

2015

Corporate Responsibility Report



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About this report

IBM's annual Corporate Responsibility Report is published during the second quarter of the subsequent calendar year. This report covers our performance in 2015 and some notable activities during the first half of 2016.

In selecting the content for inclusion in our 2015 report, we have used the [Global Reporting Initiative \(GRI\)](#) reporting principles of materiality, sustainability context, stakeholder inclusiveness, and completeness. A GRI report utilizing the [GRI G4 Sustainability Guidelines](#), as well as additional details about IBM's corporate responsibility activities and performance, can be found at our [corporate responsibility website](#).

Unless otherwise noted, the data in this report covers our global operations. Information about our business and financial performance is provided in our [2015 Annual Report](#). IBM did not employ an external agency or organization to audit the 2015 Corporate Responsibility Report.

As we continue our journey to transform IBM into a cognitive solutions and cloud platform company, we regularly review our strategy and approach to corporate responsibility. This ongoing analysis helps us to identify and prioritize the issues of relevance to our business and our stakeholders. In 2014 we engaged [Business for Social Responsibility](#), a global nonprofit business network and consultancy dedicated to sustainability, to conduct a materiality analysis. That analysis maps corporate responsibility priorities to IBM's business strategy, stakeholders, and impact on global society. This process was completed in 2014 and the results have been considered in the approach and content of this report.

The art and science of transformation



Transformation is not the same as change. The latter, by definition, is fleeting; the former, lasting. Change is something that happens to you, a wave that you may or may not catch. Transformation is something you build through sustained effort. It is driven by the key secular shifts of the era, and it leaves in its wake not just ripples, but lasting structures.

The topic of transformation is much on our minds this year, as IBM turns 105. Ours is the only company in our industry to have reinvented itself through every era of technology — and we know the ability to do that rests not in any product or strategy, or even how we lead the company. It comes, instead, from how we define IBM.

This is an enterprise that simultaneously creates the most advanced technology and applies it to solve the most important challenges facing business and society.

That's simple to say, but enormously challenging to accomplish, because both dimensions — call them the art and the science of transformation — are inherently dynamic. Each requires constant re-examination, re-affirmation, re-invention and contemporization.

At one time, “high tech” was punched card tabulators, vacuum-tube calculators, the mainframe, the PC. Today, it includes cloud platforms. Most importantly, it means a revolutionary new technology called cognitive computing, whose most well-known manifestation is our breakthrough IBM Watson™ system. Cognitive systems can ingest vast new flows of data. They can form

hypotheses. And unlike any technology before them, they learn — in fact, they never stop learning. Their spectrum of capabilities includes, but goes far beyond, “artificial intelligence.” And contrary to what we see in pop culture, they are not about man vs. machine. Rather, they are about man plus machine — augmenting human intelligence and enhancing experts’ decision making through new kinds of human-computer collaboration.

The same commitment to continuous transformation that leads us to invent a Watson also shapes the role we play in society. In a world best understood as a system of complex systems — natural, economic, societal, cultural — we do not believe that checkbook philanthropy or short-term interventions make an enduring impact. Instead, we seek to establish new institutional forms and to engage broadly in ways that drive sustainable progress.

You see this in innovations that are transforming education at a societal, even global scale — from P-TECH, which is reinventing high school and dramatically improving college completion rates; to Teacher Advisor, Powered by IBM Watson, which will use cognitive computing to support teachers in improving teaching and student achievement. You see it in environmental innovations like Green Horizons that offer replicable ways to manage entire cities for pollution control. You see it in the use of cloud and mobile technologies to create wholly new approaches to disaster response — spanning weather, pandemics or other natural or man-made crises. You see it in Impact Grants supporting cognitive solutions, such as one in Shenzhen in China, in partnership with the Center for Disease Control and Prevention. You see it in On Demand Community,[®] a radical reimagining of volunteerism through which more than 280,000 IBMers have engaged in improving their communities.

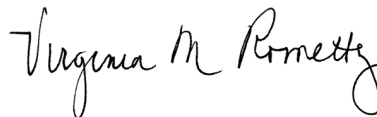
You also see it in new models of global citizen engagement such as our trailblazing Corporate Service Corps and Smarter Cities Challenge[®] — and their newest offshoot, IBM Health Corps, which is sending interdisciplinary teams of IBMers into communities around the world to expand access to healthcare. Importantly, each team will have a notable new member — Watson — which will not only assist IBMers and their local partners with individual

projects, but will also, as a learning system, become an increasingly expert resource on community health — the “last mile” of global healthcare.

This distinctive approach to structural transformation also shapes IBM’s long-standing commitment to policies of equal opportunity, fairness and diversity — from our stand against segregation in the 1950s, to our pioneering protection of employees’ genetic privacy, to our staunch defense of our clients’ data against government intrusions and of LGBT IBMers’ rights against regressive laws.

Finally, continuous transformation means always rethinking what it means to be a modern business, while remaining true to who you are. That is why we are training our global workforce in Agile methods and design thinking; infusing cognitive and cloud into our own operations; investing more than \$1 billion to modernize and create new workspaces and to develop new skills; and rethinking everything from performance management to how we design and develop products and services.

In the end, systemic transformation is the core responsibility of every IBM CEO, and every generation of IBMers. It requires both a long view of history and a systemic and collaborative approach, spanning business, government and civil society. And it is grounded in clarity on what must change and what must endure. This is never-ending work — and it is why generation after generation of the world’s most brilliant women and men come here. They are IBMers because they seek to make not just a living, but a difference.



Virginia M. Rometty
Chairman, President and Chief Executive Officer

Our approach to corporate responsibility

IBM pursues the highest standards of corporate responsibility, from how we support and empower our employees, to how we work with our clients, to how we govern the corporation and connect to communities. In this section, you will find more detail about our approach to corporate responsibility and corporate citizenship.

For more than 100 years IBM has been delivering differentiating value to stakeholders, demonstrating the sustainability of our business practices and our ability to transform ourselves as markets and industries change. We have nearly 400,000 employees and do business in more than 175 countries. And we have an extensive, integrated supply chain of approximately 14,000 suppliers operating in nearly 100 countries. Our definition of corporate responsibility reflects our expansive footprint and spans environmental responsibility; social responsibility to our workforce, clients and business partners; innovation to address critical societal needs in the communities in which we operate; and a culture of ethics and integrity — guided by a rigorous system of corporate governance — that promotes transparency on a global basis.

IBM's large and complex operations involve a vast ecosystem of stakeholders, including shareholders, employees, suppliers, non-governmental organizations, public officials and community organizations. Exceeding the expectations of all of these varied interests is part of our corporate culture and integral to our business strategy and success. All of these stakeholders are equally important and should, and do, benefit from IBM's operations. Thomas Watson Jr., IBM's second chairman and the son of its founder, put it this way: "Corporations prosper only to the extent that they satisfy human needs. Profit is only the scoring system. The end is better living for us all."

IBM is pioneering many of the technologies that are driving global business and societal progress — data and analytics, cognitive computing, cloud, mobile, social and security. In 2015, we invested more than 6 percent of our revenue on research and development aimed at making a positive and meaningful impact around the world. For the 23rd consecutive year, IBM led the U.S. list of patent recipients, once again breaking the 7,000 threshold.

Guiding principles

We follow four guiding principles in our corporate responsibility efforts:

Alignment to values — A company must be true to its values in all of its activities — both internal and external. IBM's core values have remained consistent and are embedded in all our citizenship activities. These values are:

- Dedication to every client's success
- Innovation that matters, for our company and for the world
- Trust and personal responsibility in all relationships

Our senior management is ultimately responsible for our economic, environmental and societal performance, as well as compliance with laws, regulations and the corporate policies that govern our operations and practices worldwide. This responsibility begins with our CEO and includes the IBM Board of Directors and its committees that regularly review performance and compliance.

A Corporate Responsibility Executive Steering Committee, made up of executives from all relevant global functions across IBM, provides leadership and direction across our corporate responsibility activities. Chaired by the vice president of Corporate Citizenship and Corporate Affairs, the Steering Committee includes members from human resources, employee well-being, corporate governance, environmental affairs, governmental programs, supply chain and corporate citizenship. Through all of our community efforts, as through our business pursuits, we seek to provide meaningful leadership in creating solutions, bringing them to scale and making them sustainable. We also believe that good corporate citizenship is good for business. For example, strong communities, strong healthcare systems and strong schools go hand-in-hand with strong business enterprises, which are directly connected to jobs and economic growth. This is how our good corporate citizenship can help produce real value for society and all of IBM's stakeholders.

