

Sustainability Status of Silicon Valley 2019

Key Findings



Welcome to CSE's second research on Sustainability Status of Silicon Valley.

This report analyzes and presents conclusions on the sustainability reporting trends for the reporting period 2018-2019 of 100 leading tech companies in Silicon Valley. I would like to thank all CSE experts who worked on this research and who helped bring it to you.

Enjoy the reading!

Nikos Avlonas

President and Founder CSE

Contents

Contents	3
Executive Summary	4
Introduction.....	6
Silicon Valley Vibe	6
Research Details	6
Trends, Key Findings and Analysis	8
Company Size	8
Sustainability Reports	9
Company Type	10
Sustainability Standards and Guidelines	10
Comprehensive Sustainability Practices Analysis	11
Good Practices.....	13
Sustainability Focus Areas Analysis	16
Sustainability Rating Analysis (CSRHub)	18
Gender Gap	21
Trends in AI and Blockchain	21
Blockchain.....	21
AI.....	22

Executive Summary

This research provides an analysis of the current state of sustainability and corporate social responsibility status by technology companies based in Silicon Valley. It examines 100 technology companies, many of which are global leaders. It is intended for stakeholder groups interested in sustainability, including investors, business leaders, company boards, CSR and sustainability professionals, NGOs, Financial Analysts, academia and students. The research examines characteristics as size, type, industry, and whether companies and organizations have sustainability practices, employee sustainability professionals and provide disclosures on a variety of sustainability issues.

This research began in 2016. The past three years new trends in Sustainability including the United Nations Sustainable Development Goals (SDGs), Climate Change pressures and other factors have influenced the current state of sustainability both in Silicon Valley and around the world.

Companies: - 82% of companies are Large (>1000 employees) and 18% are MNEs (multinational enterprises). Companies categorized as Small Medium Business (SMB) in 2016 have grown to Large status.

Sustainability Reports - Of the 100 companies, 60% have a sustainability report, up from 29% in 2016. Fifty percent (50%) used GRI compliant reporting standards; 37% reported climate change performance to the CDP; 23% included reference to the UN Sustainable Development Goals, ranging from a simple statement of support to a full integration; 22% have been externally assured, significantly increasing reporting accuracy and credibility, key for investors and rating indices.

Company type – Most companies are publicly traded. Of the companies listed on the NASDAQ, 72% have a sustainability report. On the NYSE, 38% have a sustainability report.

Comprehensive Sustainability Practices - Companies with comprehensive sustainable practices show action in six focus areas: **Community, Environment, Ethics, Employees, Supply Chain and Philanthropy**. Of the companies with acceptable Sustainability Reports, 23 displayed a sustainability reporting strategy that involves all six focus areas. This represents 38% of companies with sustainability reports and only 23% of all companies in the study.

Focus Areas Analysis – Compared to previous research among reporting companies, Community, Environment, Supply Chain and Philanthropy showed significant increase in reporting. Employment held the same, and Ethics decreased from 95% to 92%. Among all companies, Environment and Ethics were the most reported focus areas.

Importance of ESG Ratings - Of the companies analyzed, 98% have an ESG ratings profile, which shows the importance of ratings to sustainability strategy and approach. According to CSRHub, the top-rated sectors are IT, Semiconductors, Computer Software, Financial Services, Medical Devices and Biotechnology.

Gender Gap – Silicon Valley lags significantly behind the national average of women in the workforce.

Blockchain - Sustainability gains in the form of reduced environmental impact and better assurance of human rights and fair work practices seem to be promising outcomes of blockchain applications.

AI - While there are many possible applications for sustainability, there are many risks associated with bias, poor decision making, low transparency, job losses and malevolent use.

Overall, the research indicates that Silicon Valley has made improvements in sustainability strategy and reporting over the past three reporting cycles. Despite improvement, much work remains for Silicon Valley to rise to national averages within the corporate world.

Introduction

Silicon Valley Vibe

In 2016, CSE released its first research report on Silicon Valley. The intent was to provide an analysis of the state of sustainability reporting by technology companies and organizations. Sustainability reporting has long stood as a proxy for a company's commitment to sustainability and a transparent means for investors and other stakeholders to gain insight on corporate social responsibility (CSR) strategy.

Many assumptions existed in 2016 that are still pervasive in 2019. That Silicon Valley is in tune to sustainability needs. That Millennials, who dominate the culture, are purpose driven and expect sustainability from employers. That technology will be the savior of humankind.

The 2016 research did not find sustainability to be a key component of Silicon Valley companies and organizations. No region can possibly live up to the hype!

What might be an explanation? Silicon Valley's predominate cultural vibe is that of startups and entrepreneurs. It is characterized by a drive for quick profits and an exit strategy. Companies are often looking for short-term gains to maximize profit. The purpose-driven Millennials are also trend seekers and accustomed to moving from company to company, often well within the three years it takes to establish a strong CSR culture. Most importantly, perhaps, Silicon Valley is investor driven with a high density of angel investors and venture capitalists. In 2016, most companies looking to finance the next big thing were not using sustainability metrics in their analysis. If investors weren't asking, why should management provide?

Fast forward to 2019. What will we find? The past three years have seen the rise of the United Nations Sustainable Development Goals (SDGs) as part of corporate strategy. They have seen impetus on sustainability placed by insurance companies' focus on risk management and investment firms such as Blackrock insisting on long-term, sustainability focused strategies from companies in its investment portfolio. Might these changes influence how Silicon Valley operates today?

This research provides an analysis of the current state of sustainability and corporate social responsibility reporting by technology companies and organizations that are based in Silicon Valley. With this insight, readers can judge which advances are most productive and where there is still room to grow.

Research Details

The process with which this series of research was conducted consists of three parts. The first part of the process encompassed data gathering. For consistency from 2016 to 2019, we focused on the same companies. Data gathering involved finding one hundred technology companies headquartered in Silicon Valley, identifying their product or service, researching whether or not each of the companies disclose their sustainability practices, whether they have a sustainability professional and have issued a sustainability report. For those companies with sustainability professionals or reports, we delved into the specific duties

and details of those professionals and reports. For each of the sustainability reports found, a link to the online version of the report was provided, and if no link was available, a PDF version was attached.

