners, suppliers, and internal users.

Information on our compliance with product recycling regulations, such as the Waste Electrical and Electronic Equipment (WEEE) can be found in the Environmental compliance section above.

Improving the customer returns experience

Knowing that the user experience is key to driving product returns and the circular model we envision, we simplified the product return process for customers and partners in FY20. We analyzed over two dozen processes across Cisco and found two areas where we could make an immediate change, with meaningful impact for our customers.

First, we consolidated all the information on Cisco returns procedures into one Cisco Returns Portal. This new portal walks the user through the process step by step, making it easier for customers and partners to request and complete returns, and providing a phone number to answer any questions.

Second, we re-launched our product takeback program in the U.S.—Takeback and Recycle is now Takeback and Reuse. Customers can follow simple instructions using a web form, a new call center, or our Send IT Back mobile app to conveniently request a free pickup of any used Cisco equipment. This program can also be applied to competitive equipment with approval. In the coming months, we plan to expand this program in compliance with all global trade regulations.

A summary of Cisco product return programs is provided in Table 37 with additional detail provided in the following sections.

Table 37: Cisco product return programs

Customer Programs	Programs for companies producing or repairing Cisco products	Internal programs for Cisco
• Cisco Takeback and Reuse Program • Exceptional Pick-Up Program (EPUP) • Customer Recycling Solutions (CRS) • Cisco Migration Incentive Program (MIP)	• Manufacturing Scrap/Reuse Program • Global Scrap Program	• eBin/Lab Scrap Program • Cisco Data Center Server Recycling Program • Non-Genuine Brand Program • Recycle IT Day events

The Cisco Returns Portal helps customers and partners find the right return path to meet their needs.

Customer and partner programs

Our trade-in and recycling programs are designed to bring back the products that Cisco or our acquired companies sold to customers. The Cisco Migration Incentive Program (MIP; formerly Technology Migration Program) and Product Takeback and Reuse Program (formerly Takeback and Recycling) enable customers to return equipment at end-of-use. MIP is a global channel partner program that uses discounts in exchange for product returns to reward partners for migrating their customers' networks to new Cisco technologies. The Product Takeback and Reuse Program, which includes the Exceptional Pick-Up Program (EPUP), provides a simple, secure and sustainable means of returning end-of-use Cisco equipment, along with Cisco-acquired-company equipment, at no cost. It was relaunched in FY20 in support of our commitment to the circular economy and our pledge of 100 percent product return.

Customers who specifically seek to return end-of-life equipment to be recycled can take advantage of Cisco's free recycling program, recently rebranded as Customer Recycling Solutions (CRS). The CRS Program focuses on Cisco-branded items that are ready to be recycled. CRS also accepts equipment from other manufacturers that has been replaced by newly purchased Cisco items. These materials go to the closest Cisco-approved recycling site. The number of locations of Cisco authorized recyclers continues to expand based on the growth in our business and the requirements of local regulations.

- Cisco Customer Recycling Solutions Submission Form
- Customer Recycling Solutions Program (email): recycling@external.cisco.com

Cisco-internal programs

Manufacturing scrap/reuse and global scrap

The Cisco Manufacturing Scrap/Reuse Program collects and works to redeploy excess, obsolete, or damaged materials from our contract manufacturers, manufacturing partners, original equipment manufacturers (OEMs), original design manufacturers (ODMs), and proprietary component suppliers. In addition, the Global Scrap Program supports the recycling needs of our contracted repair manufacturers and distribution depots. Both programs are a valuable source of reusable product.

- Global Scrap Program
- Manufacturing Scrap/Reuse (email): cmeod-recycling@cisco.com

eBin / Cisco data centers / non-genuine Cisco products

The largest of Cisco's internal programs is the eBin/Lab Scrap Program. eBins are green plastic rolling bins, or in some cases gaylord boxes, that are placed in labs or Cisco offices around the world to collect orphaned, used, and test equipment for recycling. In FY20, our eBin program serviced 235 offices and accounted for 13 percent of the total weight collected globally for recycling.

The Cisco Data Center Server Recycling Program serves data centers in eleven countries. When a data center no longer needs a server, it is offered to other Cisco data centers for possible reuse. When one of these servers reaches the end of its useful life, it is recycled, and all parts are shredded.

The Non-Genuine Materials Program handles non-genuine Cisco products sometimes received in an equipment return. Items are classified "non-genuine" if they are competitor products or if they are Cisco products that have been altered by someone outside of our certified repair vendors. They can also come to Cisco through law enforcement seizure of counterfeit Cisco equipment. When we find non-genuine equipment, we use a special witnessed protocol whereby we shred and separate materials into their basic components to send to downstream recyclers and vendors.

- Data center / eBin / Non-genuine Submission Form

Recycle IT Day

Employees have an opportunity to return unneeded personal electronics at our annual Recycle IT Day scheduled as part of Earth Day-related activities. Cisco employees and contractors can bring their e-scrap from home, and Cisco pays to have the materials recycled properly. Any Cisco office location can host a recycling day event. In FY19, we held our 24th annual Recycle IT Day event, with 161 Cisco sites around the world participating and 191.5 metric tonne of used electronics collected. Since Cisco started holding these events in 1995, our employees and contractors have helped recycle 3,235 metric tonne of used electronics.

Recycle IT Day usually takes place on or around Earth Day in April. Due to COVID-19, we postponed and eventually canceled our FY20 Recycle IT Day for the safety of our employees. More information is available in the Environment employee engagement section.

Reuse

Reuse is always our first priority. Returned devices that can be reused are remanufactured, refurbished, or repaired and reused by Cisco CX Service Operations or our internal labs, or resold by Cisco Refresh.

Cisco Refresh, our certified remanufactured equipment program, plays an important role in our circular economy initiatives, creating a second life for equipment and thereby not only saving the resources required for new manufacturing, but also reducing waste. Cisco Refresh products are backed by the same Cisco warranty and service options as new products. Equipment is sold only through Cisco authorized resellers and is available in more than 80 countries. Inventory includes products from all technology areas, including switching, routing, wireless, IP telephony, security, and other advanced technologies.

We also reuse product in our Return to A-Stock program, where unused products from our distribution centers are sent to be reused by our contracted manufacturing sites. In FY20, Cisco expanded this program from nine sites to 10. Returned products that are considered "new-in-box" are sent back to be tested and, if necessary, reconfigured. This allows us to better reuse these products while also improving our ability to satisfy demand for new equipment without new manufacturing.

Alongside our efforts to increase our reuse of used equipment, we must also address external barriers in order to scale these opportunities. We collaborate with peer companies, NGOs and policymakers to address challenges and unintended consequences, such as the many global classifications of waste for transboundary movement which can impact our ability to repair equipment.

End of life

When products can no longer be re-used, they are sent to recyclers for components to be harvested and the remaining commodities to be responsibly recycled and redirected to global materials markets. We currently have two contracted recyclers. Each recycler uses both company-owned facilities and subcontracted recyclers to provide global recycling coverage. Cisco's contracted recyclers are required to be certified to one or more e-scrap-specific recycling standards, such as R2, R2 RIOS, eStewards, and WEEELABEX.

In addition, our contracts with our recyclers include strict and formally documented recycling processes that are also applied to subcontractors that work with Cisco equipment. We approve every prospective recycling company and every recycling location before sending any Cisco equipment for processing.

Each contracted recycler provides Cisco with monthly reports showing all cases opened and processed on a lot-by-lot basis. Reports include a mass balance showing the weight as received and the weights of each fractional commodity adding up to the gross weight received. On a quarterly basis, we hold business reviews with the recyclers to review recent results, action items, and upcoming focus areas. We also conduct random site audits of recycling facilities.

Harvesting

Cisco's overarching goal is to redeploy as much material as possible, which led to the launch of a harvesting pilot program in January 2017. For the first time, Cisco allowed our recycling partners to capture commodity components from product sent to the recycler for disposition. The pilot was a success, and harvesting is now part of our standard process.

After material is received and weighed on a calibrated scale, recyclers review items for possible component harvesting. They may harvest processors, memory, and other hardware with sufficient market value to offset the cost of their harvesting, cleaning, packaging, and resale. Harvested components must be cleared of data in compliance with the NIST 800-88 standard before being available for resale. In FY20 our component harvesting program allowed more than 120 million components to be reintroduced into the market, thus extending their useful lives and reducing the need to manufacture new parts.

After harvesting, the remainder of the product e-scrap is dismantled and sorted into "commodity fractions": steel, aluminum, cardboard, plastic, wire/cable, and printed circuit boards (PCBs). All other materials, including any batteries or packaging materials, are sent to downstream recyclers.

Recycling

Recyclers are the last resort after we have exhausted all options for reuse. They are the common destination of all end-of-life materials, including customer returns, employee office equipment, and lab equipment, as well as excess, obsolete, and damaged materials from our contract manufacturers, manufacturing partners, original equipment manufacturers (OEMs), original design manufacturers (ODMs), contracted repair partners, and distribution depots.