Cross-sector collaboration — We work closely with the public and private sectors, including local, regional and national governments, nonprofit organizations, universities, research organizations and school systems. We engage with highly qualified public and civic entities that are deeply committed to solving problems, finding solutions and bringing them to scale.

Solving problems by leveraging the full range of our company resources and then bringing solutions to scale — To address some of the world's most vexing problems at their roots requires more than simply writing checks. We take a hands-on approach to identify and implement solutions, drawing on all of IBM's technologies and expertise. We focus on building innovative solutions and then bringing them to scale. We collaborate with people, companies and governments across sectors and silos to concentrate efforts on fewer, more comprehensive programs that can help address issues that no single entity can manage alone.

Impact and measurement — Whether we are taking on some of the unique and complex problems of the world's cities, helping to transform global health or working to prepare students for 21st-century careers, we endeavor to effect widespread, measurable and sustainable change. We measure that change by developing a set of comprehensive desired outcomes and key performance indicators for each program we initiate. To maximize the impact of our investments, we plan for the longevity and sustainability of our solutions by ensuring that they are scalable and transferable.

Stakeholder engagement

At IBM, engaging and collaborating with stakeholders from a cross-section of communities, governments, investors and the social sector is integral to our business strategy. Here are a few examples:

In an innovative education initiative to close the skills gap and blaze a clear pathway from high school to college and career, IBM has forged key partnerships with governments, school districts, postsecondary education institutions and corporate partners. Public/private collaborations and partnerships are essential to overcoming societal challenges that are too big for any single public entity or industry sector to manage alone. That's why IBM

works with a variety of education stakeholders — including policy makers, administrators, teachers, labor, business and nonprofit leaders — to help bring about transformative and sustainable change to benefit the greater society. IBM Corporate Citizenship and Corporate Affairs Vice President Stanley S. Litow brings a unique set of skills and deep personal commitment to our education initiatives as a former deputy chancellor of the New York City Public Schools and a governor's appointee as a trustee of the State University of New York. Corporate Citizenship Director Maura Banta — former chair of the Massachusetts Board of Education for Elementary and Secondary Education, now serving on the Massachusetts Board of Higher Education — also brings her knowledge and expertise in the education sector to support IBM's initiatives.

IBM is a founding member of the Electronic Industry Citizenship Coalition (EICC), a nonprofit industry group with the ultimate goal of enabling the sector to consistently operate in a socially and environmentally responsible fashion. IBM encourages its suppliers of products and services to join the group and participate in the development and deployment of resources aimed at driving improvements in social responsibility. The EICC has grown to over 100 member companies across retail, electronics brands, contract manufacturing, hardware components, software, logistics, and communication industries, representing multiple distinct tiers of the extended supply chain. The EICC Code of Conduct contains provisions on labor, health and safety, environmental, ethics and management systems. The standards set out in the Code of Conduct reference international norms and standards, including the Universal Declaration of Human Rights, ILO International Labor Standards, OECD Guidelines for Multinational Enterprises, ISO and SA standards, and many more. The EICC Code of Conduct was updated in January 2016 and, in turn, IBM updated its Global Employment Standards to be in alignment.

Incorporating the latest thinking and external expertise into our leadership development offerings and programs, IBM is a member of The Conference Board, a global, independent business membership and research association with a mission to provide the world's leading organizations with the practical knowledge they need to improve their performance and better serve

society. The Conference Board works within and across three main subject areas — Corporate Leadership; Economy and Business Environment; and Human Capital. The unique, enterprise-wide perspective enables IBM to hone our thought leadership on important topics and better respond, anticipate and make the right strategic decisions. IBM has 15 senior executives serving on or leading each of the Conference Board's key councils, in addition to nearly 1,500 IBM employees who engage with and benefit from research provided by The Conference Board throughout the year.

IBM is a founding member of IMPACT 2030, a business-led coalition launched in 2015 that convenes leaders from corporations, the United Nations (U.N.), civil society, academia and philanthropic organizations from around the world. As a member of IMPACT 2030's Executive Committee, Diane Melley, IBM Vice President, Global Citizenship Initiatives, is leading the effort to align companies and their employee volunteer efforts with the Global Goals, advance the practice of employee volunteering and pro bono consulting, and create real and sustainable change. IMPACT 2030 is the first time that companies will unite their corporate volunteering efforts to address the U.N. Development Agenda through collaboration. To continue to redefine employee engagement, IBM is a member of the Points of Light Corporate Service Council, a global platform for mobilizing, equipping and inspiring high-impact volunteering. Council members include 75 of the world's largest and most successful companies. The Council fosters and develops corporate thought leaders and connects them with experts in academia, business and civil society to advance the corporate citizenship field on issues that include creating effective employee volunteer programs, scaling and deepening global impact through service and more.

IBM promotes habitat conservation and management through its membership and participation in the Wildlife Habitat Council (WHC). Four IBM sites in the United States have had their land management and wildlife habitat programs certified by the WHC, including IBM's corporate headquarters located in Westchester County, New York, where IBM established a 2-acre wildflower meadow and installed approximately 20 nest boxes to provide habitat for Eastern bluebirds, songbirds and other species.

IBM actively seeks to work with organizations that share our commitment to local, national and global corporate citizenship and sustainability. We often play leadership roles in these organizations, which in turn influence our approach to corporate responsibility. Some of the organizations we work with are listed below:

- ACHIEVE
- American Federation of Teachers
- American Red Cross
- Australian Business Volunteers
- Business for Social Responsibility
- Carnegie Endowment for International Peace
- Center for Climate and Energy Solutions
- Committee Encouraging Corporate Philanthropy
- Corporate Responsibility Association
- Council on Foreign Relations
- CSR Asia
- CSR Europe
- Digital Opportunities Trust
- Electronic Industry Citizenship Coalition
- Environmental Law Institute
- European Academy of Business in Society
- Global FoodBanking Network
- Independent Sector
- International Medical Corps
- Meridian International Center
- Peace Corps
- Points of Light Institute and Corporate Service Council
- Pyxera Global
- Student Achievement Partners
- The Conference Board
- The Conservation Fund
- The National Board of Professional Teaching Standards
- The Nature Conservancy
- UnboundEd
- U.S. Agency for International Development (USAID)
- U.S. Chamber Foundation Center for Corporate Citizenship
- U.S. Department of State
- VSO International
- White House/Let Girls Learn
- Wildlife Habitat Council
- World Environmental Center

Year in review

IBM's commitment to continuous transformation shapes our approach to corporate responsibility. We seek meaningful, productive change through sustained and purposeful effort. And we believe that through the actions we take, the examples we set and the priorities that guide us, we can have a distinct and positive impact that benefits society. Our commitment is evident in the relationships we build with all stakeholders, from our clients and employees to our business partners and shareholders. Each year we strive to evolve our corporate responsibility goals as the needs of the world around us continue to evolve, and 2015 was no exception.

Five aspects of IBM's corporate responsibility activities are of particular interest to our stakeholders:

1. The ability of IBM to positively affect societal progress in communities
2. The support of our employees and communities
3. The impact of IBM's products and operations on the environment
4. The management of our global supply chain
5. The governance, ethics and integrity of our company

This section highlights our activity in 2015 in these five key areas of corporate responsibility. For more detailed information, please visit our [corporate responsibility website](#).

Communities

Throughout 2015, IBM continued our global collaborations with governments, cities, nonprofit service providers and others to develop new ways to improve the human condition. We forged and expanded essential partnerships in citizen diplomacy, disaster response, economic development, education, humanitarian research and social services to achieve what individual entities cannot accomplish alone. And as always, we called upon our innovative technologies, our expertise and the skills of our people to broaden and deepen our commitment to service. Below are selected examples of IBM's corporate responsibility efforts in 2015:

IBM launched the innovative P-TECH grades 9 — 14 program in 2011 with a single school in Brooklyn, New York. By the time this report is published, more than three dozen P-TECH students — all from low-income families — will have finished their high school diplomas and associate degrees either one or two years ahead of schedule. And by fall 2016, the initiative plans to have 60 schools and serve thousands of students across six U.S. states and Australia. P-TECH graduates already have taken entry-level professional jobs at IBM while working toward their four-year degrees at major colleges and universities — or both.

The need to address the skills gap while assisting military veterans led to the creation of the Veterans Employment Initiative (part of the IBM Impact Grant portfolio) to train transitioning service members to become certified as advanced data analysts. To date, IBM expert software trainers have coached 98 percent of program participants to successful certification — with 25 percent of that cohort accepting positions with IBM or other participating employers.

IBM Cognitive Computing is reshaping all aspects of our company — including our approach to corporate citizenship. Teacher Advisor, powered by IBM Watson, is being launched to function as a virtual mentor to help teachers learn more, create more effective lesson plans and refine their classroom skills — confidentially and free of charge. The newly launched IBM Health Corps will employ cognitive and analytical technologies — along with IBM’s global consulting expertise — to solving the world’s toughest community health challenges.

