Corporate Social Responsibility

2018 Report

Contents

About this Report

Welcome to our inaugural Corporate Social Responsibility (CSR) report in which we share a summary of our current position and insights into key programs related to our environmental stewardship, social progress, and economic success. As we continue developing our CSR program, we will expand our reporting format to evolve into a more detailed, data-rich report that is further aligned with the internationally-recognized Global Reporting Initiative (GRI) Sustainability Reporting Guidelines.

This report spans the fiscal years of 2017 and 2018 and encompasses the operations of our company globally. We anticipate that our CSR report will be updated on a biennial basis.

A Message from Gary Smith

We have made tremendous progress during the past several years in establishing a strong corporate social responsibility program, and I am excited to introduce Ciena's first Corporate Social Responsibility (CSR) report that details our dedication to being a supplier, employer and neighbor of choice.

At Ciena, we all aim to do the right thing – a commitment by leadership and employees around the globe that forms our culture's ethos and underpins our core values. This behavior is embedded in all aspects of our business, including the processes and procedures we follow in our operations, the ethical policies we practice and enforce in our workplace, and the support we provide to the communities where we operate. Embracing a well-structured CSR program has come naturally to the Ciena team to benefit our business and to position us as an ethically responsible partner to our customers around the world.

We've pledged to uphold the CSR principles laid out in the Responsible Business Alliance (RBA, formerly Electronic Industry Citizenship Coalition (EICC)) Code of Conduct (CoC) through active stakeholder engagement. Specifically, we aim to conduct business in an ethical and socially responsible manner within the law. We take responsibility for the impacts of our decisions and activities on the environment, our employees, customers, suppliers, stakeholders, and in our communities.

During the past two years, we've enjoyed several notable achievements that highlight key tenets of our CSR program.

- Received the 'Great Place to Work' recognition;
- Named a FORTUNE World's Most Admired company;
- Mobilized inclusion and diversity initiatives including Women@Ciena and Black and African Heritage employee groups;
- Achieved a gold rating by independent CSR assessment body Ecovadis;
- Completed our global Environment, Health and Safety management system certification;
- Outperformed the supply chain sector in our CDP Climate Score; and,
- Revamped our Ciena Cares to a truly world-class community giving program

This report provides greater insight into the priorities and key activities that comprise our approach to CSR. I look forward to continuing to advance our program to unlock even greater value for our business and for our employees, customers, and other stakeholders.

Sincerely,

Gary B. Smith
President & Chief Executive Officer

See what attributes contributed to Ciena being named to FORTUNE World's Most Admired companies list

Read why Ciena was recognized as a "Great Place to Work"

Ciena Overview

Ciena is a networking systems, services and software company. We provide solutions that help our clients create the Adaptive Network™ in response to the constantly changing demands of their end-users. By delivering best-in-class networking technology through high-touch consultative relationships, we build the world's most agile networks with automation, openness and scale. Ciena has 26 years of experience in building and transforming networks, including 80% of the world's largest service providers, as well as Forbes 2000 enterprises, Internet content providers, government, and other private network operators.

Employees:
6,000+

Clients:
1,500+ worldwide

NYSE Listing:
CIEN

Headquarters:
Maryland

In a world where user demands are skyrocketing, the volume of devices and data is exploding, and legacy systems are incapable of keeping up, networks and business require transformational change. To meet this exploding volume and demand while still maintaining control, networks and businesses must be reimagined—transformed from a necessary capability into a strategic asset. Doing so requires a partner with expertise, a thirst for innovation and a dedication to propel business forward.

From our founding, Ciena has always been a pioneer in the networking industry. Coupled with innovation, our growth and success have been built on our ability to partner with clients—delivering the next-generation solutions they require to evolve their networks. We do this by adapting and connecting hardware, ser-vices, and software in an open environment to ensure networks are securely `fit for flexibility' today and into the future.

With approximately 6,000 specialists in 30 countries, we support more than 1,500 of the world's most agile networks. Our inspiration to innovate comes di-rectly from the unique dynamics of each client's business. Ciena engineers have received more than 2,000 patents, representing a diverse range of inventions that underpin our clients' continued success.

Ciena was the 1st

- First in coherent optics with 40G, 100G, and 400G solutions

- First OTN contol plane on an optical switch

- First Carrier Ethernet aggregation switch supporting a virtualized switching architecture

- First intelligent optical core switch

- First packet-optical convergence platform

- First 100G transport SDN testbed adopting OpenFlow and an open source controller

- First multi-layer, multi-vendor transport SDN controller based on OpenDaylight

- First multi-vendor SDN/NFV platform

- First Carrier SDN platform

- First multi-domain orchestrator to integrate data center, NFV, and the WAN

Ciena holds 2,000+ patents worldwide

Financial Summary

On December 13, 2018, Ciena Corporation (NYSE: CIEN) announced financial results for its fiscal year, ending October 31, 2018.

"We achieved outstanding financial results in fiscal 2018 due to continued execution of our proven strategy, The combination of our innovation strength, successful interception of market trends and sustained ability to take share and outperform the market, along with a thriving industry environment, gives us tremendous confidence in both the near and longer term outlook for our business."

- Gary B. Smith, President & Chief Executive Officer

For fiscal year 2018, Ciena reported revenue of $3.09 billion, as compared to $2.80 billion for fiscal year 2017.

Introduction

Our Corporate Social Responsibility practices and policies are designed to help Ciena operate as a supplier of choice, an employer of choice, and a neighbor of choice around the globe.
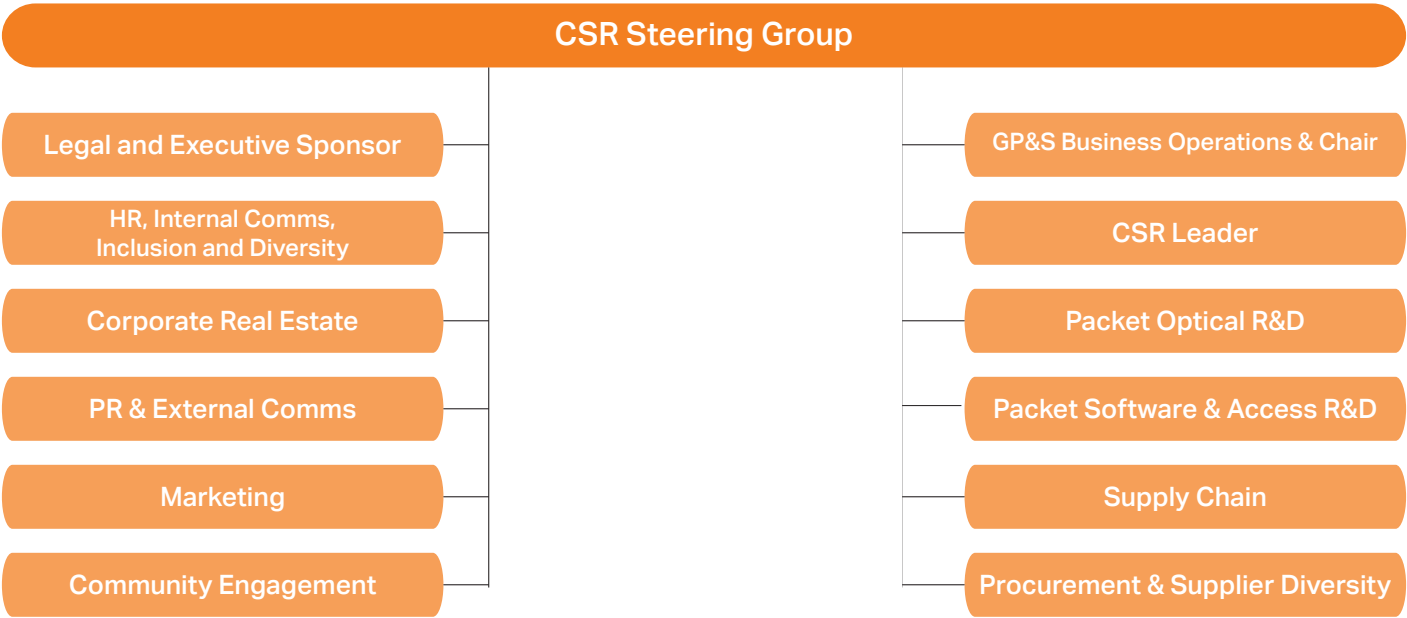
Mark Stevens, Corporate Social
Responsibility Director

A member of the Responsible Business Alliance (RBA, formerly known as the Electronics Industry Citizenship Coalition) since 2012, Ciena has adopted the principles set out in the RBA Code of Conduct, which establishes standards to ensure working conditions in the electronics industry supply chain are safe, that workers are treated with dignity and respect, and that business operations are environmentally responsible and conducted ethically. Fundamental to these principles is the understanding that a business must operate in full compliance with the laws of the countries in which it operates. Importantly, we require our suppliers to adhere to these same standards and principles.

Ciena's Organizational Approach to CSR

To ensure that we maximize Ciena's CSR efforts, we established a CSR Steering Group (see *Figure 1* below) which drives our areas of focus, prioritization, and implementation.

Figure 1. CSR Steering Group Structure

CSR Steering Group

Legal and Executive Sponsor	GP&S Business Operations & Chair
HR, Internal Comms, Inclusion and Diversity	CSR Leader
Corporate Real Estate	Packet Optical R&D
PR & External Comms	Packet Software & Access R&D
Marketing	Supply Chain
Community Engagement	Procurement & Supplier Diversity

Ciena's CSR Steering Group is comprised of individuals representing the above areas, including participation from the Executive Sponsor, David Rothenstein, Senior Vice President, General Counsel and Secretary. The Group's charter includes the following responsibilities:

- Review and approve CSR policy, strategy, and plans;
- Ensure the Executive Team and Board are well-informed; and,
- Share the importance of CSR throughout Ciena

In early 2016, Ciena received a Gold rating from the internationally recognized and independent CSR assessment company, Ecovadis. To benchmark the maturity of our CSR efforts, the Steering Group uses the Ecovadis maturity assessment process and scoring. This has allowed us to evolve our program and identify specific actions over time that would enhance our program, with continued measurable results. Our subsequent CSR developments during 2016 were further recognized during a re-assessment in March 2017, with an uplift into the "Advanced" categorization.

Ciena has developed its program over time and each step of the maturity journey has been reflected in an increased Ecovadis rating (see *Table 1* below)

Table 1. CSR Maturity Benchmark

CSR Maturity Benchmark: Ciena Progress		
Submission Year	Ciena Rating (100pt Scale)	Key Steps Take to Improve
2010	30	• First Submission
2011	40	• EHS certification in Belfast • Initial supplier assessment--Ciena questionnaire • CSR Steering Group established
2013	50	• Ciena joined the RBA (formerly EICC) • CDP submission (private) • EHS certification for London
2014	52	• Appointment of CSR lead role • Supplier Diversity program • Global Accident / Incident Management Process
2015	58	• Regional EHS Committees established • Transition to RBA-SAQ for supplier assessments • Initial CSR materiality assessment
2016	63	• EHS certification of APAC, NA, India regions • Sustainability reviews initiated with Contract Manufacturers • Women@Ciena / Day of Service introduced
2017	71	• Public CDP reporting • Global EHS certification completion • Product LCA completed • Revamped Ciena Cares program

Materiality

In 2014, the Executive Leadership Team confirmed the following high-level areas of priority:
- Product Sustainability;
- Sustainable Supply Chain;
- Environment and Safety; and,
- Community Engagement

In 2017, Ciena engaged a third-party sustainability consultancy to conduct a structured Materiality Assessment, gathering feedback from internal and external stakeholder groups to help define the Corporate Social Responsibility elements that are most material to Ciena's business and to deepen Ciena management's understanding of stakeholder concerns. This Assessment helped determine which elements could be prioritized for implementation of sustainability initiatives and enhance the development of future CSR reporting.

Topic Identification

To begin the Materiality Assessment, the Ciena Sustainability Team identified CSR elements for evaluation, referencing the following materials:

- The Responsible Business Alliance guidelines (formerly the Electronic Industry Citizenship Coalition);
- The Sustainability Accounting Standards Board guidelines; and,
- The Global Reporting Initiative Standards.

An element was considered if it represented a risk or opportunity to Ciena from an internal or external perspective and was identified as relevant to Ciena's business and stakeholders.

The relative importance of the CSR elements was reviewed by the Ciena Sustainability Team to ensure they properly reflected the business and focus areas of Ciena's sustainability program. The elements were refined and grouped into three categories, Environment, People, and Business, to allow for a more manageable list of elements for discussion, keeping in mind the importance of detail to describe key issues. Each element was explored in detail to understand its relevance to business and stakeholders through a web-survey and interview process.

Prioritization

Ciena determined that key internal stakeholders (Ciena employees) would participate in a materiality web-survey and external stakeholders (customers, suppliers, investors) and the Ciena executive team would partake in interviews. Additionally, non-governmental organizations' priorities were reviewed. These stakeholder perspectives – whether in agreement or disparate – were key to understanding and assessing the importance of each CSR element.

Material Issue Validation

The structured materiality process enables Ciena to identify elements for prioritization by looking at the level of stakeholder concern, the relevance to Ciena, and Ciena's ability to influence that issue. Ciena Sustainability Team Leads determined additional input was needed to accurately depict Ciena's business and a weighting was applied to stakeholder groups.

After rating the significance of each element on a four-point scale, elements were classified into 13 categories under either the Environmental, People, or Business topic areas. Aggregated ratings across the stakeholder groups were used to determine the relative importance of each element. The results of the Assessment are reflected on the Materiality Matrix (*Graph 1*) presented below.