Cisco's two contracted recyclers together have worldwide coverage as shown shaded in blue in Figure 1.

Figure 1: Cisco reverse logistics locations
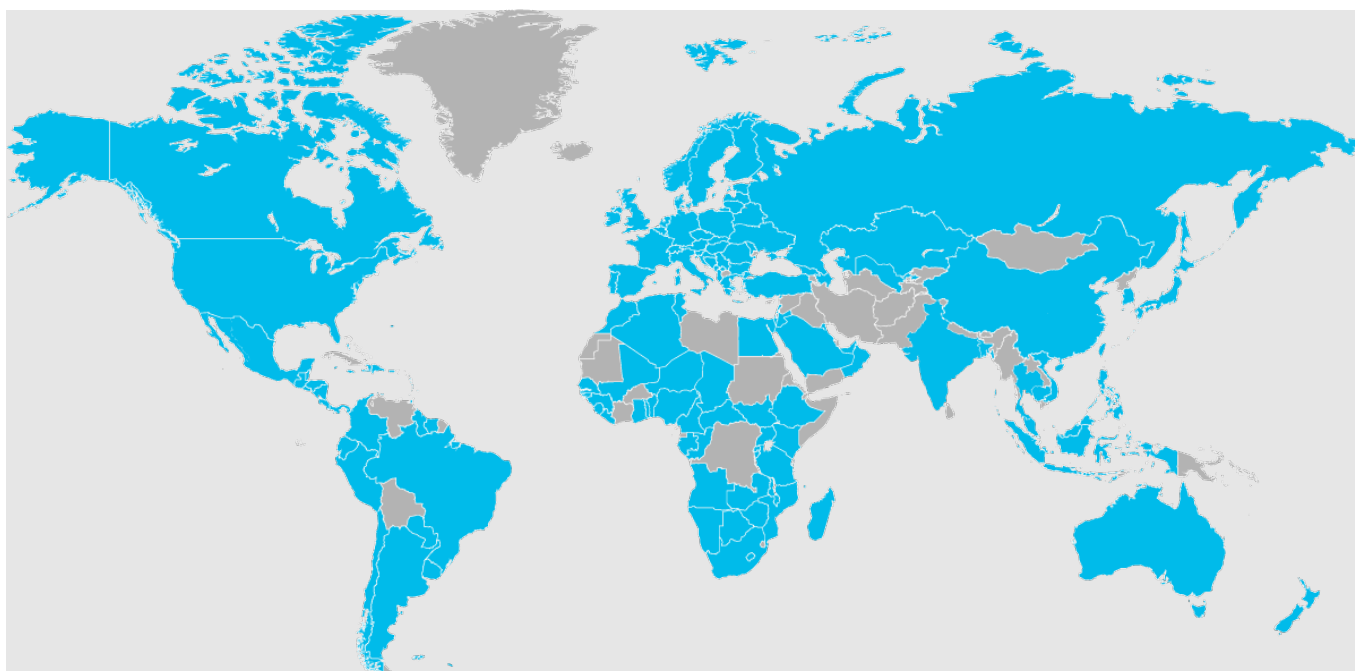
Of products sent to our e-scrap recyclers, nearly 100 percent are harvested or broken down into commodity fractions and sent to downstream vendors to create new products. From FY16–18, our target was to keep the percentage of material sent to landfill under 0.48 percent. In FY19, this objective was lowered to 0.38 percent. Because our customers or partners are responsible for packaging used product for return to Cisco, we have limited control over the material received, including any packaging or trash. In spite of this uncertainty, we will continue to use 0.38 percent to landfill as an operational measure of our recycling partners.

In fiscal 2020, we saw an overall decrease in return volume coupled with an increase in our reuse, resale, and refurbishment rate, while the percentage of material sent to landfill decreased (Table 38). Some of the decline in returns is due to site access limitations due to COVID-19 restrictions, as well as a decline in returns of unused products from our distributors. However, returns from customer end-of-use have held steady, and this is the area we are focused on for growth. Increases in reuse can be attributed to incremental improvements in the channels for reused or refurbished equipment, an area where we made progress in fiscal 2020, despite challenges related to COVID-19. We continue to explore opportunities to use recycled content in our new products as described under Recycled material content.

Table 38: Product return, reuse and recycling

KPI	FY16	FY17	FY18	FY19	FY20	Comments
Product returns, metric tonne	12,609	11,398	13,946	9,881	8,914	All materials sent for harvesting, recycling, and reuse, including materials received via a Product Return Materials Authorization (RMA)
Refurbish, resell, and reuse rate, percent	19.0%	15.7%	31.0%	13.1%	15.3%	Material returned from customers, stock rotations, or internal sources that is redeployed by Value Recovery and Repo Depot groups to Cisco Service Supply, Cisco Refresh, or internal users to avoid new purchases
Recycle rate, percent	80.7%	83.9%	68.6%	86.5%	84.6%	All remaining electronic waste materials, including plastics, precious and nonprecious metals, that are shredded

						and recycled by our contracted e-scrap recyclers
Returned material sent to landfill, percent	0.28%	0.36%	0.35%	0.38%	0.16%	Landfill material consists of nonelectronic waste materials, such as broken pallets, wet cardboard, and shrink wrap, accompanying Cisco product returned by customers

Product packaging

In a truly circular economy, there is no such thing as waste. The current reality is that many packaging materials become waste immediately after first use. We are working to remove unnecessary packaging and make what remains reusable and/or easy to recycle. Some common materials used for packaging are difficult to recycle, like foams or expanded polymers, yet they continue to be selected due to their ability to protect products during shipment. Products that are damaged in transit create negative business and environmental impacts, since repairing or replacing a damaged good damages customer good will and requires more material and energy resources.

To support Cisco's commitment to sustainable packaging, we announced two new goals in July 2019 focused on reducing the use of foam and improving product packaging efficiency.

Table 39: Performance toward foam reduction goal

KPI	FY19	FY20	Comments
Percent reduction in foam in packaging Goal: Reduce all foam used in Cisco product packaging by 75 percent, measured by weight, by FY25 (FY19 base year).	baseline	-11.5%	

For the foam-reduction goal, COVID-19-related impacts beginning in March 2020 through the July end of Cisco's fiscal year affected reporting. We expect FY21 reporting to be more representative of actual progress toward meeting this goal.

We are reducing the environmental footprint of our packaging and making progress toward our goals by optimizing packaging efficiency, minimizing single-use plastics and foam, reducing unwanted or redundant items in shipments, and using readily recyclable materials. In FY20, we updated the packaging for our Carrier Routing System Performance Route Processor and Fan Controller spares by redesigning the foam cushions and carton. These changes reduced the dimensional weight of the spare pack while also removing nearly two pounds of foam for each product shipped. Through additional packaging design changes, we also eliminated more than 80,000 pounds of corrugate from our total packaging shipped in fiscal 2020. With a number of additional projects underway, we expect to see increased reduction in fiscal 2021.

Beyond basic packaging and material requirements, Cisco evaluates four additional aspects of environmental package design:

- Packaging material optimization: Designing a package that adequately protects the product from transport damage or waste while optimizing the volume of material and complying with all relevant environmental regulations

- Space efficiency optimization: Designing a package that optimizes space efficiency during transport. Per Table 10, we have set a goal to increase product packaging cube efficiency by 50% by FY25 (FY19 base year). We refined our packaging efficiency efforts to focus on packaging volume rather than volume per weight of product. In doing so, we will both reduce the total amount of packaging used and realize logistics savings. We will report our progress against this goal in our FY21 CSR reporting.

- Multi-pack evaluation: Design a multi-pack solution when appropriate for high volume products to reduce the total amount of packaging material.

- Sustainable materials: Including recycled content and recyclability

Table 40: Focus areas for sustainable product, packaging and fulfillment solutions

Category	Benefits	Cisco product examples
Secondary product configurable options	Reduce materials, packaging, and shipping costs by providing customers with a way to opt out of receiving cables, brackets, and similar items.	Customers can choose not to receive: • Cables from our UCS Storage products, Security products and Catalyst switching products • Cisco Aironet® wireless access point mounting brackets and clips We intend to expand the availability of options to address growing customer demands. However, widespread customer awareness and adoption of such options remains a challenge.
Electronic delivery of software, licenses, and product documentation	Increase dematerialization and operational efficiencies. Reduce CDs, paper, and packaging. Reduce packaging and fulfillment costs.	The eDelivery program updates products available for electronic delivery though unique product IDs and/or Cisco Commerce- based electronic fulfillment preferences. "Pointer cards" are used across Cisco product lines to consolidate web links for product and compliance documentation.
Multi-packs	Reduce packaging and shipping costs and increase operational efficiencies by shipping products in multi-unit packaging.	Bulk-pack models are available for select high-volume products or spare, including cables, optics pluggables, memory, central processing units, hard drives, fans, and rack gear kits.
Waste reduction	Reduce amount of packaging being used on Cisco products.	Improved product testing had led to a reduction in the amount of packaging needed to protect products. Designs have been optimized to reduce corrugate, paper, and foam.
Use of recycled materials	Reduce the amount of new materials required to produce our products and packaging and divert waste from landfill.	Sourcing alternative materials with recycled content, such as molded fiber and thermoform cushions.