In 2015, IBM Corporate Service Corps forged a historic partnership with the Peace Corps to share expertise and access to influencers for projects in Ghana, the Philippines and Mexico. The initial collaboration — the Let Girls Learn initiative in Ghana — seeks to tackle some of the barriers keeping Ghanaian girls out of classrooms. Our pro bono consultants also worked with the Global FoodBanking Network to increase donated food supplies in Argentina, Colombia, Ecuador and Mexico — helping to drive a 41 percent increase in food donors to help feed 15,000 people each month.

Hunger and poor nutrition also plague low-income communities in the United States, and in 2015 an IBM Smarter Cities Challenge engagement in Birmingham, Alabama, addressed that problem head-on. To help alleviate “food deserts” — neighborhoods from which low-income residents lack transportation to suburban supermarkets — Smarter Cities consultants and city leaders used data analytics to design efficient delivery routes for a mobile food market program to transport groceries to the area’s neediest residents.

The ability of nonprofit organizations to improve their service for those most in need was IBM’s focus in developing and deploying SafetyNet software through settlement house partners in New York City. The software allows those on the front lines of service to improve their effectiveness via access to better client data. SafetyNet also automates record keeping and reduces the costs for back-office tasks, while ensuring that outreach organizations are able to remain in compliance with funding regulations more easily.

In a turbulent year, IBM provided essential aid to survivors of natural disasters and political upheaval in Nepal, India and the Middle East. IBM technologies and skills-based volunteering played critical roles in assisting the governments of India and Nepal after last year’s massive and deadly earthquakes. Experts from across our business designed and donated an installation of one of the world’s most sophisticated disaster recovery solutions — a cloud-based IBM Intelligent Operations Center for Emergency Management (IOC-EM) — following unprecedented disasters in Asia. And IBM responded to the global refugee crisis by developing custom applications for nonprofits in France, Germany and Italy to use in critical areas of service delivery to migrants from Syria, Afghanistan and countries in northern Africa. In each instance, our contributions of technology and expertise were complemented by volunteer service from IBMers around the world.

The IBMer

Throughout 2015, IBM launched or furthered a number of programs to help IBMers reimagine how they work and innovate. With input from IBMers around the world, we co-created Checkpoint, a new approach to performance management aligned with more agile ways of working and frequent feedback. To make it easier for IBMers to discover and navigate career opportunities at IBM, we launched Blue Matching, which uses analytics to provide targeted potential job opportunities to anyone who opts in. We also launched the ACE (Appreciation, Coaching and Evaluation) app, which lets IBMers easily give and receive feedback any time, any place. In line with our long-standing commitment to helping IBMers grow their skills and develop new ones, we also expanded our Think Academy courses to 29.

We continued our commitment to innovative wellness incentives with the launch of new benefit options in 2015 for U.S. employees by offering both no-cost Apple Watches or Apple Watches at a reduced price, depending on the health plan selected. In conjunction, we launched two Watson-powered programs, making it easier for employees to ask questions about their benefit plan; access information on fitness, nutrition and local activities; and ask health-related questions, as well as a pilot program for employees to get connected to second opinion and expert physician services.

Appreciating that differences help drive innovation, in 2015, IBM continued to demonstrate leadership in support of constituent groups. We received prestigious awards for lesbian, gay, bisexual, transgender (LGBT) workplace equality and the advancement of women. We continued to support our recruiting team in identifying and interviewing skilled people with disabilities with a new training module and recruitment guide. We also introduced new workshops and other offerings to educate IBMers on unconscious bias.

With a focus on the critical role IBMers play in the company's transformation, in 2015 IBM introduced landmark innovations in leadership development. We launched the Transformational Leadership Framework (TLF) to our top executives to encourage a set of behaviors that are essential to building an agile culture and pivoting our company to cloud and cognitive solutions. Supporting the TLF, we created the IBM Leadership Academy, a portal to all leadership development content and activities. IBMers can personalize this cutting-edge content designed to help them thrive in an increasingly collaborative and self-directed environment.

Environment

Our comprehensive environmental programs range from energy and climate protection to pollution prevention, chemical and waste management, resource conservation, and product design for the environment. IBM's [energy conservation and climate protection programs](#) are highlighted here because of the global interest in this topic. In 2015, we achieved outstanding operational results in this area and continued to leverage our research, technologies and solutions to help clients and the world advance in ways that are more energy-efficient and protective of our planet.

Energy conservation across the enterprise

In 2015, IBM's energy conservation projects delivered savings equal to 6.3 percent of our total energy use, surpassing our annual goal of 3.5 percent. These projects saved and avoided the consumption of 272,000 megawatt-hours (MWh) of electricity and 172,000 million British thermal units (MMBtu) of fuel oil and natural gas, avoiding 122,000 metric tons of carbon dioxide (CO₂) emissions. Our 2015 conservation measures also saved \$28.9 million in energy expenses. Between 1990 and 2015, IBM saved 7 million MWh of electricity consumption, avoided 4.3 million metric tons of CO₂ emissions (equal to 63 percent of the company's 1990 global CO₂ emissions) and saved \$579 million through energy conservation actions.

Renewable electricity

In 2015, IBM contracted to purchase over 679,000 MWh of renewable energy over and above the quantity already included in our electricity purchases from the grid. The 679,000 MWh represented 16.2 percent of our global electricity consumption and resulted in the avoidance of 252,000 metric tons of CO₂ emissions. IBM works with its electricity providers to directly procure renewable electricity for IBM's facilities, making a clear connection by matching purchases to consumption as opposed to purchasing renewable energy certificates as offsets. Our goal is to procure electricity from contracted renewable sources for 20 percent of IBM's annual electricity consumption by 2020.

Third-generation CO₂ emissions reduction goal

We continue to make progress toward our third-generation CO₂ emissions reduction goal: to reduce emissions associated with our energy consumption 35 percent by year-end 2020, against base year 2005 and adjusted for acquisitions and divestitures. This goal represents an additional 20 percent reduction, from year-end 2012 to year-end 2020, over the reductions achieved from 2005 to 2012 under IBM's second-generation goal. Adjusting the baseline to remove emissions from the recently divested semiconductor manufacturing operations, IBM has reduced its CO₂ emissions by 28.7 percent since 2005, and we are on track to achieve the 35 percent reduction by 2020.

Leveraging analytics for further efficiencies

IBM energy management and data center teams are expanding their use of analytics to minimize energy use and optimize building and data center operating performance. Over 50 percent of 2015 conservation projects at IBM's top 10 energy-consuming sites resulted from projects involving analytics to drive energy savings. IBM's TRIRIGA® Real Estate Environmental Sustainability (TREES) Impact Manager has been deployed at more than 145 buildings, representing 45 percent of IBM's global energy consumption. Annual savings of 32,300 MWh of energy and \$1.7 million were realized from these deployments in 2015. IBM has sustained an average 10 percent reduction in energy use annually since 2011 for the building and systems monitored and managed by the TREES Impact Manager solution. We offer this and other energy management solutions to our clients to help them achieve greater operational efficiencies.

Energy solutions for a more sustainable future

Our solutions have enabled our clients to improve their efficiency and reduce their environmental impact. Moving forward, cognitive technology is creating opportunities for an ever-more-instrumented planet — what some call the Internet of Things (IoT).

The IBM Building Management Center solution combines cognitive computing and IoT to mine and aggregate data from multiple sources across an enterprise, providing operators new insights to manage operations, energy use and space within and across facilities while reducing cost and associated greenhouse gas emissions. This solution, delivered via the IBM SoftLayer® cloud platform, has been implemented at a major U.S. university. It currently covers nine buildings and monitors thousands of data points from building automation and control systems made by several different manufacturers. After only four months of work focusing on 60-plus air handling units, annualized energy savings of 16,000 MWh of electricity and over \$135,000 have been identified through the solution.

IBM researchers are working with academic, government and industry collaborators to develop a self-learning weather model and renewable forecasting technology, known as SMT, through a program supported by the U.S. Department of Energy's SunShot Initiative. The SMT system uses machine learning, big data and analytics to continuously analyze, learn from and improve solar forecasts derived from a large number of weather models. These refined forecasts, when combined with a grid management system that balances supply and demand, can be used to increase and optimize the output of solar and other renewable resources. By using state-of-the-art machine learning and other cognitive computing technologies, IBM scientists are generating solar and wind output and demand forecasts that are up to 30 percent more accurate than ones created using conventional approaches, whether minutes or days in advance.