The overall highest averages indicate the elements of most importance to Ciena's business and external stakeholders. These three categories comprise, from highest importance:
1. Governance
2. Employee diversity and development
3. Supply Chain

The weighted Materiality Matrix shows the relative and overall importance of each category based on the following inputs:

- *X-axis*: Executive interviews and employee materiality web-survey
- *Y-axis*: Supplier, investor, customer interviews and NGO themes

The bubble size indicates theme strength. The largest bubbles are: *governance*; *supply chain*; *employee development and diversity*; and *labor/ social rights for workers*.

Graph 1. Materiality Matrix - Weighted

Ciena's Core Values

At Ciena, staying true to our strong core values is integral to the successes we achieve as a company. Our core values are reflected in our day-to-day business, from the solutions we provide our customers, to the collaborative and innovative culture of our team.

Figure 2. Ciena's Core Values

Customer First   **Integrity**   **Velocity**   **Innovation**   **Outstanding People**

Ciena's culture values and rewards exceptional people. Our people are motivated, well-trained, disciplined, empowered, collaborative, and accountable. We reward employees who demonstrate our cultural values with SPOT awards from supervisors and peer recognition programs such as our Applause ecard program.

Ciena's values (illustrated in *Figure 2* above) are embedded in our company CSR model, enabling us to offer a socially-responsible product to our customers, produced through operating procedures by people who value doing good for the communities in which we operate. At Ciena, our core values are the foundation of everything we are and everything we do. We reflect those values in the way we interact with our customers and with each other, and in the way we approach our business. Simply put, Ciena's success is built upon our values and how we live them each and every day.

Customer-first
Treat them like you expect to be treated

Integrity
Always do the right thing; keep your promises

Velocity
Be quick and efficient

Innovation
Think outside the box; be original

Outstanding People
We support you to be your best; support others

We deliver these values through three ways:
1. A distinctive culture & way of working
2. A customer-intimate engagement approach
3. A unique technology philosophy

Corporate Governance and Ethics

Integrity is one of Ciena's five core values and provides a strong moral and ethical foundation for all that we do. Honesty, adherence to high ethical standards, and good business judgment are essential to Ciena's success in the market. These traits are also the key to fostering strong, trusted relationships with our customers and business partners, and to promoting a workplace among colleagues of which we can all be proud.

Ciena's management team and Board of Directors believe that good corporate governance and high ethical standards are essential to Ciena's long-term success. Accordingly, the Board has adopted numerous policies and procedures that are intended to assist it and the management team to carry out their responsibilities effectively. These policies are reviewed and amended periodically and can be found at http://www.ciena.com/about/company/corporate-responsibility/

Code of Business Conduct and Ethics

At Ciena, we believe that honesty, a strong commitment to ethical behavior, and respectable judgment are a part of the foundation to doing the right thing in all our business dealings. Along with sound business judgment, our Code of Business Conduct and Ethics ("Code") serves as a guide for conducting business ethically and making good decisions. By following the Code, we uphold our legal and ethical commitments, promote Ciena's values, and ensure the continued success of our business.

David M. Rothenstein,
Senior Vice President, General
Counsel and Secretary

"The code of Business Conduct and Ethics is an extension of our values, setting forth the standards of conduct that Ciena expects of all of its employees, officers, and members of the Board of Directors. Each of us is expected to read, be familiar with, and follow the Code. We also expect that our suppliers, service providers, and other business partners will adhere to these same high standards. While a lot of the information in the Code may seem like common sense, it serves as an important reminder of those behaviors expected of each of us in order to "do the right thing" in our business activities at Ciena."

- Gary B. Smith, President & Chief Executive Officer

Our Code of Business Conduct and Ethics training is essential to provide our staff with a foundational understanding of expectations, grounded in the principles of fairness, and to provide clarity on what constitutes unacceptable conduct and improper practices. This training is mandatory for all Ciena employees and includes a refresher course on an annual basis.

In addition to adhering to our Code, we must follow the laws and regulations that apply to the work we do and the countries in which we conduct business. Each of us has a responsibility to understand and abide by these laws.

The EthicsPoint service can be reached by calling EthicsPoint's toll-free number: 1-866-384-4277 or via their website

Reporting a Violation of Ciena's Code of Business Conduct and Ethics

Ciena believes that honesty, adherence to high ethical standards, and compliance with the law on the part of all of its employees, officers, and directors are essential to Ciena's success. Anyone who becomes aware of a violation of Ciena's Code of Business Conduct and Business Ethics may report it using EthicsPoint, an independent third-party service. Additionally, violations can be reported to supervisors, managers, HR, the General Counsel or another attorney in the Legal Department, or a member of the Internal Audit Department.

Reports filed through EthicsPoint are directed to the General Counsel and other appropriate persons within Ciena management. Reports of financial or accounting violations are forwarded to the General Counsel and the Chair of the Audit Committee of Ciena's Board of Directors.

Corporate Compliance Committee

As we grow, so do the risks to our business. With 5,500+ employees globally, it is critically important that we regularly and systematically address key areas of compliance – an element of our core value of integrity. We have a multi-disciplinary Corporate Compliance Committee to oversee and administer our global compliance program. Chaired by our General Counsel, the Committee is responsible for:

- Ensuring that we communicate the importance of legal and ethical business practices throughout the company;
- Developing and implementing corporate compliance-related training
- Reviewing corporate policies; and,
- Assessing our practices relating to reporting code and ethics violations.

The Committee delivers an annual report of its work, findings, and recommendations to the Board of Directors.

Ciena operates in full compliance with the workplace standards required by the International Labor Organization (ILO), as well as all country specific standards where we have operations. We have in place and enforce strict workplace policies on ethical behavior and workplace safety, and provide regular training to support adherence to the policies.

Environmental Perspectives

At Ciena, we are conscientious about the impact of our operations—including our facilities, workforce, and products—upon the environment.

We report on climate-related risks and opportunities as part of our annual CDP Climate submittal.

Climate

Ciena continues to monitor developments in relation to climate change and the potential impact on our operations. This is part of a holistic approach to business continuity and business strategic planning. We operate a third-party certified Business Continuity Management System which identifies business continuity risks (including climate change risks). The Business Continuity Program includes reviews, exercises and recovery plans regarding emergency processes at the asset level. This program also reviews business impact and enables implementation of mitigation plans to minimize impact to business operations, e.g. disruption from adverse weather conditions. This strategy is reviewed by senior management along with our business strategic planning which spans a longer time horizon. Types of programs may include planning for natural hazards and their effect on operational sites including offices, labs, test and production assets, key personnel, and supply chain assets.

Prioritization is determined by operational significance and investment requirements. Additionally, following the annual functional area reviews with the Business Continuity Team, the affected parties review the risks and opportunities. The risks and opportunities identified are then prioritized in the context of their business impact and operational response is planned in line with that identified risk and priority.

Water

Following the outsourcing of Ciena's manufacturing more than a decade ago, water usage across Ciena's operations is no longer considered to be a significant aspect. Water usage at Ciena is accounted for by employee refreshments and hygiene arrangements in an office-based environment; therefore, it is not possible to change the usage profile across the business operations without impacting wellness for staff.

Although water is no longer material to our direct business operations, we recognize the importance of water use and good water stewardship in our communities. While our direct operations are not water intensive, we do recognize the water used in our outsourced manufacturing. Our manufacturers take water stewardship seriously, including re-use and re-purposing of water for multiple uses on campus.

Emissions

Ciena participates in the CDP Climate reporting process on an annual basis. We've seen our investment in environmental management systems and operations change, reflected in an improving trend in CDP feedback during the past five years, culminating in a climate score performance band grading of "B" for our submission made in July 2017 (summary found below in Tables 2 & 3):

Table 2. CDP 2017 Climate Score

CDP 2017 Climate Score	
Company Name	**Performance Band**
Ciena Corporation	B
CDP Supply Chain Average	D

Table 3. CDP 2017 Climate Performance Band Categories

CDP 2017 Climate Performance Band Categories		
Company Name	**Performance Category Band**	**Supply Chain Average Category Band**
Governance and Strategy	C	C-
Risk and Opportunity Management	B-	D
Emissions Management	B	D

In 2017, our CDP submission was supported by the engagement of a third-party certification body to validate the emissions data submission. Table 4 on the following page reflects Ciena's emissions data by scope over the past 3 years.

Annual Scope 1 and Scope 3 emissions have increased over 3 years, while Scope 2 emissions have decreased nearly 40% since FY2014. Changes in emissions are due to several factors, including, but not limited to: business growth, data collection improvements, and energy saving initiatives.

Table 4. Ciena Emissions Data 2015 - 2017

	FY 2015	FY 2016	FY 2017
Total Scope 1 (metric tons CO2)	646	973	1,509
Total Scope 2 (metric tons CO2)	19,273	18,341	19,869
Total Scope 3 (metric tons CO2)	57,948	47,539	64,334

Scope 1 Emissions
1509.07 tCO2e

Comprising (in order of magnitude):
- Natural gas consumption
- Fuel consumption for rented vehicles
- Diesel generator emissions
- Fugitive emissions from refrigerants

Actions under review:
- Campaign to reduce unnecessary staff-related travel and to increase the use of alternative meeting protocols (e.g. telepresence). This will reduce rented vehicle and fuel consumption related to staff travel

Scope 2 Emissions
19869.12 tCO2e

Comprising:
- Electricity consumption

Actions under review:
- Migration of staff to new office facilities, designed to Leadership in Energy and Environmental Design (LEED) or equivalent standard. This is expected to to be reflected in the 2019 CDP submission; and
- Review of location based energy management improvement programs, which we expect to be reflected in the 2019 CDP submission.

Scope 3 Emissions
**64334.15 tCO2e**

Comprising (in order of magnitude):
- Other upstream (Contract Manufacturer) emissions
- Downstream tranportation and distribution
- Business travel
- Employee Commuting
- Waste generated in operations

Actions under review:
- Ciena will be working with their contract manufacturers to determine opportunities to reduce Scope 3 impact, which we expect to be reflected in the 2019 CDP submission.
- Changes to Ciena's flexible working policy will enable more remote working and reduce some of the commuting-based contribution to Scope 3 emissions.
- Campaign to reduce unnecessary staff related travel and to increase the use of alternative meeting protocols (e.g. telepresence). This will reduce the significant impact of air and road travel contributions, which we expect to be reflected in our 2019 CDP submission, and
- A review of Ciena's current waste profile and identification of opportunities to increase the proportion of waste being recycled, which we expect to impact the 2019 CDP submission.

In 2017, we completed various energy saving initiatives at some of our facilities in the United Kingdom, Europe, and United States, which led to over 450 metric tonnes CO2e savings annually. An example of our in-progress energy saving initiatives follows:
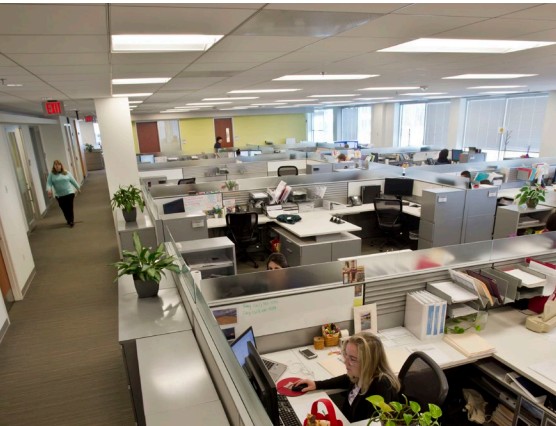
As part of the Energy Savings Opportunity Scheme regulation in the United Kingdom and Europe, Ciena engaged a third-party to assess climate change risks presented by each of Ciena's operational sites in Europe. By performing an energy audit, we were able to generate a list of opportunity areas, such as the installation of LED lighting, replacement of electrical kettles, and HVAC upgrades and equipment swaps for labs.

Sustainability in Real Estate

At Ciena, we recognize that 18%* of greenhouse gas emissions come from commercial office buildings. As such, our goal is to mitigate the environmental impact of Ciena operations globally. Ciena's Corporate Real Estate function addresses this challenge from three platforms.
Source DOE Buildings Energy Data Book

Building Systems

We have expanded our site selection process to include key differentiators such as LEED (or equivalent) status, single occupancy vehicle alternative commute options, and building management systems. As a result, currently five of our largest properties are U.S. Green Building Council (USGBC) LEED-certified or equivalent; 71% of Ciena locations have easy access to public transportation; and state-of-the-art building management systems to efficiently control consumption are operating at over half of our locations around the world. In all of our newer locations, workspace designs incorporate a variety of solutions that reflect healthy building design concepts as defined by International Well Building Institute.

LEED Certification

Hanover: LEED Gold certified
Sydney: LEED Gold equivalent
Ottawa: All 3 buildings LEED Silver certifiable (but not yet certified)
Buenes Aires: LEED Gold certified

Property Operations

Ciena currently operates in more than 60 locations around the world with a real estate portfolio totaling 1.4 million square feet. The make-up of the properties vary from large research and development centers to small serviced office environments. As such, our efforts to address energy consumption and environmental concerns have focused on locations where we can have the greatest impact in influencing behavior and driving solutions. Ciena's waste management efforts include a growing recycling program, which is currently active in 82% of our locations. In regions where energy sourcing is deregulated, we have 12% of our energy demand coming from renewable sources. Each year since we began tracking consumption metrics and against the backdrop of continued growth in the company, property operation initiatives have resulted in year over year reductions in CO_2 emissions.

