Watch the Video! Cisco EnergyWise gives companies a global view of energy management. Energy use can be controlled through the network, delivering economic and environmental savings.

Environment

Economic growth can be decoupled from energy usage through the use of information and communications technology (ICT). An improved standard of living for developing regions and underserved communities does not have to be at the expense of environmental sustainability. Developed economies can also benefit from innovative use of ICT to transform how people live, work, and learn.

How to Use This Report

We encourage you to use the complete report PDF, which includes all sections and allows full access to videos, search capabilities, and bookmarks. Alternatively, if you visit us online, you can access each section of our report individually. We've also created an Executive Summary, which provides an overview of our achievements in fiscal year 2011 (FY11).

Bookmarks

This pdf is bookmark enabled. We have pre-populated bookmarks in the Environment section only.

Recommended Software

· Adobe Acrobat* Version 7.0 and above
· QuickTime

Cisco Environmental Sustainability

This section of the Cisco Corporate Social Responsibility (CSR) report provides information regarding our environmental challenges and how we are managing them. Our environmental Key Performance Indicators (KPIs) and our Objectives for FY12 are provided at the end. A review of the organization of this section and the changes we made in response to stakeholder feedback is provided in Appendix 1.

For easier navigation within this section, please enable the Acrobat bookmarks pane if it is not already visible on the left.

Materiality

Based on input from stakeholders and results of life cycle assessments (LCAs) and other analyses of our products, Cisco prioritized environmental impact into five tiers as shown in Table 1.

This materiality is based on the overall impact of the ICT industry sector, which helps prioritize issues globally, as well as additional criteria aiding prioritization for Cisco: the impact from Cisco's operations, the impact from our supply chain, and the use of our products by our customers.

Energy and GHG emissions are the most important and complex issues for Cisco. The issue of energy consumption includes not only our own operations, but the extended operations of our business/supply chain partners because we outsource business functions such as manufacturing, component supply, and transport logistics. Product energy efficiency is material to Cisco because life cycle analyses of electronic products indicate that the use phase, depending on the product and assumptions made, can make up more than 90 percent of the carbon footprint of typical network products.

Another aspect of the energy and GHG emissions issue that is highly material to Cisco is the opportunity for Cisco products to help reduce GHG emissions in other industry sectors. According to a Gartner study and confirmed by the SMART 2020 report, ICT energy consumption is estimated to produce about 2% of all energy-related emissions. Through the use of ICT, emissions can be reduced in other industry sectors such as transportation and buildings: what's been called "The 98%."

Cisco has focused its energy/GHG efforts on the improvement of our operations, supply chain, product energy efficiency, and technology solutions that enable emissions reductions in other sectors for ourselves and our customers.

Cisco also works to minimize the environmental impact of our products by providing comprehensive product end-of-life services for our equipment. Cisco has built a worldwide network of qualified recyclers. Through several programs discussed in more detail in a later section, customers can return any Cisco equipment for credit or for recycling at Cisco's expense. With advanced recycling techniques, essentially all recycled products are directed into various commodity waste streams for processing and recovery. Our challenge is to promote awareness of our take-back and recycling programs among our channel partners and customers in the event that they do not have their own network of world-class recyclers.

Discussions of other issues listed in the Table 1 are provided under the appropriate topic of the Environment section.

Table 1: Materiality Tiers for Cisco Environment-related Issues	
Tier	**Environment Topic**
1	Product energy efficiency
	Energy consumption (operations)
2	Waste (product end of life)
3	Transport emissions (from product logistics)
	Potential water pollution (Liquid effluents)
	Waste (packaging)
4	Waste (operational "trash")
	Controlled substances
	Water use
	Biodiversity and land use
5	Hazardous waste
	Non-GHG airborne emissions

Environment

Principles

Governing principles for environmental sustainability at Cisco that inform policy development are:

- Cisco integrates environmental responsibility into all aspects of our business while meeting customer expectations with respect to product function, delivery, quality, service, and end-of-life management.

- Cisco works with its suppliers ("extended operations") to integrate environmental responsibility into all phases of Cisco's product life cycles.

- Cisco uses the Global Reporting Initiative (GRI) performance indicators to define the minimum scope of our environmental impact assessment, reporting, and initiatives. All GRI indicators are accorded due diligence to support a meaningful impact assessment.

- Cisco provides complete, accurate, and public environmental reporting for our stakeholders.

- Cisco maintains the following governance for our environmental sustainability efforts:

  - Cisco actively seeks out stakeholder feedback on materiality assessment, reporting, and the results of our initiatives.

  - Cisco has made a long-term commitment to use our executive-level EcoBoard to set policy and priorities.

  - Cisco seeks and maintains ISO 14001 certification for all sites with significant potential for environmental impact.

  - Cisco uses our CSR Business Process to tactically drive reporting, stakeholder feedback, initiative prioritization, implementation, and metrics for environmental sustainability issues.

- The risk from increasing GHG concentrations in the Earth's atmosphere is real and significant. Cisco supports the reduction of global GHG emissions through improvements to our products, and operations, and through the actions of our business partners. Cisco develops and uses our own products

to demonstrate at scale innovative and cost-effective methods to reduce GHG emissions, and to help our customers to do likewise.

- Cisco uses its position as a respected global leader and an industry bellwether to environmental advocacy groups, standards bodies, and policymakers to effect practical and effective solutions to global environmental challenges.

- Cisco believes that most effective leadership is done by example. We will effect continuing improvements in our environmental impact assessment, reporting, and initiatives, and encourage our supply chain and business partners to further develop best practices for their own operations.

Organization

Cisco utilizes an EcoBoard of senior executives representing key business functions to set Cisco's environmental strategy. The EcoBoard is a cross-functional body made up of vice presidents and senior vice presidents that is responsible for Cisco's environmental vision and strategy, including climate change. The EcoBoard meets quarterly. In FY11, EcoBoard membership included 14 business-unit and operational organizations, including Legal, Corporate Affairs/Sustainable Business Practices, Sales, Supply Chain Operations, Communications, Finance, Product Development, Marketing, Services, and IT. Each of our major geographic theatres is also represented. The EcoBoard establishes environment-related objectives for Cisco that address GHG emissions from operations; product energy efficiency; customer environmental requirements; customer solutions; and opportunities for employee education, awareness, and involvement. Laura Ipsen (Senior Vice President and General Manager of the SmartGrid Business Unit) is founder and co-chair of the EcoBoard. Laura reports to Marthin De Beer, who heads the Emerging Technologies Group.

The EcoBoard, in tandem with business functions that are covered by our environmental management system (described below), create and implement

operational change. These teams promote environmental sustainability through cross-functional collaboration and a wide-reaching network of contacts across the business, including our customers. The teams focus on corporate-level initiatives that directly enhance Cisco's environmental performance.

Performance-Based Compensation

At Cisco, we believe that environmental sustainability can be a part of each employee's job. We are encouraging employees to have environmental sustainability-related goals in our online performance management tool, which documents the results of the performance review process and compensation and bonus decisions. Currently, about 300 Cisco employees have one or more environmental goals in their formal development plans that will be reviewed as part of the Cisco Performance Connection evaluation process. Cisco is working to increase the number of employees that have individual environmental performance goals. Each member of the EcoBoard promotes individual environmental performance goals for employees in their respective organizations. Incorporation of these goals in individual performance reviews effectively pushes the environmental agenda deeper into each functional area.

Environmental Management System

An environmental management system (EMS) refers to the management of an organization's environmental impacts and programs in a comprehensive, systematic, and planned manner. It includes the organizational structure, planning, and resources used for developing, implementing, and maintaining a policy for environmental protection, as well as setting environmental objectives and targets. An EMS:

- Serves as a tool to improve environmental performance

- Provides a systematic way of managing an organization's environmental impacts, requirements, and programs

Environment

- Addresses immediate and long-term impacts of an organization's products, services, and processes on the environment
- Gives order and consistency for organizations to address environmental concerns through the allocation of resources, assignment of responsibility, and ongoing evaluation of practices, procedures, and processes and their impacts
- Focuses on the improvement of the system and environmental performance

Cisco seeks to decrease our negative impacts while enhancing our positive impacts on the environment, and this concept and foundation are set out in our Corporate Environmental Policy. Our Corporate Environmental Policy, in conjunction with our EMS, provides an environmental performance framework that enables us to monitor and manage the environmental impacts that we find to be of greatest material importance for our business.

Cisco sites for ISO 14001 certification are selected based on a set of criteria that includes:

- Facility size and lab area
- Building headcount capacity or persons housed
- Primary facility function

The application of these criteria allows us to apply resources to the certification of sites that we believe will make the greatest contribution to managing and reducing Cisco's environmental impacts. Once a site has been certified, an analysis is performed to evaluate its associated environmental impacts. This includes an evaluation of corporate functional areas; the 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. All of this information is incorporated into the calculation of an environmental score, which then guides the prioritization of facilities and the mitigation of the associated environmental impacts.

Cisco's EMS is certified to the internationally recognized EMS standard, ISO 14001:2004. All of Cisco's ISO 14001 certified sites are audited by an independent third party. Sites that were part of an acquisition are included in the scope of the Corporate Environmental Policy and corporate environmental initiatives.

See Table 2 for our ISO 14001 certification KPIs.

The EMS is used to identify the most significant environmental impacts at each Cisco site and set relevant corporate and local environmental objectives or targets. Based on potential impacts, site teams adopt one or more initiatives to implement at a given site.

All ISO 14001 certified sites have teams that pursue environmental goals. Examples of these efforts include:

- Waste reduction and recycling (25 sites)
- E-scrap management (corporate level and 21 sites)
- Energy management (corporate level and 10 sites)
- Environmental awareness (4 sites)
- Wastewater management (1 site)

In addition to the site operational teams, Cisco has our EcoBoard that sets goals, initiatives, and metrics that measure Cisco's environmental performance on an internal ISO 14001 dashboard. We use performance tracking, metrics, and governance to track our progress toward meeting our goals, as well as to guide us in finding ways to improve our EMS.

Audits are a key component of Cisco's EMS, providing regular assessments as to whether our environmental processes and commitments are implemented, and that we are improving our EMS at our certified sites. The frequency of these audits depends on set criteria, such as the size and operational activities at the site, in addition to the results of previous year-over-year findings. Typically, within a three-year period, every site receives one onsite audit and one virtual audit. In FY11, we conducted 33 site audits (14 of them virtually using Cisco TelePresence and Cisco WebEx).

Table 2: Cisco Environmental Management System ISO 14001 Certification						
KPI	FY2007	FY2008	FY2009	FY2010	FY2011	Comments
Number of Cisco sites with ISO 14001 certification	23	23	25	26	28	Calendar year certifications assigned to fiscal year (e.g., CY2011 assigned to FY2011)
Employees at sites covered by ISO 14001 certification	74%	73%	70%	71%	69%	Head count-based metric calculated per 2010. Future reporting will be by real estate footprint (below).
Real estate portfolio with ISO 14001 certification	100%	96%	92%	92%	91%	Real estate footprint viewed as better measure of potential environmental impact. Candidate ISO 14K sites filtered by minimum size and engineering lab function.

Environment

Best Practices

An important component of our audit process is to identify best practices. These are shared across the business functions through our internal EMS newsletter and our ISO 14001 committee meetings, which include the ISO 14001 key partners. The best practices that were identified in FY11 include:

- A lab prototype in Netanya, Israel, that is ergonomically and environmentally designed using less floor space and about 20 percent less energy than a typical lab

- Implementation of databases for improved and easy access to Emergency Response Plans in Research Triangle Park, North Carolina

- Identification and management of critical electrical systems for data centers in Richardson and Allen, Texas

- An "exceptional workplace resources" vendor management process that promotes performance, environmental awareness, and minimization of environmental impact while vendors are onsite in Amsterdam

Life Cycle Assessment

Cisco focuses current LCAs on estimating greenhouse gas emissions associated with our products. Further discussion of this work is provided in a later section on Scope 3 emissions. LCA is a holistic approach to assessing the environmental impact of a system, process, or product from cradle to grave. At Cisco, LCA has the following benefits:

- Assess the materiality of various contributors to environmental impact

- Facilitate more informed material selection of alternative materials that are more environmentally friendly

- Understand the impact of product power consumption on product environmental footprint

- Compare assembly and test scenarios to help develop more energy efficient manufacturing processes

- Inform packaging and accessory kit reduction projects on the trade-offs of alternative materials and the environmental impact improvement of reducing materials

- Understand the relative carbon efficiency of different transport modalities of our products to logistics centers and customers

To aid in performing LCA work in various areas, we utilize data sources such as PE International's GaBI and ecoInvent. In addition, we use data from the International Energy Agency (IEA), the U.K. Department for Environment Food and Rural Affairs (DEFRA), and the Greenhouse Gas Protocol (GHGP).

Design for Environment

Although the largest impact of most of our products comes from energy consumption, many other factors related to materials, transportation, and disposal are considered during the design stage to reduce the environmental impact of our products. We employ design-for-environment principles in our product design standards. The benefits include:

- Increasing the energy efficiency of our products

- Shipping our products with less material

- Shipping our products in tighter packaging footprint

- Designing our products for ease of recycling

We have incorporated design-for-environment into our product requirements document template, which focuses on the following areas:

- Energy efficiency (minimum 80 percent efficient power supply and component)

- Hazardous materials (exclusion of hazardous materials based on Cisco's Controlled Substances Specification)

- Design-for-recyclability and upgradeability

- Recycling marking (ISO11469, SPI codes)

- Packaging (reduction of materials and package volume)

- Design-for-longevity (designing products for long lifetimes)

- Product take-back

Employee Training

We have incorporated environmental design principles into our products, systems, and solutions. The goal is to improve designs in order to reduce the use of raw material, packaging, and transportation while enabling more effective recycling. The first step was to incorporate environmental design features into our product requirements document. To support these goals, we implemented companywide informational and training events such as Virtual Earth Day and video-on-demand classes. These show employees how they can contribute to our environmental goal of reducing carbon emissions by creating new products like SmartGrid, improving upon existing product designs, and working with our supply chain to make upstream operations more environmentally conscious.

Cisco launched a web-based course, sponsored by the Cisco engineering leadership team, targeting all employees who have a significant role in defining product requirements or developing our products. Employees will learn about Cisco's green initiatives and what they can do to contribute to these efforts. In FY11, this training was made available in Mandarin. The web-based training has been completed by over 1100 members of our product development community.

To further embed environmental practices as part of our standard business operations, Cisco offers employee training on our business management system, which includes an explanation of our EMS and environmental policy, and how it applies to each employee.

In FY11, we developed a web-based training module on sustainability and the Supplier Code of Conduct for employees who engage regularly with suppliers. The rollout will continue during FY12. The training is based on a course developed by the Electronics Industry Citizenship Coalition (EICC), which we have customized to address Cisco programs and procedures. Supplier management teams will be required to take refresher training as necessary to update them on changes to the Code and other emerging issues.

Supply Chain

To identify and reduce supplier environmental impacts and support their improvement efforts, we have three supplier improvement programs:

- Supplier selection criteria
- Supplier performance monitoring/audit
- Supplier improvement programs

Supplier Selection Criteria

To be selected as part of Cisco's supply chain procurement team, suppliers must meet business performance criteria that include on-time performance, quality, and cost. Embedding sustainability into the process of supplier selection helps suppliers understand our sustainability goals and vision. This includes our Supplier Code of Conduct, and working directly with suppliers as well as through industry initiatives designed to build sustainability capabilities.

Sustainability, alongside other criteria such as quality and technical requirements, will be an integral part of the scorecard for preferred suppliers beginning in FY12.

Cisco has adopted the EICC Code of Conduct for all supply chain partners. Compliance with the Supplier Code of Conduct is part of our contractual agreements with suppliers and helps to drive environmental/sustainability performance further into the business scorecard process that we use to establish preferred supplier status. We consulted with our suppliers in developing these criteria to help target the most relevant issues. Cisco's goal is for sustainability, alongside other criteria such as quality and technical requirements, to be an integral part of the scorecard for preferred suppliers in FY12 and beyond.

Supplier Performance Monitoring

We monitor the environmental performance of our preferred suppliers using the business scorecard process mentioned in the previous section. For example, suppliers are scored as to whether they have measured and reported their GHG emissions to the Carbon Disclosure Project. Our goal for FY12 is to review supplier performance against sustainability metrics as part of business reviews at least twice a year. This will help our preferred suppliers better understand their environmental performance, identify where they need support, and promote improvements around GHG emissions, water, and waste. This topic is also discussed in the Value Chain section.

Supplier Improvement

Suppliers that have gaps in defined capabilities, as determined by the performance monitoring efforts, may go through a supplier improvement program. After FY12, we expect to have enough data to assess gaps within our supply chain and to work with suppliers to help raise their environmental awareness, capability, and performance.

Environmental management of our suppliers is outlined in the Supplier Code of Conduct and is included as part of the audit and improvement process. The environmental factors that we focus on are GHG emissions, water

use and discharge, solid waste, and hazardous materials management. Helping suppliers improve their management of environmental issues and reduce their impacts can in turn help us reduce the overall impacts of our products throughout their life cycle.

We want to raise sustainability standards throughout the supply chain by working with our suppliers to help them improve their management systems and put in place similar processes to work with their own suppliers. Our Supplier Code of Conduct requires our Tier 1 suppliers—those with whom we have a direct relationship—to apply these same standards to their own suppliers. We also encourage them to join the EICC to participate in wider industry efforts to build capability and drive standardization. This topic is also discussed in the Value Chain section.

Below we have included supply chain related information for water, biodiversity, non-GHG emissions, effluents, and solid waste. Supply chain GHG and energy topics are discussed in the Energy and GHG section

Water: Water quality and availability are of concern to Cisco not only in its operations but also within the supply chain. Water consumption in our supply chain wholly depends on the type of supplier. For Cisco's suppliers that manufacture finished goods, water is a very small component of environmental impact. However, water consumption may be greater for other supplier types. For example, pure water requirements for semiconductor manufacturing becomes stricter as wafer technologies advance.

We will address the water issue through its incorporation as a sustainability metric into our preferred supplier scorecard. This scorecard is used to determine supplier status and monitor performance. Performance against these metrics is reviewed at least twice a year.

Environment

Biodiversity: Cisco has no active programs addressing biodiversity issues in our supply chain. As we work with our manufacturing partners on CSR reporting, it is our expectation that all GRI performance indicators will be addressed.