Supply Chain

IBM incorporates social and environmental responsibility in our relationships with approximately 14,000 suppliers in nearly 100 countries. We understand the potential for progress in a supply chain of this scale, and invest in a range of initiatives to promote sustainable performance as a shared objective. Our global supplier spending was nearly \$26 billion, distributed geographically in support of clients and their needs for hardware, software and services. The supply chain section of this report presents details of our varied social responsibility initiatives, their results, and challenges we face in the global marketplace. Here are a few highlights from 2015:

- We continue to promote social responsibility throughout our supply chain, through our active participation in the Electronic Industry Citizenship Coalition (EICC) and by engaging with a range of local and nongovernmental organizations worldwide. Assessment activities are essential for evaluating compliance and promoting improvement among our suppliers, and the 63 full-scope supplier audits in 2015 brought the total to 1,858 from 2004 through 2015.
- Diversity among our suppliers is a formal priority for IBM, because it adds to our competitive advantage while stimulating growth in a global marketplace. Although our spending with diverse suppliers declined in 2015, reflecting the reduction in overall spending, IBM purchased \$2.6 billion in goods and services from first- and second-tier diverse suppliers globally — including \$1.3 billion with first-tier suppliers in the United States and \$718 million with first-tier suppliers in other countries.
- IBM continued working with other members of the EICC, in conjunction with companies from seven business sectors, to achieve a supply chain free of minerals mined and processed in the conflict regions of the Democratic Republic of the Congo. At year-end 2015, we determined that 73 percent of the smelters and refiners identified by our upstream suppliers were conflict-free — up from 49 percent at year-end 2014. Our ongoing efforts toward a conflict-free supply chain are detailed in the conflict minerals section of this report.

Governance

In 2015, we continued to enhance how we govern the conduct of the company, manage risk and contribute our expertise to public discourse. Through online courses, integrity summits and seminars, and our Global Integrity survey, we foster a culture of ethics and integrity that extends to our employees and leaders, and our IBM Business Partners and suppliers.

We are furthering our leadership in privacy and data protection as we transform into a cognitive solutions and cloud platform company. For example, IBM's Watson Health Cloud is HIPAA-enabled, allowing us to maintain and curate health data in accordance with HIPAA security requirements.

Key enterprise risk management (ERM) activities this year included driving a higher level of collaboration across IBM business units, functions and geographies. We enhanced our identification and management of emerging risks, and expanded the analytics to assess the risks to our business partners within their respective countries. Raising the general level of risk awareness to all employees, we began regular video blogging.

Building on our rich history of healthcare innovation, many of IBM's public policy efforts this year were focused on working collaboratively to educate influencers and policy makers on the strengths and capabilities of exciting health cognitive technologies centered on the needs and safety of patients and consumers.

Awards and recognition

Every year, IBM is rated and recognized by publications, advocacy groups, governments and non-governmental organizations around the world for our corporate responsibility efforts. We are proud to share highlights of our recognition at a local, regional, national and international level.

- *Fortune* — Most Admired Companies
- *Fortune* — First “Change the World” list
- *Fortune* — The Most Powerful Women, Ginni Rometty
- *Forbes* — World’s Most Valuable Brands
- Interbrand — Best Global Brands

Corporate responsibility

- *CR Magazine* — 100 Best Corporate Citizens
- Dow Jones Sustainability Index, North America
- EcoVadis — Gold-level CSR rating
- U.S. Chamber of Commerce Foundation — Best Corporate Steward Award, Large Business

Community impact

- PYXERA Global — Purposeful Global Engagement Pioneer Award
- US2020 — 2015 National STEM mentoring award, Excellence in Corporate Culture
- Tech Insider — 13 Most Innovative Schools in the World, P-TECH
- Webby Award — People’s Voice Award, IBM’s World Community Grid website
- Atlantic Media/Allstate Renewal Awards — One of America’s Best Social Innovators, P-TECH
- Startup Noodle — Among America’s Most Innovative Schools, P-TECH

HR/diversity

- *DiversityInc.* — Top 10 Companies for Global Diversity
- National Association of Female Executives — Top 50 Companies for Female Executives
- *Working Mother* — Top 10 Companies for Multicultural Women
- *Working Mother* — 100 Best Companies
- Workplace Pride Foundation — World’s Most LGBT-Inclusive Company
- Human Rights Campaign Foundation — Best Places to Work for LGBT Equality
- Stonewall Global Equity Index — Star Performer LGBT-friendly workplace
- Association of Talent Development — 2015 Excellence in Practice Awards
- Ragan Communications — Best Employee Advocacy Program Award
- Brandon Hall Group — Two Gold Awards, Measuring the Impact of Leadership and Learning Measurement

Environment

United States

2016 Climate Leadership Award

IBM received a 2016 Climate Leadership Award from the U.S. Environmental Protection Agency (EPA), the Center for Climate and Energy Solutions, and The Climate Registry. The award was in the category of Excellence in Greenhouse Gas (GHG) Management (Goal Setting), which recognized IBM for setting a third-generation GHG emissions reduction goal. IBM has received four Climate Leadership Awards since the award program's launch in 2012, and is the first recipient to win an award in each of the four award categories recognizing individual organizations.

2016 AmeriStar Award

IBM received a 2016 AmeriStar Award from the Institute of Packaging Professionals for its IBM System z® rack packaging for domestic U.S. shipments, which utilizes on-caster deliveries and a compostable mushroom-based material. IBM's entry won in the electronics category. The AmeriStar Award honors outstanding contributions to the packaging community.

2015 Chairman's Award

IBM received the 2015 Chairman's Award from the Alliance to Save Energy. The Chairman's Award is presented to an individual or organization that has shown exemplary service to the cause of energy efficiency. IBM was recognized for its long-standing and comprehensive global energy management program, as well as the impressive results that we achieved.

Green Power Partners

Three IBM SoftLayer® cloud data centers in Texas were recognized by the U.S. Environmental Protection Agency as Green Power Partners. At these locations, 100 percent of the electricity consumed is generated by wind.

Ethics in Business and Community Award

IBM Austin, Texas, received an Ethics in Business and Community Award in the large business category from RecognizeGood, a nonprofit working locally to promote the good work of individuals, businesses and other nonprofits in the community. The award recognized IBM Austin's overall business practices, including a significant commitment to environmental leadership and performance.

Colorado Environmental Leadership Program — Gold Leader

IBM Boulder, Colorado, was recognized as a Gold Leader in the Colorado Environmental Leadership Program by the Colorado Department of Public Health and Environment. The award recognized IBM Boulder's environmental management system, environmental goals and record of compliance. The Colorado Environmental Leadership Program is a voluntary program recognizing Colorado entities that go beyond compliance with environmental regulations and reach toward the goal of sustainability.

Business Recycling Achievement Award —

Excellence in Recycling

IBM Gaithersburg, Maryland, received a Business Recycling Achievement Award — Excellence in Recycling from the Montgomery County Department of Environmental Protection. The award recognized the site for recycling a high percentage of its waste stream.

Bike Friendly Business Award

IBM Rochester, Minnesota, received a Bike Friendly Business Award — Bronze Level from the League of American Bicyclists. The award recognized IBM Rochester's investment in construction and maintenance of 3.7 miles of on-site bike trails. IBM also partnered with the city of Rochester by providing an easement in 2013 to allow for the interconnection of the site's bike trails with the city of Rochester bicycle trails and Douglas State Trail. The site provides bike rack parking close to buildings and locker and shower facilities to accommodate employees who ride to work.

Ecuador

General Rumiñahui Award for Social Responsibility Best Practices

IBM Ecuador received a General Rumiñahui Award for Social Responsibility Best Practices from the Pichincha provincial government. The award recognizes companies for their good practices in areas such as human rights, social responsibility, community investment and environmental practices.

Mexico

Environmental Excellence Award

IBM Mexico received an Environmental Excellence Award from the Mexican Federal Environmental Protection and Enforcement Agency (PROFEPA) for its outstanding commitment to environmental protection, preservation and social responsibility, and for continuous improvements in environmental performance. IBM's implementation of EPA's SmartWay program for all our shipments of goods in Mexico, and the development and execution of two Smarter Cities® projects, were among the programs and projects recognized by the award. IBM Mexico has been certified under PROFEPA's Clean Industry Program since 2005.

Philippines

Outstanding Energy Award

IBM Philippines received an Outstanding Energy Award from the Philippine Department of Energy in the 2015 Don Emilio Abello Energy Efficiency Awards for energy savings and carbon dioxide (CO₂) emissions avoidance.