The second part of the research consisted of gathering more specific data pertaining to the companies' sustainability efforts. For each company that practiced some form of sustainability, a short paragraph describing their sustainability practices was written. Additional company details were gathered. Items like company size, industry classification, company type, and additional details and reports were added to the database. Each company was categorized according to the Global Reporting Initiative (GRI). The companies' sustainability focus areas were categorized to fit six different sustainability categories of Community, Environment, Ethics, Employees, Supply Chain and Philanthropy.

Sustainability performance data were taken from the CSRHub ratings platform. CSRHub's objective is to provide consistent ratings of Corporate Social Responsibility (CSR) performance for as broad a range of companies as possible. CSRHub divides CSR performance into four categories: Environment, Community, Employees and Governance, and twelve subcategories. They gather data from publicly available, active sources and convert it into a rating on a 0 to 100 scale (100 = positive rating). Each rated company is categorized by industry, based loosely on the NAICS code structure, and location in which it participates to create industry and country averages.

The third part of the research consisted of the analysis of all of the data from part one and part two. Graphs and charts were created to portray trends, major findings and analysis.

The primary criteria used for choosing the one hundred technology companies was their size. At the time of original research, a company was categorized as being a Small and Mid-sized Business (SMB) if it had fewer than 1000 employees and as a Large business if it had greater than 1000 employees. The research also includes MNEs (multinational enterprises). The companies chosen are some of the largest technology companies in the Silicon Valley area. This year's research omits SMBs in the sample mix as the few SMBs from 2016 have grown to at least Large. The focus on primarily large businesses is an attempt to take a closer look at what industry leaders are concentrating their sustainability efforts.

Trends, Key Findings and Analysis

Company Size

Company size is the primary criteria used for choosing the one hundred technology companies in this series of research. The companies chosen are some of the largest technology companies in the Silicon Valley area.

Unlike 2016, this year's research does not include SMBs (fewer than 1000 employees) in the sample mix. Companies on the cusp in 2016 have grown to Large status, those businesses with greater than 1000 employees. The focus on large businesses is an attempt to take a closer look at what industry leaders are concentrating their sustainability efforts.

With the overall growth in company size, this year's research differentiates MNEs (multinational enterprises) defined by the OECD as enterprises that are established in several countries and coordinate their operations in various ways, including complex supply chains. Companies in this range are increasingly expected to adhere to sustainability guidelines described by the OECD as voluntary principles and standards, covering all major areas of business ethics: human rights, information disclosure, employment and labor, environment, anti-corruption, consumer interests, science and technology, competition and taxation.

The company size of the one hundred technology companies are broken down into Large enterprises and MNEs.

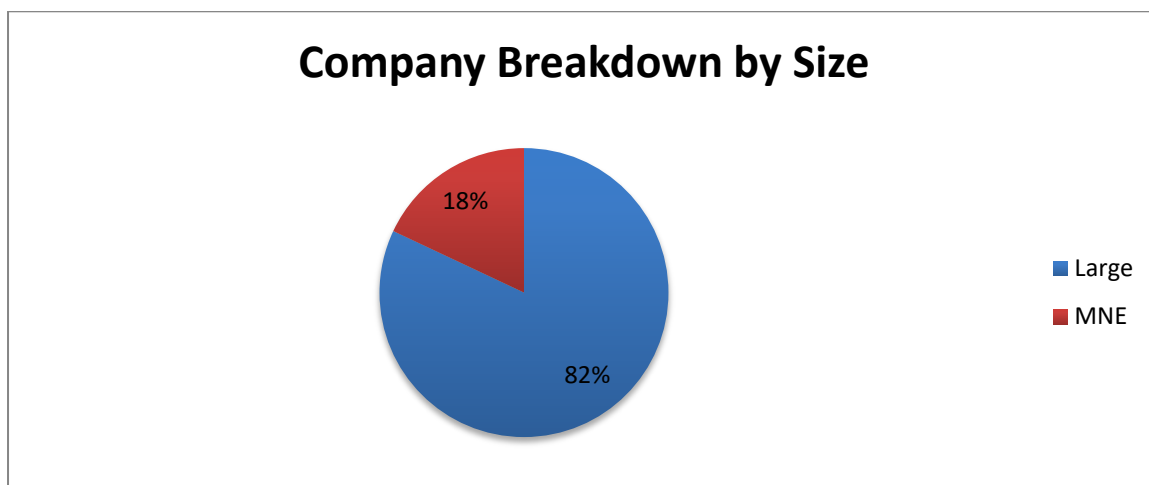


Image 1: Large Businesses vs MNEs

Sustainability Reports

In analyzing Sustainability Reports, this research only takes into consideration reports that are in a clear report format. The research omits reports that are strictly online or in a web-based style featuring only quick facts or brief overviews of large and vague goals.

Of the one hundred companies, 60% have a sustainability report.