People Choices

The front line of Ciena's sustainability efforts begins with its people. Our efforts in waste reduction and energy conservation include awareness initiatives that can be used at the office and at home, as well as providing options for alternate work settings including work at home. In addition, incentives associated with desired behaviors include preferred parking for ride share and fuel-efficient vehicles at our larger locations. Along with the active choices for our occupants, we also instituted a number of passive programs including single stream recycling, print default protocols to reduce paper consumption, and replacing all the utensils and food service products (cups, plates, cutlery) with biodegradable options. In 2016, we initiated a series of pilots around the world to test passive solutions to reduce energy consumption. Many of these solutions have been implemented at Ciena locations; eventually, we anticipate these solutions will be employed at all Ciena locations.

Product Sustainability

Ciena produces some of the world's most advanced networking products, featuring innovative features and utilizing some of the world's most complex technology. These products enable efficient connectivity to transform networks.

In this section we highlight the benefits to the environment of our products in two ways. First are environmental benefits from our transformation of the network itself and second are environmental benefits of our individual networking products.

Environmental Advantages of Network Transformation

Ciena architects products to create network transformations that maximize network efficiency for our customers. Examples include Digital Signal Processing (DSP) based optical line modem technology (WaveLogic Family of Modems), Photonic Layer Bypass for Submarine Solutions (GeoMesh), and the recently announced Liquid Spectrum. Our products change the network by eliminating many racks of electronics and reducing the amount of fiber optic pairs needed in the outside plant. This drastically reduces the amount of material required during manufacturing, the amount of energy used to build and operate the electronics, and the amount of energy and material to expand the fiber optics cable in the outside plant.

Here are just three examples of how our solutions work to reduce the environment impact of optical transport equipment.

DSP Based Optical Line Termination Technology

Ciena was the first company in the world to introduce DSP-based optical line termination technology. In 2005 DSP electronic dispersion compensation optimized optics were introduced on our 10G direct detect technology on 6500 (illustrated in *Figure 3* below). This permitted substantive physical footprint reduction in the optical transport long haul marketplace.

Figure 3. Implementing DSP to Simplify Optical Networks

Before: Direct detection (10G and below)

Transmitter — Receiver

Encode bits using "on" and "off"

Light = 1
No light = 0

DSP-Assisted Optical Line Terminating Equipment

Transmitter — Fiber — Receiver

Encode bits using amplitude & phase

Phase and amplitude combinations signify 1s and 0s

Dispersion Slope Compensating Modules

Amplifier
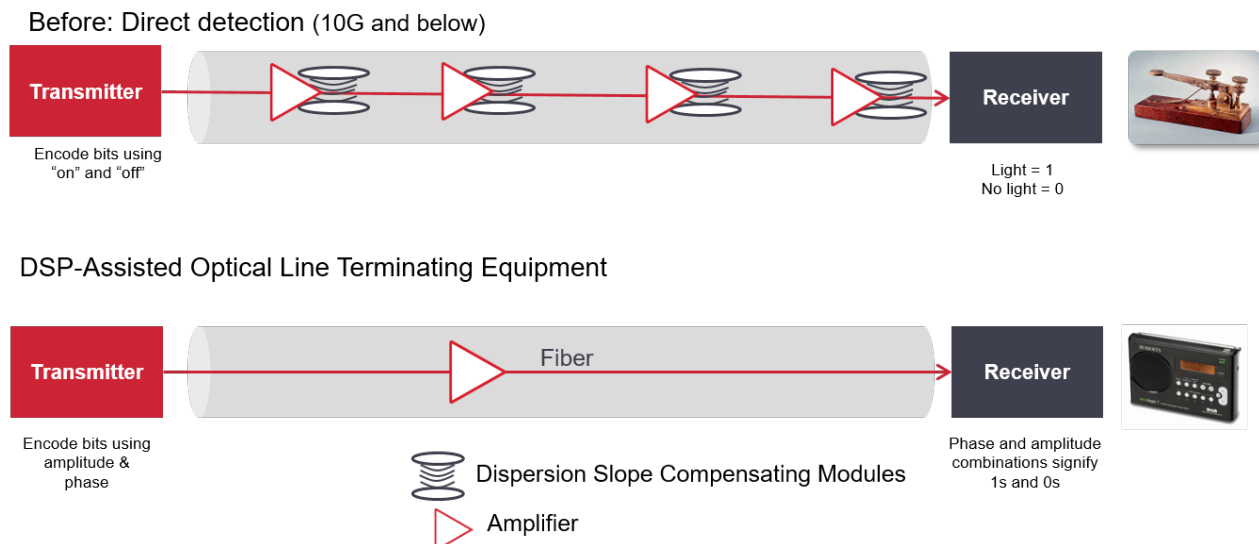
Figure 4. Ciena's DSP Solution
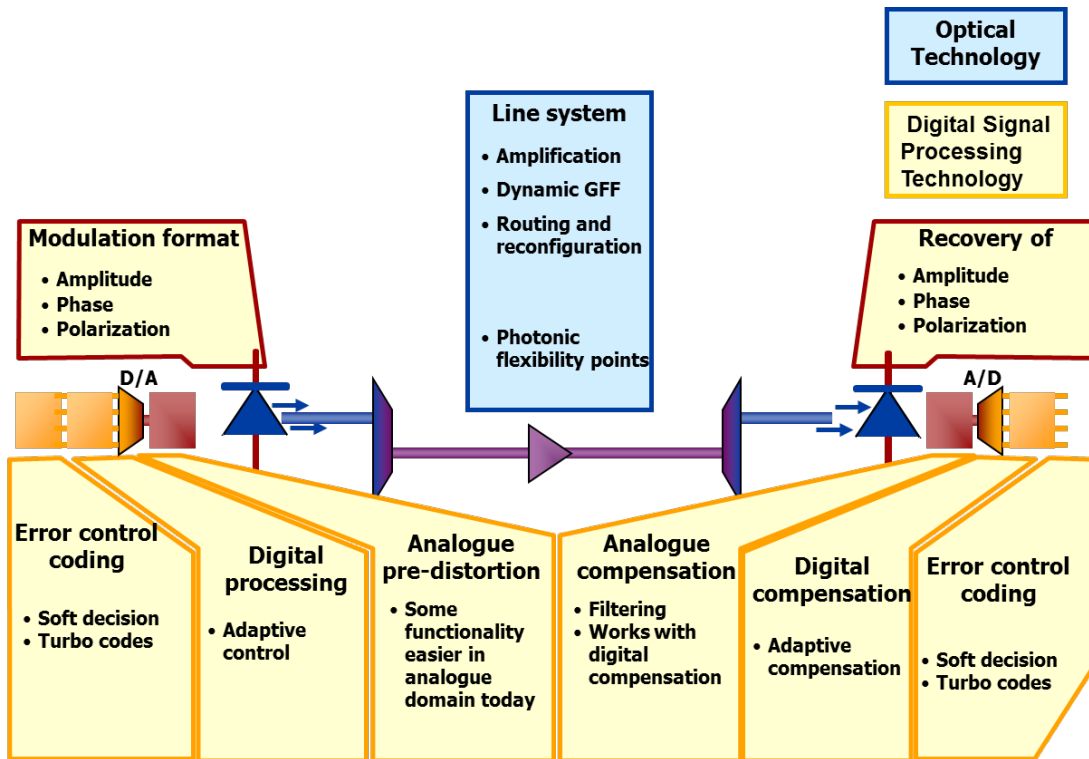
The physical optical equipment that provide the following functions are now performed in a single DSP ASIC (illustrated in *Figure 4* above).

Equipment removed per fiber:
- Optical Pre-compensation;
- Optical Multiple Dispersion compensation; and,
- Extra amplifiers needed due to all the optical equipment inserted in the optical path.

Equipment removed per wavelength:
- Optical Polarization Mode Dispersion; and,
- Optical Pre-Distortion.

The amount of optical equipment removed from the network is substantive. This reduction in overall equipment needed provides significant space reduction and very significant reduction in equipment that needs to be manufactured.

WaveLogic Coherent Optic Integration

Ciena has integrated our WaveLogic coherent modem technology into many of our switching platforms (see how in *figure 5* below): the 6500, 5400, and Z-Series Packet-Optical platforms, as well as our 8700 Packetwave platform, thus removing the transponder functionality, and the resulting additional hardware that would have been required, from the network end points.
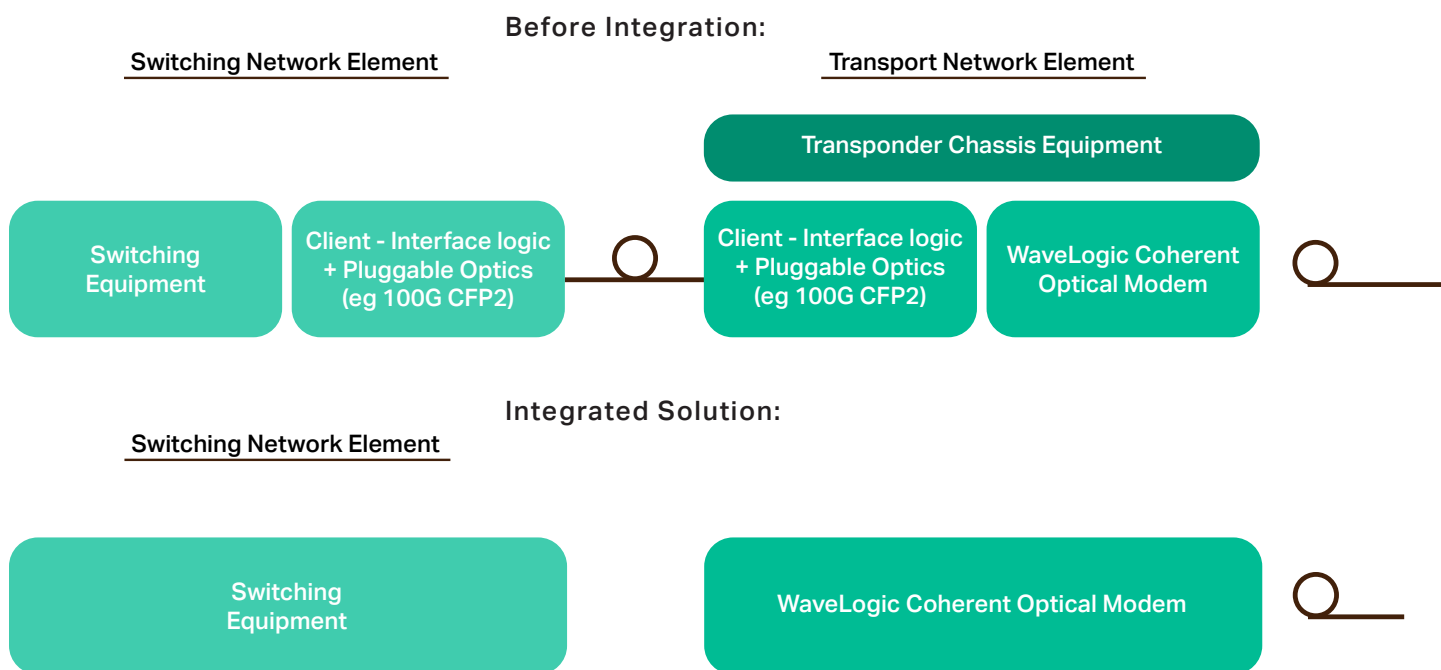
Figure 5. Before and After Optic Integration

Before Integration:

Switching Network Element

Transport Network Element

Switching Equipment

Client - Interface logic + Pluggable Optics (eg 100G CFP2)

Transponder Chassis Equipment

Client - Interface logic + Pluggable Optics (eg 100G CFP2)

WaveLogic Coherent Optical Modem

Integrated Solution:

Switching Network Element

Switching Equipment

WaveLogic Coherent Optical Modem

Equipment reduced per 100G Port
- Client side logic electronics;
- 2x Client Pluggable Transceivers; and,
- All the transponder common equipment – chassis, central processing unit, cooling units, power input cards, etc.

In addition, Ciena also offers ultra-dense, compact transponder equipment that minimize footprint and energy consumption. For example, the Waveserver Ai's compact 1RU platform can be used to reduce rack space footprint in rack and stack deployments, and its ultra-low power consumption reduces ongoing energy costs.

Photonic Layer Bypass – GeoMesh

Photonic Layer Bypass techniques for submarine (Branded GeoMesh) when compared to traditional electrical routing techniques have permitted major reductions in the number of network elements needed to provide connectivity between customer locations.

The following is an example of the environmental benefits from transforming two data centers connected over a submarine network.