Non-GHG Emissions: Cisco has no active programs addressing non-GHG emissions in our supply chain. As part of our Supplier Code of Conduct, all local environmental laws must be followed, including those governing air emissions. As we work with our manufacturing partners on CSR reporting, it is our expectation that all GRI performance indicators will be addressed.

Effluents: Effluents consist of waste that is released from industrial outfalls into the environment. Water quality is an important area of concern for our supply chain. Although our quantity of water use could be small, the quality of that water is vital. We are working with industry groups, such as the Institute of Public and Environmental Affairs (IPE) in China and the Electronics Industry Citizenship Coalition, to identify water scarcity and water quality issues that may occur within the supply chain.

In April 2010, the IPE identified electronics manufacturing facilities supplying components to global ICT brands that did not comply with regulations for emissions of heavy metals in wastewater. One of our suppliers was listed, although it was not supplying products to us at the time of the release. After learning of inclusion on this list, we contacted the supplier and commissioned a third-party audit of its environmental procedures to understand how heavy metals had entered the wastewater and to find out if there was an ongoing problem. The supplier took appropriate corrective actions to improve its wastewater management system.

We used our experience from working with this facility to produce and share guidance with our other manufacturing suppliers to educate them on our strict requirements and to help them perform accurate assessments of their environmental performance. We continue to engage with IPE through the EICC to increase compliance with environmental regulations across the industry. This topic is also discussed in the Value Chain section.

Solid Waste: We will be adding a solid waste performance measurement to our supplier scorecard process.

Employee Engagement
Cisco supports employee interest in the environment through several efforts:

- Virtual Earth Day: An annual activity consisting of a series of webinars on a variety of environmental topics either specific to Cisco or of general interest to our worldwide employee base.

- Think Green, Act Green: An internal, quarterly newsletter summarizing Cisco environmental activities for the period.

- Civic Councils: Cisco sponsors more than 30 Civic Councils at major Cisco sites around the world. These councils, discussed in more detail in the Society section, provide a means for groups of employees to volunteer in their local communities on social or environment-related programs.

- Employee Electronics Recycling (e-scrap): Yearly Cisco employees can bring in used electronics, which are recycled using the same vendors and processes used in Cisco's business.

- Employee Commuter Incentives: Cisco encourages employee use of mass transit at some sites through programs that allow eligible employees to use pre-tax dollars to purchase mass transit passes. Cisco has begun installing electric vehicle charging stations for our employees, discussed in a later section on Scope 3/employee commuting.

For more information on these efforts, see Appendix 2.

Regulatory Fines
GRI EN28: Monetary value of significant fines and total number of non-monetary sanctions for non-compliance with environmental laws and regulations.

Our EMS certifications provide regular assessment of our environmental compliance. Our culture is one of transparency and collaboration, and employees are encouraged to raise concerns or report issues without fear of retaliation. We investigate any allegation of noncompliance to determine root causes and implement corrective actions, if needed, to prevent their recurrence. Cisco's proactive approach and close attention to environmental requirements have resulted in no significant fines or penalties greater than US$10,000 in the past five years.

Materials

GRI EN1: Materials used by weight or volume.

Packaging

The growing amount of municipal solid waste being added to landfills from product packaging has become an area of environmental concern. To minimize Cisco's impacts in this area, our packaging team designs packages to protect against shipping damage while minimizing material usage. Each design goes through rigorous drop and vibration testing because a product damaged in transit has both negative business and environmental impacts as it needs to be disposed of and a replacement product shipped.

After the basic packaging and material requirements have been met, Cisco evaluates four additional aspects of environmental package design:

- Packaging material optimization: Designing a package that provides protection for the product while reducing the overall amount of packaging material used.
- Space efficiency optimization: Because the environmental impact from transportation and logistics is greater than that from packaging material use, increasing space/cube efficiency that fills the same amount of space in a transportation vehicle with more units of product can reduce a unit's environmental impact.
- Decreasing product size: Our product designers look to decrease the size of the product in two ways:
  - Shipping our products configured
  - Designing our products with distribution in mind, taking into consideration characteristics such as protrusions, compactability, and fragility.
- More environmentally friendly materials: After reducing the overall material used for packaging, our packaging team then focuses on using recycled content and recyclable features.

An example of one of the packaging reduction projects from FY11 is the Cisco Nexus 2000 pack, in which we reduced the height of the accessory kit to shrink the size of the customer pack. This project reduced inbound and outbound shipping costs as well as packaging costs and had a weight savings of 1.84 oz of plastic and 6.1 oz of corrugated cardboard per unit.

More than 95 percent of our packaging parts are made of one material or using materials that are easily separable for recycling. However, the recycled content varies from item to item and also varies with geographic regions. The ability of our customers to recycle our packaging depends on the recycling facilities in place in their region. Except for antistatic bags, which constitute a very small percentage by weight of all packaging material, all Cisco packaging is designed to be easily processed by the local recycling infrastructure.

In FY11, Cisco continued to work with packaging suppliers to reduce the environmental impact of product packaging. These efforts included designing packaging to minimize excessive space and materials, creating multipacks in which we send our customers multiple units in a single box with a configured quantity of accessories and documentation, and enabling configured shipping to reduce the amount of packaging required for the same unit. We have also been working with our suppliers to get all of our corrugated materials certified by the Forest Stewardship Council (FSC) or similar agency.

Our packaging is designed with the intent to meet or exceed all applicable compliance regulations, including those in the European Union and Australia, and all of our packaging materials meet relevant environmental standards and do not use hazardous constituents. All Cisco engineered packages are subject to European packaging standards including CEN 13428:2004, CEN13430:2004, and CEN13431:2004.

As a result of all of these efforts, we reduced our packaging material by 1200 metric tonne during the FY11 and a total of 3000 metric tonne over the last three years.

Watch the Video! Smart design reduces the environmental impacts of packaging. Cisco's design-led approach to packaging has reduced waste and decreased transportation costs.

Product

Understanding the materials that make up our products helps Cisco identify opportunities to reduce or eliminate their use. Over the last three years, Cisco has used product dematerialization projects to identify and remove unnecessary items that ship with our products. These include removing excess or unnecessary accessory kit items, such as documentation, bags, and hardware, from our products.

Dematerialization projects are cross-functional, collaborative efforts that reduce the auxiliary material previously included with most products, and also allow further packaging reductions. Best practices developed on these projects have been incorporated into our product design cycle and processes. One example is known as the pointer card, a small printed card that provides the customer links to access product documentation and software on the web. The pointer card has replaced large documents within accessory kits in many product families.

Customers also have the option to order a "reduced material" accessory kit, which provides a minimum set of supporting material, and eliminates items that our customers may not need in their installation, such as console cables, large documents, and cable management brackets.

From projects initiated in FY11, Cisco has collectively eliminated 4.53 million pounds of material from our supply chain, through improvements including documentation, raw materials, and packaging.

Recycled Content

GRI EN2: Percentage of materials used that are recycled input materials.

Packaging

Where possible, Cisco uses corrugated cardboard that is approximately 50 percent recycled content and thermoformed cushions that are made from 100 percent recycled polyethylene. However, this type of cushion is not suitable for every product, and therefore some products use foam cushions made from virgin material or recycled substitutes. Cisco products also use recyclable polyethylene bags for certain purposes (for protection and accessory kit subassembly consolidation), but we are reducing the thickness and quantity of bags shipped with products while maintaining adequate product protection.

Cisco's intention is to encourage and promote the use of recyclable packaging. There are some applications that require use of dissimilar materials joined together that cannot easily be recycled, such as metallized static shielding bags, or ESD bags, but in those cases we minimize the quantity and amount of material used and evaluate internal reuse programs for them. An alternative is the use of antistatic, recyclable pink poly bags in place of ESD bags where the amount and type of protection required permits.

Product

In addition to recycled packaging content, most products have material that has been recycled from other products. Electronic products consist mostly of circuit boards, steel, and plastics. In general, the enclosures and structures of our products utilize recycled materials consistent with safety and performance requirements. We use reground plastic in our IP phones where structural rigidity is not required, and we use recycled material in the steel that makes up enclosures of our products. Printed circuit boards typically use recycled material, such as copper, and most electronic components make use of recycled material that is reclaimed from electronics recycling.

Our dematerialization efforts help us optimize the amount and type of auxiliary items that we ship with our products, without compromising the customer experience or product quality. For items that we can't eliminate or minimize further, we work toward using as many recyclable and recycled materials as possible. For example, recycled content documentation is a Cisco standard.

All of our documentation specifications call for the use of chlorine-free paper with at least 10 percent post-consumer waste paper. In FY08, we added a provision to the approval process that all new vendors be FSC members. Because FSC membership requires complete chain of custody and reforestation for any materials, the environmental impact of virgin paper is minimal. However, we continue to apply the 10 percent recycled content criterion where possible, even to FSC member printers.

Our print vendors use state-of-the-art processes to minimize their environmental impact, and where practical (on boxes or large print diagrams, for instance) we encourage our vendors to use natural inks. However, where clarity is important (safety materials, operating instructions), the vendor is expected to use a type of ink that does not bleed or fade.

Along with documentation, Cisco optimizes the thickness and types of plastic bags shipped with our products. This allows us to use the appropriate size, type, and thickness of bags for the items that they are protecting, which means being as efficient as possible with the plastic bags we ship with our products.

Energy and GHG Emissions

This section reviews Cisco's environmental impacts and our initiatives concerning energy and GHG emissions. The Global Reporting Initiative (GRI) indicator protocols place GHG emissions under the Emissions, Effluents, and Waste category. Because Cisco GHG emissions are almost all directly associated with the use of energy (typically electricity), we report GHG emissions with energy.

Cisco has made two GHG emission reduction goals:

- September 2006: Clinton Global Initiative (CGI) commitment to reduce GHG emissions from all Cisco business air travel worldwide by 10 percent absolute (against a FY2006 baseline).

  This CGI goal has been met and the commitment closed with CGI.

- June 2008: EPA Climate Leaders commitment to reduce all Scope 1, 2, and business-air-travel Scope 3 GHG emissions worldwide by 25 percent absolute by CY2012 (CY2007 baseline).

  Cisco is on track to meet this EPA Climate Leaders goal. This goal has not changed since the original announcement.

Cisco has been recognized for our greenhouse gas reporting by both Greenpeace and Carbon Disclosure Project (CDP).

- In December 2010, Greenpeace rated Cisco the #1 company in its Cool IT Challenge (v4). We were also rated #1 in the previous iteration of the Challenge. Cisco did particularly well on our GHG emission reporting, providing ICT solutions that our customers can use to reduce their GHG emissions, and calculating the impact of these solutions.

Environment

- In September 2010, Cisco was rated the top IT company in the world by CDP as reported in CDP's analysis of responses to CDP's investor survey. (Cisco was rated the #1 and #2 IT company in 2008 and 2009, respectively.) In September 2011, Cisco was once again ranked the #1 IT company in the world and was ranked #5 worldwide among all companies in all sectors. A copy of our 2011 survey response is available on the CDP website.

Operations Scope 1 and 2

GRI EN3: Direct energy consumption by primary energy source.

GRI EN4: Indirect energy consumption by primary source.

GRI EN16: Total direct and indirect greenhouse gas emissions by weight.

See Table 3 below for our Scope 1 and 2 GHG emissions KPIs.

All prior-year Scope 1, 2, and Scope 3 business air travel emissions data vary to some extent from previously reported values, either in the most recent CDP survey or in our FY10 CSR Report, because of updates to emissions factors, methodology, and correction of minor errors found upon repeated review. To support

Table 3: Summary of Scope 1 and 2 GHG Emissions						
KPI	FY2007	FY2008	FY2009	FY2010	FY2011	Comments
Total gross GHG emissions: Scope 1, metric tonne CO_2e	51,399	51,661	53,453	53,363	60,382	*Gross* is used consistent with Carbon Disclosure Project (CDP) terminology. Gross GHG emissions do not include reductions from renewable energy purchases.
Total gross GHG emissions: Scope 2, metric tonne CO_2e	461,456	539,867	590,755	597,257	610,832	
Total contractual GHG emissions: Scope 2, metric tonne CO_2e	395,720	296,417	235,520	339,630	367,513	*Contractual* is used consistent with CDP terminology. Contractual GHG emissions include reductions from renewable energy purchases.
Scope 1 and 2 emissions (gross) intensity, metric tonne CO_2e per million US$ revenue	14.7	15.0	17.8	16.2	15.5	
Scope 2 emissions from primary date	96.4%	97.1%	96.9%	98.6%	98.0%	
Total contractual GHG emissions: Scope 1 and 2, metric tonne CO_2e	447,120	348,079	288,973	392,993	427,895	
Progress against reduction goal. Goal: reduce all Scope 1, 2, [and business-air-travel Scope 3] GHG emissions worldwide by 25 percent absolute by CY2012 (CY2007 baseline)	na	-22%	-35%	-12%	-4%	Cisco's corporate GHG reduction goal was set as part of U.S. EPA Climate Leaders program, which required a *calendar*-year baseline. The Climate Leaders program has since been discontinued. To avoid reporting both calendar and fiscal year data, Cisco is publicly reporting emissions using fiscal year data.

Environment

standardization and benchmarking across companies, Cisco uses the Greenhouse Gas Protocol Corporate Accounting Standard as the basis for our Scope 1, 2, and 3 (business air travel) emissions calculations. The EPA Climate Leaders program provides additional program guidance.

Cisco has reported to the CDP in all nine years that the CDP survey has been distributed. CDP is an independent, not-for-profit organization that holds the largest database of GHG emissions in the world. The CDP questionnaire and our answers provide a comprehensive view of the following topics related to climate change: risks and opportunities, actual emissions, reduction goals, avoided emissions, and regulatory and policy activities.

Each year, Cisco has an independent third-party review our GHG inventory, including all emissions relevant to our current GHG reduction goal, which includes Scope 1 and Scope 2 emission sources and Scope 3 business-air-travel emissions. In FY11, this limited assurance review was provided by WSP Environment & Energy in accordance with the ISO 14065 International Standard.

Use-weighted electricity emissions factors KPIs for all Cisco facilities as well as for our major data centers are provided in Table 4.

Reducing Emissions from Operations
GRI EN5: Energy saved due to conservation and efficiency improvements.

GRI EN7: Initiatives to reduce indirect energy consumption and reductions achieved.

GRI EN18: Initiatives to reduce greenhouse gas emissions and reductions achieved.

GRI EN30: Total environmental protection expenditures and investments by type.

Reducing our energy consumption and enabling a diverse energy supply for our facilities makes good business sense as well as benefiting the environment. A number of programs and projects are underway to help us reduce our present energy costs and future exposure to energy price fluctuations. These tactics help us stay competitive and reinforce our commitment to being environmentally responsible.

Table 4: Electricity Emissions Factors						
KPI	FY2007	FY2008	FY2009	FY2010	FY2011	Comments
International Energy Agency (IEA) world average EF, g CO_2e per kWh	508.4	504.5	500.0	500.0	500.0	Calendar year per IEA. Latest 2009 EF from IEA value used for 2009-2011.
Cisco, global average electricity EF (gross) g CO_2e per kWh	437.1	448.8	456.9	460.9	443.2	
Cisco, global average electricity EF (contractual) g CO_2e per kWh	375.4	246.4	182.2	262.1	266.6	
Cisco, major data center average electricity EF (gross) g CO_2e per kWh	397.5	401.3	418.8	435.4	435.0	

See Table 5 for a summary of all of our energy-related KPIs.

Our approach to reduce energy consumption and GHG emissions from our operations is to:

- Deploy an updated building space policy to reduce the amount of our office space through implementation of Cisco Connected Workplace products

- Improve the efficiency of our buildings, focusing on our engineering labs, which are Cisco's largest consumer of electricity and source of GHG emissions

- Purchase electricity from certified low-carbon and renewable sources where available

- Produce electricity from low-carbon, onsite technologies

Through these collective efforts, in FY11 Cisco estimates that it has conserved approximately 16.9 million kWh of energy and avoided GHG emissions by 7400 metric tonne CO_2e through an investment of US$1.9 million in energy conservation projects. Since FY09, we estimate that through our continued investment in energy projects, Cisco has conserved approximately 67 million kWh of energy and avoided 29,600 metric tonne CO_2e. More detail on these major reduction activities are provided in the following sections.

Building Space Policy and Cisco Connected Workplace
As a result of Cisco's new building space policy, we will expand the amount of Cisco Connected Workplace in our real estate portfolio because all new and renovation projects must comply with Cisco Connected Workplace requirements. By the end of FY11, Cisco Connected Workplace represented approximately 17.5 percent of Cisco's total office space. Cisco Connected Workplace is one of the most cost-effective GHG-reduction strategies that we are deploying in our real estate operations.

Labs
Because Scope 2 emissions from electricity consumption make up more than 85 percent of our worldwide total Scope 1 and 2 emissions, reducing electricity consumption is a priority for Cisco. Considering that over 60 percent of our electricity is used to power and cool equipment in our engineering labs, making our labs more energy efficient represents a large opportunity to reduce GHG and energy costs.

We have been evaluating and experimenting with different ways to reduce electricity consumption in our labs, such as retrocommissioning projects, increasing lab ambient temperature, and installing smart power distribution units (PDUs) to turn equipment off when not in use. In FY11, Cisco formed a lab energy management team to update our global lab energy strategy, coordinating three areas concerning lab energy use:

- Improve the energy efficiency of the building infrastructure that supports our labs

- Install and utilize power monitoring and control technologies in our labs

- Develop and execute a lab employee engagement program

Table 5: Energy Totals						
KPI	FY2007	FY2008	FY2009	FY2010	FY2011	Comments
Energy usage, GWh	1,282	1,438	1,533	1,524	1,629	
Indirect energy usage, GWh	1,054	1,203	1,293	1,296	1,378	Indirect energy usage is electricity consumption. Direct energy consumption is the sum of Cisco's natural gas and diesel usage for heating and back-up power generation and regular gasoline and diesel fuel used in Cisco's fleet.
Direct energy usage, GWh	228	235	240	228	250	
Electricity usage, GWh	1,054	1,203	1,293	1,296	1,378	
Natural gas usage, GWh	150	158	147	118	121	

Initial pilots have shown that significant energy can be saved through a combination of these efforts. This program is now being deployed across the lab community. When completed, we expect that this lab energy program to reduce Cisco's electricity costs by approximately US$9 million per year and reduce GHG emissions by over 30,000 metric tonnes CO_2e.

Data Centers

A review of Cisco's latest green data center is provided in a later section on cloud computing.