Supply Chain

- Women's Business Enterprise National Council — One of America's Top Corporations and the William J. Alcorn Leadership Award
- National Minority Supplier Development Council — Top Global Program for Supplier Diversity
- U.K. Employers Network for Equality and Inclusion — Global Diversity Award
- Minority Business News — One of America's Most Admired Corporations for Supplier Diversity and Champion for Supplier Diversity
- United States Hispanic Chamber of Commerce — Million Dollar Club
- *Asian Enterprise* — One of the top corporations for Asian-American owned businesses
- *DiversityInc.* — Ranked #1 for providing opportunities to diverse businesses
- *DiversityPlus* — One of the Top 30 Champions of Diversity
- MSD China — Corporation of the Year and Top Contributor in Supplier Diversity
- U.S. Business Leadership Network — Top corporation for disability-owned businesses
- U.S. Department of Treasury — Mentor Protégé of the Year Award
- Women's Enterprise USA — Top leaders for Supplier Diversity

Performance summary

IBM relies on a series of metrics to measure our corporate responsibility efforts every year. Below is a summary of the data in several important areas. Our key performance indicators (KPIs) for various parts of the business are also noted, along with some explanation.

KPI denotes key performance indicator

Employees

Learning

We encourage IBMers to flourish by providing guidance and opportunities for career and expertise growth, with the intention of helping both the company and our employees succeed in this rapidly changing world. IBM blends traditional, virtual and work-enabling learning and development activities to accomplish this. This strategy allows us to provide timely, comprehensive and targeted learning through efficient, effective learning delivery mechanisms.

	2011	2012	2013	2014	2015
Learning investments worldwide (\$M) KPI	466	477	525	482	484
Learning hours worldwide (M)	27.4	33	40	25.8	25
Learning hours per employee KPI	63	78	82	62.5	58.3

Women in the workforce **KPI**

For more than 100 years, IBM has been dedicated to addressing the specific needs of women in our workforce and to creating work-life and career development programs that address these needs. We are committed to the progress and leadership development of women in our workforce and to providing opportunities across the more than 170 countries where we do business.

Women in the workforce %	2011	2012	2013	2014	2015
Global workforce	28.1	30.0	30.1	31.1	31.4
Global executives	21.5	22.3	23.2	23.9	24.0
Managers	24.6	25.6	26.0	26.5	26.4

Global illness/injury rate

For more than 100 years, IBM has been dedicated to addressing the specific needs of women in our workforce and to creating work-life and career development programs that address these needs. We are committed to the progress and leadership development of women in our workforce and to providing opportunities across the more than 170 countries where we do business.

Global illness/injury rate	2011	2012	2013	2014	2015
Total number (per 100 employees)	0.33	0.29	0.30	0.42	0.33

Volunteering

IBM supports and encourages employees and retirees in skills-based volunteering in their local communities around the world. Since 2003, when IBM launched its volunteering enablement initiative, 280,000 registered users have logged nearly 20 million hours of service worldwide.

Retiree and employee volunteer hours (K)	2011*	2012*	2013	2014	2015
Total worldwide	3,201	1,581	1,496	1,532	1,195

* IBM celebrated its Centennial in 2011 – 12 and the exceptionally high volunteer hours reflect the many special volunteer projects associated with the Centennial.

Giving

IBM tracks and reports global corporate contributions by issue, geography and type of grant. Giving by issue is important, as our goal is to maintain education as our primary focus by using IBM's innovative skills and technology to improve student skills and performance. Giving by geography is also important, to help us understand the alignment of our resources with our global operations. But the type of our giving — a combination of problem-solving services, innovative technology (including software) and select contributions of cash, all combined in a way to transform approaches to societal challenges and achieve measurable outcomes that are both sustainable and scalable — that is what we believe distinguishes IBM.

While education is our highest priority, educational improvement cannot be achieved unless its connection to other issues is understood. Consequently we intend to continue strategic investments in human services, culture, health and the environment. In addition, it is vitally important that we maintain the flexibility to respond to emerging needs and develop new initiatives, as well as address extraordinary external conditions such as disaster relief and recovery. We believe that our contributions in 2015 met these goals.

IBM operates in a global, fully integrated fashion. This is reflected in the distribution of our citizenship contributions by geography. Some of our contributions are given on a globally competitive basis, so geographical distribution may vary due to the number and quality of applications. By type of contribution, technology and services as a percentage of total contributions increased in 2015. This is fully consistent with our focus on providing transformative and effective solutions. We do not set goals for percentage change in contributions year-to-year, nor for giving by geography or contribution type. We focus instead on increasing the quality of our work with organizations — on projects that successfully use our most innovative solutions, have a significant and measurable impact on key social issues, and are both scalable and sustainable. Current trends in contributions will not necessarily continue, but rather will be determined within the framework of our goal to increase the effectiveness of our contributions.

Global corporate contributions by issue (\$M) KPI	2011	2012	2013	2014	2015
Education	141.8	143.0	147.1	149.2	154.8
Culture	3.8	3.7	3.0	3.6	3.4
Human Services	17.9	16.9	17.3	20.1	18.6
Health	4.5	3.5	3.5	3.7	3.6
Other	22.7	24.8	32.0	30.7	23.9
Environment	5.4	5.2	5.0	3.1	0.6
Total	196.1	197.1	207.9	210.4	205.0

Global corporate contributions by type (\$M) KPI	2011	2012	2013	2014	2015
Cash	46.9	42.6	41.4	36.8	35.5
Technology	91.3	99.2	100.2	104.4	109.5
Services	57.9	55.3	66.3	69.2	60.0
Total	196.1	197.1	207.9	210.4	205.0

Global corporate contributions by geography (\$M) KPI	2011	2012	2013	2014	2015
United States	70.8	69.9	75.7	77.8	60.4
Asia Pacific	36.3	35.9	37.5	40.3	42.6
Canada	6.8	7.1	7.8	6.9	5.0
Europe, Middle East, Africa	60.2	64.4	65.7	64.8	82.2
Latin America	22.0	19.8	21.2	20.6	14.8
Total	196.1	197.1	207.9	210.4	205.0

Environment

IBM maintains goals covering the range of its environmental programs, including climate protection, energy and water conservation, waste management and product stewardship.

These goals and our performance against them are discussed in this report. The goals identified here as KPIs are based on stakeholder interest and materiality. IBM considers all of its goals to be important metrics of the company's performance against its commitment to environmental protection.

Energy conservation KPI

IBM's goal is to achieve annual energy conservation savings equal to 3.5 percent of IBM's total energy use. In 2015, IBM again achieved this goal, attaining a 6.3 percent savings from its energy conservation projects.

Energy conservation	2011	2012	2013	2014	2015
As % of total electricity use	7.4	6.5	6.7	6.7	6.3

Product energy efficiency KPI

IBM's product energy goal is to improve the computing power delivered for each kilowatt-hour of electricity used with each new generation or model of a product. Please see the product stewardship goals and performance table on [page 62](#).

Recycled plastics

In 2015, 5.05 percent of the plastic resins procured by IBM and its suppliers through IBM's corporate contracts for use in IBM's products contained some recycled content. Comparing only the weight of the recycled fraction of these resins to the total weight of plastics purchased (virgin and recycled), 2.8 percent of IBM's total plastic purchases in 2015 were recycled plastic versus the corporate goal of 5 percent. The significant decline in the use of recycled plastics in 2015 is largely attributable to the divestiture of IBM's x86 server business to Lenovo in 2014. Given the diminishing amount of plastics contained in IBM's current product portfolio, we are re-evaluating the goal to determine how it should be modified to better align with IBM's current business.

Recycled plastics	2011	2012	2013	2014	2015
% of total plastics procured through IBM contracts for use in its products that have been recycled	12.4	12.6	10.8	12.1	2.8

Product end-of-life management KPI

IBM's goal is to reuse or recycle end-of-life IT products such that the amount of product waste sent by IBM's product end-of-life management (PELM) operations to landfills or incineration for treatment does not exceed a combined 3 percent of the total amount processed.

In 2015, IBM's PELM operations sent only 0.7 percent of the total processed to landfill or incineration facilities for treatment.

PELM management	2011	2012	2013	2014	2015
% of total processed sent by IBM's PELM operations to landfill or incineration for treatment	0.4	0.3	0.3	0.5	0.7

Nonhazardous waste recycling

Our voluntary environmental goal is to send an average of 75 percent by weight of the nonhazardous waste generated at locations managed by IBM to be recycled. In 2015, we recovered and recycled 85 percent of our nonhazardous waste.