Figure 6. GeoMesh Architecture
All Coherent Optical PoP-to-PoP Connectivity
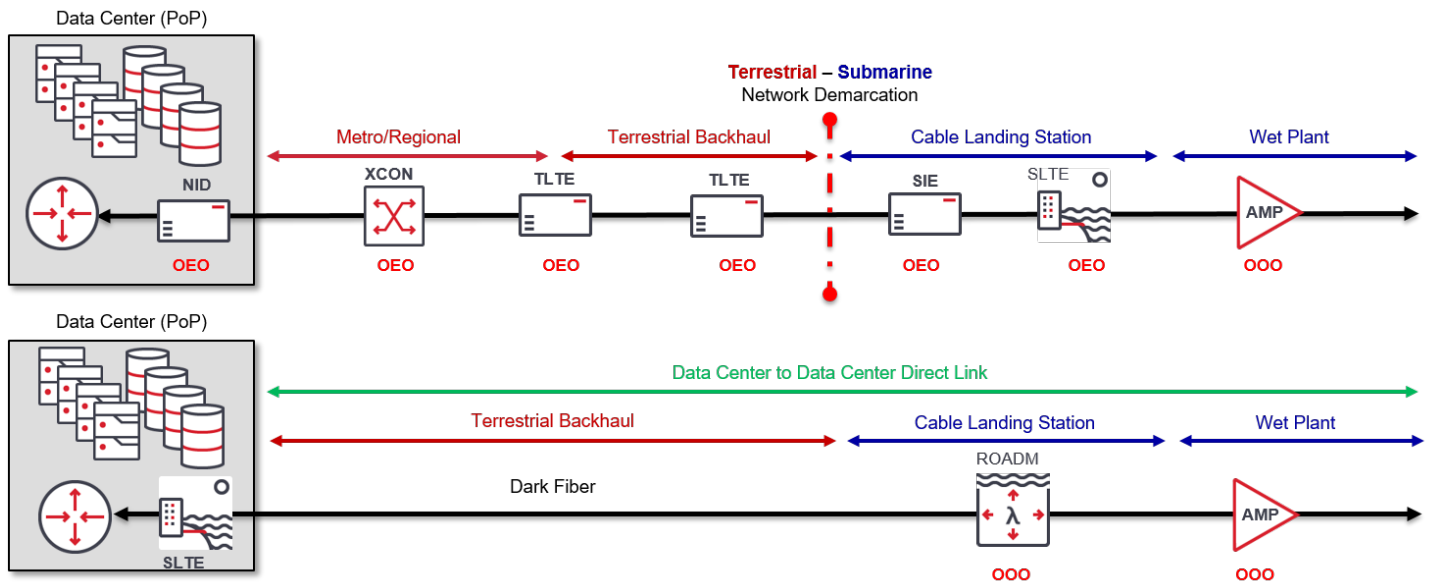
AMP: Submarine Repeater (Amplifier)

NID: Network Interface Device

OEO: Optical-Electrical-Optical

OOO: Optical-Optical-Optical

PoP: Point of Presence

ROADM: Reconfigurable Optical Add/Drop
          Multiplexer

SIE: SDH Interconnection Equipment

SLTE: Submarine Line Terminating Equipment

TLTE: Terrestrial Line Terminating Equipment

XCON: Cross-Connect

The following network elements are removed from the Traditional network:
- \>50 RUs of rack spaces of equipment which consumed thousands of watts (W) of power.

The following network elements are added in the GeoMesh defined network:
- Reconfigurable Optical Add Drop Multiplexer (ROADM)– transparently maps the optical connection to go over the appropriate optical channel in the submarine network's wet plant (no optical-electrical-optical termination required); and,
- ~10 RUs of rack space of equipment using ~500W of power.

Figure 6 illustrates the massive reduction in equipment required, thus reducing power requirements for the network elements and the air conditioning needed for the offices. Additionally, an existing Cable Landing Station building does not need to be physically expanded. A massive reduction in the product's environmental footprint is realized by reduced manufacturing and transport of all this extra equipment. In a number of our customers' Landing Stations, the customers have actually removed the traditional equipment, which frees up space for future expansion and reduces operation power consumption.

Our Network Products' Design for Sustainability

During the definition and development stage of our products (network elements) we follow a Product Life Cycle process that is TL9000 certified. The process includes design for:

- Reliability;
- Design for longevity;
- Design for robustness;
- Design for upgradeability;
- Design for optimized physical footprint;
- Design for power efficiency (power/bit); and,
- Design for regulatory compliance (safety, Electro-Magnetic Compatibility, and restriction of hazardous substances (RoHS))

The above design efforts result in less need to return to site to fault find, fix, or change the product. Hence this has the sustainability desirable outcome of:

- Offering potential for customers to reduce energy consumption relative to traffic throughput;
- Potential reductions in associated plant (e.g. air conditioning) required to support operation;
- Reducing the number of truck rolls;
- Reducing the need for sparing;
- Reducing the need for the purchase of new or replacement material for change-out;
- Reducing the associated logistics, transport, and handling activities; and,
- Reducing associated packaging needs.

These examples help to illustrate the results of the design process.

1. Design for upgradeability
The 6500 - 14 slot chassis introduced in 2005 is still in use today.
- In 2005, the chassis was introduced as an optical SDH/SONET switch and/or 10G Transport shelf (e.g. 10G electronically-compensating optics were introduced; original WaveLogic product);
- In 2008, the same shelf was able to support 40G Transponders (WaveLogic 2);
- In 2013, the same shelf was able to house 100G Transponders (WaveLogic 3); and,
- In 2017, this same shelf was able to house 400G Transponders (WaveLogic Ai).

2. Design for optimized physical footprint
In the 6500 family, we have developed different chassis that permit the customer to minimize their physical footprint for photonics and broadband applications.

For small offices or points of access, we have a 2-slot, 2RU chassis.
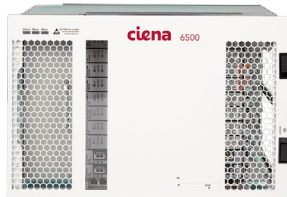
For medium-sized applications, we have a 7-slot, 6RU chassis.

For large-scale deployments, we have a 14-slot, 13RU chassis.

For ultra-large scale applications, we have a 32-slot, 22RU chassis.

As a result, customers are able to deploy just the necessary common equipment needed for the specific application. *This minimizes the equipment needed and thus is optimized for power and space which is beneficial for the environment.*

3. Design for power efficiency (power/bit)

Ciena continues to drive reduction in power/bit on our line termination equipment. The following figure shows the reductions we have realized.

DSP-Based Transponders on 6500:

Transponders provide the function of taking a bit stream from a short distance fiber optic transceiver (known as client side interfaces) and mapping the bit stream into a long haul or metro optical DWDM wavelength via our DSP-based Optical Modems.

Figure 7. 6500 - Coninuous Pack Power Reduction through Design Optimization
Example: Power Reduction for 100Gb/s
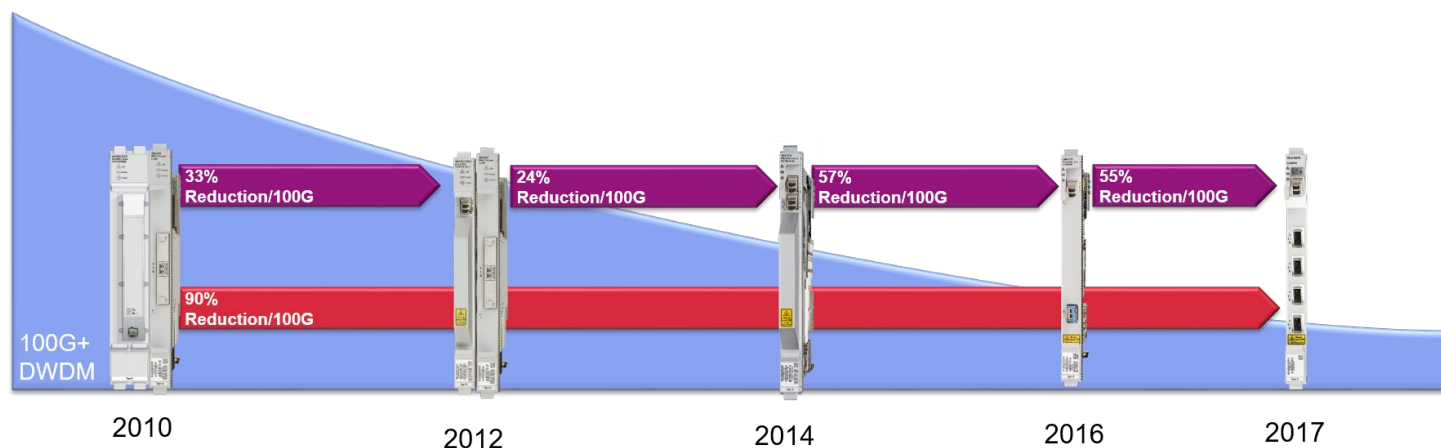
Figure 7 illustrates the gain from our first WaveLogic 2-based DWDM transponder to our existing WaveLogic Ai 400G muxponder being over 8x improvement in power usage and 12x improvement in space usage.

DSP-based Optical Modems

Our optical modem technology has evolved from 10G to 400G. Between WaveLogic 1 and WaveLogic Ai, power has been reduced by a factor of 17.

Shipping Packaging

Ciena continues to modify our packing material to minimize our environmental footprint. We are introducing shipping options with less packing material and more recyclable content.

One option for reducing packing material is through packaging in place. With this option, the individual field replaceable line cards are shipped installed in the chassis. Also, the pluggable transceivers are installed in the line cards. The result is that the shipping boxes for each individual line card and separate packing boxes for the pluggable transceivers are not required.

Compliance

Ciena is committed to environmentally responsible behavior. As part of this commitment, we continually work to comply with environmental take back and recycling obligations and legislation such as the European Union's Waste Electrical and Electronic Equipment (WEEE) Directive 2012/19/EU and national regulations as applicable. The European Union has well-established regulations, but many countries located outside of Europe, including those in Asia-Pacific, North and South America, and the Middle East, are developing product-specific legislation and have imposed certain restrictions to varying degrees. Ciena continues to monitor this progress and is compliant with all regional product legislation where Ciena's products are supplied.

End of Life

Ciena works with compliance partners and compliance organizations to meet its take back and recycling obligations. In the countries where we do business, Ciena partners with Approved Authorized Treatment Facilities (AATFs) to offer its take back and recycling program for products falling within the scope of the WEEE legislation and national regulations. This program provides customers a means by which to properly manage Ciena products at the end of their useful life (as determined by the customer), in line with the applicable regulatory or contractual obligations.

Even where there may be no regulatory compliance obligations for take back, Ciena would still like to support its customers, who would like to return products they have determined to have reached the end of their useful life.

As part of Ciena's commitment to the principles of the circular economy, we encourage customers to support these aims by allowing Ciena to reuse or repurpose returned equipment to elongate the productive life, before final recycling and safe disposal.

Life Cycle Assessment – Network Element

To gain further insight into the environmental footprint of our products, and in recognition of the growing importance of product sustainability, Ciena has been working with a world-renowned sustainability partner, Thinkstep, to understand the outcome of our engineering approach in sustainability terms and has completed a full Life Cycle Assessment (LCA) of one of our most complex products.

Life Cycle Assessment – Findings

The product LCA was a thorough, ISO 14040-compliant assessment, which drew the following conclusions:

- Use Phase - dominates, where the customer is on a typical electrical power grid (Low carbon/renewable customers are the exception); and,
- Manufacturing Phase - highest contribution from integrated circuits (ICs) and printed circuit boards (PCBs).

"Our lifecycle assessment findings have confirmed that Ciena's network transformation strategy and delivering higher performance, lower power solutions to market are making a positive impact for our customers and their networks worldwide. Ciena will continue to strengthen its eco-design guidelines, through continuous improvements in our Product Lifecycle (PLC) process and we will work in partnership with our suppliers to explore further opportunities to reduce our carbon footprint."

- Scott McFeely, Senior Vice President of Global Products & Services

Circular Economy

In February 2017, Ciena convened its product teams, select suppliers and customers to learn how Circular Economy models enable extended use and reuse of products and materials for both financial and environmental benefits. This was followed by a workshop to identify potential opportunities to apply circularity thinking and in 2018, a review of operational practices was conducted to identify any existing areas of circularity in action already. In 2019, Ciena will train product teams in eco-design best practices, emphasizing "Design for Circularity" as well as guide the senior management team in company-wide strategies for further participation in the Circular Economy. Additionally, Ciena will be working to update its product lifecycle process to ensure that products incorporate circular design strategies and methods on an increasing basis.

Awards & Recognition

MEF 18 Proof of Concept AWARDS — GOLD

MEF 18 Multi-Domain Application-Defined Global Interconnection Orchestration — AT&T, ciena | blueplanet, EQUINIX WHERE OPPORTUNITY CONNECTS

MEF AWARDS 2018
Technology Provider of the Year
Ciena

MEF AWARDS 2018
Technology Solution of the Year *LSO Leadership*
Blue Planet

MEF AWARDS 2018
Technology Solution of the Year *Optical*
WaveLogic Ai

MEF AWARDS 2018
Technology Solution of the Year *Service Assurance*
Blue Planet ROA

2018 DIAMOND TECHNOLOGY REVIEWS — BTR BROADBAND TECHNOLOGY REPORT

6500 Reconfigurable Line System (4 stars)

8180 Coherent Networking Platform (4.5 stars)

5170 Service Aggregation Platform (4 stars)

READERS' CHOICE & INNOVATION AWARDS 2018 — telecomasia

Analytics Innovation of the Year
Blue Planet/Packet Design

Fixed Broadband Innovation of the Year
5170 Service Aggregation Switch

Optical Network Innovation of the Year
6500 Reconfigurable Line System

NETWORK TRANSFORMATION AWARDS 2018
10 October 2018
LAYER123

Best New Orchestration and Control
Blue Planet

global carrier Awards 2018
Winner
Best Network Technology Innovation
Ciena

WaveLogic Ai

Sustainable Supply Chain

Ciena's production process depends on our innovative product design coupled with carefully selected suppliers providing electronic components and materials, fabrication and assembly, and test and customer delivery. To deliver our competitive solutions to customers, we ensure that our supply-chain operations are agile, growth-oriented, *and responsible*. Transformation is at the heart of our strategy as we continue to challenge the status quo, leveraging the immense talent in our supply-chain team to drive change that helps us scale efficiently while supporting the growth of our business.

John Brots, Vice President Supply Chain Operations

We know this success must be achieved sustainably. Ciena is committed to effecting change through a supply chain with exemplary ethical business behaviour, environmental stewardship, and employee treatment – according to the RBA Code of Conduct. Ciena works with its suppliers on opportunities that will make a sustainable difference, including participating jointly in a Circular Economy strategy.