Building Energy Efficiency

Cisco takes three parallel approaches to making our real estate portfolio as energy efficient as possible:

- Incorporate efficiency into a new or majorly renovated space by following standards in accordance with the U.S. Green Building Council Leadership in Energy and Environmental Design (LEED) standards

- Use Cisco's new "green leasing" standards in selecting leased space and working with landlords to improve the energy efficiency of their buildings

- Identify and implement energy-efficiency projects throughout our global operations

We have made significant progress since our first LEED-certified building was built in August 2009 toward integrating green building standards into our real estate portfolio. By the end of FY11, 23 Cisco facilities had achieved LEED certification, 15 of them Gold or Platinum status. These include our new data center in Allen, Texas, and a renovated data center in Research Triangle Park, North Carolina, both of which achieved LEED Platinum certification in FY11. When we build or renovate significant new space, we will include LEED design standards in the project and pursue LEED or similar certification.

We worked closely with our real estate partner, Jones Lang LaSalle, to create "green leasing" terms and integrate these terms into our standard lease template in FY11. These terms vary depending on the size of the building and the length of the leasing contract, but in general, the larger the building and the longer the lease, the more stringent the green leasing terms. Sample terms in the green leasing template include:

- Temperature controls
- Sub-meters for major utilities
- Building recycling program
- No chlorofluorocarbons (CFCs) used in HVAC system
- Bicycle storage and facilities for cycling commuters to change for work
- Green building certification (e.g., LEED, BREEAM, ENERGY STAR)

Incorporating these terms into leases up front is important for Cisco because about half of Cisco's real estate footprint is leased rather than owned, and in many cases these leases exceed 10 years. In addition, if we do not specify any green leasing requirements at the time of leasing, it can be extremely difficult to incorporate the requirements later.

Not all of the terms in Cisco's green lease template are mandatory to implement in every lease. At a minimum, the template provides a tool for Cisco's real estate team to negotiate with the landlord to promote Cisco's sustainability goals that its leased facilities are healthy, efficient, and sustainable, both now and throughout the term of the lease.

Global Energy Management

Cisco maintains a global energy management team that meets on a biweekly basis to discuss energy efficiency and onsite power generation opportunities in our real

estate portfolio. This team includes Cisco employees as well as our current facility manager partners, CB Richard Ellis (CBRE) and Johnson Controls (JCI), that manage the day-to-day maintenance of our buildings. Cisco incorporated energy-efficiency requirements as part of our facility management contracts. These new contracts were implemented in FY10. For each year of the five-year contract, our partners are required to identify and implement various energy-efficiency projects at Cisco facilities, including lighting-efficiency upgrades, retro-commissioning, and HVAC upgrades. In FY11, approximately US$1.9 million in energy-efficiency projects were identified and implemented.

Onsite Power Generation – Solar

In FY11, Cisco installed and commissioned solar photovoltaic (PV) systems at two of its data centers. The first system was installed in Allen, Texas, on Cisco's new data center, and the second system was installed in Research Triangle Park, North Carolina, on another data center. Both have a capacity of 100 kW. Cisco will use the experience gained through the use of these pilot systems to assess wider implementation.

Cisco solar array at Allen, Texas data center.

Environment

Purchasing Renewable Energy

The percent of electricity purchased from renewable energy sources for various regions is shown in Table 6.

Table 6: FY11 Electricity Usage from Renewable Sources	
Region	Percent of FY11 electricity from renewable sources
Europe	64%
United States	27%
Global	26%

Cisco has increased renewable power purchases since FY06 by buying Renewable Energy Certificates (RECs) and entering into green power contracts with various electricity suppliers in the United States to reduce GHG emissions from Cisco operations. Purchased RECs are certified by Green-e, an independent auditor of renewable energy products, and are generated from hydropower projects in Washington; wind projects in Iowa, Texas, North Dakota, and New Mexico; and biomass projects in Tennessee and Kentucky. In addition, Cisco purchased approximately 89 million kWh through various European green power suppliers. We follow the guidelines from the U.K. Department for Environmental and Rural Affairs (DEFRA) and use the grid average when calculating emissions associated with this power.

Cisco participates in the U.S. EPA's Green Power Partnership. As of July 2011, Cisco was listed ninth among the National Top 50 and seventh among Fortune 500 companies in the EPA's green power ranking. This ranking is updated quarterly by the U.S. EPA.

Table 7: Renewable Energy					
KPI	FY2007	FY2008	FY2009	FY2010	FY2011
Electricity from renewable sources, GWh	110	342	469	351	358
Electricity from renewable sources	10%	28%	36%	27%	26%
GHG emissions reduction from renewable energy, metric tonne CO_2e	65,736	243,450	355,235	257,627	243,319

Purchasing electricity generated from renewable and non-carbon sources has been an important component of Cisco's GHG reduction strategy. Cisco purchases renewable power where it is available in the local power market. Cisco currently purchases power from no- or low-carbon sources in both the United States and Europe and plans to support no- or low-carbon energy sources in other regions of the world as they become available in the marketplace. Cisco's global renewable electricity purchases are summarized in Table 7.

Operations Scope 3
GRI EN17: Other relevant indirect greenhouse gas emissions by weight.

Cisco has prioritized its Scope 3 operations-related efforts on reducing our business air travel, and developing business processes, management practices, information systems, and standardized methodologies for using network technologies to reduce air travel. During this time, Cisco actively participated in the development of the Greenhouse Gas Protocol (GHGP) Scope 3 and GHGP Product accounting standards led by the World Resources Institute (WRI) and World Business Council for Sustainable Development (WBCSD).

Scope 3 emissions cover a broad range of activities, and we have expanded our efforts to address all life cycle emissions, including our supply chain, logistics, use phase, and end of life. Cisco provides a comprehensive response to Scope 3 questions on the CDP Investor survey. Cisco also initiated the GHGP Scope 3/Product ICT Sector Supplement under the auspices of the WRI and WBCSD.

The following sections provide additional detail on our Scope 3 emissions reporting and reduction activities. A later section provides an overview of the Cisco solutions that help our customers reduce their own Scope 1, 2, and 3 GHG emissions. Cisco uses many of these same solutions internally to test the effect on GHG emissions of our products at scale, as well as to understand the "soft" challenges to successful implementation—the necessary updates to business processes, management expectations, and employee behavior.

Scope 3 Business Air Travel
GRI EN29: Significant environmental impacts of transporting products and other goods and materials used for the organization's operations, and transporting members of the workforce.

Cisco believes that the global problem of climate change requires a significant reduction in emissions in absolute terms. For our operations, Cisco has made the following public commitments that impact Scope 3 emissions:

- September 2006: Clinton Global Initiative (CGI) commitment to reduce GHG emissions from all Cisco business air travel worldwide by 10 percent absolute (against a FY2006 baseline).

  This CGI goal has been met and the commitment closed with CGI.

- June 2008: EPA Climate Leaders commitment to reduce all [Scope 1, 2, and] business-air-travel Scope 3 GHG emissions worldwide by 25 percent absolute by CY2012 (CY2007 baseline).

  Cisco is on track to meet this EPA Climate Leaders goal, which has not changed since the original announcement.

This section reviews our progress meeting the EPA Climate Leaders goal and provides additional information concerning our Scope 3 emissions. Cisco's total global GHG emissions from business air travel over the last five fiscal years are shown in Table 8.

Because of EPA requirements, our reduction goal is stated in terms of calendar years. To avoid potential confusion from reporting very similar numbers for fiscal and calendar years, we report only emissions by fiscal year and use fiscal-year emissions internally for operational control and initiative planning. We will report against our CY12 EPA commitment in our FY13 CSR Report. Because of rolling updates to air flight data, prior-year business air travel emissions data vary slightly from values previously reported in either our 2010 CSR Report or our response to the Carbon Disclosure Project 2011 Investor survey.

We have not adopted different emissions factors for different classes of air service, for two reasons. First, Cisco's focus is on using Cisco ICT remote collaboration technologies to not travel. Reporting reduced emissions because a larger fraction of employees flew economy class this year compared to last moves the focus away from travel substitution. Second, we are unsure of the treatment of using different emissions factors for different classes of air travel for a given company. Even though Cisco is a large company, it is likely that scheduled air service has not been impacted by our reduction in air travel, even reductions measured in hundreds of

thousands of flights per year. That is, the same number of planes are still flying. Of course, as more companies adopt these network technologies, the number of plane flights should decrease. Therefore, we have chosen not to complicate what is inherently a conceptual reduction by considering class of service flown in selecting emissions factors. We use DEFRA air travel emissions factors in our calculations.

Our FY11 Scope 3 air travel emissions data and calculations were reviewed by a representative of WSP Environment and Energy. Our Scope 3 emissions reporting process has been audited in the past by both Cisco's internal audit team and our external ISO 14001 auditor, but was not selected for either audit in FY11.

Reducing GHG Emissions from Scope 3 Business Air Travel
To replace physical travel and meet our EPA Climate Leaders reduction goal, Cisco is relying on Cisco remote collaboration technologies, including Cisco TelePresence, products from the acquisition of Tandberg, and Cisco WebEx desktop conferencing.

Worldwide utilization of general-use Cisco TelePresence units has remained steady at just under 50 percent based on a 10-hour day. Many Cisco TelePresence units are

Table 8: Scope 3 Air Travel Greenhouse Gas Emissions						
KPI	FY2007	FY2008	FY2009	FY2010	FY2011	Comments
Total air travel GHG emissions: Scope 3 metric tonne CO_2e	205,796	197,867	118,602	106,783	127,232	Primary air travel data adjusted to represent 100% of Cisco business-air-travel.
Scope 3 air travel emissions from primary data	98.0%	98.5%	97.9%	96.1%	98.2%	
Progress against reduction goal. Goal: reduce all [Scope 1, 2, and] business-air-travel Scope 3 GHG emissions worldwide by 25 percent absolute by CY2012 (CY2007 baseline)	base year	+4%	–42%	–48%	–38%	See prior comment on Scope 1 and 2 portion of reduction goal.

booked at or over 100 percent capacity based on a 10-hour day. The larger, three-screen Cisco TelePresence systems have a higher utilization rate. For example, our CTS-3200 series units, which seat 18 people, have a utilization rate of about 65 percent based on a 10-hour day. Higher utilization of the larger Cisco TelePresence rooms is constrained by room availability or because of substantial time differences between endpoints. Table 9 illustrates our rollout of Cisco TelePresence across the company since September 2006, which is in the first quarter of our FY07.

EBC stands for Executive Briefing Center, one of numerous regional meeting facilities that Cisco uses for presentations to customers. Many executives have Cisco TelePresence units in their offices, typically the CTS-500. We also have rolled out thousands of Tandberg, desktop, hardware-based (e.g., EX60, EX90) and software-based (Movi), high-definition video conferencing units in a move to make high-definition video interaction pervasive at Cisco.

We have installed various Cisco TelePresence models at many locations to accommodate the different requirements of each site. This includes models that

Cisco CTS-3000 TelePresence unit (6 users) with CTS-3200 TelePresence (18 users)

accommodate anywhere from one or two users in a private office setting to larger group meetings of up to 18 people. By having a range of Cisco TelePresence units available, more types of interactions can be virtualized, avoiding more physical travel and reducing travel expenses and GHG emissions. Up to 42 screens in multiple locations can be scheduled for an internal meeting using the Cisco TelePresence Multipoint Switch.

Table 9: Cisco-internal TelePresence Room Cumulative Deployment			
Cumulative, as of End of Fiscal Year	Total Number of Cisco TelePresence Rooms	Total Number of Cities	Total Number of Countries
2007 (general use)	72	50	20
2008 (general use)	179	109	37
2009 (general use)	369	156	44
2010 (general use)	534	214	59
2011 (general use)	601	238	67
2007 (private or EBC)	26	6	3
2008 (private or EBC)	53	12	7
2009 (private or EBC)	179	47	21
2010 (private or EBC)	334	73	26
2011 (private or EBC)	433	98	28

Cisco WebEx and Cisco MeetingPlace products are also part of the suite of solutions our employees use to collaborate virtually with other Cisco employees, and our customers, partners, and other stakeholders. Table 10, our use of Cisco MeetingPlace and Cisco WebEx continues to grow, mirroring a similar growth in Cisco TelePresence use. A "people-hour," as used in the table, is one person attending a remote meeting for one hour, either by teleconference or via the web and a personal computer. Five people attending a two-hour meeting would equal 10 people-hours.

Table 10: Cisco WebEx and MeetingPlace Usage	
Year	Total Web Conferencing (Millions of People-hours)
2007	4.7
2008	7.6
2009	13.3
2010	19.3
2011	23.0

Cisco TelePresence and WebEx now interoperate (WebEx users see TelePresence video), expanding the types of remote collaboration experiences that are enabled by our network technologies.

Using Cisco TelePresence, Tandberg products, and web conferencing, Cisco has piloted and developed the business processes and management practices for virtual company meetings, executive operational reviews, department "all hands" meetings, our annual sales meeting, and our annual senior leadership "offsite" meeting, thereby expanding the types of interactions that

can effectively be completed remotely. About 42 percent of our global ISO 14001 site audits were performed using Cisco remote collaboration solutions. This real-world experience guides product development and supports rollout of the supporting management practices. Use of and familiarity with these and related products continue to expand at Cisco for more functions and business activities. Decisions are made faster, cross-cultural communications are improved, stakeholder and customer feedback from around the world is better disseminated within the company, and products move to market faster.

Avoided GHG Emissions from Scope 3 Business Air Travel
It is difficult to project with certainty what might have happened to Cisco air travel emissions without widespread use of these collaborative technologies. However, in response to stakeholder inquiries, Cisco has compared changes to our actual air travel emissions against changes to revenue and headcount. Revenue and headcount are the two factors believed to be the primary drivers of air travel. In Figure 1, actual emissions on the x-axis are plotted against revenue (light green line, left axis) and headcount (dark green line, right axis).

Figure 1: Avoided CO_2 Emissions from Use of Remote Collaboration Technologies

Environment

The timing of Cisco's acquisition of WebEx in mid-FY06, the start of Cisco TelePresence use and our CGI air travel emissions reduction commitment in early FY07, and our Tandberg acquisition in the second half of FY10 are also shown. From FY04 to FY06, changes to GHG emissions were roughly proportional to changes in revenue and headcount. This observation is consistent with the fact that about two-thirds of Cisco's air travel emissions were from our sales and service organizations, both "high touch" business functions. The more products sold and the more customers Cisco serves, the more the potential for business travel.

The case for collaborative technologies to reduce physical travel and GHG emissions is unambiguous. With a 25 percent increase in revenue and headcount compared to FY07, in FY11 air travel emissions have dropped almost 40 percent on an absolute basis compared to FY07, exceeding our EPA Climate Leaders goal of a 25 percent absolute reduction. In prior years, Cisco worked to first overcome upward pressure on travel from business growth, and then achieved absolute reductions in emissions compared to the base year. As a result of this earlier effort, we experienced an initial reduction in air travel emissions starting in FY08. Because of the economic downturn first seen toward the beginning of FY09, the emissions-reduction emphasis changed to growing customer relationships in spite of restrained travel. As the economy has slowly recovered, our travel has increased from last year, but we are still well below our committed goal. The net effect of our collaborative technologies has been a reduction in travel, carbon emissions, and travel costs with an increase in employee productivity and work-life integration, while maintaining and growing the customer relationships needed for continued revenue growth as the worldwide economy improves.

Replacing business air travel with remote collaboration requires more than just installing more technology. Business processes, management practices, and culture need to be adapted to take full advantage of these new network technologies. As experience with remote collaboration technologies increases, both within Cisco and among our customers and partners, remote interactions will progress from the exception of a few years ago, to standard practice within Cisco, and to the expected behavior worldwide in the future.

Scope 3 Employee Commuting

Teleworking

The employee skill sets developed to reduce business-air-travel and the accompanying business processes and management practices are also used to reduce employee travel between home and work, as well as between buildings at a Cisco site. The wide availability of sophisticated collaboration tools within Cisco permits employees to become well versed in integrating these technologies into daily business activities. Several Cisco technologies permit flexible working environments, including Cisco Virtual Office and Cisco OfficeExtend. Cisco Virtual Office is based on an 800-series, Cisco Integrated Services Router providing secure, wired and wireless voice, data, and video service for small commercial offices or an employee home. OfficeExtend is a simpler, remote wireless access point in the employee home that provides secure communications to a WLAN controller at the company campus.

As shown in Table 11, employees have rapidly adopted Cisco Virtual Office, which includes an Integrated Services Router and IP phone, to effectively work remotely. Although telecommuting or working in a flexible office space does not directly reduce air travel, it does afford opportunities to become more proficient in using collaborative technologies. This proficiency can be applied directly to business activities where remote collaboration does reduce air travel.

Table 11: Cisco Virtual Office Installations in Employee Homes	
As of End of Calendar Year	Total Installations (Cumulative)
2005	1,467
2006	5,006
2007	8,234
2008	9,214
2009	13,457
2010	16,449
2011 (through July)	20,487

Electric Vehicle Charging Stations

In FY11, Cisco installed nine electric vehicle charging stations for use by Cisco employees and guests at several headquarters campus locations in San Jose. We are providing these charging stations to expand the employee base that could commute to work using a plug-in hybrid or an all-electric vehicle.

Electric vehicle charging at Cisco (San Jose, California)

The charging stations are located next to Buildings 10, 21, and J. Charging is currently free for registered employees and Cisco guests.

Scope 3 Life Cycle Emissions

Cisco's general use of life cycle assessment (LCA) techniques was discussed in an earlier section. Carbon footprinting, the LCA specifically focused on the environmental impact from GHG emissions, is the subject of multiple standards activities as well as increasing numbers of channel partner, service provider, and end-use customer inquiries.

ISO 14040:2006 provides the principles and framework for life cycle assessments as part of environmental management.

Cisco has adopted the five product life cycle stages defined by the Greenhouse Gas Protocol in its 2011 Product Life Cycle Accounting and Reporting Standard, which is based on the ISO 14040-series standards:

1. Material acquisition and pre-processing
2. Production
3. Distribution and storage
4. Use
5. End of life

Cisco is committed to shaping our industry in this area through two avenues:

- Industry involvement
- Internal research to develop our capabilities

Our internal LCA studies have focused on our most common products, including IP phones, standalone switches/routers (which covers a substantial portion of our product line), and Cisco TelePresence. For our switching and routing systems, we have determined that the use phase dominates, with between 80 and 90 percent of the carbon life cycle impact. (There may be as much as a 25 percent uncertainty in these values due to variation in assumed product use.) Global emissions factors can vary by a factor of three, which impacts emissions factors and use phase emissions.