Nonhazardous waste recycling	2011	2012	2013	2014	2015
% sent for recycling of total generated	78	87	86	86	85

Supply chain

2015 global supplier spending was down \$4.5 billion, affected by decreased revenue across IBM's product and services lines, by the completed divestiture of our microelectronics business to GlobalFoundries, and from leveraging marketplace pricing opportunities. Production Procurement, Logistics Procurement and diverse-supplier spending had the largest percentage decrease owing to the divestiture. Geographic distribution of supplier spending remained consistent, as our supply base is positioned to serve the needs of our clients on a global basis.

Supplier spending by category	2011	2012	2013	2014	2015
Services and general procurement (%)	64	64	67	71	79
Production procurement (%)	33	33	30	26	18
Logistics procurement (%)	3	3	3	3	3
Services and general procurement (\$B)	23.4	22.8	22.1	21.6	20.3
Production procurement (\$B)	12	11.5	9.7	7.8	4.7
Logistics procurement (\$B)	1.1	1	1	0.9	0.8

Supplier spending by location	2011	2012	2013	2014	2015
North America (%)	34	35	36	37	42
Asia Pacific (%)	34	35	35	33	31
Europe, Middle East, Africa (%)	23	21	21	23	22
Latin America (%)	9	9	8	7	5
North America (\$B)	12.5	12.4	11.8	11.2	10.8
Asia Pacific (\$B)	12.5	12.4	11.4	9.9	8
Europe, Middle East, Africa (\$B)	8.3	7.4	7.0	6.9	5.8
Latin America (\$B)	3.2	3.1	2.6	2.3	1.2

First-tier spending	2011	2012	2013	2014	2015
Total U.S. (\$B)	10.6	10.7	10.2	9.8	9.3
Diverse U.S. (\$B)	1.7	1.7	1.9	1.5	1.3
Diverse non-U.S. (\$M)	881	939	917	883	718

The increase in supplier improvement plans completed and accepted was due to a larger number of social responsibility full audits and re-audits conducted in late 2014 and 2015. IBM requires an improvement plan for all suppliers with noncompliance discovered during an EICC audit or re-audit of their facilities; implementation of the plans may begin in one calendar year and complete in the next.

Corrective action plans	2011	2012	2013	2014	2015
Supplier corrective action plans completed and accepted	473	311	175	141	161

Communities

Through an integrated portfolio of innovative programs, IBM and IBMers contribute our best assets — our technology, time and global expertise — to create innovative solutions to some of the most challenging problems facing society in the places where we live, work and do business. The story of corporate responsibility at IBM includes people helping communities recover from natural disasters; developing new ways to educate and mentor students; including persons with disabilities; creating a virtual supercomputer for use by humanitarian researchers; contributing time, skills and funds to organizations that do good work — and the company that encourages and enables these contributions. Our stories demonstrate our commitment to serving the greater good by going beyond mere generosity and “giving back.” The IBM Corporate Citizenship story illustrates how critical and systemic societal problems can be addressed head-on through the development of innovative approaches that not only achieve excellent results, but also can be brought to scale. As a company, as individuals and in collaboration with public- and private-sector partners, we use our technology and our expertise to protect and improve human life, human dignity and our planet.

Education

Education and skills form the basis of any economy. They enable social movement and can make the difference between poverty and prosperity. At IBM, we call upon our global expertise to outthink the world’s toughest challenges to education, economic development and the prosperity they generate.

To address the growing skills gap, IBM has created an innovative grade 9 to 14 schools model that is influencing national and global actions to create public-private partnerships with the power to transform economies. Designed by IBM, the program enables students to navigate a clear pathway from school to college and career. We also are developing the means for cognitive computing to help teachers improve their teaching, which is connected directly to higher student achievement. In 2015, IBM pioneered a training, certification and job placement program to help military veterans repurpose their expertise and enter the civilian workforce. And our program that facilitates access to large companies’ supply chain spending by small businesses helps them grow and create new jobs.

Shaping the future of American education

At its highest point since World War II, youth unemployment in the United States is at crisis levels — with conditions particularly dire for children of color from low-income families. Among 24-year-olds from low-income backgrounds, fewer than one in 10 hold a college degree. College completion rates across the board are dismally low, despite huge amounts of student, family and taxpayer money spent on remediation. At the same time, an increasing number of today’s better jobs require at least a two-year postsecondary degree and work readiness skills. In a tragic disconnect, middle-class jobs requiring postsecondary preparation are on the rise as college completion rates, and the number of job candidates with workplace-ready skills, remain far too low. (See Harvard University’s [Pathways to Prosperity](#) study for more on the skills gap.) To address this challenge head-on, IBM created and opened the first **P-TECH** school in 2011 in Brooklyn, New York. The vision was to graduate young people

from an integrated grades 9 to 14 program within six years, with both their high school diploma and Associate in Applied Science degree — ready to meet the challenges of college and career. In June 2015, P-TECH's first six graduates finished their "six-year" program two full years ahead of schedule. By June 2016, more than three dozen P-TECH students had finished their degrees either one or two years ahead of schedule.

"The world is becoming increasingly competitive for jobs, and allowing our kids to have a little bit of a head start while they are still in high school to be able to come out with an associate degree...is a tremendous advantage."

— John Hickenlooper, Governor of Colorado

All of P-TECH's graduates were offered positions with IBM. Kiambu Gall, Gabriel Rosa and Radcliffe Sadler joined the company in entry-level professional jobs, while Cletus Andoh, Rahat Mahmud and Michelle Nguyen matriculated at four-year colleges and universities. In December 2015, five more students graduated from P-TECH early. Three are working at IBM while completing their four-year degrees, and two will be attending a four-year college or university on scholarship.

The innovative P-TECH program was designed to work in any community. Since 2011, P-TECH has grown to 40 schools across three U.S. states, plus two schools in Australia. IBM is partnering directly with four of these schools, and more than 100 other businesses are replicating the IBM P-TECH model in schools focused on preparing graduates for careers in advanced manufacturing, healthcare and IT. A total of 60 schools across six U.S. states will be open by September 2016. Each school is a tri-sector partnership among a school district, a higher-education institution and a participating company that helps direct the school's curriculum to prepare graduates for where the jobs will be. These companies also provide paid internships and one-on-one mentoring for each student. Each school is open admissions (no testing), and most serve young people from historically underrepresented and underprivileged groups. P-TECH is changing the odds for the next generation.

By fall 2016, the P-TECH model will have expanded to 60 schools in six U.S. states and Australia. Here are some of the reasons why:

- Out of P-TECH's first two cohorts of approximately 100 students each, 26 percent of Cohort 1 will have graduated by this June — earning both their high school and college degrees anywhere from one to two years ahead of schedule.
- Meanwhile, 11 percent of Cohort 2 will complete their "six-year" program in only four years.
- P-TECH Cohort 1 is on track to exceed a 60 percent community college degree completion rate — a degree completion rate that is 50 percent above the U.S. national average.
- P-TECH students' grades far exceed expectations. High-school students from the inaugural school in Brooklyn, New York, earned grades of A, B or C in 86 percent of their fall 2015 college courses. They received failing grades in only 3 percent of their college courses.



[P-TECH: How high schoolers are redefining their future](#)

Helping teachers teach and students learn

The first letter of “STEM” stands for “science,” yet far too few teachers are prepared to teach it effectively — particularly in the earlier grades. That’s why IBM created Teachers TryScience, a global resource for science lessons and support for front-line educators. The Teachers TryScience website offers 589 lessons in 15 languages (including 116 new lessons in four new languages added in 2015 alone), along with 69 pedagogical videos and tutorials. IBM developed each resource in collaboration with master science teachers

The program made an especially strong impact in Southeast Asia and sub-Saharan Africa in 2015. In Vietnam, the website proved so effective that the Sóc Sơn district in Hanoi integrated Teachers TryScience’s lessons and active learning methodologies into the official secondary school curriculum. And in Kenya, IBM established a partnership with the Centre for Mathematics, Science and Technology Education in Africa (CEMASTEA) — the Ministry of Education’s professional development agency for STEM teachers — to train 100 education leaders from urban, rural and arid regions how to integrate Teachers TryScience into their classrooms. This effort helped engage nearly 15,000 students throughout 2015. In 2016, CEMASTEAs and IBM plan to train 200 educators in 10 counties — part of a three-year rollout of Teachers TryScience in Kenya.

IBM Watson cognitive computing already is helping to accelerate progress in medicine and healthcare. Watson has the ability to synthesize massive amounts of data in service of human decision making, and to collaborate with experts using natural language — providing assistance when it is most needed at the point of patient contact. This ability sets Watson apart as the world’s most powerful realization of artificial intelligence. But doctors aren’t the only ones who need help making the best decisions based on the best quality of information. Teachers — who connect our children with the worlds of opportunity and imagination — too often lack the needed support to help them hone their skills and deliver high-quality instruction to their students. Teachers need Watson, too!