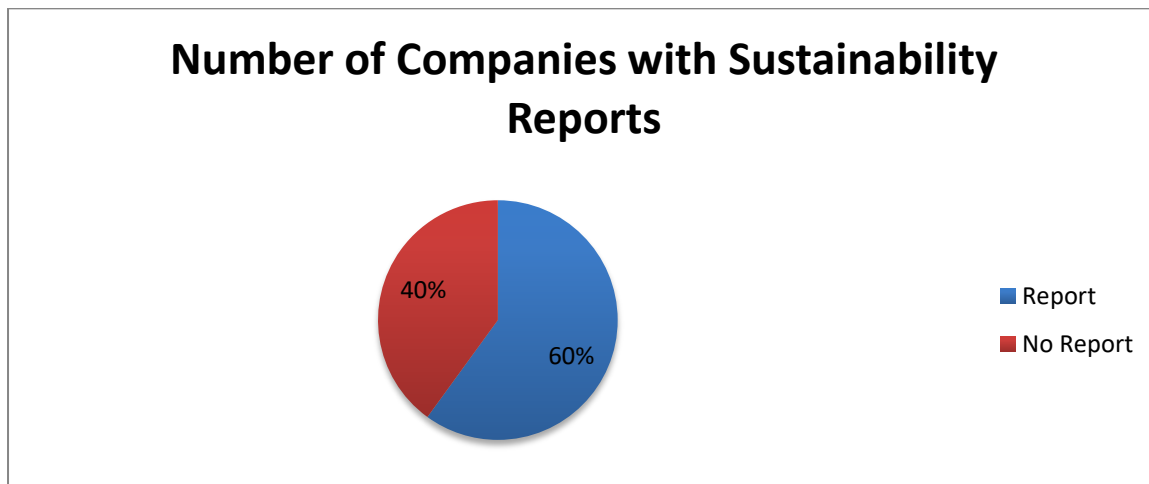


Image 2: Percentage of Companies with Sustainability Reports

Compared to the results of our previous research, there is a significant increase in the number of companies that publish a sustainability report. For the period 2013-2016, the percentage of companies that published a sustainability report was 29%, demonstrating over a 100% increase (107%). According to recent CSE research for Sustainability Reporting in the North America, sectors driving sustainability reporting include energy, mining, food and retail.

Company Type

Below is a breakdown of Listed versus Not-Listed Companies as defined by the GRI. Of the companies studied, 84% are Listed and 16% are Not-Listed.

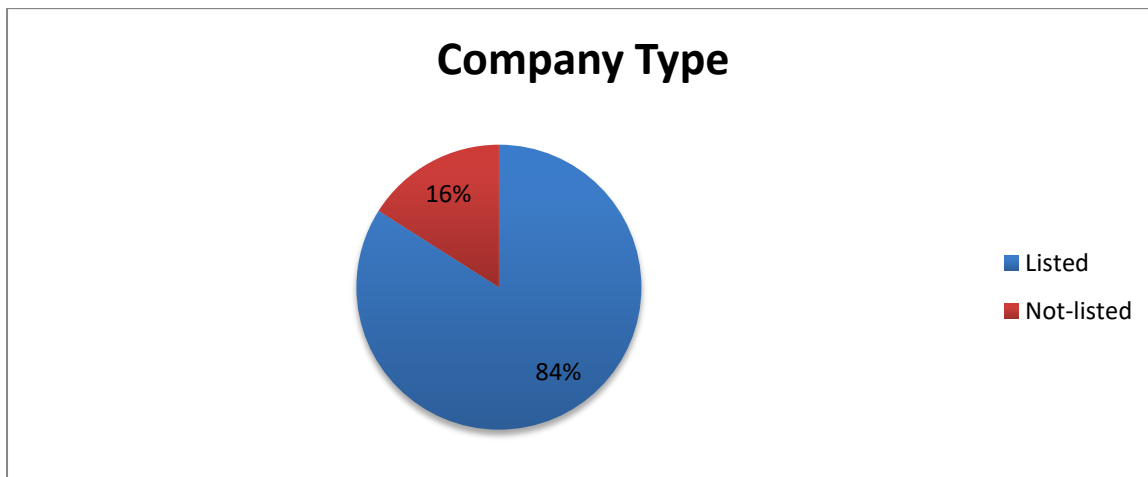


Image 7: Listed vs. Not-listed Companies

The companies are also categorized as Publicly Traded or Other. The NASDAQ and NYSE list 90% of the companies in the study. The others are OTC, private, subsidiaries or non-profit. Of the companies listed on the NASDAQ, 72% have a sustainability report. Of the companies listed on the NYSE, 38% have a sustainability report. While both stock exchanges have sustainability indexes, the discrepancy might be attributed to NASDAQ's greater emphasis on sustainability, offering more resources and exerting greater pressure that listed companies adhere to sustainability principles such as those of the UN Global Compact, of which NASDAQ is a member. Of non-publicly traded companies or organizations, 20% have sustainability reports, and these companies are all subsidiaries of companies also having sustainability reports.

Sustainability Standards and Guidelines

Part of the research was to examine how many companies use specific standards and guidelines for their sustainability reporting practices, as well as for other sustainability topics and processes. Specifically, we examined how many companies use the GRI Reporting Standards for their sustainability reports, how many have included reference to the United Nations Sustainable Development Goals in their sustainability report, how many have sought external assurance for their sustainability report, and how many report to the CDP (Carbon Disclosure Project) on their Greenhouse Gas Emissions performance.

Thirty reports out of the 60 (50%) have been conducted in a manner compliant to the GRI Reporting Standards. Those report used either the new version of the reporting standards, the GRI STANDARDS, or the previous version, the GRI G4, which was still active in 2018.

Twenty-two (37%) of the reporting companies have reported their climate change performance to the CDP which shows their commitment to specific actions and goals in order to minimize their contribution to climate change.

Fourteen (23%) companies have included in their report reference to the UN Sustainable Development Goals. This reference ranges from a simple statement of support of the SDGs up to a full integration and linkage between the company's performance, goals and initiatives and the corresponding SDGs. Where Silicon Valley lagged in 2016, in reference to the UN SDGs, Silicon Valley leads North America at large where only 14% of reports reference or integrate the SDGs (CSE, 2018).

Finally, thirteen (22%) reports have been externally assured, a process that significantly increase the reports accuracy and credibility and is key for investors and rating indices. This lags the national average of 25.7% of sustainability reports having external assurance (CSE, 2018).

Comprehensive Sustainability Practices Analysis

Of the companies with Sustainability Reports, the research assessed if a company demonstrates comprehensive sustainable practices. Companies with comprehensive sustainable practices showed action and effort in the following six focus areas of sustainability: Community, Environment, Ethics, Employees, Supply Chain and Philanthropy.

Community focuses on Community Outreach, Volunteerism, Education Programs and Youth Support Programs.

Environment involves Environmental Sustainability, Facility/Product/Operations Sustainability, Safer Materials and Carbon Reduction.

Ethics involves Governance, Ethics, Transparency and Compliance.

The **Employees** focus area involves practices surrounding employee involvement in the community and employee development.