The results of a typical analysis for a mid-level, Layer 2/3, metro access switch is shown in Figure 2.

Figure 2: Distribution of GHG Emissions Across Life Cycle for Mid-Level, Layer 2/3, Metro, Access Switch (ME-3400)

~1% EOL
3% Final Transport
7% Materials & Manufacturing
89% Use

In this analysis, a global average electricity emissions factor based on unit shipments was used. Larger core routers and switches are even more heavily weighted to the use phase. For lower power devices, especially consumer-premises equipment (CPE) that might have a shorter life time and might often be turned off or in a lower power, nonoperating mode, the percentage of emissions from the use phase is less.

Cisco actively participates in ICT industry efforts to work toward a common approach to assessing environmental impacts of products, including:

- GHG Protocol Scope 3 and previously referenced product accounting and reporting standards
- Greenhouse Gas Protocol Scope 3/Product ICT Sector Supplement (Cisco is a founding member and chapter editor)
- European Telecommunications Standards Institute (ETSI) LCA assessment of telecommunication equipment and service, DTS/EE-00014
- iNEMI Eco-Impact Evaluator Project to develop a simplified LCA tool for ICT products (Cisco is co-editor)
- Massachusetts Institute of Technology PAIA (Product Attribute to Impact Algorithm) program, developing a simplified, top-down footprinting methodology, that is sharing data and best practices with iNEMI
- Sponsorship of Stanford University civil engineering graduate program project and Massachusetts Institute of Technology internship on sustainability

The collective intent of these efforts is to build and share knowledge, apply life cycle concepts to our product design and operations, build engagement with academia, and support the ICT sector working toward practical and useful methodologies to assess the GHG emissions impact of our products.

Scope 3 Extended Operations Emissions (Supply Chain)
Cisco receives numerous inquiries from stakeholders concerning supply chain emissions. This interest is properly founded on the concern that GHG emissions "disappear" from Cisco's Scope 1 and 2 reporting when a business function, such as manufacturing or component supply, is subcontracted to a business partner. Cisco subcontracts assembly of our final products and also relies on a worldwide network of component suppliers and logistics providers. These business partners in turn rely on additional supply chain partners to support their respective contribution to Cisco's products.

While it might be theoretically possible to collect emissions data from these multiple tiers of partners

for business activity specific to their Cisco business, it would be impractical. The scale of the data collection effort would be very large and entail many companies with which Cisco has no direct business relationship. To address stakeholder concerns about supply chain emissions, Cisco utilizes life cycle assessment techniques and software, discussed in the previous section, to understand the relative contributions of the various phases of product life.

To target supply chain emissions, we are using our business relationships to encourage our business partners to report to CDP. In February 2011, Cisco requested approximately 1500 business partners to report to CDP. It is Cisco's long-term objective for business partners to:

1. Report to CDP annually

2. Make their responses publicly available

3. Provide external review of reported GHG emissions data collection, analysis, and reporting

4. Set a GHG emissions reduction goal

5. Request that their business partners also report to CDP

Our open letter to our suppliers and business partners is available in Appendix 3.

We recognize that not all partners can complete all five steps in their first year of reporting. As such, we are currently tracking, via a subscription to CDP's Reporter Services software, what percentage of Cisco spend is with suppliers that report to CDP.

We currently are tracking CDP reporting KPIs from five categories of suppliers, as shown in Table 12.

We want to continue to push this approach to GHG reporting accountability to other categories of business partners. We will also start measuring against criteria 2-5 listed previously.

Table 12: Supply Chain Partners Reporting to CDP						
KPI	FY2007	FY2008	FY2009	FY2010	FY2011	Comments
Suppliers Reporting to CDP						
· Contract manufacturing, by planned spend	na	63%	82%	100%	100%	Tier 1 partner. Goal: 100% (met)
· AVL component, by planned spend	na	54%	59%	69%	69%*	*Pending CDP Reporter Services 2011 data analysis; Tier 2 partner. Goal: 80%
· Logistics, by supplier count	na	na	na	50%	50%*	*Pending CDP Reporter Services 2011 data analysis; Tier 2 partner. Goal: 90%

Scope 3 Logistics

Logistics, the delivery of new products to our customers, is part of the transportation sector and includes shipment from our manufacturing sites to our end customers. This may include stops at warehouses and channel and distribution partners. The largest impact to Scope 3 emissions in product logistics comes from shipping by air. To minimize our impact from product transport, we are taking the following approach:

- We are engaging with our transport and logistics partners to set expectations for sustainability performance and regularly measure and score our partners on environmental performance. Our transport partners have led the industry in sustainable solutions, which includes fleet upgrades and introduction of biofuels. Our primary logistics partners with activities in North America are U.S. EPA SmartWay-certified.

- We work closely with our transport logistics partners to develop more efficient means of transporting our products. This includes packaging reduction, which therefore leads to package volume reduction and higher shipping efficiency, but also opportunities for shipping consolidation (which leads to fewer trips) and the opportunity to use alternative modes of transport.

To promote sustainability in our supply chain, there needs to be a strong partnership with our suppliers. This includes supporting public reporting and setting reduction goals. In the second half of FY11, we began scoring suppliers on providing sustainability performance data and any important initiatives that have led to reduction in the environmental impact of delivering our products.

Scope 3 Product Use Phase (Energy Efficiency)

GRI EN6: Initiatives to provide energy-efficient or renewable energy-based products and services, and reductions in energy requirements as a result of these initiatives.

GRI EN26: Initiatives to mitigate environmental impacts of products and services, and extent of impact mitigation.

As global energy use has risen, so have GHG emissions. While the ICT industry accounts for only 2 percent of the world's GHG emissions, it too is growing as adoption and use of technology expand globally. Product energy efficiency (or cutting wasted energy usage by our products) is a big issue for Cisco because of the number and type of energy-consuming products that we sell each year. Some of these devices are replacements while others are additive, contributing to the emissions from IT equipment. The largest proportion of energy they consume, and thus their GHG emissions, is during the use phase of their life cycle. Product energy that efficiency has emerged as a key design criterion in our products with our increasing awareness of climate change issues.

Customers and regulators, too, are increasingly requiring products that minimize energy costs and GHG emissions. Every year the number of environmental sustainability-related inquiries from analysts, customers, shareholders, and NGOs continues to increase. Cisco tracks energy use regulations and certification programs of all countries in which we do business. Examples of various energy-efficiency regulations are listed in Table 13.

For these reasons, improving product energy efficiency represents more than just a regulatory requirement for Cisco; it is a significant opportunity for us to help customers save on energy costs, reduce global energy demand, and lower GHG emissions. Product energy efficiency is a key part of all product design and generation improvements at Cisco (see Design for Environment).

Advocacy and Standards Development

Cisco actively engages with governments and standard-setting bodies around the world to monitor and influence the development of emerging product energy-efficiency requirements, particularly around climate change. Cisco believes that 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.

Table 13: Selected Example Energy-Efficiency Regulations
General
• EU EuP Lot-6 on Standby
• EuP Lot 26 on Networked Standby Losses of EuPs
• E-standby and MEPs
• Mexico Energy Consumption Labeling Regulation
External Power Adapters
• EuP Lot 7 External Power Supplies
• California CEC Title-20 Appliance Energy Efficiency standards for EPS (+ various state level energy efficiency standards that mimic CEC standard)
• Australia MEPS for EPS-Minimum Energy Efficiency Standards for external power adapter (EPS) Efficiency level III (Mandatory)
• The Energy Independence and Security Act of 2007
• Korea MEPS
• Energy Star EPS specification Ver.2 for EPS Voluntary endorsement labeling standard for EPS
• Swiss Energy Regulation
Set-top Boxes
• Australia MEPS on Set-top Boxes
• EuP Lot 18 on Complex Set-top Boxes
• Swiss Energy Regulation Set-top Boxes without HD

Cisco engages with these regulatory and standards bodies, directly and as part of industry groups, to influence the development of standards and requirements that are clear and effective. This engagement includes Cisco's engineering, suppliers, facilities, compliance, regulatory affairs, government affairs, and corporate affairs teams. We believe that these regulatory and standards activities when done properly bring clarity and consistency to the global marketplace, creating predictable requirements and a level playing field that reduces risk.

Improving Product Energy Efficiency
Cisco is working to qualify its most efficient products with the U.S. EPA ENERGY STAR program; to date the focus has been on set-top boxes: cable, satellite, IP, or other devices whose primary function is to receive television signals from a specific source and deliver them to a consumer display or recording device. ENERGY STAR qualified set-top boxes are at least 40 percent more efficient than conventional models. According to the EPA, if all set-top boxes in the United States met ENERGY STAR requirements, consumer energy cost savings would grow to about US$1.8 billion each year, reducing greenhouse gas emissions equivalent to those from more than 2 million vehicles. ENERGY STAR qualified set-top box products are listed on the program website.

In 2009, Cisco was coeditor for several of the Alliance for Telecommunications Industry Solutions (ATIS) standards, Energy Efficiency of Telecommunications Equipment: Methodology for Measurement and Reporting standards, specifically:

- Server and server blade (ATIS-0600015.01.2009)

- Transport/network systems (ATIS-0600015.02.2009)

- Router and Ethernet switch products (ATIS-0600015.03.2009)

Table 14: List of Energy-efficiency-related Initiatives & Organizations	
Organization	**Area/Issue of Engagement**
ATIS (North America)	Cisco is an active member of ATIS and engages with other member organizations to develop standards relevant to Telecom industry. In 2010, Cisco took a lead role in the development of the ATIS TEER standard for the measurement of product energy efficiency.
Australia and Korea MEPS	Energy performance requirements and maximum power consumption of Standby modes
ETSI (Europe)	Cisco is currently engaged with ETSI in the development of standards for energy efficiency and energy consumption for implementation of Broadband Code of Conduct.
EU/EuP (Europe)	Code of conduct that sets power consumption targets for external power supplies and reduced energy consumption during "network standby".
IEEE (worldwide)	Cisco was a major contributor to the IEEE 802.3az (Energy Efficient Ethernet) and IEEE 2030 (Smart Grid Interoperability) projects, both of which were published in the last year. Cisco continues to contribute to maintenance, revisions, and extensions for both of these programs.
ITU (worldwide)	Cisco is a major contributor to ITU-T SG5, Lead Study Group on ICTs and climate change. Cisco presented to ITU the ATIS TEER methodology, which was then incorporated into Measure L: Energy efficiency metrics and measurement for telecom equipment, creating the opportunity for a single worldwide metric.
METI (Japan)	Minimum energy efficiency requirement for networking router and switch product groups.
U.S. DOE, EPA Green Grid	Cisco has been actively working with the EPA to define ENERGY STAR standards for networking equipment. Cisco provided the initial framework about three years ago. Since then, Cisco has actively worked with Lawrence Berkeley National Labs, the EPA technical arm, on measurement methodologies and metrics. Cisco routinely provides feedback to the EPA on draft standards and actual power measurements on network products.
Climate Savers Computing Initiative (CSCI)	Cisco has been supporting CSCI on the exploration of issues and development of white papers on server power and network product energy efficiency.

These ATIS TEER standards created a framework for measuring product energy usage that takes into account product functionality and uses real-world loads to determine energy efficiency. This is important because it enables companies like Cisco to compare energy usage design improvements from product generation to generation, and it enables consumers to make more informed purchasing decisions.

Cisco is in the process of applying the router and switch standard to develop energy profiles for products within the enterprise and ISP router and switch product family categories. Representative models within the following product families have been tested:

Table 15: Cisco Product Families Tested Using the ATIS TEER Methodology	
CRS1 and CRS3	Nexus 7000
ASR 9000	15454
GSR	1900
Catalyst 6500	2800
Catalyst 4500	2900
Catalyst 2900	3900
Catalyst 3800	

Figure 3: Energy Efficiency Performance Improvements Between Two Generations of Cisco Integrated Services Routers

The products tested make up approximately 90 percent of Cisco products in ATIS TEER scope. In 2010, we collected baseline performance data for a representative product from each category. The goal is to measure products as new generations are released to gauge improvement between generations.

Figure 3 presents performance improvements per watt consumed from a selected sample set of Cisco products for which first- and second-generation energy performance was measured using the ATIS TEER standard. This is the same data used in our 2010 CSR Report, as next-generation products have not yet been released in other product lines. The results show that across the products measured, there was about a threefold increase in normalized bits/watt performance between the two generations of products.

From 2006-2010 Cisco was a major force behind Energy Efficient Ethernet (IEEE 802.3az) which specified an industry standard protocol to allow networked devices to save energy based on utilization. In 2011, Cisco has proposed and initiated a project to add a similar energy efficiency protocol for ultra high speed network interfaces within the project for enhanced 100Gb/s operation (IEEE P802.3bj).

Cisco is working to reduce energy demand by cutting the power used by the Application-Specific Integrated Circuits (ASICs) used in most Cisco products. ASICs are designed for a particular application in a particular product. Lower cost, higher volume products that Cisco sells use off-the-shelf OEM-designed ASIC chips. For the enterprise and data center switches (Cisco Nexus and Cisco Catalyst series), Cisco designs its own ASIC chips. As shown in Figure 4, ASICs consume a significant percentage of board-level energy consumption.

Figure 4: Example of Board-Level Energy Consumption by Function

Cisco is developing energy savings approaches for these chips that include:

- Feature-based energy management: ASIC chips are often developed to be rich in features and capability so they can be used in a large number of product

models. Cisco is developing new ASIC chips that are configurable to the specific features within the product using such ASIC chips. As an example, such a chip would not draw the power needed to manage 48 ports when it is placed in a 24-port switch.

- Voltage scaling: To compensate for the performance variation inherent in manufactured products, Cisco is scaling, or adjusting, the energy consumed by ASICs to achieve performance standards and minimize energy consumption. Cisco is adjusting the ASIC chip energy requirement (up and down) to compensate for any manufacturing variation in performance.

- Adaptive power management: This enables an ASIC to actively manage the energy it requires based on the load of work it is processing.

These ASIC energy management mechanisms will soon be available to designers to drive down the energy requirements for devices. These refinements have been shown, in lab tests, to reduce energy consumption between 10 and 30 percent.

Cisco has outlined in our Product Requirement Document a mandate that all power supplies be at least 85 percent efficient. As an example, improving the efficiency of the power supply for our Cisco Catalyst 6500 Series Switch from 80 to 90 percent can enable annual savings of more than 3500 kWh. See more details on how we cut power use for the Catalyst 6500 Series on the Cisco website.

Power supply efficiency is only a portion of the problem. Often in the electronics industry, power supplies are

not designed for the specific operating parameters of individual products. Thus the power supply is operating at a low utilization, and the result is products using power supplies that manage and use more energy than the product requires. The opportunity for Cisco is to specify the actual range of power demands for a given product and then design the power supply to manage and provide power within this range. Members of Cisco's product design teams are engaged in efforts, such as the Climate Savers Computing Initiative, to identify the best approaches to resolving these problems.

Scope 3 Product End of Life

The last product life cycle phase defined in the GHG Protocol Product standard is end-of-life management. There are minimal emissions associated with this life cycle phase, mostly connected to the transport of the returned product and recycling. The GHG emissions benefit from recycling is reducing upstream emissions.

As Cisco introduces initiatives to increase the return of used or end-of-life products, we will need to study the relative environmental impact of earlier or later product retirement. Energy efficiency improves with each product generation, so earlier product retirement can decrease overall emissions (because the use phase emissions dominate the product life cycle). However, creating new products introduces other environmental impacts. A similar dynamic exists in the auto industry. Overall, is it better to retire a relatively new 30 mpg car for a 50 mpg car? We will use LCA techniques to inform our strategy in this regard.

Benchmarking GHG Emissions Reduction Goals

Some stakeholders have requested reduction goals beyond 2012. While we focus in the near term on executing for FY12 and meeting our EPA Climate Leaders commitment, we will review possible Cisco roles in meeting the global challenge of climate change. Figure 5 places our 25 percent reduction goal in the context of the 80 percent goal for developed countries highlighted by the Intergovernmental Panel on Climate Change (IPCC).

To estimate Cisco's 1990 emissions levels for the above figure, we assumed the average worldwide rate of emissions growth from 1990 to 2007 and calculated a generic 1990 baseline. Cisco's actual 1990 energy consumption data was not collected, so is not available and would be unrealistic to use as a baseline given how rapidly our business has grown. Our FY1990 revenue was only 0.2 percent of FY09 revenue. More discussion will be needed in FY12, informed by COP17, to better understand how emissions allocations for developed and emerging countries will affect expectations for Cisco's next reduction goal.

Cisco will continue to develop products that leverage network technologies and implement the recommendations of the SMART 2020 report. Roughly 75 percent of energy-related GHG emissions are from buildings and transportation. By advancing Cisco solutions discussed in this section, we are well positioned to reduce not only our own building and transportation emissions, but also the aggregated emissions of our customers.

The Enabling Effect–The 98%

In the previous sections, we provided an overview of our Scope 1, 2, and 3 emissions from our own operations, metrics addressing the emissions of our supply chain as well as other phases of the product life cycle. An additional consideration when accessing the carbon footprint of a product or service over its life cycle is the so-called "enabling effect." The term "enabling" is used where ICT sector products and services can be used to enable reductions in GHG emissions in other industry sectors. For example, high-definition videoconferencing (ICT sector) can be used to simulate face-to-face interaction in order to avoid air travel (transportation sector), or energy monitoring and control of IP-enabled devices (ICT sector) can be used to reduce energy consumption in buildings (real estate, industrial sectors).

Figure 5: Idealized Greenhouse Gas Emissions Reduction Model

According to data from the International Energy Agency (IEA) and U.S. Energy Information Agency (EIA) summarized in Figure 6, about 75 percent of energy-related GHG emissions are from buildings and transportation.

Although the use of ICT products such as computers, data center devices, and network equipment consumes energy, there is substantial opportunity to use ICT products to reduce global energy-related GHG emissions and make the world more energy efficient. In FY09, Cisco sponsored and contributed to the SMART 2020 report, which identified opportunities for the ICT sector to develop and apply network technologies to reducing annual GHG emissions by 15 percent, which is a substantial positive impact considering that the ICT sector was projected to be responsible for only 3 percent of global emissions in 2020. Potential abatements are concentrated in the areas of transportation, buildings,

power/energy, and industry. Innovative application of network technologies promotes change through our solutions, our products, and our operations.