Figure 8. Our Supply Chain

● Manufacturing and distribution locations

● Supply Chain operations locations
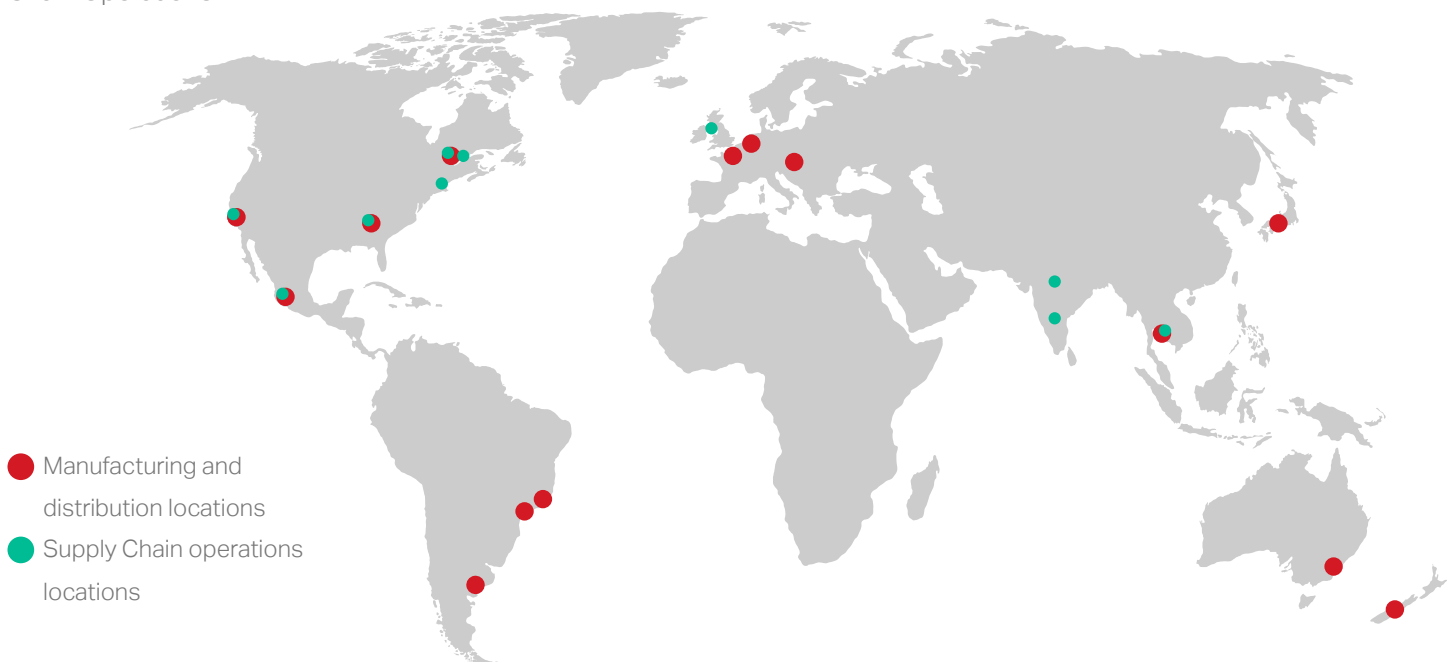
Transparency and Human Rights in Our Supply Chain

Respect for human rights is fundamental to Ciena and our customers. Ciena has an outsourced supply-chain model, so ensuring that workers' rights are respected requires a clear agreement on expectations.

As an active member of the RBA, Ciena supports efforts to ensure that working conditions are safe; that workers are treated with respect and dignity; and that business operations are environmentally responsible and conducted ethically. Ciena is engaged in many initiatives to ensure that our suppliers do not practice human trafficking, forced labor, or child labor:

THE UK
MODERN SLAVERY ACT
2015

In terms of specific arrangements for compliance to the UK Modern Slavery Act, Ciena's latest statement can be found in the Corporate Governance section of Ciena's external internet site.

- Ciena expects all suppliers to adhere to a strict set of Supplier Guidelines. The RBA Code of Conduct, which contains provisions related to freely chosen employment and child labor avoidance, is a fundamental part of these guidelines;

- Ciena requires its suppliers to comply with all applicable laws, which include those related to slavery and human trafficking. Additionally, Ciena requires its key suppliers to confirm their compliance with United Nations labor and human rights conventions, including the abolition of child, bonded, and forced labor, as well as working-hours laws and anti-discriminatory work practices;

- Ciena assesses its suppliers against the requirements of the RBA Code of Conduct, which precludes forced labor, slavery, and trafficking of persons. This assessment includes evaluating results of independent, announced, third party compliance audits, conducted in line with RBA audit protocols;

- Ciena has required suppliers to confirm, through completion of the RBA's Self-Assessment Questionnaire (SAQ), their compliance with fair labor practices; and,

- Ciena has a rigorous Code of Business Conduct applicable to all employees. The company does not tolerate unlawful discrimination or harassment of any kind, and requires employees to comply with all applicable laws, which include those regarding slavery and human trafficking.

Ciena ensures that employees and management who have direct responsibility for supplier engagement and selection receive training on human trafficking and slavery, particularly with respect to mitigating risks within the supply chain.

Conflict Minerals

Ciena is committed to sourcing components we use in our products in ethical and socially responsible ways. Ciena supports efforts to eliminate the use of tantalum, tin, tungsten, and gold (3TG) obtained from sources that directly or indirectly finance or benefit armed groups in the Democratic Republic of the Congo or adjoining countries.

Ciena's supply chain is complex, with many third parties in the supply chain between the ultimate manufacturer of our products and the original source of the 3TG. Ciena does not purchase 3TG directly from mines, smelters, or refiners. We must therefore rely on our suppliers to provide information regarding the origin of 3TG that are required in the production of our products. Moreover, we believe that

the smelters and refiners of 3TG are best situated to identify the country of origin of the 3TG in the supply chain, and therefore have taken steps to identify the applicable smelters and refiners of 3TG in our supply chain.

Ciena engages with its suppliers on the basis of a reasonable country of origin inquiry ("RCOI") and due diligence program. Our due diligence measures have been designed to conform, in all material respects, with the Organization for Economic Co-operation and Development's "Due Diligence Guidance for Responsible Supply Chains of Minerals from Conflict-Affected Areas and High-Risk Areas, Second Edition (2013)" and the related Supplements for gold and for tin, tantalum, and tungsten (the "OECD Framework").

Ciena has requested suppliers of components that may contain tantalum, tin, gold, or tungsten to submit sourcing information using the questionnaire developed by the RBA/Global eSustainability Initiative (GeSI) working group. Ciena requires its suppliers to take similar measures with their own suppliers to reasonably assure conflict-free sourcing throughout the supply chain.

Ciena continues membership in the RBA's Responsible Minerals Initiative (formerly known as CFSI), and the associated Conflict Free Smelter Program (CFSP) which manages the smelter/refiner-validation and audit process.

More details are available in Ciena's latest conflict minerals statement.

Supplier Sustainability Assessment

Ciena recognizes that our CSR performance is viewed by stakeholders as a combination of practices and actions by both Ciena and our outsourced supply chain. Thus, gaining insight into the key elements that comprise performance and standards compliance in our supply base is important.

Our supplier assessment approach is anchored in the RBA Code of Conduct and has been applied to key suppliers, representing more than 85% of Ciena's direct spend. On the following page, *Figure 9* summarizes the four primary elements that have comprised the CSR supplier engagement framework at Ciena since the 2017 financial year.

Figure 9. Ciena's Four Primary Elements of Supplier Engagement

Expectations Setting

Risk Evaluation

Development

Monitoring

- RBA (formerly EICC) Code of Conduct compliance expectation
- Contractually defined

- Key suppliers
- CSR maturity assessment by Ecovadis

- Assessment improvement focus and corrective action follow-up
- Transparency encouragement through public CSR reporting and CDP participation
- Sustainability reviews to explore potential improvement projects

- Review of publicly available supplier information against expectations
- Re-assessment / Audit

Ciena updated its supplier CSR assessment protocol in 2017, moving away from being based solely on the results of the RBA Self-Assessment Questionnaire (SAQ) risk rating, to a new CSR maturity rating approach, working with our independent partner Ecovadis.

Ciena continues to focus its assessment process on its key suppliers, which represent more than 85% of its supplier spend. The maturity assessment model (*Figure 10*) is summarized on the following page (courtesy of Ecovadis) with each supplier receiving benchmarked feedback, in a scorecard form, to identify examples of good practice and any areas of concern, where the supplier should focus their improvement efforts.

Figure 10. Ecovadis Assessment Process
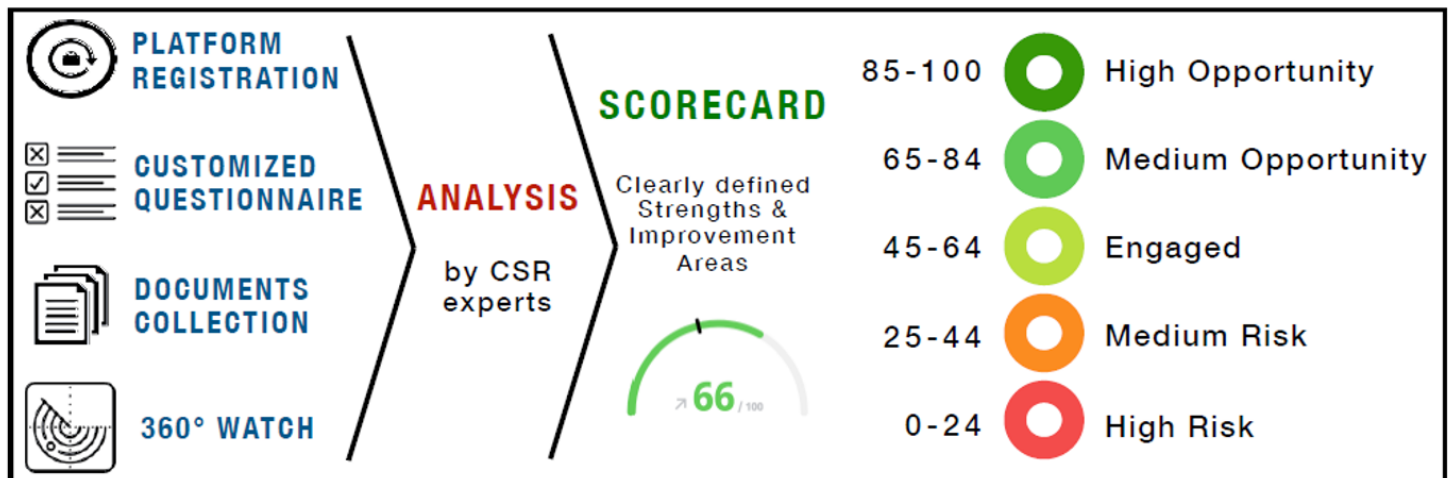
The above figure represents the structured process that comprises the assessment methodology:

- Initial questionnaire completion by the supplier
- Evidential documentation upload to the portal
- 360° Watch – Additional research conducted by Ecovadis that takes input from a range of external stakeholders.
- Analysis of all information sourced by CSR experts
- Scorecard compilation, providing an overall assessment scoring out of 100, against comparative benchmarks and identifying areas of good practice and areas for improvement.

Figure 11. Scope of CSR Criteria Assessed

ENVIRONMENT	LABOR & HUMAN RIGHTS	ETHICS	SUSTAINABLE PROCUREMENT
Energy & GHG Water Biodiversity Local Pollutions Materials, Chemicals, Waste Product Use Product End-of-Life Customer Health & Safety Sustainable Consumption	Employees' Health & Safety Working Conditions Social Dialogue Career Management & Training Child & Forced Labor Discrimination Fundamental Human Rights	Corruption & Bribery Anticompetitive practices Responsible Information Management	Environmental performance Social practice

The above figure summarises the CSR criteria that underpins the assessment process throughout and which is used as the basis of the scorecard feedback and associated benchmarking scoring analysis.

Table 5. The Scoring Scale

Score	CSR Performance		Likely Outcome	
85-100	Outstanding	• Structured and proactive CSR approach • Policies and tangible actions on all topics • Comprehensive CSR Reporting on actions & KPIs • Innovative practices and external recognition	High Opportunity	Company has best-in-class CSR practices which present **major opportunities for their customers** in regards to product/service **innovation, market differentiation, creating shared value**, etc.
65-84	Advanced	• Structured and proactive CSR approach • Policies and tangible actions on major topics with • Significant CSR Reporting on actions & KPIs	Medium Opportunity	Company has an advanced CSR management system which could yield **positive business outcomes** in terms of **cost reduction, productivity improvements, efficiency gains**, etc.
45-64	Confirmed	• Structured and proactive CSR approach • Policies and tangible actions on major topics • Basic reporting on actions or KPIs	Engaged	Company is engaged in major CSR topics, therefore risks are limited. Company **embraces continuous performance improvements** on CSR and should be considered for **a long-term business relationship.**
25-44	Partial	• No structured CSR approach • Few tangible actions on selected topics • Partial certification or possible products with eco-labels	Medium Risk	Company has partial involvement in CSR topics which could present medium risk for customers. **Improvement areas identified should be addressed** to encourage evolution of CSR performance.
0-24	None	• No engagements or tangible actions regarding CSR • Evidence in certain cases of misconduct (e.g. pollution, corruption)	High Risk	Company lacks engagement on CSR which could present high risk for their customers with regards to **regulatory compliance, impact on reputation, supply disruption**, etc.