Product packaging materials

Generally, our packaging uses corrugated cardboard that includes a minimum of 25 percent recycled content. Almost all of our packaging for new products is made either of a single material or of multiple materials that are separable for recycling. In our global market, customer, municipal, and regional recycling practices vary greatly. Customers' ability to recycle our packaging depends on the recycling facilities in place in their location.

The plastic used in Cisco packaging falls into categories identified by Resin Identification Codes 1 to 7. Polyethylene (codes 2 and 4) is the predominant material. Some plastic components carry labels indicating their plastic recycling code number to support end-of-life recycling. We use thermoformed medium-density polyethylene cushions made from virgin material or from recycled substitutes. When regionally available and technically feasible, we use cushions made from recycled polyethylene. Cisco legacy products, including those produced by our acquired companies, may not incorporate all current packaging best practices. A similar challenge also exists for packaging provided with OEM products that a Cisco supplier delivers directly to a customer.

We strive to use recyclable packaging, however sometimes this is not possible due to limited options for alternative, sustainable materials. For example, although metallized antistatic bags are not easily recycled, they are essential to the safe transport of products susceptible to damage from electrostatic discharge. We size bags to fit the product being shipped and minimize the amount of material we use. Our contract manufacturers also reuse antistatic bags.

Product packaging end-of-life

Cisco product packaging is designed to be separable and recyclable so it can be absorbed by local packaging material recycling programs. Cisco does not collect used packaging, as shipping empty product packaging to Cisco for recycling would create unnecessary environmental impacts. However, we are exploring reusable packaging options for specific scenarios. One example is using reusable packaging for customers near our distribution sites. This would allow packaging to move between two locations for reuse while minimizing the environmental impact of shipping empty material. Read more about Cisco's compliance with environmental packaging regulations.

Water

Even though Cisco does not use significant amounts of water in our direct operations[1], we understand the importance of reducing water consumption as much as we can in our operations and supply chain. It's essential to protect this limited resource not only for our business needs, but also for the sake of communities in which we operate.

Cisco's water strategy is to:

- Benchmark and report water use and risks according to industry best practices
- Conserve water in our operations, focusing on water-scarce and water-stressed locations
- Work towards setting long-term water goals at our major campuses

Water usage

Cisco's primary use of fresh water in our direct operations is for water, sanitation, and hygiene (WASH) services in the workplace, such as in restrooms and cafeterias. We also use water in our cooling towers and for irrigation where we are unable to use recycled water. Our primary use of recycled water is for irrigating landscapes and use in our cooling towers at several of our major campuses. See Table 41 for details on Cisco's water use.

Many of our suppliers require fresh water as a direct input during production, and for drinking water and sanitation for their employees. Our Tier 1 suppliers' (i.e., contract manufacturing and ODM suppliers) primary use of fresh water is the same as Cisco's. They provide WASH services in the workplace as well as for cooling towers and irrigation. For some Tier 2 component suppliers that need large amounts of water in their production process, such as semiconductor and PCB suppliers, water quantity and quality impact their daily operations.

We use the WRI Aqueduct tool to better understand our water use and risks within our operations. The Aqueduct tool revealed that 19% percent of Cisco's water use by volume is withdrawn from water-stressed areas – mainly in Bangalore, India. Notably, our headquarters in San Jose are no longer considered water stressed. This because in 2019, the WRI Aqueduct Tool updated its baseline water stress for the California Coyote River Basin, in which our headquarters are located, from Extremely High (>80%) to Low (<10%). This change does not affect our commitment to water stewardship in California. We will continue to monitor our entire portfolio for changes in water availability and will develop contextual water management strategies accordingly.

Table 41: Water use in direct operations

KPI	FY16	FY17	FY18	FY19	FY20	Comments
Total water withdrawn, m³, thousands	3,050	3,220	3,394	3,299	3,183	This figure covers 100 percent of Cisco's facilities within our operational control. Withdrawal sources are reported below. Cisco does not withdraw water from any source not listed below.
Water withdrawn from municipal supply (third-party sources), m³, thousands	3,010	3,204	3,366	3,111	2,929	The majority of Cisco's water withdrawals are from third-party sources.
Water withdrawn from fresh surface water, m³, thousands	148	168	169	165	220	We withdraw water from a nearby lake at our Vaud, Switzerland, location, use it on site in a closed-loop cooling system, then discharge it back to the lake
Water withdrawn from groundwater, m³, thousands	40	16	28	22	34	Water is treated on site at our Boxborough facilities and then discharged back to the groundwater.
Total water recycled and reused, m³, thousands	95	106	116	109	62	Cisco recycles and reuses about 60 percent of the water it withdraws for use at our Bangalore, India, facilities.

Total water consumption, m³, thousands	-	-	108	358	334	We are in the process of improving our water accounting practices and expect to more accurately report the water we use for evaporative cooling and irrigation.
Total water discharged, m³, thousands	3,050	3,220	3,286	2,941	2,848	This figure covers 100 percent of Cisco's facilities within our operational control. Discharge destinations are reported below. Cisco does not discharge water to any destination not listed below.
Total water discharged to sewer (third-party destinations), m³, thousands	2,862	3,149	3,258	2,753	2,595	The majority of Cisco's water discharges are to third-party destinations.
Total water discharged to fresh surface water, m³, thousands	148	168	159	165	220	We withdraw water from a nearby lake at our Vaud, Switzerland, location, use it on site in a closed-loop cooling system, then discharge it back to the lake.
Total water discharged to groundwater, m³, thousands	40	16	28	22	34	Water is treated on site at our Boxborough facilities and then discharged back to the groundwater.
Real estate portfolio Real estate portfolio covered by water reporting	100%	100%	100%	100%	100%	
Real estate portfolio where we receive water data from the utility	73%	72%	71%	71%	70%	

[1] *The Energy Information Agency (EIA) estimates large commercial buildings in the U.S. use about 18,400 gallons (69.7 m3) of water per worker per year. In FY19, Cisco used 42 m³ of water per employee, far below the EIA average.*

Water stewardship

Cisco is committed to managing water responsibly across our direct operations and our supply chain, see Supplier water security. We have implemented numerous water conservation projects in our direct operations over the past few years. These projects are still conserving water today and will continue to do so for many years to come:

- Upgrading irrigation controllers throughout the San Jose main campus

- Using reclaimed water for irrigation and cooling towers in RTP

- Installing variable-frequency drives in our cooling towers

- Installing two-way valves for toilets, waterless urinals, sink aerators, low-flow showerheads, and pre-rinse spray valves for kitchen sinks

- Replacing water fountains and turf in San Jose and RTP with native planter beds that require little water, and installing drip irrigation lines to improve irrigation efficiency

- Cisco has also implemented a comprehensive water management system in Bangalore, India. The campus is a zero-discharge facility, meaning no wastewater is discharged to third parties or the environment. All building water discharge is sent to two sewage treatment plants that use filtration and reverse osmosis to treat the water for eventual reuse. The treated water is used in an evaporative cooling system, for irrigation, and for toilet flushing in two campus buildings.

- We also achieved our water neutrality goal for our RTP campus. We began by completing a water audit to determine how water efficient the campus was and identify opportunities to reduce our water usage. The audit concluded that the campus is already quite water efficient; however, several efficiency opportunities (such as replacing kitchen sprayers, sink and showerhead fixtures and installing new filters in cooling towers) were identified that we plan to implement in FY21.

To balance the remainder of the water that we use in RTP, we invested in water restoration projects that restore local watersheds in North Carolina and the Southeast. We are collectively restoring a volume of water equal to RTP campus' annual water consumption through these projects, enabling us to meet our

water neutrality goal. One of the projects we invested in is the removal of a decommissioned dam in Western North Carolina. This project opens recreational access, improves public safety, restores important free flowing aquatic habitat for several species and improves water quality. It also reconnects 140 miles of streams and ranks as the highest-priority dam removal project in the state and highest in the region in terms of ecological improvement.

The next phase of our water stewardship journey is to develop targeted strategies to conserve water and evaluate partnerships with local organizations to address local water issues at our major campuses around the world. We are preparing for this initiative by performing water audits and upgrading key water infrastructure in these locations.

Water-energy nexus

The production of electrical power is one of the largest users of fresh water. Therefore, one of the greatest opportunities for Cisco to reduce our impact on water resources globally is by continuing to make our products and operations more energy efficient.