The **Supply Chain** focus area involves Health and Safety, Conflict Minerals and Supply Chains.

The **Philanthropy** focus area involves topics surrounding the companies' work with their Philanthropic Foundations.

Of the companies with acceptable Sustainability Reports, the following twenty-three companies are examples of companies which have displayed a sustainability reporting strategy that involves the six aforementioned sustainability focus areas. They are included in the group of companies that demonstrated

comprehensive sustainable practices. This represents 38% of companies with sustainability reports and only 23% of all the companies in the study.

Of the following companies, all of them have a sustainability report or web-based sustainability efforts summary. The reports included in this section of analysis include both comprehensive PDF and also less comprehensive web-based sustainability summary reports.

Company	Sustainability Strategy Objectives - Material Issues					
	Community (Y/N)	Environment (Y/N)	Ethics (Y/N)	Employees (Y/N)	Supply Chain (Y/N)	Philanthropy (Y/N)
Adobe	Yes	Yes	Yes	Yes	Yes	Yes
Agilent Technologies	Yes	Yes	Yes	Yes	Yes	Yes
Applied Materials	Yes	Yes	Yes	Yes	Yes	Yes
Atmel Corporation	Yes	Yes	Yes	Yes	Yes	Yes
Cisco	Yes	Yes	Yes	Yes	Yes	Yes
Coherent, Inc.	Yes	Yes	Yes	Yes	Yes	Yes
Fairchild Semiconductor	Yes	Yes	Yes	Yes	Yes	Yes
Hewlett-Packard	Yes	Yes	Yes	Yes	Yes	Yes
HGST	Yes	Yes	Yes	Yes	Yes	Yes
Intel	Yes	Yes	Yes	Yes	Yes	Yes
Juniper Networks	Yes	Yes	Yes	Yes	Yes	Yes
Lam Research	Yes	Yes	Yes	Yes	Yes	Yes
Logitech	Yes	Yes	Yes	Yes	Yes	Yes
NVIDIA	Yes	Yes	Yes	Yes	Yes	Yes
Oracle	Yes	Yes	Yes	Yes	Yes	Yes
Salesforce	Yes	Yes	Yes	Yes	Yes	Yes
SunPower	Yes	Yes	Yes	Yes	Yes	Yes

Symantec	Yes	Yes	Yes	Yes	Yes	Yes
Synopsys	Yes	Yes	Yes	Yes	Yes	Yes
Varian Medical Systems	Yes	Yes	Yes	Yes	Yes	Yes
VMware	Yes	Yes	Yes	Yes	Yes	Yes
Workday, Inc.	Yes	Yes	Yes	Yes	Yes	Yes
Xilinx	Yes	Yes	Yes	Yes	Yes	Yes

Image 8: Companies with Comprehensive Sustainable Practices

Good Practices

Companies exhibiting good practices have clearly communicated sustainability initiatives and often have articulated this as a strategy or mission statement. They participate in all six of the sustainability practices examined by this research. They have a sustainability professional in a leadership position and often have a sustainability focused department or cross-divisional team. They publish sustainability reports which express goals and accomplishments. They are also leaders in ESG ratings, important to investors.

Adobe and Intel are two companies from Silicon Valley which exhibit sustainability good practices.

Adobe's [Corporate Responsibility](#) section focuses on environmental sustainability and community outreach in addition to its compliance-driven sustainability efforts in the areas of corporate governance and supply chains. The company focuses on [waste reduction](#) via operational sustainability actions, recycling and [sustainable product innovations](#). Adobe's [energy conservation](#) efforts include joining [RE100](#) and a pledge to The White House's American Business Act on Climate. **Community:** Adobe [Employee Outreach Fund](#), Adobe's [Corporate Responsibility \(CR\) Action Teams](#) connect Adobe employees, resources and products to increase the impact of their nonprofit partners. The [Product Donation Program](#) helps 15,000 nonprofits worldwide benefit from their software product donations. [Project 1324](#) provides opportunities for emerging creatives to connect, collaborate on projects, and increase the visibility and impact of their work. Adobe has committed over \$300 million in software and professional development services to the White House's [ConnectED](#) initiative. Examples of corporate governance documents that Adobe features are its Amended and Restated Bylaws, the Code of Business Conduct, Code of Business Ethics, Corporate Governance Guidelines and well as a [Taxation Policy Statement](#). The supply chain section features the company's [Global Human Rights Policy](#), [Conflict Minerals Report](#), [Business Partner Code of Conduct](#), [Conflict of Interest Policy Statement](#), [Slavery and Human Trafficking Policy Statement](#), and their [Supply Chain Implementation Standard](#) along with other important documents.

Adobe's overall CSRhub rating is 63, with environment being the highest rated category (73) followed by Employees (66), Governance (59) and Community (54). Adobe has 49 active sources used to derive this rating such as: Dow Jones Sustainability North America Index, Fortune 100 Best Companies, Glassdoor.com Top 50 Best Places to Work, Ideal Ratings, Vigeo and NASDAQ OMX CRD Global Sustainability Index.

Intel's Corporate Responsibility efforts include Intel's Corporate Governance and Ethics, Investor Relations and Public Policy, Supply chain responsibility, Intel Programs for Girls and Women, She Will Connect program (including Girl Rising, Girls and Women in STEM). Intel Involved includes Fighting Hunger Coalition, LEGO* Robotics, Community Giving, Intel Involved Volunteers, Stories of a Better Future. Intel Invests in Communities includes Investing in America, Inspiring young innovators; Supporting teachers and schools, Strengthening communities, and Intel Around the World. Intel Education delivers a comprehensive approach to creating successful learning environments.

Intel's overall CSRhub rating is 63, with environment being the highest rated category (68) followed by Employees (67), Governance (61) and Community (58). Intel has 61 active sources used to derive this rating such as: Dow Jones Sustainability North America Index, EIRIS, Global Reporting Initiative, UN Global Compact, Trucost, NASDAQ OMX CRD Global Sustainability Index and MSCI ESG.