Cisco sponsored and participated in a September 2010 follow-on study, with Boston Consulting Group and WSP Environment & Energy, which began to gather methods to quantify the enabling effect and test methods for applying ISO 14040 and various LCA techniques to this problem. The GHG Protocol Scope 3/Product ICT Sector Supplement mentioned previously is intended to fully develop this methodology for use by practitioners in the field.

Cisco customers are looking for ways to reduce their energy-related costs and their carbon footprint. This creates market opportunities for Cisco. Cisco is researching, developing, piloting, and delivering network technologies that can help reduce GHG emissions by:

- Offering low-carbon ways to avoid business travel and employee commuting: Customers are rethinking their behaviors and finding innovative, network-enabled alternatives, such as web-based collaboration rather than travel, and telework rather than daily commuting.

- Providing connected energy management: Customers can employ the network as the platform to measure, monitor, report, and plan for greater energy efficiencies.

At Cisco, we are developing solutions for both mitigating and adapting to climate change. To help mitigate avoidable emissions, we are looking for ways to increase energy productivity or energy efficiency, slowing growth in energy demand and reducing the rate of increase in global GHG emissions from increasing energy use. Cisco data center virtualization technologies, for example, significantly reduce the number of data center components. Fewer components mean less electricity used to operate both the ICT equipment and the HVAC equipment used for data center cooling. Fewer components also reduce emissions from the manufacture of underutilized equipment.

Cisco recognizes that the application of technology alone will not result in a drop in emissions. Changes in culture, management practices, and business processes are also needed to achieve the full potential of the technology. However, this evolution to collaborative technologies, smart buildings and work spaces, and connected energy management creates additional benefits, including faster decision making, improved cross-cultural communications, broader dissemination of information around the world, and increased ability to efficiently deploy scarce internal resources.

Figure 6: Industry Sector Breakdown of Greenhouse Gases from Energy Use

U.S. Energy Information Agency (EIA 2009)

26% Industrial
34% Transportation
19% Buildings Commercial
21% Buildings Residential

International Energy Agency (IEA14 2004)

26% Manufacturing
26% Passenger Transport
14% Buildings Services
11% Freight
22% Buildings Household

Environment

The following sections highlight Cisco customer solutions and R&D programs that not only address the key sources of energy-related GHG emissions shown in the previous pie chart, but also address the challenges associated with adapting to climate change.

Transportation

There are two use cases that utilize Cisco remote collaboration technologies: avoiding business air travel and avoiding employee commuting.

The figure in Appendix 4 depicts the business-as-usual (BAU) business meeting (requiring travel) and the remote collaboration meeting (utilizing ICT) that provides voice, desktop sharing, and high-definition video among multiple locations.

The increasing interoperability of our remote collaboration products, Cisco TelePresence, Cisco WebEx, and Tandberg, further extend the potential for remote collaboration. For instance, Tandberg and Cisco TelePresence products can both be endpoints in a single meeting. WebEx is integrated into Cisco TelePresence, so that WebEx attendees who may not be near a Cisco TelePresence room can still see the TelePresence video stream and hear the audio.

Cisco TelePresence exchanges, similar to telephone switchboards, are now in place with partners such as AT&T, BT, and Tata, so that Cisco TelePresence calls can be made both within a single company and between companies through the exchanges. As an example of interoperability, Cisco sponsored the September 2010 (FY11) Carbon Disclosure Project Global Forum by connecting Cisco TelePresence screens on the auditorium stage in the Bank of America building in New York City with units at Walmart in Bentonville, and in Cisco offices in Washington DC, San Francisco, Beijing, Sâo Paulo, Nairobi, and London.

The figure in Appendix 5 depicts the second use case for transport substitution: business-as-usual employee commuting (requiring travel) and teleworking, using many of the same technologies used to avoid business travel (plus high-definition video-capable broadband to the home).

The left side of the figure depicts car, bus, and rail commuting to a multi-building campus. The teleworking depiction on the right side of the figure shows a campus with fewer buildings, augmented by employees working from home or from nearby satellite offices used by one or more companies.

Several calculators have been released to estimate the enabling effect for Cisco solutions.

Cisco has developed calculators for Remote Collaboration, Cisco Virtual Office/Telecommuting, Connected Buildings, and Connected Workplace. We've collected these interactive calculators into a single PowerPoint file.

Each calculator has eight or nine tabs at the top—accessible when in full-screen mode–divided between inputs (on left) and results (on right). Results are net emissions. The input tabs and the provided DOMANI validation letters provide an explanation of assumptions.

There is also a web implementation of the TelePresence tab of this spreadsheet.

The current PowerPoint revision is slightly ahead of the web version, which is being updated.

An additional standalone web-based calculator for TelePresence has also been released for mobile phones and web browsers.

Because of the additional, dedicated equipment, Cisco carefully studied the energy/GHG from Cisco TelePresence operation. Most of the energy/GHG cost is from the operation of the end-user equipment (screens, lighting, and local electronics), accompanying local HVAC, and vampire loads. Several orders of magnitude less power is used by network aggregation and backbone functions, as shown in work partly sponsored by Cisco (IEEE, UCSB).

As discussed previously, Cisco has driven industry efforts to push such calculations into the standards arena.

Buildings
Virtualization and Cloud Computing

According to a Forrester Consulting study commissioned in 2009 by VMware, firms initially deployed virtual servers in order to improve hardware utilization. Today these firms cite improved power and cooling efficiency as the motivation to adopt virtualization technology. Cisco data center solutions achieve resource savings of up to 70 percent through virtualization.

At the Cisco Efficiency Assurance Program website, information on power consumption can be found through the "planning" box, the calculators and planning tools being midway down the list of choices. A tutorial on the calculator is available. A product-specific calculator for the ASR 1000 Aggregation Services Router for service providers is also provided.

Cisco opened a new green data center in Allen, Texas, with an architecture deploying Cisco's entire data center technology portfolio spanning computing, switching, and data storage access to support Cisco's internal private cloud. All of these technologies are available to our customers to improve the efficiency of their data center operations.

Our new data center incorporates numerous features to reduce environmental impact:

- Instead of hundreds of batteries typically used in older data centers, the uninterruptible power supply (UPS) room in the 5 MW data center (expandable to 10 MW) uses rotary flywheels, which require little energy to continue in motion, to start the diesel generators in case of power loss.

- The data center is cooled by an air-side economizer design that reduces the need for mechanical chilling by using ambient air when the outside temperature is low. Cisco calculates the facility can use filtered, outside unchilled air 65 percent of the time, saving an expected US$600,000 per year in cooling costs.

- A lagoon captures rainwater to irrigate the indigenous, drought-resistant landscape plants.

- Solar cells on the roof generate 100 kW of power for the office spaces in the building.

- Cisco submitted the data center for Gold certification by Leadership in Energy and Environmental Design (LEED). Developed by the U.S. Green Board Council, LEED provides builders with a framework for measurable green building design, construction, operations, and maintenance solutions.

The new data center is designed to achieve a Power Usage Effectiveness metric of 1.35. This metric was developed by the Green Grid an industry consortium to specifically measure data center energy efficiency. An interview showing various features of the data center was done by Data Center Knowledge in June 2011. The new data center is paired with a second one in Richardson, Texas, to form what we call a Metro Virtual Data Center. Together, the data centers form a virtualized, dynamic IT services cloud, also serving as backup sites for one another. This enables both data centers to run real-time critical applications, such as Cisco WebEx, simultaneously in both places for world-class business resiliency.

This next-generation data center tightly integrates Cisco Unified Fabric, Unified Computing, and Unified Network Services into a holistic data center fabric designed to be simple, scalable, and highly secure, delivering any application across any location, within the data center, across data centers, and to the cloud.

EnergyWise

Cisco EnergyWise is an energy management technology that allows organizations to report and reduce the energy use of all IP-enabled equipment. Cisco EnergyWise is embedded in our switching and routing portfolio and helps improve operational efficiency and reduce energy costs and GHG emissions across the corporate infrastructure, potentially impacting any powered device. EnergyWise is a part of Cisco IOS software, but interfacing hardware is upgraded to enable the hardware to understand EnergyWise commands. The purpose of EnergyWise is to control power-over-Ethernet at the switch or, if the end-user hardware device has also been upgraded, at the end-user device itself.

Two schools in Lisbon (E. S. D. Dinis and E. S. Fonseca Benevides) were outfitted with SMART technologies, including Cisco EnergyWise. EnergyWise was used to control switches, WAPs, IP phones, PCs and laptops, IP cameras, IP-enabled projectors, and electronic whiteboards. At the E. S. D. Dinis school, a month of base operations (without EnergyWise) followed by a month of operations (using EnergyWise) demonstrated an approximate 25 percent energy reduction. This magnitude of reduction is thought to be possible in most buildings (and homes).

Through our developer network, Cisco has partnered with a half-dozen vendors of EnergyWise compliant power distribution units (PDUs). Each plug of the PDU is individually addressable for EnergyWise instruction and for power monitoring. Because almost every energy-using device has a power cord, EnergyWise compliant PDUs are a universal means for power monitoring and device control, regardless of vendor or date of manufacture.

Cisco EnergyWise won the Best of Interop 2009 award in the Green category for leadership in improving corporate energy efficiency and lowering operational costs with its energy-management architecture. For the average size Cisco customer, EnergyWise has the potential to reduce energy usage by 20 percent in the first phase of deployment and realize significant cost savings. A calculator for estimating energy savings is available on the Cisco website.

As part of Cisco's commitment to open standards and energy savings, Cisco has led a new working group within the Internet Engineering Task Force (IETF) to apply the principles used in EnergyWise in an open and interoperable manner that may be used without restriction by any developer in the industry.

Environment

Cisco Connected Workplace

Cisco Connected Workplace is a flexible work environment designed to support employee mobility and improve collaboration by providing a variety of workplace settings and enhanced technology tools. The initiative takes advantage of the fact that workplaces today are vacant up to 60 percent of the time because people are working away from their desks, collaborating formally and informally in person, and using rich remote technologies such as Cisco WebEx and Cisco TelePresence.

Watch the Video! Cisco EnergyWise gives companies a global view of energy management. Energy use can be controlled through the network, delivering economic and environmental savings.

Cisco Connected Workplace case studies show reduced costs associated with real estate, furniture, workplace services, and IT infrastructure. Such environments typically support 30 percent more employees than a traditional layout, thereby substantially reducing footprint demands and associated costs.

Utility/Smart Grid

Energy-related carbon dioxide emissions from the generation of electricity are about 40 percent of total energy-related GHG emissions. That is, industrial processes, buildings, and some transportation are powered directly by electricity and total about 40 percent of all energy-related emissions. Therefore, efficiency improvements in delivering electricity have significant potential to reduce GHG emissions.

In the electricity industry, the pace of change and opportunity for disruption are accelerating. Thirty years of energy policy and industry structural changes are combining with accelerated social and technological evolution. This is creating significant pressure for fundamental changes in the design, operation, structure, and regulation of the electric industry. Strategies to aid these changes require alignment among policy, economics, and technology in what Cisco calls Gridonomics.

Improved network infrastructure will help utility companies optimize power supply and demand by routing power more efficiently and allowing demand-side management and two-way, real-time information exchange with customers. This information is critical for implementing dispersed renewable generation and adding plug-in hybrid and electric vehicles to the utility grid. An Electric Power Research Institute (EPRI) report projects the role of both technologies in the low-carbon electricity mix through 2030, as shown in Figure 7.

Renewables and plug-in electric vehicles (PEVs) are seen to constitute a significant part of the projected generation mix in 2030, but only if enabled by smart grid technologies.

Combined with smart meters and time-of-day pricing, customers will see how power is being used in order to influence behavior to reduce energy consumption or shift demand in time to permit use of lower-carbon sources of electricity. Pilot projects, including a report sponsored by the U.S. Department of Energy Pacific Northwest Laboratory, have shown a 10 to 15 percent reduction in household energy use with smart grid technologies. Cisco is partnering with General Electric, Florida Power & Light, and Silver Spring Networks on Energy Smart Miami, a pilot to a comprehensive smart grid deployment. Cisco is participating in the Pecan Street Project to make the city of Austin, Texas, a test bed for clean energy and smart grid goals. Cisco is also a member of the GridWise Alliance, advocating for the adoption of smart grid technologies.

Figure 7: Contribution of Renewables and PEV to Projected Future Energy Supply

Low-carbon generation enables electrification and CO_2 reductions in other sectors of economy

© EPRI

Integrated Solutions

Smart+Connected Communities

Cities currently account for 75 percent of the world's GHG emissions. Cisco has launched the Smart+Connected Communities initiative globally to take advantage of the thought leadership, ideas, and solutions incubated by the Connected Urban Development program and drive economic, social, and environmental sustainability to our customers around the world. Cisco's Smart+Connected Communities is a global initiative that uses the network as the platform to transform physical communities into connected communities that are run on networked information to enable economic, social, and environmental sustainability. The initiative is leveraging the network to deliver integrated offerings across real estate, transportation, safety and security, utilities, health, education, and government to improve community management, economic growth, citizen quality of life, and sustainable development.

A range of additional material is available on our Internet Business Solutions Group website concerning the role of the network in creating sustainable cities. A Forbes article provides an overview of the potential impact of IT on city development and living.

Planetary Skin

Two powerful trends are reshaping the world. The first trend is resource scarcity, the result of explosive growth in demand for resources (water, energy, food, fiber, minerals) driven by growing populations with rising incomes pushing against increasing constraints

on the supply of these resources given environmental degradation, land use change, increasing variability of weather conditions and resource productivity, and the threat of catastrophic climate change. Further complicating this trend are the complex trade-offs in and between the different resource classes embedded in the land-water-energy-food-climate nexus. The second trend is data abundance, driven by an increase in low-cost sensor networks and network-enabled data collection systems; explosion of social media data; and data mining capabilities. Planetary Skin Institute (PSI) aims to address the challenge posed by the first trend with the opportunity presented by the second.

PSI is a global nonprofit research and development organization, initially incubated by Cisco and NASA, that aims to improve the lives of millions around the world by developing risk and resource management decision services. PSI partners with research and development partners to incubate replicable and scalable innovations that can significantly increase the resilience of communities; increase food, water, and energy security; and protect key ecosystems and biodiversity.

PSI aims to support the efforts of communities, governments, businesses, think tanks, international funding organizations, academic institutions, and other stakeholders by creating open-platform capabilities and tools that meaningfully advance the world's resource and risk management capabilities. PSI is committed to the development of global public goods that address the resource scarcity challenge, unpack the complexity

of the water-food-energy-land nexus, and address the increasing impact of weather extremes. See more details on the Planetary Skin Institute website.

Connected Urban Development

Management of the Connected Urban Development (CUD) program, originally funded in September 2006 as a US$15 million Clinton Global Initiative pilot program, has been transferred to The Climate Group. Please visit the CUD website for information on its activities.

Cities currently account for 75 percent of the world's GHG emissions. Information and communication technology enables economic, social and environmental sustainability.

Environment

Water Use

GRI EN8: Total water withdrawal by source.

GRI EN9: Water sources significantly affected by withdrawal of water.

Because our headquarters are located in California, where water rights and usage are a significant issue, Cisco has always been conscious of water use in our operations. Since FY07, Cisco has been collecting water data for our major campus locations. Using the World Business Council for Sustainable Development water tool, we believe that three of these sites are located in water-scarce areas, and two sites are in water-stressed areas.

Key objectives of Cisco's water management program are to:

- Identify and respond to site-level water conservation opportunities for our operations
- Work with partners such as local governments, water utilities, and owners of our leased buildings to pursue and replicate best practices in our operations and beyond

Cisco's primary water impacts come from office building potable water and sanitation, landscaping, and cooling towers. Over the past year, we have continued measuring our water use so we can better understand the impact of our programs. Given the size and geographic dispersion of our operations, this has been a challenging task, as many of the locations where Cisco shares a building with other tenants do not have water submeters installed. In FY11, we were able to continue collecting and analyzing water data for 66 percent of our total real estate portfolio by area. See Table 16.

We are minimizing our water impacts through innovative approaches to both reductions and reuse. Although our efforts to date have recognized the importance of a locally relevant approach to water management, we are now acting to institutionalize water management systems.

Wherever appropriate, Cisco reduces water consumption and uses reclaimed water for landscaping and similar applications. We have been able to make many changes to our landscaping practices, while also creating attractive and inviting landscapes for our customers, employees, and our surrounding communities. Over the last three years, we have accomplished the following water conservations projects:

- Use of recycled water: Our headquarters in San Jose, California, uses only recycled water for landscape irrigation and fountains, representing approximately 30 percent of our 700,000 cubic meters of water consumption.

- Installed irrigation controls: These controls track variables such as plant type and weather patterns to dispense the least amount of water needed via the drip system. This resulted in an approximate 8 to 10 percent water savings.
- Elimination of decorative fountains: We are taking many of our fountains or water features offline or converting them to landscaped beds with California native and drought-resistant plants.
- Installed water-efficient fixtures: Throughout the San Jose campus, low-flow toilets, flow restrictors on faucets, and waterless urinals have been installed.

We mitigate our impacts in water-scarce areas by incorporating resource constraints into our local office building and data center development plans. Cisco seeks to site our operations in areas where we can most successfully serve our customers while minimizing negative environmental impacts.

Because the production of electrical power is one of the largest uses of fresh water worldwide, the largest opportunity for Cisco to reduce our impact on water resources is by making our operations (and those of our suppliers) and products (our customer operations) more energy efficient.

Table 16: Water Use						
KPI	FY2007	FY2008	FY2009	FY2010	FY2011	Comments
Total water use, m³	1,725,618	1,570,831	1,690,348	1,753,269	1,790,061	Includes irrigation (where used) and potable water
Real estate portfolio covered by water reporting	59%	58%	65%	67%	66%	

Biodiversity and Land Use

GRI EN11: Location and size of land owned, leased, managed in, or adjacent to, protected areas and areas of high biodiversity value outside protected areas.

GRI EN12: Description of significant impacts of activities, products, and services on biodiversity in protected areas and areas of high biodiversity value outside protected areas.

GRI EN13: Habitats protected or restored.

GRI EN14: Strategies, current actions, and future plans for managing impacts on biodiversity.

GRI EN15: Number of IUCN Red List species and national conservation list species with habitats in areas affected by operations, by level of extinction risk.