The U.S. Geological Survey estimates in their latest 2015 water report that an average 15 gallons of water are used to produce 1 kilowatt- hour of electricity in the U.S. Considering this, the energy savings we achieve through our energy and GHG reduction efforts have a big impact on reducing water usage. We estimate our FY20 energy reduction projects (Table 23), which avoided 19.3 GWh of energy usage, also avoided 1.1 million cubic meters (m^3) of water – roughly half/a third of our total FY20 water use.

Biodiversity (including land use)

Biodiversity is the variability among living organisms and the ecological complexes they are a part of. All organizations impact biodiversity directly through their own activities or indirectly through their supply chains. Cisco's primary impact on biodiversity is the land we use for our facilities. We mitigate this impact by reducing the demand for physical office space through employee telework programs and other support solutions.

Operations

Cisco uses environmental impact assessments to evaluate the biodiversity and land-use impacts of our sites. We generate annual biodiversity summary reports for all land and property we own. Table 42 shows the percentage of our portfolio with biodiversity assessments in place. Note that as Cisco's total square footage decreases, our percentage of real estate portfolio with biodiversity assessment decreases as well. Some of the buildings we own in San Jose are located near a protected area for the American Cliff Swallow, which is a bird species on the Least Concern category of the International Union for Conservation of Nature (IUCN) Red List. To protect their habitat during nesting season, we close our balconies on those buildings. We then remove the mud nesting locations on our buildings after nesting season is over.

Table 42: Biodiversity and land use

KPI	FY16	FY17	FY18	FY19	FY20	Comments
Percent of real estate portfolio with biodiversity assessment	59%	58%	54%	55%	53%	Includes IUCN Red List and national conservation list species with habitats in areas affected by operations. See Cisco's current CDP Water and Climate responses.
Total real estate footprint square footage, millions	22.2	20.8	21.4	20.6	19.4	Reducing our square footage minimizes our physical impact.

Over the last several years, we've come to understand the importance of ocean biodiversity and ecosystem health. To support and promote improved ocean health, Cisco has become a signatory to the UN Global Compact Sustainable Ocean Principles. Guided by these principles, Cisco commits, where

relevant, to ensure that we integrate material ocean-related risks and opportunities in corporate strategy, risk management, and reporting.

Species conservation

In FY20, Cisco donated networking equipment to five game reserves located in Botswana, Kenya and South Africa. These game reserves are using networking technology to reduce poaching by improving game reserve boundary control, monitoring people entering or within the reserves, or tracking the animals to more effectively deploy park resources that protect the animals.

Solid waste from operations (trash)

Cisco's waste reduction and recycling program is a key component of our ISO 14001 certification and global environmental policy. While municipal and regional recycling practices vary, all our facilities take steps to reduce their operational waste and reuse and recycle materials. Our strategy is to reduce both our total waste produced and the proportion of waste sent to landfill by incorporating the principles of reduce, reuse and recycle throughout all of our direct operations. See Table 43 for examples of our waste reduction initiatives.

Information on reducing solid waste at our supply chain manufacturing facilities is addressed in the Supplier material waste section above.

Table 43: Cisco solid waste reduction initiatives

Reduce	- Using online learning and communications technologies to reduce paper use - Automatic double-sided print for all printers - Making product information available online to reduce paper use - Replacing plastic to-go containers with biodegradable alternatives - Rightsizing meal portions and catering orders to minimize food waste
Reuse	- Managing an internal Repo Depot program, which allows us to reuse lab and testing equipment - Reusing incoming pallets with outgoing shipments wherever possible - Collecting PC equipment for reuse by our vendor - Donating surplus used office supplies to local schools - Utilizing reusable cutlery and dishware in select cafes and breakrooms - Donating furniture from refreshed Cisco spaces - Donating excess cafeteria food to local nonprofits
Recycle	- Batteries - Kitchen Oil - Lightbulbs - Confidential materials - Beverage containers - Wood and pallets - Glass - Cardboard - Mixed paper - Toner cartridges - Compost - Polyurethane foam - Landscape waste for onsite compost/mulch - Electronic scrap - Food waste - Construction waste

In FY20, we diverted approximately 80 percent of the waste generated at our facilities from landfill globally (Table 45).

Table 44: Recycling rates for solid waste (trash) from major campus locations

Campus location	FY16	FY17	FY18	FY19	FY20
San Jose	85%	84%	86%	87%	86%
Boxborough	84%	86%	100%	100%	100%
RTP	52%	60%	67%	67%	69%
Bedfont Lakes	22%	15%	100%	100%	100%
Greenpark	NA	74%	100%	100%	100%
Shanghai	30%	29%	43%	59%	41%
Tokyo	90%	90%	87%	90%	75%
Bangalore	63%	71%	68%	84%	91%
Total	75%	68%	73%	81%	81%

COVID-19 had a significant impact on the total waste generated at our facilities (Table 45). The majority of our sites were closed, with employees under mandatory work from home, for almost half the year. As a result, we produced about half of the waste compared to the previous year. Our headquarters in San Jose diverted 89 percent of all waste streams from landfill in FY20, including a compost program that diverted approximately 520 metric tonne of waste from local landfills. To build upon the success of our program, we continue to set and work toward aggressive waste and recycling goals.

Table 45: Solid waste from operations (trash)

KPI	FY16	FY17	FY18	FY19	FY20	Comments
Total operational waste generated, metric tonne	9,805	12,519	10,559	10,498	5,715	This figure covers 100 percent of Cisco's facilities over which we have operational control. COVID-19 has significantly reduced the amount of waste generated in our facilities during FY20.
Waste sent to landfill (municipal solid waste)	2,448	4,019	2,842	2,004	1,077	This includes waste sent to landfill and waste incinerated.
Landfill diversion rate	75%	68%	73%	81%	81%	
Total operational waste diverted, metric tonne	7,358	8,500	7,717	8,480	4,638	This includes waste recycled, composted, hazardous/universal waste recycled, and waste to energy. The FY20 number is dramatically down from FY19 due to the COVID-19 work from home order.
Recycled	6,369	7,407	6,292	6,683	2,296	Municipal recycling
Composted	784	770	808	1,180	1,945	
Hazardous/ Universal waste	205	323	617	617	255	This includes batteries, kitchen oil, lamps, printer toner
Waste to energy	-	-	-	-	142	This is waste burned to generate energy. Data prior to FY19 is not available.
Percent real estate portfolio covered by waste reporting	100%	100%	100%	100%	100%	Includes major campus locations in the United States, India, and China.

RTP zero waste

We have been working toward a zero waste goal for our RTP campus[8]. More information on our RTP campus goals can be found here. In FY20, we diverted 69% percent of the waste produced at RTP campus from landfill, up from 38 percent diverted in FY14.

In the first half of the year we expanded the zero waste program by switching plastic breakroom, cafe and catering items over to reusable and compostable options and transitioning the campus from deskside trash bins to centralized waste. However, COVID-19 had a significant impact on achieving our zero waste goal in FY20: total waste produced at the campus is down 80 percent and the reusable program is on hold until we return back to the office.

Other campus waste initiatives

We are also moving away from plastic and paper cups and toward reusable cups and mugs in many offices around the world, including our Bedfont Lakes campus in the U.K. and the majority of our facilities in Asia and Europe. In the U.K., we are also replacing the plastic and polystyrene to-go boxes, cutlery, and straws with compostable options, and adding campus composting. In FY20, 128 facilities, making up about 40 percent of our office square footage, were paper-cup-free.

The next phase of our waste reduction journey is to work towards setting long-term waste diversion and reduction goals at our major campuses.

Effluents (Liquid)

We seek to locate our operations in areas where we can successfully serve our customers while limiting our negative environmental impacts. Effluent spills, such as chemical, oil, and fuel spills, can have significant negative impacts on the surrounding environment. They can potentially affect soil, water, air, biodiversity, and human health, as well as our business. We take this and other environmental health and safety issues very seriously. Cisco has had no significant releases to an environmental receptor over the reporting year. Table 46 tracks liquid spills and discharges from Cisco facilities.

Table 46: Effluent spills and discharges

KPI	FY16	FY17	FY18	FY19	FY20
Spills and discharges	None	None	None	None	None

Non-GHG emissions

Because our production is outsourced to supply chain partners, our global operations primarily consist of standard office activities and research labs. This limits our non-GHG emissions to volatile organic compounds (VOCs) from cleaning products, nitrous oxides (NOX), and sulfur oxides (SOX) from on-site fuel combustion (from vehicle engines, boilers, or emergency generators), and the subsequent formation of ozone from the photochemical reaction of NOX. Table 47 summarizes our relevant non-GHG-related airborne emissions: VOCs, NOX, SOX, and particulate matter.