Sustainability Focus Areas Analysis

The following industries demonstrated a heavy emphasis on Environment, Ethics and compliance:

- Electrical and electronic manufacturing
- Information technology and services
- Renewables and environment

Ethics, which includes governance, compliance and transparency, was practiced by 57 of the 100 companies. *Image 9* shows the companies' aggregated efforts in the various respective categories of sustainability and refers to the total sample of 100 companies. It demonstrates that environment is of highest importance out of the six categories. Environment is followed by Ethics and Supply Chain, with Employees and Community coming in fourth and fifth, with philanthropy in last place.

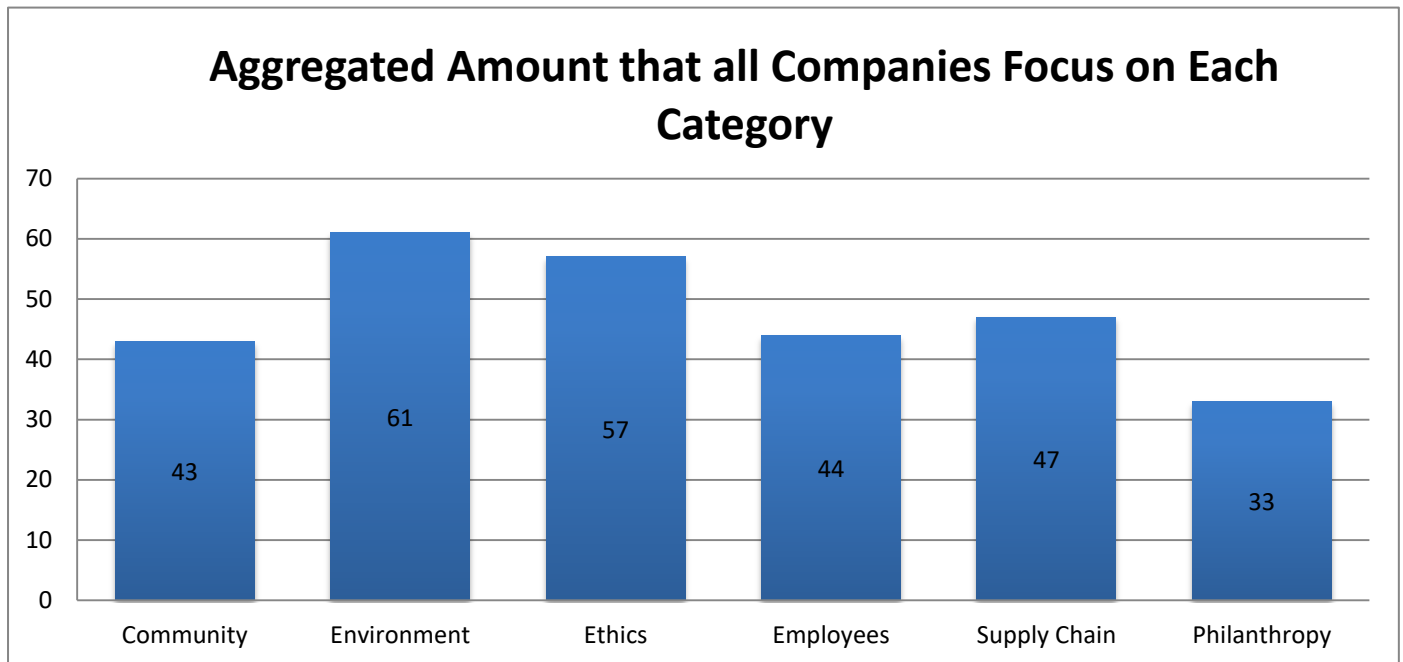


Image 9: Aggregated Amount That All Companies Focus on Each Respective Category

Focusing on the reporting companies, Environment and Ethics are the top reported general topics. Compared to the previous research, Community, Environment, Supply Chain and Philanthropy showed significant increase in reporting. Employment held the same, and Ethics decreased from 95% to 92%.