INNOVATION / **RISK**

The above table provides a detailed insight into how to interpret the finalised CSR maturity assessment scoring, showing the relationship between risk reduction and opportunity enablement.
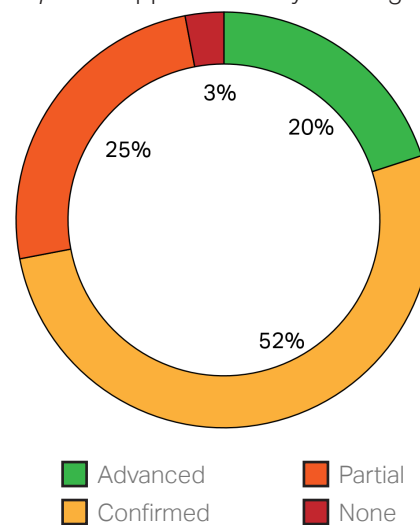
Ecovadis Supplier Survey Results

The first year results of partnering with Ecovadis on supplier assessments, using the new protocol, are summarized in the graphs below and have provided Ciena with a much more comprehensive, foundational understanding of its supplier base, in CSR maturity terms. The figures below show key data points, spanning the overall grading outcomes and maturity trends.

Graph 2. CSR Maturity Grading Supplier Trends

16%
16%
48%
20%

☐ First Assessment ☐ Unchanged
☐ Improving ☐ Deteriotating
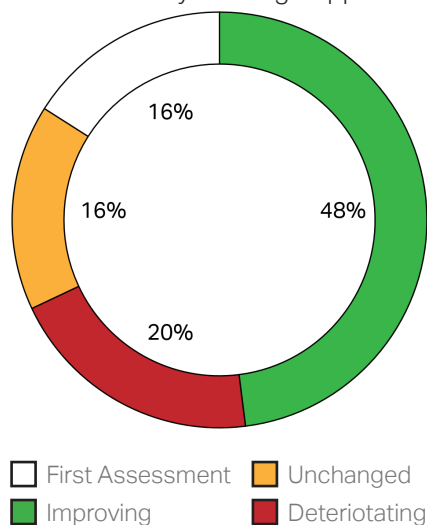
Graph 3. Supplier Maturity Grading

3%
20%
25%
52%

☐ Advanced ☐ Partial
☐ Confirmed ☐ None

In 2019, we will focus upon improving maturity scores, predicated around a supportive development approach. We will work with those suppliers not yet meeting Ciena's expectations, to build upon their baseline capability and to support their efforts to improve performance over the coming assessment window.

Supplier Diversity

Ciena's network of partners and suppliers is critical to our long-term success, especially when innovation and excellence are key to winning in a competitive market. Our customers expect world-class products and services—and we deliver.

Our supplier diversity program, launched in 2013, delivers an improved customer experience by providing equal access to a supply base that reflects the diversity of where we live, work, and serve.

"We know that diversity in all its various forms drives greater innovation, creating significant competitive advantage in the marketplace for both Ciena and our customers. We are committed to driving our diversity agenda and fostering a culture of inclusion to continue pushing the envelope of our technology leadership and go-to-market strategy. And most importantly, we are keenly focused on inclusion and diversity in order to create a nurturing and supportive environment for our employees, customers, and the communities in which we operate. It's simply the right thing to do."

- Gary B. Smith, President & Chief Executive Officer

To assist in recruiting new suppliers and engaging our diverse supplier base, Ciena has created a dedicated web portal which contains clear definitions of qualifying diverse businesses in each of the categories below:
- Small Disadvantaged Business
- Woman-Owned Small Business
- Veteran-Owned Small Business
- Disabled Veteran-Owned Small Business
- Historically Underutilized Business Zone Small Business Concern
- Minority Business Enterprise
- Woman Business Enterprise

$30M
Spend with Diverse Suppliers
(Minority, Women, Small Disadvantaged, and Veteran-Owned Businesses)

A solid diversity program is good for business, enables sales, and can give Ciena a competitive edge in Customer RFPs.

Ciena is a member of the following supplier diversity organizations in support of growth and development of small, minority and women-owned suppliers:

- National Minority Supplier Development Council (NMSDC);
- Women's Business Enterprise National Council (WBENC); and,
- Canadian Aboriginal and Minority Supplier Council (CAMSC).

Environment, Health and Safety

Ciena seeks to operate its business in a manner that is environmentally responsible and protective of the health and safety of its employees and the public where operations may have an impact. Ciena takes an integrated approach to its Environmental, Health and Safety management, governed by compliance to the associated International Standards.

In the last year, Ciena completed the final steps of its Environmental, Health and Safety Management System (EMS) rollout program, illustrated below in *Figure 12*, to cover the global Ciena landscape. Our approach is based upon an ownership model spanning both corporate and regional responsibilities and leverages common processes, where possible, for consistency.

In recognition of this accomplishment, Ciena has achieved third party certification of its global EHS management system to the requirements of the international ISO 14001 and OHSAS 18001 management standards.

Figure 12. Ciena's EMS Program
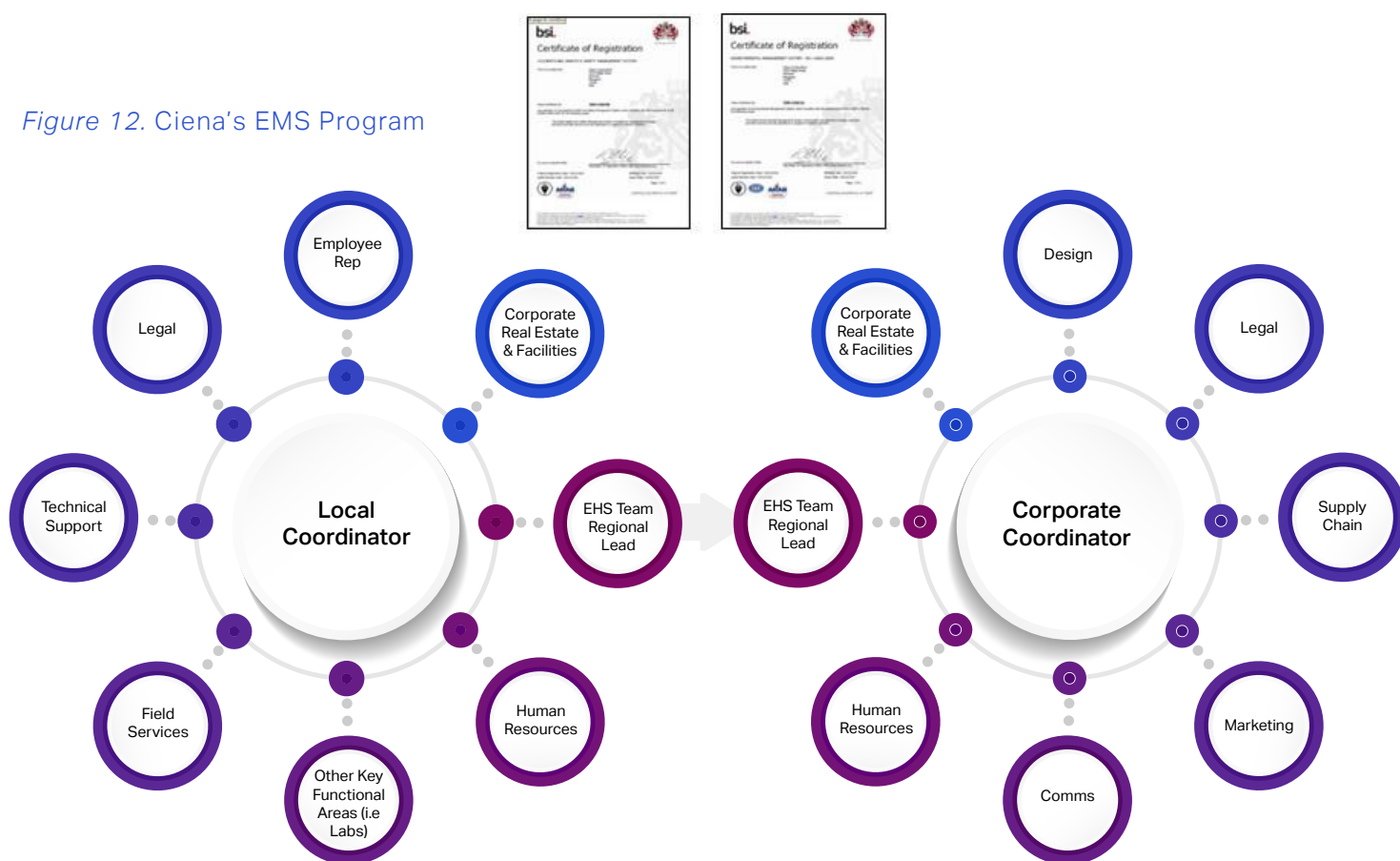
Ciena's integrated management system is underpinned by a risk-based, internal audit program. Ciena takes a comprehensive approach to risk assessment in both safety risks and those of environmental aspects and impacts. Overall, this can be considered to be a relatively low risk situation, which is supported by *Graphs 4-6* following key data reflecting the current status.

Graph 4.

Total Accident/Illness Frequency Rate
Yearly Comparison

Q1 0.02 / 0.17
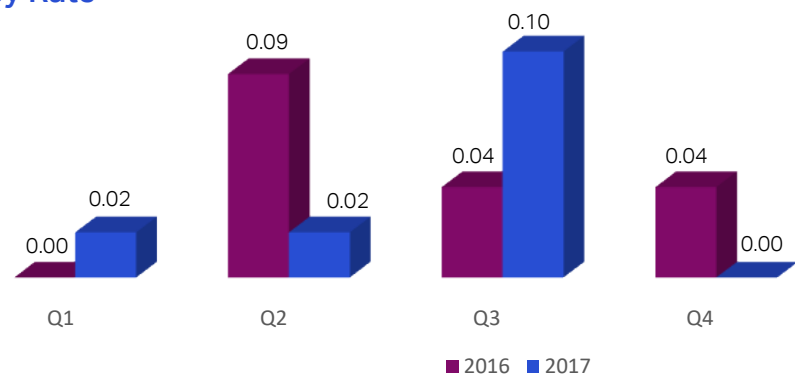**Q2** 0.26 / 0.12
Q3 0.07 / 0.12
Q4 0.13 / 0.00

■ 2016 ■ 2017
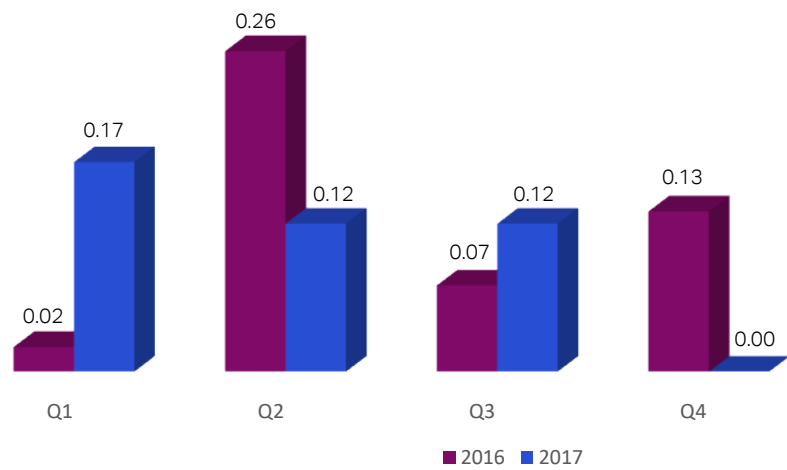
Graph 5.

Recordable Accident/Illness Frequency Rate
Yearly Comparison

Q1 0.00 / 0.02
Q2 0.09 / 0.02
Q3 0.04 / 0.10
Q4 0.04 / 0.00

■ 2016 ■ 2017

Graph 6.

Total Lost Time Accident Frequency Rate
Yearly Comparison

Q1 0.00 / 0.00
Q2 0.02 / 0.02
Q3 0.02 / 0.05
Q4 0.02 / 0.00

■ 2016 ■ 2017
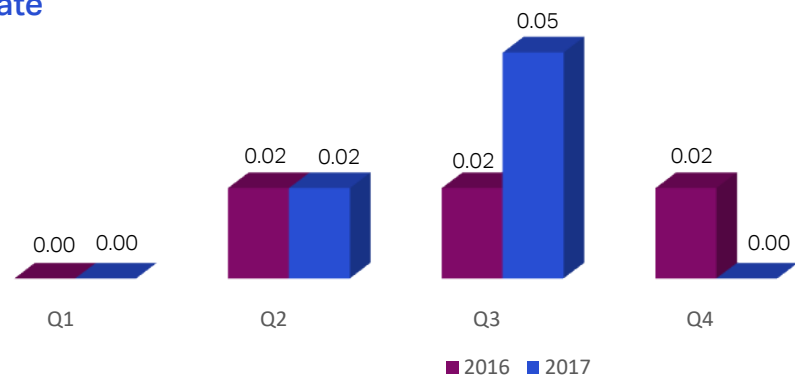
Occupational Health and Safety

Ciena takes a comprehensive approach to the management of health and safety matters in compliance with our third party certified, OHSAS 18001 management system including:

- Risk assessments and risk registers;
- Regulatory monitoring;
- Internal and third-party audits;
- Accident / Incident reporting;
- Emergency preparedness;
- Awareness training; and,
- Knowledge sharing resources.

Ciena has regional EHS Committees for the following regions:
- North America;
- Caribbean and Latin America;
- Asia Pacific; and,
- Europe, Middle East, and Africa.

The committees meet regularly throughout the year and comprise representatives from all key functional areas, including employee representation. The responsibilities of the Committee comprise:
- Identifying and recommending regional EHS objectives;
- Ensuring functional aspects and impacts and tracking any resulting projects;
- Reviewing local laws and regulations and assess compliance;
- Ensuring each functional area is regularly reviewing their risks and associated operational controls; and,
- Tracking accidents and incidents and investigation outcomes to determine any corrective/preventive actions required.