We comply with California Air Resources Board requests and do not use mechanical equipment, such as gasoline-powered lawn mowers, after 11 a.m. on designated Spare the Air days, when air quality is poor in the San Francisco Bay Area. In accordance with the 1987 Montreal Protocol On Substances That Deplete The Ozone Layer, we also have worked with our supply chain partners to phase out the use of ozone-depleting substances.

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[8] According to definitions used in the TRUE and UL Zero Waste certification protocols, "zero waste" diversion is defined as a 90 percent or greater overall diversion of solid, nonhazardous wastes from landfill, incineration (waste-to-energy), and the environment. Diversion methods can include reduction, reuse, recycling, and/or compost.

Table 47: Non-GHG emissions

KPI	FY16	FY17	FY18	FY19	FY20
Volatile organic compound (VOC) emissions[1]	Negligible	Negligible	Negligible	Negligible	Negligible
NOx, metric tonne	207	138	176	156	223
SOx, metric tonne	0.72	0.65	0.67	0.59	0.58
Particulate matter	Negligible	Negligible	Negligible	Negligible	Negligible

[1] *Quantities of VOC-based chemicals deployed are minimal and monitoring is not required.*

Appendix I – Sustainability Accounting Standards Board (SASB)

SASB standards were published in late 2018. In the current version of the standards, a materiality matrix establishes 26 issue categories grouped into five dimensions. These issue categories are then applied by SASB across 11 industry sectors broken into 77 industries.

Cisco is classified by SASB in the Hardware industry category under the Technology & Communications sector. On the SASB materiality matrix, five issue categories are identified as material for the Hardware industry.

Table 48 provides Cisco's SASB disclosure for the Hardware industry. Disclosure guidance was taken from the SASB Hardware Sustainability Accounting Standard (October 2018) as informed by the SASB Hardware Basis for Conclusions report (October 2018).

Table 48: SASB sustainability disclosure topics & accounting metrics (Hardware industry)

Topic	SASB Code	SASB Accounting Metric	Disclosure
Data Security	TC-HW-230a.1	Description of approach to identifying and addressing data security risks in products	Please refer to pp. 23-24 of the 2020 CSR Impact Report
Employee Engagement, Diversity & Inclusion	TC-HW-330a.1	Percentage of gender and racial/ethnic group representation for (1) management, (2) technical staff, and (3) all other employees	Please refer to pp. 43-46 of the 2020 CSR Impact Report
Product Design and Life-cycle Management	TC-HW-410a.1	Percentage of products by revenue that contain IEC 62474 declarable substances	100% of our electronic products may contain small amounts of some of the chemicals on the IEC 62474 declarable substances list. We have tracked and restricted the substances of concern in our products that have been identified as highest priority for restriction in jurisdictions worldwide. Any remaining uses of substances of concern in products are for applications that lack viable alternatives or substances of lower regulatory priority. Electronics companies still have products which claim RoHS exemptions or REACH candidate substances when there is no currently viable alternative. For example, 100% of electronics products still contain some amount of lead used in specialized applications that are allowed under RoHS exemptions. Also, ethylene glycol dimethyl ether (EGDME), for which there is no known replacement, is used in all coin cell batteries.
	TC-HW-410a.2	Percentage of eligible products, by revenue, meeting the requirements for EPEAT registration or equivalent	To be provided mid-2021
	TC-HW-410a.3	Percentage of eligible products, by revenue, meeting ENERGY STAR® criteria	To be provided mid-2021
	TC-HW-410a.4	Weight of end-of-life products and e-waste recovered, percentage recycled	1. Product return: Weight of product returned from customers, stock rotations or Cisco-internal sources, including via recycling request or Return Materials Authorization (RMA) FY20: 8914 metric tonne 2. Refurbish, resell and reuse: Material redeployed to Cisco services, Cisco Refresh, or internal FY20: 1363 metric tonne (15.3%) 3. All material not refurbished, resold or reused is redirected for component and commodity harvesting. Landfill material only consists of nonelectronic waste materials—such as broken pallets, wet cardboard, and shrink wrap—accompanying Cisco product returned by customers.

				FY20: 0.16% to landfill
Supply Chain Management	TC-HW-430a.1	Percentage of Tier 1 supplier facilities audited in the RBA Validated Audit Process (VAP) or equivalent, by (a) all facilities and (b) high-risk facilities		We require RBA audits of all manufacturing partners every two years. Each year, RBA or Cisco audits at least 25% of component supplier facilities that are deemed high risk according to our risk assessment are required to conduct RBA audits.
	TC-HW-430a.2	Tier 1 suppliers' (1) non-conformance rate with the RBA Validated Audit Process (VAP) or equivalent, and (2) associated corrective action rate for (a) priority non-conformances and (b) other non-conformances		Information on our RBA audit program is provided in the Audits and self assessments (environment) section above. Details about our RBA VAP audit program can be found in the ESG Hub. Details about the audit nonconformances can be found here.
Materials Sourcing & Efficiency	TC-HW-440a.1	Description of the management of risks associated with the use of critical materials		Cisco assesses and addresses supply chain business continuity risks through its business resiliency program.

Appendix II – Task Force on Climate-related Financial Disclosures (TCFD)

TCFD was established to assess potential business impacts of climate change, including efforts to reduce GHG emissions and to mitigate the impact of climate change. These impacts can potentially emerge over a time period measured in decades and for which typical business forecasting is not well suited. Suggested TCFD methodology focuses on evaluating scenarios. Per section B.2 of TCFD Technical Supplement, *The Use of Scenario Analysis in Disclosure of Climate Related Risks and Opportunities*:

> *It is important to remember that scenarios are hypothetical constructs; they are not forecasts or predictions nor are they sensitivity analyses… Scenario analysis is a tool to enhance critical strategic thinking. A key feature of scenarios is that they should challenge conventional wisdom about the future.*

Section B.2 of the Technical Supplement further explains that scenarios should be plausible, distinctive, consistent, relevant and challenging.

The science and scenarios

The impact of increasing greenhouse gas concentrations in the Earth's atmosphere is projected to have increasing impacts on climate as the global average temperature increases due to the retention of energy previously radiated into space.

The Mauna Loa CO_2 data shown in Figure 2 are a clear view of the potential for climate change given the unabated increases in CO_2 concentrations that interfere with black body re-radiation. The Mauna Loa data only reports on CO_2. Other GHG emissions, such as methane and chlorofluorocarbons, are also increasing, contributing to the absorption of infrared radiation emitted by the Earth.

Atmospheric CO_2 concentrations continue to increase and are increasing at a faster rate.

Figure 2: Atmospheric CO_2 concentrations at Mauna Loa Observatory
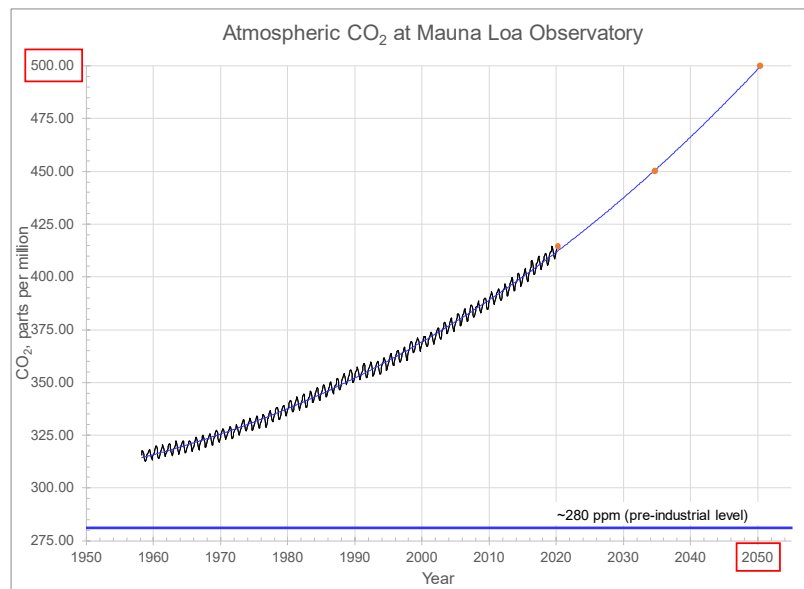
Before 1960, the rate of increase was less than 1 ppm CO_2 /yr. Today the increase is more than 2.5 ppm/yr, with the absolute CO_2 concentration increasing from around 315 ppm CO_2 to about 415 ppm CO_2.

Extrapolating to the year 2050, CO_2 concentrations will likely approach or even exceed 500 ppm CO_2. This path to 500 ppm by 2050 has been chosen as our base-case scenario. This base case includes GHG reduction efforts implemented worldwide to date and that may continue, but which have not had an appreciable impact on GHG concentrations in the Earth's atmosphere.

From Figure 3, the increase in CO_2 concentration above the historic maximum of 280 ppm has gone from 35 ppm CO_2 in 1960 to 135 ppm CO_2 in 2020 (280+35=315 ppm, the approximate CO_2 concentration in 1960; 280+135=415 ppm, the approximate CO_2 concentration in 2020).