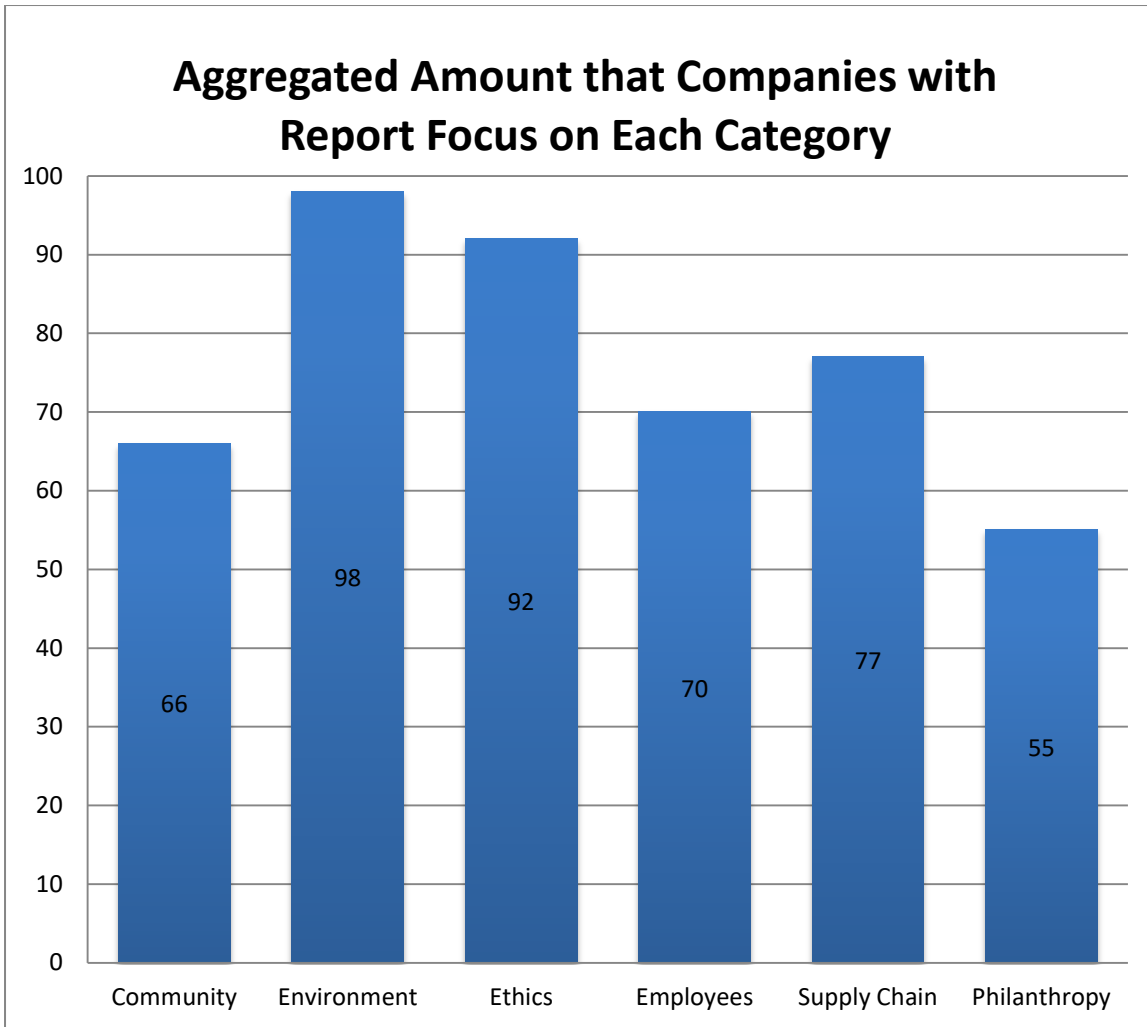


Image 10: Aggregated Amount That Companies with Report Focus on Each Respective Category

Pillar	2017-2018	2013-2016
Community	66%	51%
Environment	98%	63%
Ethics	92%	95%
Employees	70%	70%
Supply Chain	77%	64%
Philanthropy	55%	32%

Comparison of efforts spent in each sector in the areas of Ethics, Environment and Community

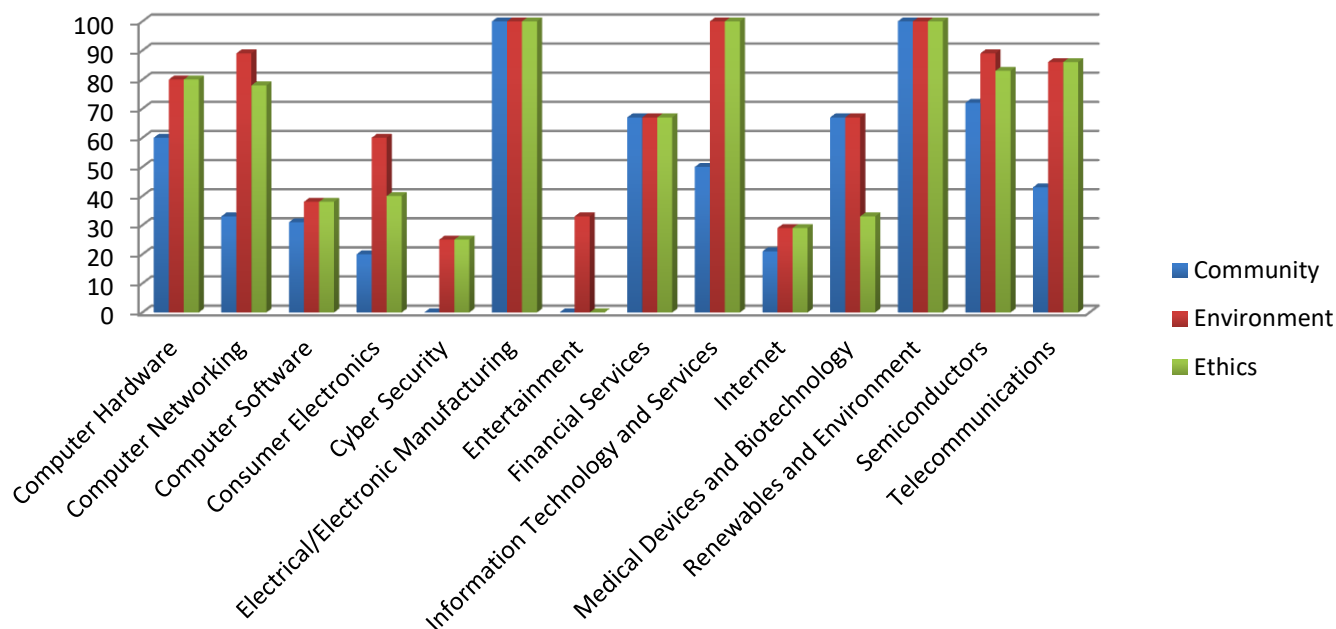


Image 10: Comparison of efforts spent in each sector in the areas of Ethics, Environment and Community