Outstanding People

Ciena's future and competitive edge is achieved through attracting and retaining the best people. We've grown, organically and inorganically, to a company of more than 6,000 people across the globe. Evidenced through our recent work on our employee value proposition, we know that people value our openness, informality, and professionalism and want more empowerment, transparency, flexibility, and collaboration.

Jane Hobbs, Senior Vice President and Chief People Officer

It is important to remember that each individual's experience is never the same. Our challenge is to address our growing population at scale but retain our agility and strength in personal relationships. Continuing to engage and motivate everyone is vital to our future accomplishments.

A key mechanism for doing this is through the execution of Ciena's People Plan, a rolling annual plan that dove-tails with the company's strategic plan and underpins our core values of Outstanding People and Integrity. Our People Plan, launched in 2014 on the three pillars of "Attract, Develop, and Engage" (illustrated in *Figure 13* below) ensures that we have the right capability to execute on our business plan. Built on feedback from the individuals in the business, we keep on course against this Plan to meet our objectives of attracting, developing, and engaging the best people to inspire and enable rewarding experiences for each other, our customers, and our partners.

Figure 13. Ciena's People Plan - Three Pillars

Attracting the Best

Success is not possible without continuous growth and inspired ideas – two facets of our business that we build through attracting talented, diverse people to work at Ciena. We aim to expand our workforce of the best and brightest in the following ways:

- Build a strong employer brand within our industry;
- Provide competitive reward packages;
- Be recognized for a positive candidate experience;
- Have a compelling and inspiring vision for the company; and,
- Demonstrate continued improvement in our flexible working environment.

Motivating our workforce is an important part of our success. Offering competitive benefits and flexible working opportunities attracts talented and innovative employees to our ever-growing global team.

Global Family Leave

We understand that work and home balance continue to intersect, so we offer a global family leave program which provides 18 weeks of fully paid time off and helps mothers return to work by allowing a reduced working week, with full pay for up to 6 months. Fathers receive 4 weeks paid leave, helping both parents to enjoy bonding time with their newborn. For those who are adopting, 4 weeks paid leave are provided any time during first 18 weeks from date of adoption. For Carers, 2 weeks of paid leave (per year) are provided to help look after a spouse, child, or parent who has serious health conditions. Where the statutory provisions exceed Ciena's global family leave program, Ciena's global family policy is integrated with statutory requirements.

Flexible Working

Ciena offers three classifications of flexible workers to provide the most ease for our employees. Office workers are those individuals who work permanently from a Ciena office and will work from home occasionally 2 to 3 times per month. A flexible worker is an office based employee who works from home on a regular and scheduled basis (typically 1 to 3 days per week). Lastly, an employee can be classified as a remote worker if they work full-time from home and may come into the office 2 to 3 times a month for meetings.

Focusing on Development

Career development is a top priority for employees around the world. We value the hard work of our employees and aspire to continually strengthen our people and invest in focused development through:

- Supporting new hires and transfers contribute in their roles;
- Fostering a culture of development;
- Ensuring all managers consistently deliver on their people management responsibilities;
- Building a healthy environment for internal mobility;
- Understanding and articulating future and desired skills to all individuals; and,
- Effectively delivering change through confident and capable leadership.

Our Individual Development Planning (IDP) process facilitates conversations between managers and individuals, which enables our employees to develop personally and professionally. These development activities also support continuous organization growth by fostering a supportive work environment to drive organizational growth. Also, for the first time in 2017, we are sharing transparently where people sit on a salary scale relative to the percentile benchmark.

Development Programs

Ciena provides full functional curriculums, formally and informally, for leaders, managers, and individuals. These programs provide the opportunity for on the job and stretch project assignments in various functional area of the business. We are pragmatic in the way we implement development opportunities and look to follow a 70/20/10 model for on-the-job development and collaborative learning from peers, in class rooms, and through courses and reading.
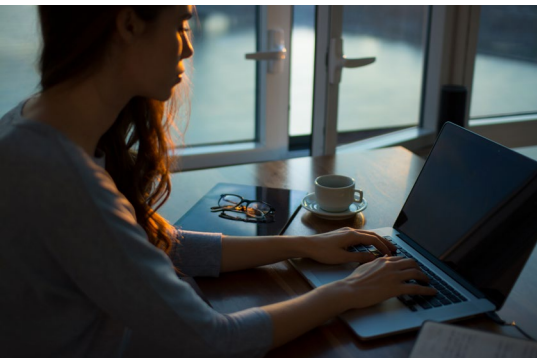
70% On-the-job Experience	**20%** Informal Learning	**10%** Formal Learning

Continuous Engagement

Our employee satisfaction begins from the ground up. We work to build and maintain our employees' confidence and fulfilment gained by working at Ciena through offering an inspiring and challenging work environment that values the skills and contributions of our employees. By adhering to the following basic principles of engagement, we are able to exceed expectations and thrive within our industry:

- Having an engaged and positive work environment that reflects openness, informality, and professionalism;
- Making sure everyone understands Ciena's direction and goals and how they personally contribute to them;
- Recognizing and rewarding individuals with transparent and competitive rewards strategies;
- Enabling a culture that supports work-life flexibility, inclusivity, and wellbeing; and,
- Communicating with honesty and authenticity.

Ciena's employee engagement approach was recognized in India when Ciena India received the "Most Successful Employee Engagement Award" in 2014 and 2015.

"This award reinforces our continued transformation to be a great place to work. We all recognize there are many factors that influence and impact employee engagement, and our efforts in maintaining the critical balance between a strong corporate culture with local differences reinforces what we do at Ciena against some of the biggest multinational companies operating out of India."

- Dimple Amin, Vice President GP&S - Business Operations and Managing Director - Ciena India

Recognition Programs

We never miss the opportunity to celebrate and recognize our people when they go above and beyond the call of duty. Our reward program, called bravo!, is a single platform that rewards exemplary acts with a range of rewards. From non-monetary thank-you's to financial rewards, those who live all five Ciena Core values are recognized through the Spirit of Ciena Employee and Team of the year.

In addition to the corporate recognitions, we award specialized annual functional awards for Technical Awards of Distinction (Ciena Fellows and Ciena Distinguished Engineers) and Sales & System Engineers.

Great Place to Work

In 2016, Ciena was honored to receive recognition of our exceptional corporate culture by being recognized as a "Great Place to Work". Full details of the survey and the results can be found at http://reviews.greatplacetowork.com/ciena-corporation, but we have highlighted a number of the key points that contributed to this success in the following summary.

Ciena has also been successful in being certified as a "Great Place to Work" for India, Canada, and United States in 2017 and 2018. These awards serve as a testament to the commitment of our people and speaks to our continual focus on creating the right environment with the right action plans to support it.

95% Company-paid health coverage for employees, dependents, and part-timers

Compensation Programs & Other Perks to Make Life Easier

401(k)
Employee stock purchase plan
Pre-tax savings account
Restricted stock units to employees

24 Weekly hours required for part-timers to receive health insurance

Fitness classes

Banking

Subsidized public transport

Personal travel service

Free beverages

Massage therapy

FORTUNE WORLD'S MOST ADMIRED COMPANIES® 2017

See the full details of [2017 World's Most Admired Companies](#).

Fortune World's Most Admired Companies

In addition to being recognized as a great workplace, Ciena has achieved an exemplary reputation in our industry, as evidenced by our ranking in FORTUNE magazine. The Fortune World's Most Admired Companies study surveys top executives and directors from eligible companies, as well as financial analysts, to identify the companies that enjoy the strongest reputations within their industries. In making the list for the first time, Ciena is ranked #5 in our industry. Each organization is measured against nine attributes:

- Ability to attract and retain talented people;
- Quality of management;
- Social responsibility to the community and the environment;
- Innovativeness;
- Quality of products or services;
- Wise use of corporate assets;
- Financial soundness;
- Long-term investment value; and,
- Effectiveness in doing business globally

Diversity and Inclusion – Striving for a Better Ciena

As part of our commitment to diversity and inclusion, we want to foster an environment that values and respects all individual's strengths, perspectives, ideas, and ability to meet the needs of our customers globally.

Ciena values the diversity of its workforce and respects its employees as individuals, regardless of their race, nationality, religion, sexual orientation, gender, disability, or age.

Women@Ciena

The Women@Ciena program is an internal networking and inclusion initiative that aims to motivate and inspire women at all levels of our organization by recognizing and fostering talent. Initiatives such as mentoring, coaching, and development discussions aim to encourage the hiring, development, and retention of women, and promote greater representation at the leadership and executive level. Although aimed at women, everyone is welcome to participate in and take advantage of the benefits of this network.

Women@Ciena in Action
Group photo of our very first Montreal Introduce a Girl to Engineering day. This picture features the entire team including the Ciena volunteers who helped make this event a success!

Women@Ciena regularly share news and updates through internal collaboration tools that keep people informed and up to date with what's happening and how to make the most of their network.It is also supported by a dedicated internal website, external community, and Women@Ciena email account.

Women@Ciena in Action
As a part of International Women's Day, our Denver chapter hosted Planting a Seed, an event to discuss best practices on how to nurture and grow women engagement inside organizations.

Black and African Heritage

In March 2017, Ciena launched its Black and African Heritage @ Ciena Council to focus on attracting, developing, retaining and increasing the contributions of black people and those of African heritage to enhance Ciena's business outcomes.

Black & African Heritage@Ciena
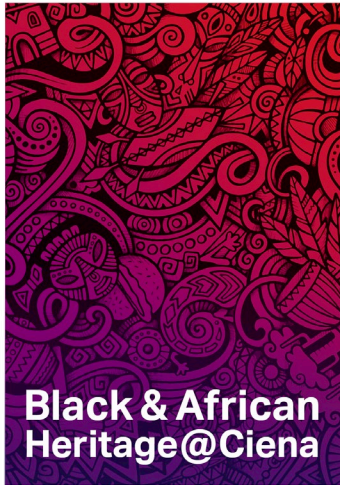
Ciena is one of 702 companies in the 2020 Women on Boards database of 1,745 to achieve this recognition.

Bringing like-minded people together strengthens the voice of employees and enables the power of diverse thinking to influence business decisions and results. With our commitment to build and retain diverse teams, we are keen to extend our Inclusivity Councils. We know diversity and differences make us stronger, more competitive, more innovative, and creative. Inclusion occurs when we successfully leverage our differences. With that in mind, these inclusivity groups extend our cultural reach, and create an opportunity for internal and external connections where employees can interact, learn, and support each other, as well as share interests.

- Formal programs support professional develpoment for all employees;
- Three events a year connect employees with peers from different racial/ethnic, religious or country-of-origin identities;
- Married employees in same-sex or heterosexual relationships receive the same benefits;
- Non-birth parents in same-sex relationships can take parental leave.

2020 Women on Boards Winning "W" Company
We're pleased to share that in 2016, Ciena was recognized as a 2020 Women on Boards Winning "W" Company. Ciena received this recognition for its commitment to maintaining a gender diverse board of directors in 2016 and having 20% or more of board seats held by female directors.

Started in 2010, 2020 Women on Boards is a non-profit organization dedicated to increasing the representation of women on U.S. company boards. The 2020 Women on Boards campaign goal is to increase the representation of women on boards to 20% by 2020. Focused on educating all people on the importance of this issue, the campaign aims to redefine what is successful corporate governance and gender diversity standards and to create a cultural imperative for corporate action.

Women@Ciena encourages gender diversity by encouraging women to take the steps necessary to make the most of their careers: from onboarding new talent, coaching, and mentoring to career planning, development, and progression, as well as help women the executive level. Thus, it is an honor to be recognized by the 2020 Women on Boards.

Wellbeing

Ciena supports our employees from a wellbeing perspective, with the intention of reducing lost time, managing health-related costs, harmonizing productivity and improving employee engagement. The following comprise some key elements of the program illustrated below in *Figure 14*:

- Flexible volunteering;
- Medical/ Dental/ Vision benefits;
- On-site health benefits such as flu shots and complete biometric screenings;
- Wellness reimbursement;
- Work-life balance options, such as flexible scheduling or telecommuting;
- Family care programs;
- Accident insurance benefits;
- Employee Assistance Program.

Ciena has continued to further develop its wellbeing program in 2017 with the introduction of Wellbeing Coordinators, a new wellbeing portal for staff, and an expansion of its capability to reflect a more holistic approach.

90 Days
Job-protected maternity leave

20 Days
Job-protected paternity leave & fully-paid parental leave for adoptive parents

Figure 14. Ciena's Wellbeing Program

Global Wellbeing

Physical: Healthy lifestyles, acute and chronic conditions, work environment.
- Wellness challenges
- Healthy lifestyle choices
- Biometric screening
- Disease management

Social: Connections, community, volunteering, peer support.
- Ciena Cares
- Community volunteerism
- Employee resource networks

Emotional: Resilience, mindfulness, mental health.
- ComPysch EAP
- Stress management
- Family resources

Financial: Security, life planning, retirement.
- Financial skills
- Personal budgeting
- Sofi student loans
- Financial planning

Community Engagement

Ciena's commitment to the communities where we live and work can be summed up with one simple statement: Ciena Cares. We care about our neighbors, our customers, our industry, and our current and future employees. Ciena Cares is our global community engagement program.

ciena cares

Date 10/7/16

Pay to the
Order of Donna M. Saunders Foundation $ 2,750.00

Two-thousand & seven hundred-fifty & 0/100   Dollars

Authorized James E. Moyla, Jr.   Memo 2nd Annual Walk
Signature   for Awareness

ciena cares

Given one of our core values is Outstanding People, it's no surprise that employees at Ciena have always demonstrated a strong commitment to good causes and charities in support of making a difference to those in the communities where they live and work, or indeed, further afield where a greater need exists. In 2014, we took a significant step in further enabling our company and people's outreach potential by giving every employee a day of paid volunteering time to work with not-for-profit organizations. However, we didn't stop there; we transformed Ciena Cares in 2017.