Figure 3: Atmospheric CO_2 concentrations for the past 800,000 years
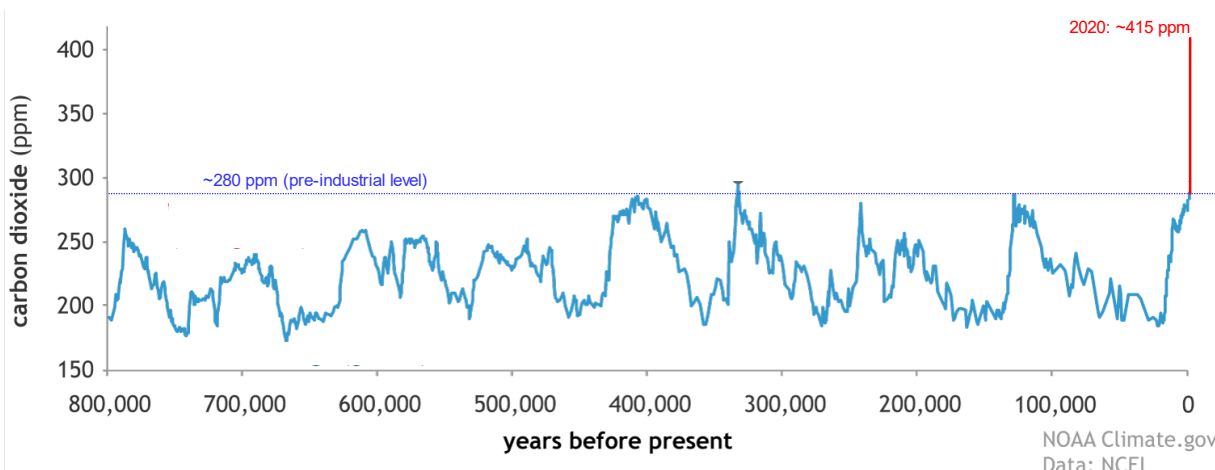
Per Table 3.1 of the IPCC report, *Climate Change 2014 – Synthesis Report*, 500 ppm in 2050 is indicative of a 3 ºC temperature rise "more likely than not." Continued increases in GHG concentration through 2100 would further push temperature upward. Cisco is using the "2050 base case" for its scenario construction and risk assessment.

CO_2-eq Concentrations in 2100 (ppm CO_2-eq) [f] Category label (conc. range)	Subcategories	Relative position of the RCPs [d]	Change in CO_2-eq emissions compared to 2010 (in %) [c] 2050	2100	Likelihood of staying below a specific temperature level over the 21st century (relative to 1850–1900) [d, e] 1.5°C	2°C	3°C	4°C
<430	Only a limited number of individual model studies have explored levels below 430 ppm CO_2-eq [i]							
450 (430 to 480)	Total range [a, g]	RCP2.6	−72 to −41	−118 to −78	More unlikely than likely	Likely		
500 (480 to 530)	No overshoot of 530 ppm CO_2-eq		−57 to −42	−107 to −73		More likely than not	Likely	Likely
	Overshoot of 530 ppm CO_2-eq		−55 to −25	−114 to −90		About as likely as not		
550 (530 to 580)	No overshoot of 580 ppm CO_2-eq		−47 to −19	−81 to −59	Unlikely	More unlikely than likely [i]		
	Overshoot of 580 ppm CO_2-eq		−16 to 7	−183 to −86				
(580 to 650)	Total range	RCP4.5	−38 to 24	−134 to −50				
(650 to 720)	Total range		−11 to 17	−54 to −21		Unlikely	More likely than not	
(720 to 1000) [b]	Total range	RCP6.0	18 to 54	−7 to 72	Unlikely [h]		More unlikely than likely	More unlikely than likely
>1000 [b]	Total range	RCP8.5	52 to 95	74 to 178	Unlikely [h]	Unlikely	Unlikely	

A second scenario is constructed projecting that, as of some future date, there will be no net impact on GHG concentrations from Cisco operations or from its products. Although terminology such as "carbon neutral" and "net zero" has not been standardized, "no net impact" is used to mean that, starting at a to-be-determined future date, there would be no net increase in GHG emissions from Cisco operations or from product manufacture, use, or end-of-life. Accomplishing such a future state would be the result of energy efficiency initiatives, low-carbon sources of energy, and validated carbon offset mechanisms, the latter needed to remove residual GHG emissions from any remaining use of fossil fuels.

Assuming a "no net impact" date of 2050, this second Cisco scenario is aligned with a 1.5°C 21st-century temperature rise, relative to pre-industrial levels, described in Figure 4 from the 2019 IPCC special report, *Global Warming of 1.5 ºC*.

Figure 4: Global total net CO_2 emissions in pathways limiting global warming to 1.5°C (Figure SPM.3a of IPCC special report)
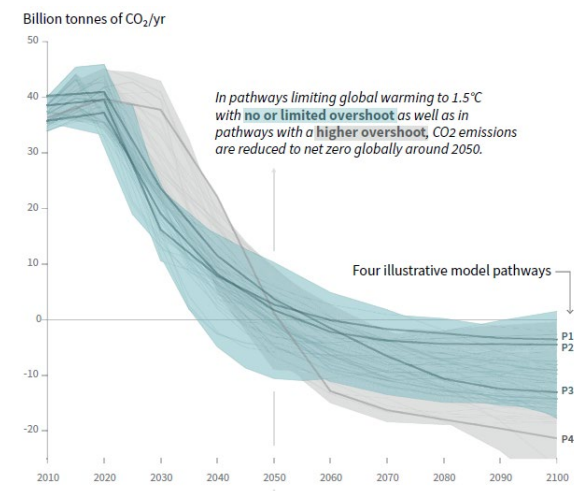
This Scenario 2 has two distinct paths:

1. Cisco successfully implements "no net impact", as does the world
2. Cisco successfully implements "no net impact", but global action is similar in effect as the Scenario 1 base case

Analysis

TCFD documentation specifies two kinds of reporting. The first is four widely adoptable recommendations for disclosure on governance, strategy, risk management, and metrics and targets, provided as Table 49.

Table 49: TCFD recommended disclosures*

	Recommended disclosures	Discussion
1. Governance	a) Board oversight of risks and opportunities	The Board Nomination and Governance Committee reviews policies and programs concerning corporate social responsibility. Environmental sustainability was reported to the company Board in early April 2020.
	b) Management role in assessing and managing climate-related risks and opportunities.	The Corporate Affairs environmental sustainability team is responsible for environmental sustainability strategy and initiatives. Currently, our facilities (WPR/Workplace Resources), manufacturing (SCO/Supply Chain Operations) and Engineering organizations have announced public, GHG emissions-related goals against which Cisco reports annually in this sustainability report. Services (Cx/Customer Experience), Legal Regulatory Affairs, Corporate Compliance, Finance, and Government Affairs also support Cisco environmental sustainability efforts. Refer to section CSR materiality for a discussion of sustainability materiality and Table 10 and Appendix V for current and past goals, respectively.
2. Strategy	a) climate-related risks and opportunities the organization has identified over the short, medium, and long term.	Summary: Physical risks from climate change are enveloped by factors already considered in current continuity-of-supply assessments. As part of our response to COVID-19, Cisco has demonstrated substantial resilience to potential physical risks to operations (Cisco-owned or -leased facilities) from climate change, where most of our workforce easily switched to teleworking. Our collaboration technology and associated culture facilitated this ready migration. Adverse weather and other environmental factors can affect our employees in their personal lives, potentially impact business operation or productivity. Recent examples include water shortages in India, a prolonged freeze in Texas, and wildfires and the accompanying smoke in California.

		Many environment-related improvement efforts focus on resource efficiency, whether water, materials or energy. Efficiency is typically driven by improved monitoring, measurement and analysis, which requires the use of network technologies and provides business opportunity.
		More detailed discussion of risks and opportunities is provided in our response to Section C2 questions in the CDP carbon questionnaire.
	b) Business, strategy and financial planning impact	Refer to our response to Section C3 Business Strategy questions in the CDP carbon questionnaire.
	c) Strategy scenario resilience	Cisco operations and supply chain are relatively energy, water and land efficient with limited presence in coastal regions that may be affected by climate change.
3. Risk management	a) Climate risk assessment process	Climate-related input is provided to the enterprise risk management (ERM) process, the results of which are presented to the company Board. Cisco includes climate risk assessment details in our response to CDP's annual carbon questionnaire
	b) Managing risks process	Cisco uses public goals to address identified environment-related risks, taking advantage of existing sustainability materiality assessment and performance reporting processes.
	c) Climate process integration with ERM	Climate-related input is provided to the enterprise risk management (ERM) process, the results of which are presented to the company Board.
4. Metrics and targets	a) Metrics disclosure	Cisco reports climate-related metrics in our annual sustainability reporting (this ETR). We establish goals based on sustainability materiality and use the goal approval and release process to establish management consensus and commitment. The seniority of management engaged in this process depends on the required resources and coordination across business functions.
	b) Scope 1, 2 and 3 emissions and risks	Our Scope 1 and 2 emissions are reported in Table 20. Scope 3 emissions are reported in Appendix IV – FY20 Scope 3 emissions. References in the Appendix to ETR report sections provide more detail for the more significant sources of Scope 3 emissions.
		Cisco's environmental goals, including those related to GHG emissions reduction and product energy efficiency, are provided in Table 10. Our goals are designed to reduce significant environmental impacts, reducing risk.
	c) Targets to manage risks, opportunities and performance	Refer to Item 4b for reference to tables detailing our publicly announced goals and performance. Cisco is currently studying the impact of a "no net impact" GHG emissions goal in accordance with Scenario 2 reported previously in this Appendix II.