GRI EN25: Identity, size, protected status, and biodiversity value of water bodies and related habitats significantly affected by the reporting organization's discharges of water and runoff.

At Cisco, land use for facilities and office-based operations represents our primary impact on biodiversity. Cisco mitigates our impact by reducing the demand for physical office space. Cisco employee telework programs and support solutions, such as Cisco Connected Workplace, Cisco Virtual Office, and OfficeExtend are instrumental to our strategy. The flexibility of Cisco Connected Workplace and Cisco collaboration technologies reduces the demands for office space by more efficiently using existing space and enabling employees to work remotely while remaining productive. As mentioned previously, a space using Connected Workplace could accommodate approximately 30 percent more employees compared to a traditional office layout, substantially reducing office space and land use requirements and its associated impacts on the environment. See Table 17.

Cisco actively evaluates the biodiversity and land-use impacts of potential facility sites through environmental impact assessments required for permitting. For example, in Alviso, California, Cisco has a 20.4 acre-parcel of land that is a protected habitat for the burrowing owl and a rare plant species (Congdon's Tarplant). Protection activities that Cisco has implemented on this parcel include the following:

- Developing and implementing a wetland mitigation plan that created 0.77 acres of wetlands in the habitat preserve area and establishing a five-year monitoring program and maintenance program.

- Implementing a rare plant species mitigation plan to protect Congdon's Tarplant. This plan required seed collection and replanting within the habitat preserve area and ongoing maintenance over a five-year period.

- Implementing a burrowing owl mitigation plan that required preconstruction surveys for burrowing owls and the installation of 12 artificial burrows in the habitat preserve area, habitat maintenance measures to encourage owls to relocate to and remain in the preserve area, monitoring during construction activities, and a permanent perimeter fence around the preserve area.

- Locating grazing cattle on this habitat preserve area as a method of weed abatement and soil compaction to help facilitate wetlands establishment.

Table 17: Biodiversity and Land Use						
KPI	FY2007	FY2008	FY2009	FY2010	FY2011	Comments
Real estate portfolio with biodiversity assessment	not reported	not reported	not reported	65%	63%	Includes International Union for Conservation of Nature (IUCN) Red List and national conservation list species with habitats in areas affected by operations. Owned property.

Non-GHG Emissions

GRI EN19: Emissions of ozone-depleting substances by weight

GRI EN20: NOx, SOx, and other significant air emissions by type and weight.

Because most of Cisco's 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 occasional use of cleaning products, nitrous oxides (NOx) and sulfur oxides (SOx) from onsite fuel combustion, and the subsequent development of ozone from the photochemical reaction of NOx.

Table 18 summarizes other airborne emissions: VOCs, NOx, SOx and particulate matter. NOx and SOx emissions originate from combustion of fossil fuels in vehicle engines, boilers, or emergency generators that are occasionally tested onsite. These emissions are calculated based on fuel consumption collected in the past three fiscal years. As Cisco is working on reducing overall GHG emissions, we expect a proportional reduction of NOx and SOx emissions across our operations.

The actual quantities of VOC-based chemicals are minimal, and therefore monitoring is not required.

At locations across Northern California, Cisco complies with California Air Resources Board requests and does not use any 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 Bay Area. In addition, we have instituted Summer Saturday Shift Work, which reduces equipment emissions due to improvements in maintenance staff productivity. Over the course of 32 weeks, we saved 44 hours per week of grounds crew time as a result of increases in efficiency.

In accordance with the 1987 Montreal Protocol on Substances That Deplete the Ozone Layer, we have been working with our supply chain partners to phase out ozone-depleting substances (ODS) in their manufacturing processes.

Table 18: Non-GHG Emissions						
KPI	FY2007	FY2008	FY2009	FY2010	FY2011	Comments
Volatile organic compound (VOC) emissions	negligible	negligible	negligible	negligible	negligible	Because most of Cisco's production is outsourced to supply chain partners, Cisco's global operations primarily consist of standard office activities and research labs, which may require the occasional use of cleaning products containing VOCs. Quantities of VOC-based chemicals are minimal and are not required to be monitored.
NOx, metric tonne	177	167	164	241	339	
SOx, metric tonne	0.67	0.71	0.73	0.84	1.05	
Particulate matter	negligible	negligible	negligible	negligible	negligible	

Effluents (Liquid)

GRI EN10: Percentage and total volume of water recycled and reused.

GRI EN21: Total water discharge by quality and destination.

GRI EN23: Total number and volume of significant spills.

We seek to site our operations in areas where we can successfully service our customers while minimizing our negative environmental impacts. Operations siting is an especially important consideration with our data centers. We currently cool most of our data centers by air movement. However, as equipment becomes more compact and consumes more power per unit area, we need to identify more efficient cooling mechanisms, and one of the options we are considering is water-based cooling.

We also work closely with the owners of our leased spaces to incorporate environmentally sound practices into lease agreements. Our green lease terms incorporate LEED criteria, allowing us to negotiate requirements such as water use measures into new leases as well as those up for renewal. Given the nature of office buildings, these changes often benefit all tenants and frequently provide cost savings to the landlord.

Cisco seeks out partners, such as local governments and utilities, that can provide support and best-practice sharing to help reduce water use (and effluents). We count on these experts and leaders as a resource in our own operational efforts. Cisco participates in the California Environmental Dialogue Longview Committee, a forum for frank and honest discussion about California's long-term strategic environmental, economic, and resource management issues. Table 19 shows Cisco's KPI for liquid effluents.

Waste

Controlled Substances
As a global supplier of electronic equipment to consumers and industry, Cisco is responsible for the management of materials within our products. Global environmental regulations and Cisco's interest in reducing the impact of the materials used within our products and supply chain have helped drive the development of products that use more environmentally friendly materials. Cisco has established substance requirements for products in our controlled substances specification. The purpose of this specification is to communicate Cisco's substance use and reporting requirements to suppliers and manufacturers. The specification outlines the restricted substances, exemptions to these restrictions, substances to be reported and phased out, and substances to be watched for potential inclusion on the restricted substances list. These include controlled substances associated with applicable global regulations such as RoHS and REACH. Brominated flame retardants (BFRs) and polyvinyl chloride (PVC) in electronics are examples of substances that Cisco monitors for reduction and substitution.

Cisco has been working with our research and development teams, manufacturing partners, industry standards technical committees, and academia to validate proposed alternatives for BFRs and PVC in our products. In the environment section of our 2009 and 2010 CSR Reports, Cisco set a 2011 target to confirm/validate alternatives for plastics containing BFR and PVC that are used in our products. Over the last 2 years we have performed material assessments, surveyed suppliers, and identified the areas within our business where we could have the greatest influence and success transitioning to BFR- and PVC-free materials. This issue is most relevant to Cisco as it relates to printed circuit boards, Cisco designed plastic parts, and cables. Findings from these efforts for each area are described in the following sections.

BFRs in printed circuit boards (PCBs): Cisco has performed its own reliability and signal integrity testing of new laminate alternatives via new material qualification processes and has qualified new halogenated flame retardant-free, PCB-laminate materials for use in 35 new products in the high-end switching and routing spaces. Cisco will continue to research new laminate materials as they become available and will continue to apply them to new products where performance requirements can be met.

Cisco supports the International Electronics Manufacturers Initiative (iNEMI) industry efforts focused on BFR reduction. Cisco is an active member of the HFR[1]-Free PCB Materials Project, chartered to study

Table 19: Effluents Spills and Discharge						
KPI	FY2007	FY2008	FY2009	FY2010	FY2011	Comments
Spills and discharges	none	none	none	none	none	In FY2011, there were no reportable spills or discharges to the environment from Cisco facilities or operations worldwide.

1. HFR stands for halogenated flame retardant; bromine is a halogen.

whether alternative materials meet performance requirements concerning delamination, via and plated through-hole reliability, pad cratering, and solder joint reliability. We are also actively participating in the HFR Free Signal Integrity initiatives to similarly evaluate material options. Cisco co-chairs the HFR Free Signal Integrity Project, which focuses on critical electrical parameters of the alternative laminates.

BFRs and PVC in Cisco Designed Plastic Parts: In FY11 Cisco completed a survey of resin suppliers, the point in our supply chain where we have the greatest design and manufacturing control. We gathered information on the presence of BFRs and PVC within Cisco specified custom injection molded parts provided to or manufactured for Cisco. The survey showed that over 60 percent of resin compounds (by count) used in Cisco designed components are currently BFRs and PVC free. Cisco designed components that contain BFRs or PVC are generally small in mass (less than 25 grams) and used in products with relatively low sales volumes.

PVC in Cables: Cisco is driving reductions in cable PVC content through the iNEMI PVC Alternatives Project, which is focused on conducting cradle-to-grave life cycle assessments of PVC and non-PVC jacketing in cables to better understand the environmental trade-offs of

standard, non-halogen, and bio-based cable jacketing. The preliminary findings of this work are under review and are scheduled to be released to iNEMI member organizations in late 2011. Cisco will continue its efforts to identify, test, and implement approved BFR and PVC alternatives in new products.

Cisco is also an active member of the High Density Packaging Users Group (HDPUG) BFR/PVC Free Cables and Wires Project, which is comparing the electrical, mechanical, performance, and manufacturability requirements of alternative materials with existing options; designing and manufacturing test samples; and conducting performance evaluations.

Separate from the above efforts, lead-based solder has been a key component of circuit boards and other electronic parts. Although lead solder is currently exempt from the RoHS Directive for networking infrastructure equipment, product conversion and testing efforts have allowed Cisco to make significant progress toward removing lead assembly solder from Cisco products. For the transition, we have developed a lead-free solder specification for components, interconnects, and printed circuit board reliability. We have also implemented lead-free data management systems, assessed supplier capabilities, tested the reliability of alternative substances,

and developed a product conversion roadmap. In the interests of protecting product quality, we are working with global industry associations to develop highly reliable lead-free solder.

Product Take-Back, Reuse, and Recycling

GRI EN27: Percentage of products sold and their packaging materials that are reclaimed by category.

Our trade-in and take-back programs are designed to bring back to Cisco any item that Cisco or our acquired companies has put on the market. Cisco recycles essentially 100 percent of the electronics sent to our e-scrap recyclers. All commodity fractions go to downstream recyclers to be made into new products. Table 20 contains Cisco's reduce, reuse, and recycle KPIs.

During FY11, Cisco's Reverse Logistics Group refurbished, resold, or reused over 2000 metric tonne of products returned to Cisco; which equates to a 17.3 percent reuse rate.

Information regarding all Cisco e-scrap recycling and our recycling programs is provided in the following description and supplemented by our reverse logistics recycling web portal[1]

Table 20: Product Trade-in and Return						
KPI	FY2007	FY2008	FY2009	FY2010	FY2011	Comments
Product return, metric tonne	*	10,030	10,730	8,580	11,595	*Before FY2008, Cisco reported weight of material sent to Cisco's recyclers. Using process improvements started in FY2008; we are now reporting weight of material received from end users, which is the metric of primary concern to stakeholders.
Material to landfill**	*	0.46%	0.44%	0.33%	0.89%	*See comment directly above. **Landfilled material consists only of nonrecyclable materials such as broken pallets, wet cardboard, and shrink wrap.

1. Cisco Connection Online registration required.

Cisco has nine different reverse logistics recycling programs to support our independent producer responsibility (IPR) efforts. These fall into three categories.

Table 21: Cisco Take-back, Reuse, and Recycling Programs	
Category	**Material Stream**
Customer programs	· Cisco Technical Migration Program (TMP) · Exceptional Pick-Up Program (EPUP) · Take-back and Recycle
Programs for companies producing or repairing Cisco products	· Scrap/Reuse Program · Global Scrap Program
Internal programs for Cisco	· eBin/Lab Scrap · Cisco Data Center Server Recycling · Non-Genuine Materials · E-scrap events

Figure 8: Reverse Logistics Material Sources and Flow of Materials for Reuse and Recycling

A flow diagram of these reverse logistics material streams is shown in Figure 8. Note that the Cisco Technical Migration Program and Exceptional Pick-Up Programs are combined in one box in the upper left of this figure.

Each program or process is formally documented and is part of the contracting process with each of our contracted recyclers.

Cisco has trade-in programs for customers who are purchasing new equipment and have qualifying equipment to upgrade. Eligible customers receive an additional discount for returning working used equipment to Cisco for possible reuse. These programs are the single largest flow of materials back to Cisco's reverse logistics programs. And the trade-in programs provide the newest and best quality used equipment with the highest potential for refurbishment and reuse.

Engaging with our reuse/recycling programs is easy and straightforward. Customers go to the web portal, select the program that applies to them, and submit a pick-up request form. Cisco then contacts the customer and arranges the pick-up and logistics to return the materials to the appropriate location. The trade-in items are routed to a returns receiving center for analysis of each item to evaluate its reuse or refurbishment potential, and take back and recycle material is routed directly to a recycler.

Customer Programs: Our two customer trade-in programs are the Cisco Technical Migration and the Exceptional Pick-Up Program. All trade-in materials are routed to a receiving center where each item is analyzed for possible reuse. If there is demand for the specific product being received, it is refurbished before being sent for reuse to Cisco Capital Remarketing, Cisco Service Supply, or to an internal Cisco lab.

Reuse is always the first priority. Cisco has reused over US$200 million of Cisco equipment, calculated at standard cost, in each of our last three fiscal years. If an item does not qualify to be reused, it goes to one of our authorized recyclers.

The Take-back and Recycle program is focused on Cisco branded items that do not qualify for either of our two trade-in programs. This program also accepts competitor equipment that has been displaced in the customer's network by newly purchased Cisco items. Take-back and

Recycle equipment is typically old with no reuse value, or is damaged. These materials go to the closest Cisco approved recycling site. Currently, there are 27 recycling locations around the world, as shown in the map.

The number and location of Cisco authorized recyclers continue to expand based on the growth in our business and the requirements of local regulations.

Cisco Reverse Logistics Global Supply Base Locations

Mouse over any of the four regional labels below for an enlarged view.

Legend:
- ■ Cisco Contracted Recycler Location
- ■ Current Warehouse/Disassembly Location
- ■ Recycler Subcontracted Partners Locations
- ■ SCFO Receiving and Reuse Operations

Map labels: Sweden, Netherlands, United Kingdom, Belgium, France, Germany, Switzerland, Italy, Russia, California, California, California, Nevada, Arizona, Canada, South Carolina, Florida, Mexico, Costa Rica, Venezuela, Colombia, Peru, Brazil, Chile, India, Thailand, Japan, Hong Kong, Taiwan, Republic of China, Hong Kong, Malaysia, Singapore

Environment

Programs for Companies Producing or Repairing Cisco Products: The Cisco manufacturing Scrap/Reuse programs takes all excess, obsolete, or damaged materials from our contract manufacturers, MPAs, OEMs, ODMs, and proprietary component suppliers. First, each load is reviewed by the Cisco Value Recovery group for possible reuse or resale. If Value Recovery does not want the materials, they go to Cisco approved e-scrap recyclers.

Cisco's contracted repair manufacturers and distribution depots use the Global Scrap program for their excess, obsolete, or damaged materials. Again, the Cisco Value Recovery team reviews all items and retains any for which they have customers, and then sends the remainder to our approved recyclers.

Internal Programs for Cisco: The largest of Cisco's internal programs is the eBin/Lab Scrap program. The eBin program began at our San Jose campus, where 185 labs produce a large amount of e-scrap. eBins are green plastic rolling bins, where materials are collected for recycling. Smaller labs may have only one eBin but large labs may have more than a dozen. Each bin has an owner, and when the bin is full the owner visits our recycling web portal and fills out a pick-up request. The recycler responds to arrange the date and time of pick up and delivers empty eBins.

Cisco Data Center Server Recycling serves data centers in 12 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, with all parts being shredded. Because these servers have sensitive data residing in their memory, they are no longer reused.

The Non-Genuine Materials program handles items that we occasionally receive in service returns which are non-genuine Cisco products. Non-genuine items also come to Cisco through law enforcement actions that seize fake Cisco equipment. When non-genuine equipment is found, we use a special witnessed protocol whereby the collected materials are properly destroyed.

We hold e-scrap events are held each year for our employees. Cisco employees and contractors can bring in their e-scrap from home and have Cisco pay to have the materials recycled properly. Any Cisco office location can hold an event as long as it has the employee volunteers to organize it and do the related collection and processing. In April 2011, we held our 16th e-scrap event, with 78 Cisco offices around the world participating and over 142 metric tonne of used electronics collected. In the years since Cisco started holding e-scrap events, our employees and contractors have helped Cisco recycle over 1617 metric tonne of used electronics.

E-Scrap Recyclers

Cisco currently has four contracted e-scrap recyclers. Each recycler has several company-owned facilities. Each recycler also has several subcontracted recyclers in certain regions. Cisco contracts require the recycler to enforce our strict recycling processes upon subcontractors doing Cisco work. Cisco must approve of each prospective recycling company and each recycling location prior to sending any Cisco equipment for processing.

Each contracted recycler provides us with monthly reports delineating all cases opened and processed, lot by lot. When each lot is processed, the report includes a mass balance showing the weight as received and the weights of each fractional commodity separate from the lot.

Cisco holds quarterly business reviews with each of the contracted recyclers to review the past quarter's results. We also review all action items that were to be worked during the quarter and the focus areas for the next quarter. Cisco also does random spot site audits of the recycling facilities.

E-Scrap Recycling Process

Each load of e-scrap is weighed in on calibrated scales upon arrival. Next, each unit is demanufactured, and a high-level sort into "commodity fractions" separates the steel, aluminum, cardboard, plastic, wire/cable, and printed circuit boards. Certain fractions may then be shredded. Most Cisco printed circuit boards contain a rechargeable battery that is removed prior to shredding. After the shredding, an additional hand sorting is done to pull off any loose pieces of the commodity fractions. All fractions are sent to downstream or second-level recyclers to be made into new products again. Shredded printed circuit boards go to a secondary smelter where as many as 17 metals are harvested from the boards. These harvested metals re-enter the metals markets to make new products. Any batteries or packaging materials sent to recycling facilities are also sent to downstream recyclers.

Product Packaging End of Life

The environmental impact, including transportation and emissions, from a packaging take-back program outweighs the benefits of using the local recycling stream. This is primarily because packaging material logistics are significant, and thus packaging creation is local to the point of shipment. Therefore, Cisco takes the approach to design our packaging to be easily separable and as recyclable as possible so it can most easily be absorbed into local packaging material recycling programs.