Teacher Advisor, Powered by IBM Watson was created by teachers, for teachers. Now in development, it will serve as a virtual mentor to educators. Teacher Advisor will help teachers enhance their content knowledge, strengthen their lesson-planning skills and improve their overall instructional practice. Best of all, it will be available whenever a teacher needs it — discreetly, confidentially and totally free. Teacher Advisor will launch as a pilot in August 2016, and will be available to all teachers during the 2016–17 school year.

Building the pipeline

Launched in 2010 to help link postsecondary education more closely to the skills needed in the workplace, the [IBM University Relations](#) Future Skills Project engages first-year university students in a cooperative, Problem-Based Learning (PBL) curriculum. IBM in Japan is among the nearly 60 companies and 20 major universities that participate in the program. In 2015, an IBM volunteer conducted a series of workshops to introduce undergraduates at Yokohama National University to IBM Watson cognitive computing — thereby helping prepare the next generation to develop new business ideas incorporating leading-edge technologies.



IBM’s Watson uses A.I. to help teachers

Learning to innovate

In August 2015, the IBM China Software Development Lab, Taiwan's Department of Transportation and Logistics Management, National Chiao Tung University, and transport engineering experts THI Consultants joined forces to compete in the first Electronic Toll Collection Innovation Contest sponsored by the Taiwan Area National Freeway Bureau. The goal was to encourage and support solutions to freeway congestion. The team of IBM and its government, university and industry partners won the top award for an innovative solution incorporating gamification, streaming analytics and user experience design — using IBM Watson analytics and cognitive capabilities.

IBM also initiated an [IBM Bluemix](#) development platform curriculum at the National Taiwan University of Science and Technology. IBM Taiwan's chief technology officer and 12 software engineers from the China Development Lab ran the program, through which students gained hands-on opportunities to create web applications, mobile apps and Internet of Things (IoT) solutions using Bluemix. A second program united IBM in Taiwan with National Cheng-Chi University to teach Bluemix development for mobile applications. Additional university partners included National Taiwan University, National Tsing Hua University, National Chiao Tung University and National Chiayi University. The IBM team plans to combine the lectures and exercises from the various engagements into Taiwan's first Bluemix textbook.

In India, Bluemix was the focus of an IBM collaboration with the Indian Institute of Information Technology and Management-Kerala. The partners sought to develop an IoT-based protocol for monitoring and adjusting water quality in public filtration and distribution systems.

Using technology to spread knowledge and skills

- Teachers TryScience — Added 116 new STEM lessons in four new languages in 2015
- Teacher Advisor, Powered by IBM Watson — Confidential, no-cost, virtual teacher mentor debuts in August 2016
- Academic initiatives — Providing Watson Analytics™ and IBM Bluemix® free of charge to more than 6,500 universities worldwide

Health

IBM is pioneering a new partnership between humanity and technology with the goal of transforming global health. Cognitive systems that understand, reason and learn are helping people expand their knowledge base, improve their productivity and deepen their expertise. With cognitive computing, we are now able to see health data that was previously hidden, and do more than we ever thought possible. The implications of IBM cognitive computing for corporate citizenship are profound. As an integral part of IBM's overall strategy, our efforts to help improve global health at all levels — including in remote areas, developing economies and economically challenged communities in mature markets — are supported by the company's worldwide resources and expertise.

In addition, IBM and volunteers together provide the massive computational power required for humanitarian research into solutions for disease and environmental issues — power that typically is beyond the reach of scientists in these areas. And our

IBM University Relations

\$13m

Awards and engagement programs in more than 20 countries

133k

IBM Bluemix development platform codes issued to faculty and students

30k+

Emerging innovators engaged by IBM's developer skills program

specialized software for nonprofit organizations ensures that providers of social support can focus on client service while maintaining compliance with public and private funding requirements and reporting of results.

Finally, IBM is a global leader in developing and deploying employee health initiatives. Read more at the conclusion of this section.

Applying cognitive computing to global issues

IBM Watson cognitive computing already is helping specialists at the Memorial Sloan Kettering and University of Texas MD Anderson cancer centers. Announced in 2015, [IBM Health Corps](#) will focus the strengths of cognitive computing and data analysis on community health issues such as age- and income-based health disparities, and healthcare access and delivery.

“Our work with IBM Health Corps shows the potential of mobile technologies at the front end in Primary Care facilities and high-impact visual modeling at the policy-maker level to provide important insights and link key players in the healthcare management chain. Real-time insights will improve decision making and planning that will have real impact on healthcare access and patients’ lives.”

— Saul Kornik, Chief Executive Officer, Africa Health Placements

Pilot projects in partnership with local governments and nonprofit organizations in Calderdale, U.K., and Johannesburg, South Africa, addressed these issues. And beginning in 2016, IBM will dispatch interdisciplinary IBM Health Corps teams to as many as five global destinations. The program will add more destinations in subsequent years.

Enabling humanitarian research

An essential aspect of promoting global health entails supporting humanitarian research, especially since scientific inquiry relies increasingly on computational power to find cures for disease and develop solutions to protect and sustain the environment. IBM’s [World Community Grid](#) works with groundbreaking researchers on HIV/AIDS, children’s cancers, Ebola, water-borne and mosquito-borne diseases, water purity and solar energy, to name a few. Unused computing power donated by volunteers from around the world is aggregated into a “virtual supercomputer” for scientists to which IBM grants access free of charge. In 2016, World Community Grid will also support research to better understand tuberculosis (TB) and develop strategies to combat it. TB ranks with HIV/AIDS as among the world’s deadliest afflictions.



Introducing IBM Health Corps



How did volunteers enable surprising water filtration discovery?

“TB is one of the world’s deadliest infectious diseases, and one-third of the world’s population harbors the TB bacterium. My team will use World Community Grid to help science better understand the TB bacterium so we can develop more effective treatments and eventually eradicate this threat to human health. Thanks to World Community Grid’s massive computational power, we can study many different mycolic acid structures instead of just a few. This type of analysis at this scale would otherwise be impossible.”

— Anna Croft, Ph.D., Principal Investigator, Help Stop TB project and Associate Professor, Faculty of Engineering, University of Nottingham (U.K.)

In May 2016, World Community Grid announced its support of a research project to help find an effective treatment for the Zika virus, which is linked to severe brain defects in infants born to mothers who contracted the virus while pregnant. The [OpenZika](#) project aims to identify drug candidates to treat the virus, using software research tools to screen millions of chemical compounds against the target proteins that the Zika virus likely uses to survive and spread. As knowledge of the virus and key proteins are identified, the OpenZika team will use the new knowledge to refine their search.

Tracking cancer trends

IBM in Hong Kong worked with The Chinese University of Hong Kong’s Stanley Ho Big Data Decision Analytics Research Centre to use IBM Watson Analytics to develop a visual analytics platform to uncover global cancer trends. The team aggregated 20 years of World Health Organization cancer data to analyze trends for 27 types of cancer across time, gender, age groups, developing and mature economies, and geographic regions. IBM Watson Analytics accelerated the team’s work through fast prototyping of visualization dashboards to help track trends.

“Big data analytics for healthcare research has revolutionized the research paradigm for disease surveillance and trend projection. Visual analytics can be effectively used for spatial and temporal comparisons of cancer incidences, and also can enhance our understanding for better healthcare decision making. Watson Analytics tools facilitate this research discovery process.”

— Professor Helen Meng, Director of the Stanley Ho Big Data Decision Analytics Research Centre, The Chinese University of Hong Kong

Throughout 2015, IBM teams from India, the Netherlands and the United States collaborated with governments, universities and commercial enterprises on projects as diverse as mitigating the effects of climate change on water resources, improving the effectiveness of urban sanitary services, bettering the accuracy and response time of emergency medical services, developing more effective protocols for diagnosing mental illness, and using metagenomics to improve food safety.

World Community Grid

155k

Years of computing time donated in 2015

16k

New volunteers who joined World Community Grid in 2015

3m

Devices that contribute unused computing time to humanitarian research

Helping nonprofits help others

Long a global issue, income inequality in the United States is at its greatest levels in nearly 100 years. To make matters worse, public funding for programs to assist low-income individuals and families is at an all-time low. As a result, nonprofit organizations that provide social services must be increasingly streamlined and efficient to remain effective. These organizations also must observe scrupulous record-keeping practices to maintain their relationships with government agencies and private funders. Efforts to complete this process of documentation can distract from normal operations and diminish service to clients. In 2015, IBM completed the build of SafetyNet, a data management solution that supports nonprofits' needs to collect and analyze essential contract, program and client information. SafetyNet is deployed free of charge to eligible nonprofit organizations. IBM partnered with New York City's United Neighborhood Houses (UNH) — a membership organization of 38 settlement houses and community centers — to roll out SafetyNet to the Hudson Guild and the Stanley M. Isaacs Neighborhood Center. UNH and these partners promote neighborhood-based services to low-income residents, and have realized time savings on reporting, administrative and assessment processes using SafetyNet — allowing them to serve their clients better.