*   from Figure 4, Recommendations and Supporting Recommended Disclosures, from Final Report, *Recommendations of the Task Force on Climate related Financial Disclosures*

The second kind of TCFD-specified reporting is a description of climate-related risks and opportunities as depicted in Figure 5 and as provided for Cisco in Table 50 and Table 51.

Figure 5: Climate-related risks and opportunities (from Figure 1 of *TCFD Recommendations of the Task Force on Climate related Financial Disclosures*)
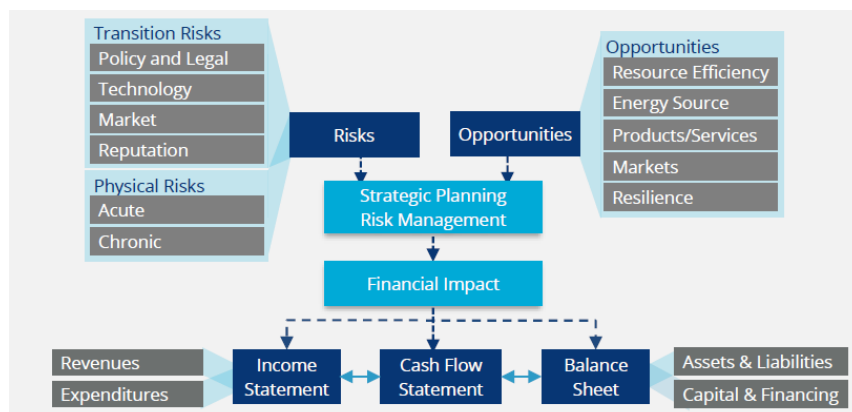

Table 50: Cisco climate-related risks and potential financial impact, per Table 1 of *TCFD Recommendations of the Task Force on Climate related Financial Disclosures*

Risks		Potential Impact
Transition risks	Policy and Legal	Carbon neutrality obligations from regulation, standards, customer requirement or voluntary/proactive company action can require investing in or purchasing carbon offsets. Projecting carbon-offset pricing is uncertain, but has increased as more companies take on carbon neutrality commitments. Investing in projects to develop carbon removal could also be subject to competition to lock up startups developing such technologies.
	Technology	Development of more energy-efficient products may require incremental investment, although managing energy consumption and heat removal is a longstanding design objective as customers fit increased network functionality into locations with fixed power and space.
	Market	Continued and growing demand for information technologies seems likely with business models and success tied to increasing traffic and use of secure networks, applications, analytics, and connectivity. Required material and components for Cisco products should not be subject to unusual cost pressures from climate change.
	Reputation	Maintaining Cisco's reputation as a socially and environmentally responsible company with top-tier ratings in notable rankings will continue to be a company objective.
Physical risks	Acute	Cisco is not thought to be exposed to acute physical risks from Increased severity of extreme weather events such as cyclones and floods.
	Chronic	Cisco is not thought to be exposed to chronic physical risks from Increased severity of extreme weather events such as cyclones and floods. A potential impact is logistics and disruptions to the supply chain should transportation facilities and lanes be unavailable for extended periods. While impact on the business physical plant may be manageable, impacts on personnel (housing, water, power, commuting) will need ongoing [re]assessment.

Table 51: Cisco climate-related opportunities and potential financial impact, per Table 2 of *TCFD Recommendations of the Task Force on Climate related Financial Disclosures*

Opportunities	Climate-related opportunity	Potential Impact
Resource efficiency	Reduced use of virgin material; increased use of recycled material.	Improved material resource efficiency through implementation of circular economy principles may reduce costs and provide alternative sources of supply.
	Improved energy efficiency in operations and extended operations (supply chain)	Investments to meet Cisco Scope 1 and 2 reduction goals have averaged about 3-1/2 years payback, ranging from <1 year to as long as 5 years. Improved energy efficiency in the

		supply chain to meet our absolute GHG reduction goal may similarly reduce cost.
Energy source	Low-carbon/renewable sources of electricity	Reduced operating costs and less exposure to future fossil fuel price increases. Circumstances can vary in regulated vs. unregulated markets.
Products and services	More energy-efficient products	Substantially more efficient products, such as the new 8000-series routers, may provide an incentive for customers to upgrade and retire legacy network gear. This incentive may be higher for a customer that has adopted carbon neutrality, although many such customers have also committed to 100% renewables, which could reduce the GHG-emissions impact of higher energy consumption.
	Cisco solutions that facilitate improved resource buildings, reduced business travel, and teleworking.	Substantial working-from-home during COVID-19 demonstrated the power of remote collaboration technologies, with the same technologies applied to telemedicine, fitness, retail, food service, and entertainment, all at the expense of physical travel and physical presence.
Markets	Acceleration or step change in cultural norms virtualizing many aspects life.	Refer to the row directly above (the opportunity starting with "Cisco solutions.")
Resilience	Use renewable energy and adopt energy efficiency measures.	Cisco has set FY22 goals to (1) use electricity from renewable sources for 85% of our worldwide electricity and (2) to reduce GHG emissions 60% (FY07 baseline) by investing more than $45 million from FY18–22 in energy efficiency and renewable energy.
	Resource substitution	Increased revenue through collaboration products that facilitate transport substitution.

Appendix III – Supplier environmental engagement and performance

This Appendix collects our direct supplier historical progress toward managing carbon emissions and waste reduction. Table 52 shows the progress of various categories of suppliers in reporting to CDP and achieving key GHG-related milestones, from reporting GHG emissions publicly to setting goals and engaging their own suppliers on GHG emissions.

Please refer to:

- Table 15 for supplier progress setting a public absolute GHG reduction target
- Table 16 for supply-chain-related Scope 3 GHG emissions and progress against our reduction goal
- Table 17 for supplier progress toward our zero waste goal.

Table 52: Supplier progress reporting to CDP and achieving key GHG-related milestones

CDP supplier reporting — climate change	FY16	FY17	FY18	FY19	FY20
Manufacturing Partners					
Report Scope 1 and Scope 2 GHG emissions to CDP	100%	100%	100%	100%	100%
Make this response publicly available	36%	33%	99%	95%	100%
3rd party assurance Scope 1 and Scope 2 emissions	20%	78%	99%	99%	100%
Set a GHG reduction target	100%	44%	100%	100%	100%
Engage their suppliers on GHG emissions	87%	32%	87%	86%	83%
Component Suppliers					
Report Scope 1 and Scope 2 GHG emissions to CDP	82%	86%	86%	91%	86%
Make this response publicly available	62%	50%	70%	73%	76%
3rd party assurance Scope 1 and Scope 2 emissions	51%	58%	64%	60%	62%
Set a GHG reduction target	72%	64%	74%	70%	69%
Engage their suppliers on GHG emissions	47%	54%	65%	66%	69%
Logistics Suppliers					
Report Scope 1 and Scope 2 GHG emissions to CDP	96%	96%	96%	95%	96%
Make this response publicly available	87%	67%	89%	95%	96%
3rd party assurance Scope 1 and Scope 2 emissions	68%	64%	62%	73%	76%
Set a GHG reduction target	90%	91%	64%	73%	71%
Engage their suppliers on GHG emissions	82%	86%	88%	85%	85%

Appendix IV – Cisco FY20 Scope 3 emissions

Table 53 provides a summary of our Scope 3 emissions. Important notes for understanding the values provided:

- Where emissions in a Scope 3 category are significant further discussion is provided in the section linked from the first column.

- Cisco's fiscal year runs August through July, so the end of our FY20 is the end of July 2020.

- Each summer, companies reporting GHG emissions as part of CDP's supply chain initiative submit data for their last completed fiscal year for which data is available. In Cisco's case, we report FY19 data in the summer of 2020 ("CDP 2020"), because our FY20 data is not yet available. A similar offset may occur for other Scope 3 reporting companies.

- CDP 2020 supply chain data was not released to supply chain members in time to support the analysis for relevant categories in this report.