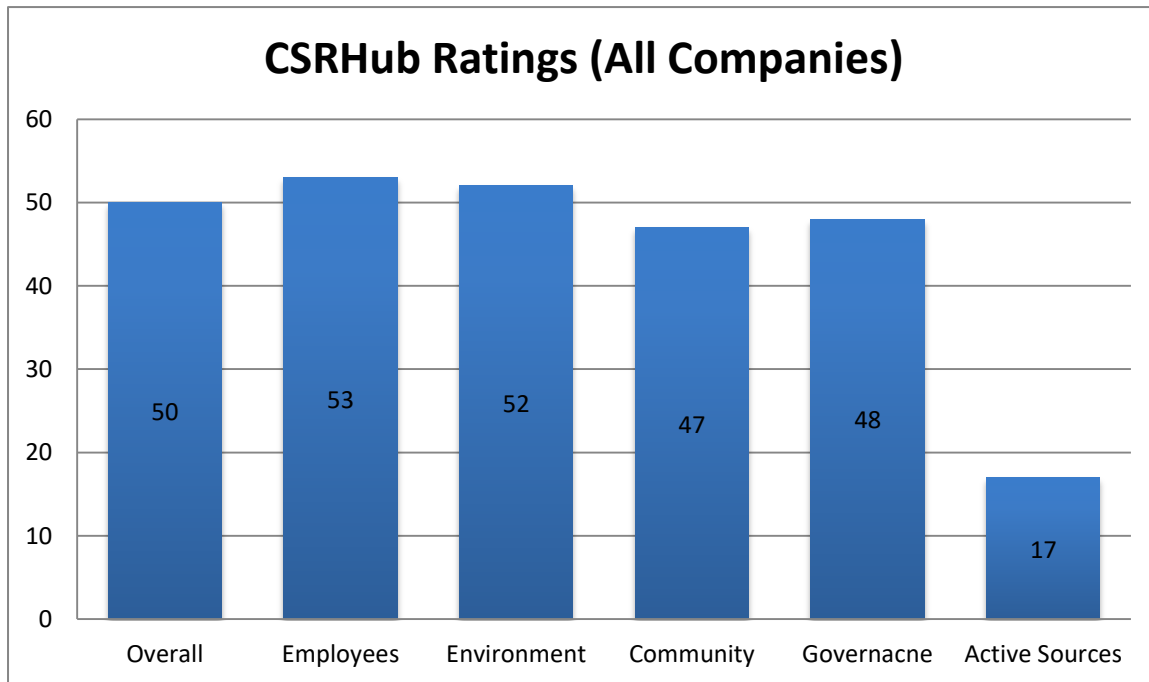
Sustainability ESG Ratings Analysis (Source -CSRHub)

CSRHub offers consensus Environment, Social & Governance (ESG) ratings to benchmark performance, study supply chains, improve reporting, and build portfolios. It offers transparent ratings and rankings of 17,443 companies from 139 countries, driven by 630 industry-leading CSR/ESG data sources including ESG analyst, crowd, government, publication, and not-for-profit data. It offers an overall rating, with ratings for four main categories (Employees, Environment, Governance, Community) and 12 subcategories (Community Development & Philanthropy, Product, Human Rights & Supply Chain, Compensation & Benefits, Diversity & Labor Rights, Training/Health & Safety, Energy & Climate Change, Environment Policy & Reporting, Resource Management, Board, Leadership Ethics, Transparency & Reporting). It also provides information on the active sources used to calculate the rating.

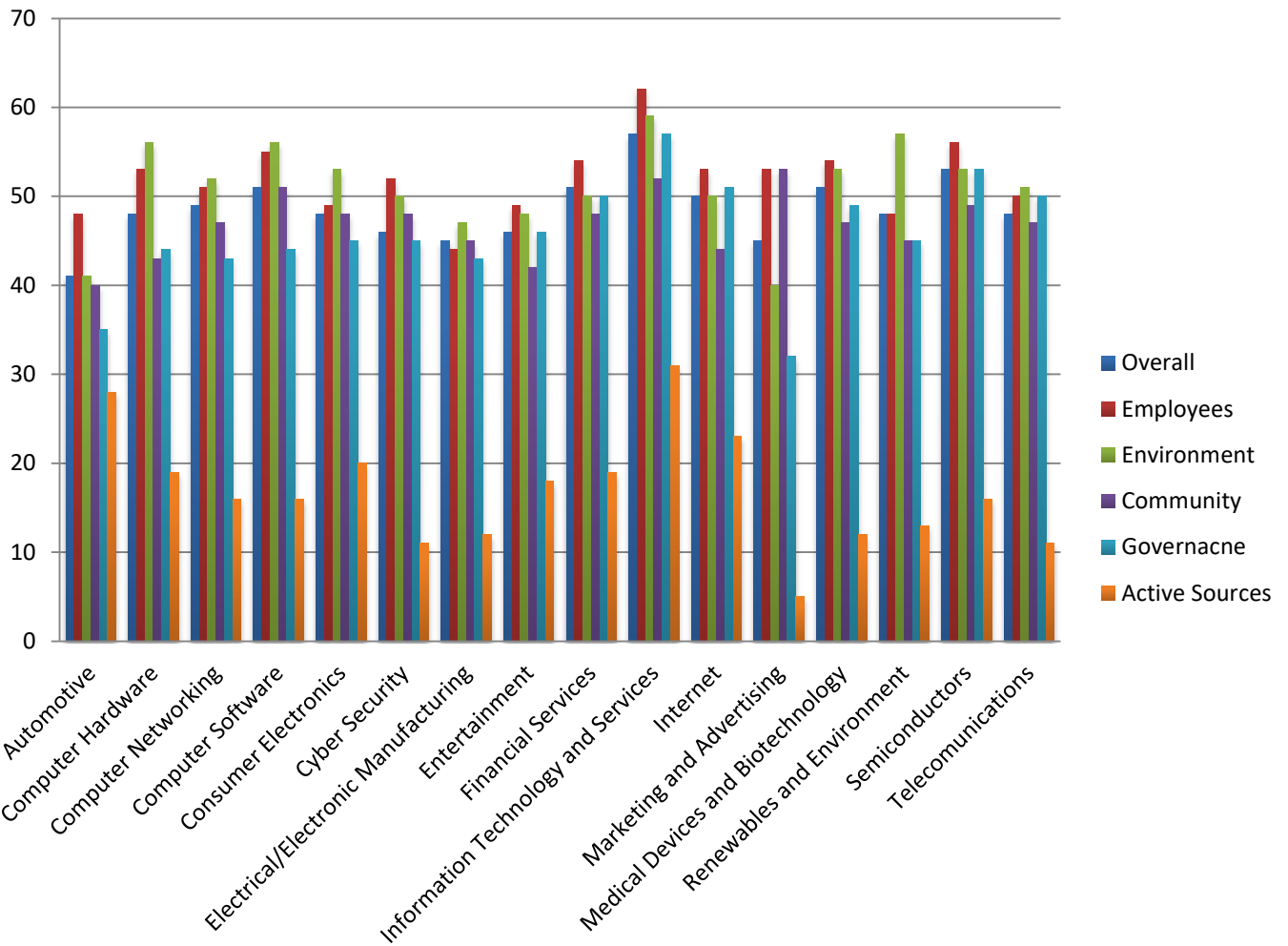
Of the companies analyzed in the research, 98% have a profile on CSRHub (regardless if they are rated or not) which shows the importance of CSRHub (and other similar ratings) to the sustainability strategy and approach of companies. Ninety-two companies have an overall score (regardless if they have an individual score for each of the pillars). The average overall score of these 92 companies is 50, which is considered as an average score, demonstrating that these companies have to enhance their efforts, both in terms of performance and of disclosure. The average active sources of the 98 companies is 17, which also is

considered as an average number of active sustainability sources of information. Out of the four main categories, Employees (53) and Environment (52) are top-rated, followed by Governance (48) and Community (47).