Solid Waste from Operations (Trash)

GRI EN22: Total weight of waste by type and disposal method.

GRI EN23: Total number and volume of significant spills.

GRI EN24: Weight of transported, imported, exported, or treated waste deemed hazardous under the terms of the Basel Convention Annex I, II, III, and VIII, and percentage of transported waste shipped internationally.

Cisco's Waste Reduction and Recycling Program is a key component of Cisco ISO 14001 certification and our global environmental policy. We routinely collect and recycle waste streams including batteries, CDs and diskettes, beverage containers, trash, wood and pallets, cardboard, mixed paper, confidential waste, packaging materials, toner cartridges, compost, polyurethane foam, landscape waste, mobile phones, food waste, and construction waste. Electronic waste collection programs are described in the previous section.

Table 22 shows our solid waste KPIs. Note that operational waste recycling performance depends on both Cisco performance and the availability of supporting services by local waste hauling and disposal vendors.

We encourage all Cisco facilities to take steps to reduce their operational waste. Initiatives at our San Jose headquarters, for example, diverted 79 percent of all waste streams in FY11.

Figure 9: Recycling Rates for Solid Waste from Major North American Operations (Trash)

Legend: San Jose, Boxborough, Richardson, RTP

Table 22: Solid Waste from Operations (Trash)						
KPI	FY2007	FY2008	FY2009	FY2010	FY2011	Comments
Total operational waste generated, metric tonne	7156	7409	6246	4845	4471	
Real estate portfolio covered by waste reporting	53%	53%	48%	46%	45%	Includes data for all Cisco campus locations in the U.S. and Canada.
Total operational waste recycled, metric tonne	4633	5023	4250	3443	3228	
Operational waste recycled	65%	68%	68%	71%	71%	

Figure 10: Breakdown of Solid Waste Streams (Trash) at San Jose, California Headquarters Campus

- **1%** Foam
- **<1%** Special Projects
- **1%** Cans & Bottles
- **<1%** Media
- **5%** Surplus Donation
- **5%** Mixed Recycling
- **6%** Mixed Paper
- **31%** Compost
- **7%** Confidential Paper
- **8%** Wood
- **11%** Cardboard
- **24%** Landscape Waste

A breakdown of our waste stream for our San Jose site is provided in Figure 10 as an illustration of our key sources of operational waste, the complexity of proper waste stream segregation, and the need for local recycling services.

In addition to specific initiatives at individual facilities, Cisco has implemented programs at multiple sites that address the following kinds of waste streams:

Electronic waste: Building on our customer-focused product recovery efforts, Cisco has implemented an e-scrap program to collect and recycle electronics resulting from Cisco's operations. We place green bins in our labs for the collection and recycling of materials damaged in research and development. Cisco also hosts e-scrap events every year for our employees to bring in end-of-life electronics from home for proper recycling. Cisco will take back any electronic goods, regardless of whether it is a Cisco branded product.

Food waste: In addition to lessening the impacts of our office environments, we strive to reduce the environmental impacts of our cafeterias. Cisco partners with Bon Appétit Management Company, a leader in sustainable food service, to provide Cisco employees in North America with healthy, sustainable, and socially responsible food options. Our sustainable food purchasing initiatives date back to 1999 with the establishment of Bon Appétit's Farm to Fork program, an initiative to purchase food locally. This program promotes local farming and supports sustainable farming and harvesting techniques.

Composting: Cisco campuses in San Jose, California, and other North American locations host programs for composting and recycling food wastes where municipal facilities are available to process these materials. During FY11, the food waste separation program at Cisco's San Jose campus diverted more than 1416 tonne of food waste that otherwise would have been sent to local landfills. The waste was then turned into compost and made available by the municipality for purchase by gardeners. In addition, Cisco's facilities in San Jose and Research Triangle Park, North Carolina, recycle waste vegetable oil. This vegetable oil is converted into biodiesel fuel used to power traditional diesel vehicles.

Bottled water: In FY08, Cisco's North American offices disposed of 13.7 million plastic water bottles. In FY09, we ran a pilot water filtration program in Boxborough, Massachusetts, and several San Jose campus buildings that reduced our plastic water bottle consumption level to 11.6 million units. After fully implementing the water filtration program as well as a new beverage vending program throughout North America, the total plastic beverage units consumed at Cisco's facilities was substantially reduced. Through FY11, both of these programs are still in place throughout Cisco facilities, and as a result, each year we prevent millions of plastic bottles from entering landfills globally.

Looking Ahead

Cisco's long-term objective for our CSR programs is to build sustainability into each business function. Sustainability is not an add-on. Like quality, sustainability can't be "inspected in" after the fact, so meeting our objective is critical for sustainability to scale throughout the business. Operating responsibility is being driven back to the affected business functions, with our EcoBoard focused on long-term strategy, sharing best practices, and promoting executive-level collaboration.

In this year's Environment section, we have introduced a reporting framework for consistent coverage of all GRI topics. This framework defines the responsibilities and challenges for each business function. We recognize that our performance and depth of reporting will need to continue to improve to meet the rising expectations of our stakeholders. We will report our progress for each of these activities in our 2012 CSR Report.

Objectives for FY12

Scale environmental sustainability reporting by our business partners. We will continue to promote CDP reporting among our supply base, and will develop a strategy to promote standardized GRI reporting by this supply base to address environmental impacts beyond energy and GHG emissions. We believe that the most credible analysts and advocacy groups are those that rely exclusively on publicly available information, and we want to continue this best practice for our operations and extend the model to our "extended operations" (supply chain). We don't believe it is productive or scalable for thousands of the largest companies worldwide to send custom surveys to each of their thousands of business partners and suppliers.

Starting in FY12, we will include partner CDP reporting status in our preferred vendor scorecards. We believe that the act of reporting is a powerful driver of increased attention to energy efficiency and GHG emissions. Cisco expects to work with our manufacturing partners to effect GHG emissions reductions, since reduction of supplier energy use may need changes to manufacturing processes that require Cisco involvement and approval.

Also related to our supply chain, we will launch in FY12 a Supplier Appreciation Award to recognize suppliers with outstanding environmental sustainability performance.

In FY12, we will move our GHG emissions and air travel data and calculations to a new, enterprisewide sustainability information system (SIS). We will also apply the SIS to improve data collection and analysis related to all GRI environment performance indicators.

We will continue to invest in the development of the Scope 3/Product ICT Sector Supplement to the GHG Protocol standards, the supplement scheduled for initial release in 2012. We believe that practitioner-level standards, informed by companies with real-world carbon accounting experience, are essential for advocacy, OEMs, customers, and policymakers to realize the promise of ICT to improve energy efficiency and reduce GHG emissions.

In FY12, Cisco will release a metric for the emissions impact of reduced employee commuting enabled by the use of our collaborative technologies. To date, we have relied on limited employee surveys to estimate this impact, but we want to report the impact based substantially on primary data, as we do for our air travel and operations GHG emissions. Cisco is exercising care in the development of this methodology to respect our policies protecting employee privacy.

We will be rolling out EnergyWise-enabled power distribution units in major engineering labs worldwide. This lab-retrofit effort started more slowly than originally planned as we waited for our development partners, such as Joulex, CyberSwitching, and FieldServer, to introduce EnergyWise compliant products into the marketplace. We believe that there will be substantial leverage in scaling energy monitoring and control, because EnergyWise is now included in Cisco routers and switches as part of their software.

Based on interest from employees, we are planning to expand in FY12 and FY13 the electric vehicle charging stations currently at our San Jose, California headquarters campus to other locations, such as Research Triangle Park, North Carolina (U.S.) and Bedfont Lakes, Feltham (U.K.).

Environment

Cisco Environmental Sustainability

Materials

Energy and GHG Emissions

Water Use

Biodiversity and Land Use

Non-GHG Emissions

Effluents (Liquid)

Waste

> Looking Ahead

Objectives for FY12 (continued)

We have been challenged to improve meaningful measurement of product reuse and end-of-life recycling. Cisco sells products to many of the largest companies in the world. Some of these companies may prefer to manage their own recycling efforts, and may in fact use the same recyclers as Cisco. Inserting a return leg through Cisco to the recycler can decrease customer efficiency and increase overall emissions and costs. We are planning to engage key customers directly on this issue to improve Cisco's accountability on product reuse and the eventual final disposition of our products.

Also engaging our key customers, we want to leverage the GHG Protocol ICT Sector Supplement to aggregate GHG emissions savings and demonstrate the desired standardized reporting of the benefit of ICT to reduce GHG emissions. Just as we aggregate performance of our suppliers, users of Cisco's remote collaboration technologies can similarly aggregate the benefit of ICT.

We will be converting more of our buildings to the Cisco Connected Workplace setup, reducing the need to expand our real estate footprint as business growth continues. Along with (1) rationalizing lab space, (2) consolidation of our data centers and the outfitting of our new data centers with the latest Cisco and Cisco partner equipment, and (3) the planned upgrade of our Cisco Virtual Office equipment to the ECT 891, significant opportunity exists to reduce energy use and GHG emissions.

Our human resources function will engage with managers and employees to identify and document environmental sustainability goals in our online performance management system.

We have started to scope our next GHG emissions reduction goal. Our EPA Climate Leaders goal year is calendar year 2012, so we are planning to announce our next goal in our CDP 2012 submittal at the end of May 2012.

GRI Index

GRI Index

GRI G3.1 Guideline (continued)	Location
Performance: Environmental	
Disclosure on Management approach	Environment/Principles
Environmental Performance indicators	
Aspect: Materials	
EN1 Materials used by weight or volume	Environment/Materials
EN2 Percentage of materials used that are recycled input materials	Environment/Materials/Recycled Content
Aspect: Energy	
EN3 Direct energy consumption by primary energy source	Environment/Energy and GHG Emissions/Operations Scope 1 and 2
EN4 Indirect energy consumption by primary source	Environment/Energy and GHG Emissions/Operations Scope 1 and 2
EN5 Energy saved due to conservation and efficiency improvements	Environment/Energy and GHG Emissions/Operations Scope 1 and 2/Reducing Emissions from Operations
EN6 Initiatives to provide energy-efficient or renewable energy based products and services, and reductions in energy requirements as a result of these initiatives	Environment/Energy and GHG Emissions/Scope 3 Product Use Phase (Energy Efficiency)
EN7 Initiatives to reduce indirect energy consumption and reductions achieved	Environment/Energy and GHG Emissions/Operations Scope 1 and 2/Reducing Emissions from Operations
Aspect: Water	
EN8 Total water withdrawal by source	Environment/Water Use
EN9 Water sources significantly affected by withdrawal of water	Environment/Water Use
EN10 Percentage and total water volume of water recycled and reused	Environment/Effluents (Liquid)
Aspect: Biodiversity	
EN11 Location and size of land owned, leased, managed in, or adjacent to, protected areas and areas of high biodiversity outside protected areas	Environment/Biodiversity and Land Use
EN12 Description of significant impacts of activities, products, and services on biodiversity in protected areas and areas of high biodiversity value outside protected areas	Environment/Biodiversity and Land Use
EN13 Habitats protected or restored	Environment/Biodiversity and Land Use
EN14 Strategies, current actions, and future plans for managing impacts on biodiversity	Environment/Biodiversity and Land Use
EN15 Number of IUCN Red List Species and national conservation list species with habitats in areas affected by operations, by level of extinction risk	Environment/Biodiversity and Land Use

GRI Index

GRI G3.1 Guideline (continued)		Location
Aspect: Emissions, Effluents and Waste		
EN16	Total direct and indirect greenhouse gas emissions by weight	Environment/Energy and GHG Emissions/Operations Scope 1 and 2
EN17	Other relevant indirect greenhouse gas emissions by weight	Environment/Energy and GHG Emissions/Operations Scope 3
EN18	Initiatives to reduce greenhouse gas emissions and reductions achieved	Environment/Energy and GHG Emissions/Operations Scope 1 and 2/Reducing Emissions from Operations
EN19	Emissions of ozone-depleting substances by weight	Environment/Non–GHG Emissions
EN20	NO_x, SO_x, and other significant air emissions by type and weight	Environment/Non–GHG Emissions
EN21	Total water discharged by quality and destination	Environment/Effluents (Liquid)
EN22	Total weight of waste by type and disposal method	Environment/ Waste/Solid Waste from Operations (trash)
EN23	Total number and volume of significant spills	Environment/Effluents (Liquid)
EN24	Weight of transported, imported, exported, or treated waste deemed hazardous under the terms of the Basel Convention Annex I, II, III, and VIII, and percentage of transported waste shipped internationally	Environment/ Waste/Solid Waste from Operations (trash)
EN25	Identity, size, protected status, and biodiversity value of water bodies and related habitats significantly affected by the reporting organization's discharges of water and runoff	Environment/Biodiversity and Land Use
Aspect: Products and Services		
EN26	Initiatives to mitigate environmental impacts of products and services, and extent of impact mitigation	Environment/Energy and GHG Emissions/Scope 3 Product Use Phase (Energy Efficiency)
EN27	Percentage of products sold and their packaging materials that are reclaimed by category	Environment/Waste/Product Take-back, Reuse and Recycle
Aspect: Compliance		
EN28	Monetary value of significant fines and total number of non-monetary sanctions for noncompliance with environmental laws and regulations	Environment/Cisco Environmental Sustainability/ Regulatory Fines
Aspect: Transport		
EN29	Significant environmental impacts of transporting products and other goods and materials used for the organization's operations, and transporting members of the workforce	Environment/Energy and GHG Emissions/Operations Scope 3/Scope 3 Business Air Travel
EN30	Total environmental protection expenditures and investments by type	Environment/Energy and GHG Emissions/Operations Scope 1 and 2/Reducing Emissions from Operations

KPIs/Report Card

CISCO

Environment Key Performance Indicators (KPIs)

A summary of Cisco's environmental key performance indicators (KPIs) is provided in the following table. Assumptions and detailed calculation methodologies for each KPI are discussed in the Environment section.

Environment KPIs						
KPI	FY2007	FY2008	FY2009	FY2010	FY2011	Comments
Environmental Management System						
Number of Cisco sites with ISO 14001 certification	23	23	25	26	28	Calendar year certifications assigned to fiscal year (e.g., CY2011 assigned to FY2011)
Employees at sites covered by ISO 14001 certification	74%	73%	70%	71%	69%	Head count-based metric calculated per 2010. Future reporting will be by real estate footprint (below).
Real estate portfolio with ISO 14001 certification	100%	96%	92%	92%	91%	Real estate footprint viewed as better measure of potential environmental impact. Candidate sites filtered by minimum size and engineering lab function.
Greenhouse Gas Emissions						
Scope 1 and 2 GHG Emissions						
Total gross GHG emissions: Scope 1, metric tonne CO_2e	51,399	51,661	53,453	53,363	60,382	*Gross* is used consistent with Carbon Disclosure Project (CDP) terminology. Gross GHG emissions do not include reductions from renewable energy purchases.
Total gross GHG emissions: Scope 2, metric tonne CO_2e	461,456	539,867	590,755	597,257	610,832	
Total contractual GHG emissions: Scope 2, metric tonne CO_2e	395,720	296,417	235,520	339,630	367,513	*Contractual* is used consistent with CDP terminology. Contractual GHG emissions include reductions from renewable energy purchases.
Scope 1 and 2 emissions (gross) intensity, metric tonne CO_2e per million US$ revenue	14.7	15.0	17.8	16.2	15.5	
Scope 2 emissions from primary data	96.4%	97.1%	96.9%	98.6%	98.0%	
Total contractual GHG emissions: Scope 1 and 2, metric tonne CO_2e	447,120	348,079	288,973	392,993	427,895	
Progress against reduction goal. Goal: reduce all Scope 1, 2, [and business-air-travel Scope 3] GHG emissions worldwide by 25 percent absolute by CY2012 (CY2007 baseline)	na	–22%	–35%	–12%	–4%	Cisco's corporate GHG reduction goal was set as part of U.S. EPA Climate Leaders program, which required a *calendar* year baseline. The Climate Leaders program has since been discontinued. To avoid reporting both calendar and fiscal year data, Cisco is publicly reporting emissions using fiscal year data.

Environment KPIs (continued)

KPI	FY2007	FY2008	FY2009	FY2010	FY2011	Comments
Electricity Emissions Factors (EF)						
International Energy Agency (IEA) world average EF, g CO_2e per kWh	508.4	504.5	500.0	500.0	500.0	Calendar year per IEA. Latest 2009 EF from IEA value used for 2009–2011.
Cisco, global average electricity EF (gross) g CO_2e per kWh	437.1	448.8	456.9	460.9	443.2	
Cisco, global average electricity EF (contractual) g CO_2e per kWh	375.4	246.4	182.2	262.1	266.6	
Cisco, major data center average electricity EF (gross) g CO_2e per kWh	397.5	401.3	418.8	435.4	435.0	
Scope 3 GHG Emissions						
Total air travel GHG emissions: Scope 3 metric tonne CO_2e	205,796	197,867	118,602	106,783	127,232	Primary air travel data adjusted to represent 100% of Cisco business-air-travel.
Scope 3 air travel emissions from primary data	98.0%	98.5%	97.9%	96.1%	98.2%	
Progress against reduction goal. Goal: reduce all [Scope 1, 2, and] business-air-travel Scope 3 GHG emissions worldwide by 25 percent absolute by CY2012 (CY2007 baseline)	base year	+4%	-42%	-48%	-38%	Cisco's corporate GHG reduction goal was set as part of U.S. EPA Climate Leaders program, which required a *calendar*-year baseline. The Climate Leaders has since been discontinued. To avoid reporting both calendar and fiscal year data, Cisco is publicly reporting emissions using fiscal year data.
Suppliers Reporting to CDP						
· Contract manufacturing, by planned spend	na	63%	82%	100%	100%	Tier 1 partner. Goal: 100% (met)
· AVL component, by planned spend	na	54%	59%	69%	69%*	*Pending CDP Reporter Services 2011 data analysis; Tier 2 partner. Goal: 80%
· Logistics, by supplier count	na	na	na	50%	50%*	*Pending CDP Reporter Services 2011 data analysis; Tier 2 partner. Goal: 90%

(continues on next page)

KPIs/Report Card

Environment KPIs (continued)

KPI	FY2007	FY2008	FY2009	FY2010	FY2011	Comments
Energy						
Totals						
Energy usage, GWh	1,282	1,438	1,533	1,524	1,629	
Indirect energy usage, GWh	1,054	1,203	1,293	1,296	1,378	Indirect energy usage is electricity consumption. Direct energy consumption is the sum of Cisco's natural gas and diesel usage for heating and back-up power generation and regular gasoline and diesel fuel used in Cisco's fleet.
Direct energy usage, GWh	228	235	240	228	250	
Electricity usage, GWh	1,054	1,203	1,293	1,296	1,378	
Natural gas usage, GWh	150	158	147	118	121	
Renewables						
Electricity from renewable sources, GWh	110	342	469	351	358	
Electricity from renewable sources	10%	28%	36%	27%	26%	
GHG emissions reductions from renewable energy, metric tonne CO_2e	65,736	243,450	355,235	257,627	243,319	
Water Use						
Total water use, m^3	1,725,618	1,570,831	1,690,348	1,753,269	1,790,061	Includes irrigation (where used) and potable water
Real estate portfolio covered by water reporting	59%	58%	65%	67%	66%	
Biodiversity and Land Use						
Real estate portfolio with biodiversity assessment	not reported	not reported	not reported	65%	63%	Includes International Union for Conservation of Nature (IUCN) Red List and national conservation list species with habitats in areas affected by operations. Owned property.