New Developments for 2017

In January 2017, we launched the next evolution of Ciena Cares, enabling even greater participation and reward across employees' investment in time and treasure, while expanding the scope and range of contributions supported by the company. The four main pillars comprising the program are summarized below in *Figure 15*.

Figure 15. Four Pillars of the Ciena Cares Program

Flexible Volunteer Hours
Ciena Cares Now Offers Flexible Volunteering to Help the Underserved (1 Day per year limit removed)

Supporting Regional Team Passions to assist the Underserved

Matching Time with Treasure
Ciena Cares Now Gives for Volunteer Hours Served- $10/hr (up to $500)

Supporting your Passion when you give your time (Any charity)

Matching Treasure with Treasure
Ciena Cares Now Matches Up to $1,000 In Donations

Supporting your Passion when you give your treasure (Any charity)

Disaster Relief
Ciena Cares Now Supports Disaster Relief with Policies

Disaster Relief

Aiding team members & customers in communities where we work & live in times of need

We have moved from a single "day of service", to a more flexible volunteering model and focused on underserved communities to gain access to basic needs (water, food, education, housing, employment, health). Staff now have a lot more flexibility to fulfill their passions.

We realized that many of our people volunteer outside of work time, so we wanted to recognise and reward that community outreach. Staff can now match the time they volunteer with a financial donation to the charity with whom they have been working.

We have doubled our gift matching threshold to $1000 per annum and made the process and tools that support it easier to use.

We have enabled staff to donate to particular disaster-relief appeals. Ciena may also match these donations too.

Supporting the Underserved

Key to our flexible volunteering is the focus on the underserved. The summary below provides our baseline reference for flexible volunteering.

Food & Water

People who lack access or means to affordable & nutritious food or sanitary water.

Examples: Water for People, food banks, meals for the elderly.

Housing

People who lack affordable housing due to unemployment, poverty, mental illness, substance abuse, & lack of needed services.

Examples: Youth homeless programs, homeless shelters.

Health

People who face barriers to accessing healthcare services due to income, race/ethnicity, age, sex, insurance coverage, absence of usual source of care.

Examples: Cross-border, international medical response, charities supporting wounded veterans.

Education

Students who do not receive adequate resources because they are low-income individuals, racial/ethnic minorities, 1st generation students.

Examples: Literacy programs, education resources, scholarship & mentor programs.

Employment

People who are low-income, homeless, disabled, formerly incarcerated, elderly, non-native speakers, youth who are disconnected from school.

Examples: Back to work charities, veterans employment programs.

Ciena Cares Champions

Ciena Cares Champions are Ciena people who are passionate about the philanthropic impact of Ciena and want to be actively engaged in our charitable programs. They are supported by Community Engagement Teams to make a real difference to the community.

Figure 16. Ciena Cares Champions

North America

New York	Denver
Petaluma	Ottawa
Spokane	Hanover
Montreal	Dallas
San Jose	Raleigh
Alpharetta	Miramar

EMEA

Paris	London
Spain	Belfast
Tel Aviv	Franfurt / Immenstadt

APAC

Sydney	Melbourne
	Manila

INDIA

Gurgaon

CALA

Buenos Aires	Sao Paulo
Guadalajara	

Thanks for all the good work you and Ciena do. We've had the privilege of working with many different teams in the US in the past several years and they have become people that I rely on to make a difference in the lives of the children living with chronic illnesses that we help. No matter which team, they immediately understood and appreciated our approach of giving anonymously because it has an exponential impact to children (That has been rare in my 18 years of running the organization).

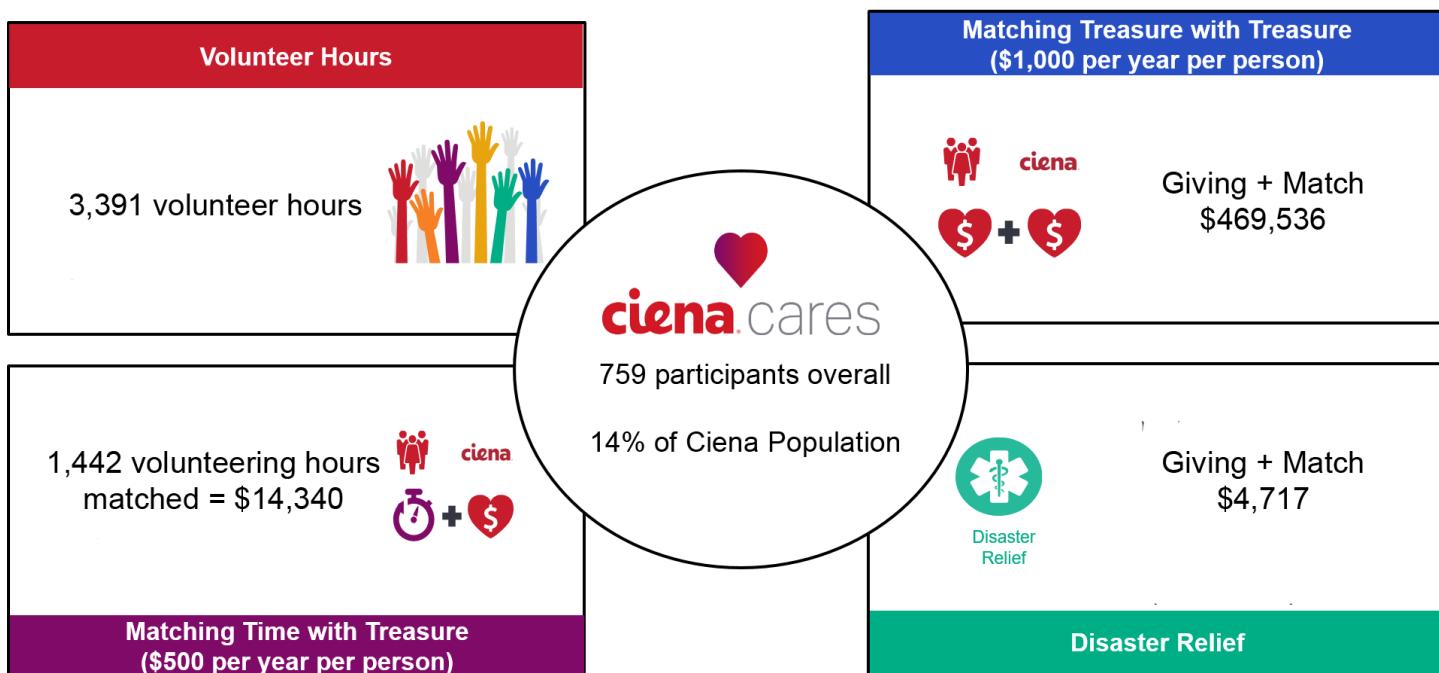- Shimmy Mehta, Founder & CEO

@ngelwish

Ciena Cares in Action

Across the company there are stories of individuals and teams that give their time or their treasure to support their communities and people in need. This energized response is a perfect representation of Ciena people living for the experience and helping to deliver better outcomes in the world.

The positive impact to the communities receiving donations and time is clear, but the internal benefits can be enormous, too. Corporate giving is no longer just about giving; it's about creating fully integrated opportunities to engage a company's employees and communities. Furthermore, impact counts – not only for the benefit of good causes, but also for the bottom line of companies.

Ciena recognizes that community outreach is important to people considering their first or next career move, and we know employees are more likely to stay and recommend Ciena to others when their passions for community engagement are supported. We have seen volunteering contribute to a greater sense of belonging and achievement, personal growth, and greater feelings of wellbeing.

Figure 17. Ciena Cares Community Engagement Performance Summary
(November 1, 2017 through to October 28, 2018)

Volunteer Hours

3,391 volunteer hours

Matching Treasure with Treasure
($1,000 per year per person)

Giving + Match
$469,536

ciena.cares

759 participants overall

14% of Ciena Population

1,442 volunteering hours
matched = $14,340

Matching Time with Treasure
($500 per year per person)

Disaster Relief

Giving + Match
$4,717

Disaster Relief

Giving back is part of our DNA. We have captured a few examples of Ciena Cares in action below.

Ciena Cares: Spotlights from around the world

You and so many caring employees of Ciena, make brighter futures possible for the women we serve. Women's Bean Project is very grateful to Ciena as they have jumped in...both feet! Your employee engagement has been amazing!

- Luanne Hill, Director of Development

We at the Ottawa Food Bank - Community Harvest program are profoundly grateful to our friends and volunteers at Ciena, not only for the enormous amount of work that you have provided to the program through our farm, but also the financial donations that your organization matches for each hour of volunteer time. Thank you so much for your support and we look forward to hosting more volunteers from Ciena in the months and years to come.

- Jason Gray, Community Harvest Manager

I just wanted to say a massive thank you to all of you that took the time to volunteer this week at Kidtropolis. The feedback on the stand and from the staff was excellent, so thank you again.

- Julian Margolin, Chief Ambassador

Belfast

The Belfast office had three relay teams running in the Belfast Relay Marathon in May 2018 to raise money for the Northern Ireland Children's Hospice, a local charity that provides unconditional care and support to terminally ill children. As a team, the runners raised £1,348.25.

Ciena Cares: The India Team's Mentorship Program

Mahatma Gandhi once said, "The best way to find yourself is to lose yourself in the service of others." Many at our India office follow this mantra as they help to enrich the lives of the less fortunate. The volunteers spend their time mentoring kids from the local DPS Shiksha Kendra school.

The school has been working towards providing quality education to children of economically weaker sections of society since 2003. More than 1,350 children have benefitted from the initiative since its inception. Our India office began to help the school in July 2013 and since then 140 have been mentored by our volunteers. Every academic year, the volunteers pitch in to make this program a success by devoting a part of their work time teaching 9th and 10th grade Math and Science to the students. Twice a week, the students visit our Unitech campus in Gurgaon to spend almost two hours with our team learning from a prescribed syllabus. The volunteers (some seen in the picture to the left with a mentee group) make the lesson plans for the academic year and not only is this a chance for them to give back, but it allows those who would rarely cross paths during their regular working hours to interact and collaborate due to their shared interest of serving our community.

The intangible benefits of volunteering with a program like this are immense. Volunteers get to improve their communications skills, build self-confidence and get introduced to the development sector. It's also a refreshing change of pace for the volunteers to revisit concepts of trigonometry, geometry, atoms and electrical energy along with the kids.

London

A group of 17 people from our London office volunteered to support KidsOut at the British Toy and Hobby Association's Toy Fair. The fair always ends with the famed Trolley Dash where KidsOut is able to pass through the fair for 30 minutes and collect as many toys as it can from exhibitors. In collaboration with other companies, our volunteers collected over 4,000 toys which will either be distributed to refuge homes for use in playrooms or used in the ongoing KidsOut Toy Box service. The organization works with Women's Aid Federation refuges across the UK to offer fun and positive experiences to children who have escaped domestic abuse, including Fun Days out and toys for playrooms.

Denver

In February 2017, the Ciena Denver team members along with their friends and family participated in the American Lung Association's Denver Fight for Air Climb. They climbed the stairs of Denver's tallest skyscraper which is 56 stories totaling in 1,098 steps. They raised nearly $5,000 and were the 7th top fundraising team in the area.

In March, the Denver team toured the Women's Bean Project (WBP), their Ciena Cares charter charity organization for 2017. The organization is a transitional job training program for chronically unemployed and impoverished women. Annually, the WBP holds a graduation celebration and fundraising luncheon called Ready, Set, Grow. Ciena Cares Denver was a corporate sponsor of the luncheon for past and present program participants. Additionally, the Denver team raised $2,355 (before company matching) for the luncheon.

Miramar

The Miramar office prepared 140 sandwiches for lunches that were later delivered to the Soup Kitchen at All Saints Mission. They were distributed to 120 homeless men and women in the local community. The office also recently collected donations to help the small communities in the mountains of Ecuador known as Mindo who need over the counter medications and supplies. The staff collected Adult & Children Multi Vitamins, Tylenol, Motrin, Ibuprofen, Antacids (such as Tums, Pepcid, etc.), Children's allergy meds and lubricant eye drops. The donations are managed and delivered by Mindo Futures.

Forward-Looking Statements

Information presented in this report contains a number of forward-looking statements. These statements are based on current expectations, forecasts, assumptions and other information available to Ciena as of the date hereof.

Forward-looking statements are provided for the purpose of assisting readers in understanding current expectations and plans regarding our CSR initiatives and objectives and financial and operational priorities. Readers should be aware that such information is not appropriate for other purposes. Forward-looking statements include Ciena's long-term financial targets, prospective financial results, return of capital plans, business strategies, expectations about its addressable markets and market share and outlook for future periods, as well as statements regarding the future. Often, these can be identified by the use of forward-looking words such as "target", "anticipate", "believe", "could", "estimate", "expect", "intend", "may", "should", "will", and "would" or similar words.

Forward-looking statements are not guarantees of future performance and are subject to risks that may cause actual results to differ materially from conclusions, goals, targets, forecasts or projections expressed in such statements, including among others, risks related to employee, stakeholder, customer, supplier, and NGO engagement and commitment to these initiatives, costs of implementing these initiatives, and the impact of changing legislation and social goals on CSR initiatives generally and risks related to our operational and financial performance reported in public filings and annual reports.

Our passion is to provide rewarding experiences that result in exceptional outcomes—for you, and for your end-users. As a network strategy and technology company, we apply technology in the context of your world—working to activate your agenda and make a meaningful difference.

We welcome your feedback at masteven@ciena.com.

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