The top-rated sectors are Information Technology and Services, Semiconductors, Computer Software, Financial Services, Medical Devices and Biotechnology.



CSRHub Ratings per Sector



Gender Gap

The role of women in the technology world, at various levels, has been the focus of a multitude of research for quite some time now. We examined 10% of the company sample (NVIDIA, Cisco, Adobe, Symantec, Logitech, Workday, Hewlett-Packard, AMD, Facebook and Intel) which employ, in total, more than 313,000 employees. Each of these companies except for Facebook and AMD report on all six of the comprehensive sustainability practices. In these companies, presumably best in class for Silicon Valley, the percentage of female employees ranges from 19% to 39%. On average, the percentage of female employees is 29% which is significantly lower than a number of other sectors and much lower than the national average of 46.8% of women in the workforce (U.S. Department of Labor, 2016). https://www.dol.gov/wb/stats/NEWSTATS/facts/women_lf.htm#CivilianLFSex

Other Trends : AI and Blockchain

Blockchain

Blockchain is one of the emerging technologies which CSE reported on in 2018. A blockchain is a distributed database that maintains a constantly growing list of transaction records, referred to as blocks, and in which every block contains a link to the previous block. This open and distributed virtual ledger captures transaction data between two parties in a permanent and verifiable way.

Sustainability gains in the form of reduced environmental impact and better assurance of human rights and fair work practices seem to be promising outcomes of blockchain applications. In the case of human rights and fair work, a clear record of product history helps product buyers to be confident that goods being purchased are coming only from sources that have been recognized as being ethically sound.

Blockchain network is becoming a significant trend in the technology world, providing major breakthroughs. For example, SolarCoin and Plastic Bank both use blockchain and digital currency to make a difference to the planet.

SolarCoin was founded by a fin-tech expert Nick Gogerty, awarded by the United Nations for solving problems utilizing blockchain technology. SolarCoin provides affordable solar energy to homeowners and businesses. SolarCoin “claimants” receive one SolarCoin for every one-megawatt hour produced. The incentive for producers is to sell their clean energy and even convert SolarCoins to bitcoins. The network is decentralized and uses peer to peer verification. SolarCoin is compatible with most major crypto wallets.

Plastic Bank is led by David Katz who produced an award-winning documentary on ocean plastic. Plastic Bank allows developing countries to turn their plastic pollution into currency. Individuals (directed toward the bottom of the pyramid) collect plastic and exchange it for secured digital tokens, electricity, and

other items. The company buys this plastic and grinds it up into small plastic balls to supply manufacturers or 3D printers. This blockchain network is partnered with IBM to create a more enhanced recycling system.

In collaboration with Capgemini, Whiteflag is a blockchain for journalists and peacekeepers to create non-combat zones with white flags during times of war. This helps bring accountability to destruction caused by combat. Blockchain will only inspire more future technology.

For all of its benefits, blockchain is energy intensive. SunPower, one of the companies in this research, is providing solar panels to reduce the carbon footprint of data mining associated with blockchain.

While blockchain is not widely reported in the companies researched for this report, the use of blockchain is a growing trend which most of the companies are exploring and many already have implemented across selected initiatives.

AI

Artificial Intelligence (AI) algorithms have the power to learn and operate without human intervention. They also provide enormous predictive value. AI is leaving the research labs and entering everyday business. As with all new technologies, careful use is required. There are identified risks associated with bias, poor decision making, low transparency, job losses and malevolent use.

The challenge is about how AI can contribute towards sustainability, towards achieving universal goals such as addressing climate change, delivering food and water security, building sustainable cities, protecting biodiversity and advancing human wellbeing. Possible applications include:

- Autonomous and connected electric vehicles – resulting in significant GHG emission reductions
- Distributed energy grids
- Smart agriculture and food systems – through automated data collection, early detection of crop diseases, timed nutrition to livestock
- Next generation weather and climate prediction
- Smarter disaster response
- AI-designed intelligent, connected and livable cities – real-time city-wide data, traffic and people flows and water consumption
- Digital Earth – tracking deforestation, water extraction, fishing and poaching, air pollution

AI tools are already available within the sustainability reporting and strategy field. CSRHub, for instance, uses AI to analyze companies' data.

Tesla, a company appearing in this research, is releasing the Tesla Semi-Truck. Since the announcement, there have been preorders from UPS, FedEx, DHL, Walmart, Anheuser Busch, J.B. Hunt, and Pepsi. To operate, the semi uses artificial intelligence, sensors, and robotics. It currently requires a backup driver but has advanced autopilot abilities that calculate the most efficient route to take. One semi is equivalent to taking 500,000 cars off the road per year. If the electricity is derived from solar, this can be a huge step forward. With major companies testing out this product, it has the ability to revolutionize supply chains.

In agriculture, AGROBOT is an automatic strawberry picker which uses graphic processing artificial intelligence, 3D sensing, and robotics. Graphic processing determines the ripeness of the berry. It uses a razor-sharp blade to cut the fruit which falls into a basket. The machine never touches the fruit. Given that 40% of a berry farmer's budget is labor cost, AGROBOT and its competitors have the potential to reduce costs and make harvesting more efficient for farmers.

[The market is taking note](#), with investors such as Intel Capital and Bloomberg investing in 51 and 23 AI ventures respectively in as of May 2019.