Environment KPIs (continued)

KPI	FY2007	FY2008	FY2009	FY2010	FY2011	Comments
Non-GHG Emissions						
Volatile organic compound (VOC) emissions	negligible	negligible	negligible	negligible	negligible	Because most of Cisco's production is outsourced to supply chain partners, Cisco's global operations primarily consist of standard office activities and research labs, which may require the occasional use of cleaning products containing VOCs. Quantities of VOC-based chemicals are minimal and are not required to be monitored.
NOx, metric tonne	177	167	164	241	339	
SOx, metric tonne	0.67	0.71	0.73	0.84	1.05	
Particulate matter	negligible	negligible	negligible	negligible	negligible	
Effluents (Liquid)						
Spills and discharges	none	none	none	none	none	In FY2011, there were no reportable spills or discharges to the environment from Cisco facilities or operations worldwide.
Product Trade-in and Return						
Product return, metric tonne	*	10,030	10,730	8,580	11,595	*Before FY2008, Cisco reported weight of material sent to Cisco's recyclers. Using process improvements started in FY2008; we are now reporting weight of material received from end users, which is the metric of primary concern to stakeholders.
Material to landfill**	*	0.46%	0.44%	0.33%	0.89%	*See comment directly above. **Landfilled material consists only of nonrecyclable materials such as broken pallets, wet cardboard, and shrink wrap.
Operational Waste						
Total operational waste generated, metric tonne	7,156	7,409	6,246	4,845	4,471	
Real estate portfolio covered by waste reporting	53%	53%	48%	46%	45%	Includes data for all Cisco campus locations in the U.S. and Canada.
Total operational waste recycled, metric tonne	4,633	5,023	4,250	3,443	3,228	
Operational waste recycled	65%	68%	68%	71%	71%	

Appendix

CISCO

How to Use This Report

We encourage you to use the complete report PDF, which includes all sections and allows full access to videos, search capabilities, and bookmarks. Alternatively, if you visit us online, you can access each section of our report individually. We've also created an Executive Summary, which provides an overview of our achievements in fiscal year 2011 (FY11).

Recommended Software

· Adobe Acrobat*
  Version 7.0 and above
· QuickTime

1. About the Environment Section

We have changed the organization of the Environment section based on stakeholder feedback, to create a structure that can be used year-to-year for our external reporting. We believe this approach will (1) help each Cisco business function focus better on its respective areas of responsibility and (2) help our stakeholders find their desired information more quickly. This change is also consistent with the evolution of environmental sustainability at Cisco. Our goal is to build CSR into every business function. We have concluded that this goal is best served by standardizing processes across the company, so that each business function can take more ownership for their part of the entire CSR business process while still retaining the necessary coordination among the affected groups.

Cisco receives hundreds of environment-related inquiries or surveys each year from a range of stakeholders, including:

· Analysts (financial, industry, socially responsible investment)
· Customers
· Employees
· Environmental advocacy groups
· Governments and national labs
· Industry groups
· Media
· Shareholders and investors
· Universities (researchers and students)

Surveys from these stakeholders can exceed 100 questions. However, many analysts and advocacy groups do not rely on surveys, and will only use publicly available information in their assessments. As a result, for this 2011 CSR environment section, we are presenting more detail in our reporting. Readers interested in a higher-level overview of Cisco's environmental practices should refer to the CSR Report Executive Summary.

As much as was practical, we included all environment-related information requested by our stakeholders in this PDF, or explicit reference has been made in the PDF to information posted on a publicly accessible web page. There are cases where business requirements dictate that information be accessible on a web page. For example, our legal compliance team posts RoHS, WEEE, and REACH information on standalone web pages on Cisco.com. Similarly, our product take-back and recycling program has web pages that our customers use to request product pickup. Rather than repeat information in this PDF, we make reference to these public web pages and explain how the information on each one fits into the environmental topic being discussed.

The Environment section generally follows the organization of the Global Reporting Initiative (GRI). There is a section for each of the major GRI environment topics, generally in the order presented in the GRI Indicator Protocols. These include:

· Materials
· Energy/GHG: We have combined greenhouse gas (GHG) emissions with energy, because we believe these two topics are most efficiently discussed together. Because of its materiality to Cisco, this topic is complex and includes sections on our Scope 1 and 2 emissions, product life-cycle Scope 3 emissions, and a description of Cisco solutions that help our customers improve energy efficiency and reduce their GHG emissions.

· Water use
· Biodiversity and land use: We include land use in this section to highlight its specific relevance to Cisco.
· Non-GHG emissions
· Effluents (Liquid)
· The waste topic has four parts, (1) controlled substances, (2) product take-back, reuse and recycling, often called end-of-life, (3) waste from product packaging, and (4) waste from operations ("trash").

There are a total of 30, GRI, environmental indicators under these main environmental topics. The are no GRI sector supplements applicable to Cisco's business. Any indicator protocol in this PDF file can be found by a simple search (such as "EN2:"or "EN16:"). We have also listed all environmental indicators in a GRI table in a separate PDF file. The body of this report is organized around the major GRI environmental topic areas listed above, structured in the following format:

· We explain the context of the issue in terms of global sustainability, outlining the issue or concern in a global or regional/local context. We want to share a common understanding of the issue across the range of stakeholders with whom we meet and work throughout the year.

· We explain Cisco's role in the issue. We want to put context around the problem, including its relative importance and how it relates to our own operations, our supply chain, our products, and our customers. This context supports statements of materiality and relative environmental impact.

· We explain Cisco's initiatives to address this problem: within the company, at our suppliers, for our customers, and with other partners.

· We explain our progress in addressing the issue.

Appendix

We have found that stakeholders prefer to have all the information for an issue in one place. Therefore, where it makes sense, we discuss the following areas within the context of each environmental topic:

- Regulations and standards

- Stakeholder engagement and feedback

- Risks and opportunities

For example, Cisco is working with the ENERGY STAR program on new guidelines for network equipment. We discuss these engagements in the Energy/GHG section under product energy efficiency. This permits the various groups within Cisco that work on Energy/GHG to assemble a more integrated story that we hope provides a clearer and more complete account of our activities in this area.

Some environmental information is also discussed in the Value Chain chapter, and cross-references are provided where appropriate. Although this results in some duplication, we learned from stakeholder feedback that this dual approach serves the broadest audience. The integrated energy/GHG section will continue to report the total impact of Cisco's operations, including suppliers ("extended" operations), in one place. For this multi-faceted, complex topic, we believe this provides the most transparent approach to reporting.

The balance of the environment section includes discussions of:

- Materiality

- Governance, including policy, our environmental management system (EMS), how we're organized, and how we engage our employees

- General information on our implementation processes

If you have further suggestions on improving the format and organization of this Environment section please write to csr_report@cisco.com.

2. Employee Engagement

Our employees look to Cisco to participate in efforts to protect the world's ecosystems for future generations. Together, we are working to reduce our environmental impacts by engaging in partnerships and delivering solutions that help customers also reduce their environmental impact. These efforts help us meet the expectations of our stakeholders and also make good business sense, often reducing operating costs and business risks.

It is of utmost importance to our environmental vision and strategy that we engage and inspire our employees to become "green ambassadors" for the company. Our strategy relies on embedding a "green" consciousness into the company. We seek to inspire our employees to make their workplace more energy- and resource-efficient and to engender pride in Cisco's environmental actions. We also look to our employees for their creative contributions to meeting Cisco's environmental goals.

Cisco encourages employees to reduce our collective impact on the environment in a variety of ways. We offer annual electronic scrap (e-scrap) recycling worldwide, e-newsletter communications, and commuter incentives including our latest addition to our San Jose, California campus, electric car charging stations.

Virtual Earth Day

At Cisco, environmental sustainability is not just about CSR, but also about operational excellence, product innovation, and creating new business solutions and market opportunities. The company's green strategy engages with and learns from our customers and our employees about what they are doing at work and at home to protect the environment.

On April 21 and 22, 2011, hundreds of employees around the world joined the third annual Virtual Earth Day and attended sessions, via Cisco TV, Cisco WebEx, or Cisco TelePresence with Cisco's EcoBoard and our

sustainability experts as they presented the company's vision, strategy, plans, and priorities. In these sessions, employees had an opportunity to:

- Have a discussion with Cisco's EcoBoard, a cross-functional leadership team, and hear them share the company's vision and strategy to create new market opportunities around green

- Learn how to improve the customer experience through a greener supply chain

- Participate in a discussion on the energy efficiency requirements for our next-generation products.

- Get involved and become part of Cisco's operational efforts to help the company achieve its environmental goals

"Think Green, Act Green"

The quarterly Cisco "Think Green, Act Green" e-newsletter has been in existence since February 2009. Produced by the Global Green Communications team at Cisco, "Think Green, Act Green" serves to keep employees informed about the company's environmental strategy, including the steps that Cisco is taking to reduce its carbon footprint. It consolidates information from internal sources across the company and includes news items, announcements of achievements and awards, links to external press coverage, green tips, and information from employees in the form of featured green pledges, videos, and wiki forum conversations. "Think Green, Act Green" currently reaches 700 subscribers; the Global Green Communications team plans to increase this number in FY12.

Civic Councils

Cisco employees volunteer throughout the year, committing thousands of service hours to philanthropic groups, NGOs, and partner organizations around the world. Some of these efforts are focused specifically on improving the environment and educating others on the importance of biodiversity to all life on our planet. Some of these stories are described in the following sections.

Connected Bees

Cisco employees in the United Kingdom, France and the Netherlands take care of bees and produce honey onsite at Cisco's offices.

As sentinels of the environment, bees play a critical role in preserving our environment, our agriculture, and ultimately the food we eat. This project is a concrete action to preserve biodiversity by reintroducing wild, native bees into the urban environment.

In 2010, after two years getting established, the Paris office hive was harvested for 110 kg (242 lb) of honey, which won a gold medal at a regional honey contest. The 2011 harvest was slightly less, 92 kg (202 lb); primarily due to normal seasonal variation.

Cisco Connected Bees

The French team's hive project is a cross-organization effort involving sales, finance, legal, engineering, marketing, and services and illustrates very well the One Cisco approach. Their high-tech approach to beekeeping has been given the name Cisco Connected Bees. French bee scientist Gerard Arnold has joined the project and has installed sensors so he can retrieve the hive's weight twice a day. In spring of 2011, Cisco IT installed a fully secure network (wired and wireless) allowing the Connected Bees team to install a Cisco video surveillance solution and some IP sensors. The result is that all Cisco employees can follow the evolution of the beehives in urban conditions in real time.

Bee fever is also spreading to other Cisco sites. As part of building consolidation at Green Park, Workplace Resources provided seed funding for a bee sustainability project. The 11-member Green Park team, mentored by member Phil Dean (a team lead whose family keeps bees) as well as the Reading Beekeepers Association and the Paris team, acquired its hives and bees. in the spring of 2011 and harvested its first 20 jars of honey in September. The group plans to establish hives at the Bedfont Lakes site and encourage other businesses in Green Park (several are interested) to start their own colonies—with the vision of a hive on every roof on every building in Green Park.

The Amsterdam site has amassed a team of 40, who will welcome their bees and hives in the spring of 2012. After tasting Green Park honey, engineers from RTP declared they will set up hives there as well.

Harvested honey is distributed to Cisco employees. Through this program we hope to raise further awareness of biodiversity and the need to protect the environment.

Environment Trust for Richmond

Sixty Cisco employees in the UK and Ireland volunteered with the Environment Trust to improve and enhance the natural spaces in and around the London borough of Richmond. The Environment Trust is an established landscape and buildings conservation charity focused on Richmond, whose purpose is to preserve and conserve open green spaces, wildlife, and the best of the built environment, and to raise awareness of the issues that affect their survival.

Cisco volunteering activities in FY11 have ranged from the annual rhododendron bash in Richmond Park to clearing the tributaries of the River Thames of rubbish and old bicycles. The local community has benefited from new open spaces such as Strawberry Hill House, which the teams have supported. Environment Trust is staffed by volunteers, and Cisco's match funding policy supports an outreach education project to educate local children on the delights of these green spaces and how to preserve them.

Community Harvest Project

In the United States, Cisco employees at Boxborough, Massachusetts, have been working with local farms since 2005 to increase sustainable agriculture while meeting community food demands for emergencies and low-income children and the elderly. In FY11 employees supported two farms through donating volunteer hours.

Waltham Fields Community Farm supports local hunger relief and food access efforts by providing fresh produce to emergency food programs in the greater Boston area, operating a special farmer's market for low-income residents of Waltham called the Waltham Fields Outreach Market, and engaging in farm-to-school distributions with the Waltham Public Schools. Its goal is to provide at least $40,000 of fresh, organically-grown vegetables through its food access programming each year.

The Community Harvest Project grows tens of thousands of pounds of tomatoes, broccoli, cabbage, squash, and other healthy foods for the Worcester County Food Bank, supporting over 80,000 children and elderly in the county.

Community Harvest Project

Employee Electronic Recycling

In addition to Cisco's take-back, reuse and recycling program for our business and our customers, Cisco offers an electronics recycling program for employees. The e-scrap program helps employees recycle all electronic products from home that are the end of their useful life. The program prevents these items from being disposed of improperly to landfills. An annual collection event is held in April in conjunction with Earth Day. Employees bring their electronics to participating Cisco sites around the world. This returned material is sent to the same recycling vendors that manage Cisco's internal and customer recycling. In FY11, 78 Cisco sites worldwide participated and collected over 142 metric tonne of e-scrap. In the years since Cisco started e-scrap collection, our employees and contractors have helped Cisco recycle over 1,617 metric tonne of used electronics.

Commuter Incentives

Cisco supports the use of incentives to reduce carbon emissions from employee transportation. Through our incentives for using public transportation, we reduce traffic congestion, reduce commute-related pollutants, and reduce the stresses of drive-alone commuting.

Cisco employees who commute to work by public transit or formal vanpool can allocate a portion of their salary on a pre-tax basis through Cisco's Pre-Tax Commuter Incentives Program. Commuter Checks are transit vouchers that can be used at participating transit authorities toward the purchase of commuter passes. Cisco regular employees in five different San Francisco Bay area work locations are eligible to participate in this program.

An EcoPass is an additional incentive available to these employees. The EcoPass is a transit pass sticker to be placed on the employee's Cisco badge to receive unlimited free rides on all San Jose, California Valley Transit Authority bus and light rail lines. Cisco vendors, contractors, and regular employees with a work address in many San Francisco Bay area cities are eligible.

Cisco has begun installing electric vehicle charging stations for our employees, discussed in the section on Scope 3/employee commuting. In 2011, Cisco San Jose installed its first electric vehicle charging stations to support employees who have "gone green" when purchasing a new car.

Employee e-scrap waiting to be palletized and shipped to Cisco recyclers

3. Global Supplier Management Letter

CISCO
Prentis Wilson
VP, Customer Value Chain Management

Global Supplier Management

Valued Business Partners:

Earlier this month, the Carbon Disclosure Project (CDP) formally released the 2011 edition of their investor survey. Responses are due May 31, 2011. Cisco is requesting that each of our Suppliers respond to the CDP survey as outlined below, making your response publicly available via an option in CDP's Online Response System (ORS).

Cisco is committed to reducing greenhouse gas (GHG) emissions. In 2008, Cisco made a public commitment to reduce Cisco's worldwide Scope 1, 2, and Scope 3 business-air-travel GHG emissions by 25 percent absolute by calendar year 2012 (against a calendar year 2007 baseline). Cisco's stakeholders and customers are concerned about GHG emissions not only from Cisco's products and operations, but also from the operations of our business partners. Therefore, for the second year, we again invite our business partners to report to CDP.

It is Cisco's long-term objective for all business partners to:
1. Report to CDP annually.
2. Make their responses publicly available (credit will be given only for submittals publicly available).
3. Provide for some level of external review of your GHG emissions data collection, analysis and reporting.
4. Set a GHG emissions reduction goal (absolute preferred).
5. Request that your business partners also report to CDP in accordance with this email.

If you have not already received an invitation from CDP to respond to CDP's survey as part of their investor, public procurement, or supply chain programs, please contact CDP at respond@cdproject.net and request an account on their system at *no cost* to you. Although the questionnaire is distributed as a PDF file, your CDP submittal is made online through CDP's Online Response System (ORS).

Please report your GHG emissions to the Carbon Disclosure Project (www.cdproject.net). Cisco will obtain your reporting status and emissions information via an analytics package offered by CDP. You should not send your emissions information to Cisco. Several useful references are provided at the end of this email.

If you have any questions about Cisco's or your company's carbon reporting, please contact Cisco's Environmental Sustainability team at cisco-cdp-questions@external.cisco.com.

Regards,

Prentis Wilson
Vice President, Global Supplier Management
Customer Value Chain Management

_____

REFERENCES
1. CDP 2011 questionnaire. Companies are encouraged to answer all questions. For first-time reporters, the minimum question set is highlighted in the PDF, the highlighting focusing on emissions numbers and numeric reduction goals.
2. CDP reports summarizing 2010 responses:
    Global 500
    S&P500
    Other reports are available online
3. Guidance to respond to the CDP survey
4. Guide to CDP's Online Response System (ORS)

4. Comparison of BAU and ICT Solution for Remote Collaboration (Avoiding Business Travel)

5. Comparison of BAU and ICT Solution for Teleworking (Avoiding Employee Commuting)