- For our response to the CDP 2021 carbon questionnaire, the numbers below will be updated to reflect full FY20 data (or CDP 2020 data for supply-chain related emissions).

Table 53: Scope 3 emissions for FY20

Emissions category	CDP response evaluation status	FY2020 (metric tonne CO_2e)
Scope 3 category 1: purchased goods and services	Relevant, calculated	1,030,000 (uses Cisco FY20 supplier spend and supplier FY19 emissions reported to CDP)
Scope 3 category 2: capital goods	Relevant, not calculated	not applicable
Scope 3 category 3: fuel- and energy-related activities (not included in scope 1 or 2)	Not relevant, calculated	36,478
Scope 3 category 4: upstream transportation and distribution	Relevant, calculated	390,000
Scope 3 category 5: waste generated in operations	Not relevant, calculated	1,080
Scope 3 category 6: business travel	Relevant, calculated	88,939
Scope 3 category 7: employee commuting	Relevant, calculated	49,463
Scope 3 category 8: upstream leased assets	Not relevant, explanation provided	not applicable
Scope 3 category 9: downstream transportation and distribution	Relevant, not calculated	not applicable
Scope 3 category 10: processing of sold products	Not relevant, explanation provided	not applicable
Scope 3 category 11: use of sold products (product energy efficiency)	Relevant, calculated	23,271,302
Scope 3 category 12: end-of-use treatment of sold products (end-of-life)	Not relevant, calculated	250*
Scope 3 category 13: downstream leased assets	Not relevant, explanation provided	not applicable
Scope 3 category 14: franchises	Not relevant, explanation provided	not applicable
Scope 3 category 15: investments	Not relevant, explanation provided	not applicable

Appendix V – Past Cisco environment goals

Past Cisco environment goals are shown in Table 54. Current goals are listed in Table 10.

Table 54: Cisco completed environment goals

Date Goal Established	Goal topic	Environment goal	Final reporting fiscal year
September 2006	Energy / GHG	Clinton Global Initiative (CGI) commitment to reduce GHG emissions from all Cisco business air travel worldwide by 10 percent absolute by FY09 (FY06 baseline).	CSR Report 2009 (p. C32)
June 2008	Energy / GHG	U.S. Environmental Protection Agency (EPA) Climate Leaders commitment to reduce all Scope 1, Scope 2, and business-air-travel Scope 3 GHG emissions worldwide by 25 percent absolute by end of CY12 (CY07 baseline).	CSR Report 2012 (p. F14)
February 2013	Energy / GHG	1. Reduce total Cisco Scope 1 and 2 GHG emissions worldwide by 40 percent absolute by FY17 (FY07 baseline). 2. Reduce total Cisco business-air-travel Scope 3 GHG emissions worldwide by 40 percent absolute by FY17 (FY07 baseline). 3. Reduce Cisco's FY17 net consumption-weighted electricity emission factor to half of the latest International Energy Agency (IEA) world average emission factor publicly available before the end of FY17. 4. Reduce total Cisco operational energy use per unit of revenue worldwide by 15 percent by FY17 (FY07 baseline). 5. Use electricity generated from renewable sources for at least 25 percent of our electricity every year through FY17.	CSR Report 2017 (pp. 101, 102, 106 and 108)
June 2016	Energy / GHG	Avoid 1 million metric tonne cumulative of GHG emissions in our supply chain from FY12 to FY20.	CSR Report 2019 (pp. 135, 142, 150, 152, 169 and 170)

Appendix VI – United Nations Sustainable Development Goals (SDGs)

In 2015, the United Nations Millennium Development Goals (MDGs) issued in 2000 were superseded by seventeen Sustainable Development Goals (SDGs). The SDGs provide a shared blueprint for peace and prosperity for people and the planet. The SDGs, their targets and indicators have a goal year of 2030.

The following tables shows how Cisco's environmental initiatives and goals align with environment-related (SDGs).[9] All environment-related SDGs are listed for clarity and completeness.

Table 55: United Nations SDGs aligned with Cisco environmental Initiatives

SDG Goals		SDG description	Cisco Initiatives and Goals
6. CLEAN WATER AND SANITATION	6. Clean Water and Sanitation	6.3 By 2030, improve water quality by reducing pollution, eliminating dumping and minimizing release of hazardous chemicals and materials, halving the proportion of untreated wastewater and substantially increasing recycling and safe reuse globally	Cisco IoT products—networks, edge processing—are used by commercial companies and municipalities that operate water and waste treatment plants. An example of a commercial use is a paper mill. Our cyber security solutions protect these systems to prevent bad actors from interfering with the proper treatment of water before use or waste before release.
		6.4 By 2030, substantially increase water-use efficiency across all sectors and ensure sustainable withdrawals and supply of freshwater to address water scarcity and substantially reduce the number of people suffering from water scarcity.	Cisco has partnered with a large food processor to use flow sensors that match real time water usage with ambient temperature in order to reduce water usage per unit of production.
7. AFFORDABLE AND CLEAN ENERGY	7. Affordable and Clean Energy	7.2 By 2030, increase substantially the share of renewable energy in the global energy mix	Cisco is currently using renewables sources for 83% of worldwide electricity use (see goal, Table 10 and performance, Table 24). Cisco has committed to reduce supply chain emissions by 30% absolute, which will likely require renewable and other low-carbon sources (see goal, Table 10 and performance, Table 45).
		7.3 By 2030, double the global rate of improvement in energy efficiency	Cisco is nearing completion of our third, 5-year, absolute Scope 1 and 2 GHG emissions reduction goal. Achieving these reductions is due to using low-carbon sources of electricity and investing in hundreds of energy efficiency projects at our facilities around the world (see goal, Table 10 and performance, Table 20 and Table 23). Cisco is improving the energy efficiency of our products (see goal, Table 10 and performance, Table 33). Cisco switches with Universal Power Over Ethernet (UPOE+) provide opportunity to increase building energy efficiency through converged DC networks and improved monitoring and control (smart buildings).
11. SUSTAINABLE CITIES AND COMMUNITIES	11. Sustainable Cities and Communities	11.6 By 2030, reduce the adverse per capita environmental impact of cities, including by paying special attention to air quality and municipal and other waste management	Refer to the discussion of Target 6.3.

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[9] Cisco priority focus areas are mapped to the SDGs in the ESG Reporting Hub.

	12. Responsible Consumption and Production	12.2 By 2030, achieve the sustainable management and efficient use of natural resources	Refer to discussion in report sections addressing Water and Products and packaging materials.
		12.4 By 2020, achieve the environmentally sound management of chemicals and all wastes throughout their life cycle, in accordance with agreed international frameworks, and significantly reduce their release to air, water and soil in order to minimize their adverse impacts on human health and the environment	Refer to discussion in report sections Materials of concern and Product end-of-use.
		12.5 By 2030, substantially reduce waste generation through prevention, reduction, recycling and reuse	Refer to discussion in report sections addressing Solid waste from operations (trash) and Products and packaging materials (see goal, Table 10 and performance, Table 17).
		12.6 Encourage companies, especially large and transnational companies, to adopt sustainable practices and to integrate sustainability information into their reporting cycle	Refer to this Environmental Technical Review.
	13. Climate Action	13.3 Improve education, awareness-raising and human and institutional capacity on climate change mitigation, adaptation, impact reduction and early warning	Refer to the discussion of Targets 7.2 and 7.3 (see energy/GHG-related goals, Table 10 and associated performance tables). Refer to discussion in the report section addressing Energy and GHG emissions.
	14. Life Below Water		Cisco currently has no initiatives directed at SDG 14 Targets.
	15. Life on Land	15.7 Take urgent action to end poaching and trafficking of protected species of flora and fauna and address both demand and supply of illegal wildlife products	Refer to the discussion in the report section addressing Biodiversity (including land use), especially Species conservation.
	17. Partnerships for the Goals	17.7 Promote the development, transfer, dissemination and diffusion of environmentally sound technologies to developing countries on favourable terms, including on concessional and preferential terms, as mutually agreed	Cisco's core business providing network technologies promotes low-impact economic development and enable reduced environmental impact through improved resource efficiency.
		17.16 Enhance the global partnership for sustainable development, complemented by multi-stakeholder partnerships that mobilize and share knowledge, expertise, technology and financial resources, to support the achievement of the sustainable development goals in all countries, in particular developing countries. 17.17 Encourage and promote effective public, public-private and civil society partnerships, building on the experience and resourcing strategies of partnerships	Cisco has maintained a 15-year relationship supporting CDP (formerly Carbon Disclosure Project) through donation of remote collaboration technologies. Cisco particularly values its participation in the Corporate EcoForum and the close and valuable engagements with sustainability leaders from many industry sectors. A list of energy efficiency-related organizations with whom Cisco actively engages is provided as Table 32. A list of supply-chain-related, environment-focused organizations with whom Cisco actively engages is provided as Table 14.

CISCO