“Our organization has been assisting families in need for more than 120 years. Now, using IBM’s SafetyNet software, we can more efficiently measure and improve the services we provide on a daily basis, as well as increase our ability to demonstrate the impact of our work.”

— Ken Jockers, Executive Director, Hudson Guild

Prioritizing employee well-being

IBM has long been a pioneer in encouraging and supporting healthy lifestyles and a meaningful work/life balance for employees.

Read about IBM's 2015 employee well-being initiatives on [page 39](#).

Citizen diplomacy

No single entity can overcome society's greatest challenges alone. That's why a critical component of IBM's approach to global citizenship involves partnerships with a diverse group of organizations that provide complementary skills and valued perspectives to our work.

Forging essential partnerships

In 2015, we announced an historic partnership between the [IBM Corporate Service Corps \(CSC\)](#) and the Peace Corps. U.S. first lady Michelle Obama announced the partnership at Fortune magazine's Most Powerful Women Summit. Working together, Corporate Service Corps and the Peace Corps will share expertise and access to influencers for projects in Ghana, the Philippines and Mexico in 2016. Additional partners for these projects will include the Let Girls Learn alliance; the U.S. Agency for International Development (USAID); the Millennium Challenge Corporation; local, regional and national governments; and private sector corporations.

“Peace Corps and IBM share a common dedication to problem-solving in a way that makes a measurable impact in the world, whether it is reinventing information and revolutionizing technology or helping communities address pressing needs at the last mile of development.”

— Peace Corps Director Carrie Hessler-Radelet



IBM and VSO: Working together to improve lives in India

In 2015, IBM also worked with the Global FoodBanking Network to increase donated food supplies in Argentina, Colombia, Ecuador and Mexico. Pro bono consultants working through IBM's Corporate Service Corps helped drive a 41 percent increase in food donors to help feed 15,000 people each month.

IBM launched the Corporate Service Corps program to enable its future leaders to excel. Nearly 10 years later, the program exemplifies corporate responsibility at the intersection of business and society. IBM demonstrates innovation in citizen diplomacy by simultaneously delivering excellence in leadership development, impact for communities facing critical challenges, and IBM skills. Having achieved its original aim, the program quickly evolved to become an enabler of scalable and sustainable change on many levels — from life-changing experiences for nearly 3,000 of IBM's best and brightest employees, to a catalyst for change for organizations positively impacting people across 37 countries, to demonstrating innovation that matters for many of IBM's clients who have developed similar programs based on the IBM CSC model.

IBM Corporate Service Corps: Excellence in leadership development

IBM Corporate Service Corps (CSC) sends teams of some of IBM's most talented employees to provide pro bono consulting to countries in the developing world that are grappling with issues that intersect business, technology, and society.



[Click to download full infographic](#)

Through a spirit of continuous improvement and collaboration, CSC has amplified the impact it makes on communities by constantly evolving its work and building partnerships to expand impact. Projections from 2015 survey results estimate that 41 million people — including approximately 19 million women and 20 million young people — would benefit from CSC projects if they were successfully implemented. 2016 will feature our ground-breaking partnership with the Peace Corps, which will expand the program's impact, and 2017 will mark a decade of CSC excellence.

Corporate Service Corps: the results

~3k

Top-talent IBMers from 60 countries who have refined their leadership and global collaboration skills

1k+

Completed projects in 37 countries; combined market value of \$70 million+ since 2008

\$12m

Market value pro bono consulting engagements across 20 countries in 2015

Corporate Service Corps: the experience

96%

Participants who say CSC increased their "ability to effectively lead a global team"

94%

CSC participants who say the program "offered important and unique learning/development opportunities that [matched their] career goals"

88%

Program participants who say they are "extremely satisfied with IBM as a place to work" after their CSC experience

Cities

Most of the world's population lives in cities, which continue in their global roles as consolidators of energy, talent and innovation while confronting the challenges of congestion, pollution and poverty. Through a variety of approaches — including pro bono consulting; collaboration with governments, nonprofits and commercial clients; and grant-making and skills-based volunteering — IBM and IBMers are dedicating their time and talent to making cities better places to live and work.

Alleviating “food deserts”

In Birmingham, Alabama, IBM provided pro bono consulting to help the city address food deserts — areas where residents do not have reasonable access to healthy and nutritious food.

Low-income food desert residents lack transportation to suburban supermarkets and must shop for groceries at neighborhood convenience stores. Consumption of unhealthy “convenience” foods leads to community medical problems such as high cholesterol, hypertension, obesity and Type 2 diabetes. In addition, the link between poor nutrition and lower academic achievement further complicates efforts to break the cycle of poverty. Working through the [Smarter Cities Challenge](#) program, IBM consultants and city authorities used data analytics to [design efficient delivery routes](#) for a mobile food market program. Using these routes, the Birmingham-Jefferson County Transit Authority and Community Food Bank of Central Alabama are establishing access to groceries for residents in need.

“During a three-week engagement, IBM consultants and the City of Birmingham were able to shine a brighter light on issues surrounding healthy food and food access while also identifying key opportunities to help mitigate these issues. With IBM's assistance, we are working hard to provide new bus routes that will increase residents' access to healthier food products. Through working together, the city, IBM, citizens and local organizations developed a camaraderie and common sense of purpose to eliminate food poverty for all Birmingham residents.”

— Mayor William A. Bell, Birmingham, Alabama

Harnessing big data to fight disease

An outbreak of dengue fever in Tainan City, Taiwan, prompted seven IBM [On Demand Community](#) volunteers to form the “IBM Mosquito Terminator” team to curb the spread of the disease. Similar to the Zika virus, dengue is a mosquito-borne disease for which there is no vaccine. Tainan City had 18,000 reported cases of dengue in 2015 alone, and attempts to manage the disease were overwhelming the city's environment and public health departments. Using their big data and analytics skills, the IBM team helped city government develop a strategy to curb the spread of the disease. After collecting both structured and unstructured data from various agencies, the team contributed their personal time to running IBM SPSS Modeler to determine the best protocol for controlling the outbreak. This research led to specific and effective recommendations for coordinating insecticide application with weather patterns — a technique that will be shared with other governments and nonprofits charged with fighting mosquito-borne diseases.

Smarter Cities Challenge

\$66m+

Value of pro bono services delivered to 130 cities worldwide

800

Number of top IBM experts who have engaged with civic and community leaders to improve quality of life for all residents

Economic and workforce development

The world's economy has never been more connected or more complex. With the right skills, innovative products and services, and access to markets, individuals and businesses can gain access to unprecedented opportunities. Through educational and economic development programs, IBM is helping to close the gap between "potential" and "success" for young people, small businesses, and military veterans transitioning to civilian careers. Our programs are helping people help themselves by giving them the motivation, training and access they need to prepare for careers, apply their expertise in new ways, and transform their businesses into engines for economic growth.

Transitioning veterans to civilian careers

After three U.S. Army combat tours in Afghanistan and Iraq, Alex Williams was ready to transition to civilian life. But like so many military veterans, Alex felt culturally disconnected from the business world and wondered how to apply his technical skills, seasoned perspective and commitment to service in a corporate setting. In addition, Alex had joined the Army straight from high school, so he needed to address both the real and perceived gaps between his proven capabilities and his academic qualifications.

In 2015, IBM worked with Alex and more than 150 additional veterans in the U.S., U.K. and Canada through our Veterans Employment Accelerator — part of an IBM Impact Grant portfolio that includes skills and capacity building. Our nonprofit partners Corporate America Supports You (CASY) and the Military Spouse Corporate Career Network (MSCCN) co-sponsor this initiative, through which vets receive free training on IBM i2 Analytics software and prepare for the Advanced Data Analyst certification exam.

"We at CASY-MSCCN are thrilled to partner with IBM on this project. Not only does the advanced data analyst certification serve as a huge plus on the resumes of those that receive the training, but the high-demand skills they develop help us put them directly into jobs in the fast-growing field of data analytics."

— Dan Kloeppe, Rear Admiral (Ret.), U.S. Navy and Founder, CASY-MSCCN

Training takes place near military bases and in other communities with large populations of veterans, and graduates receive job placement support from Veteran Service Organizations and IBM partners such as Boeing, Citi, JPMorgan Chase, and USAA. As part of the program, IBM also donates Kenexa on Cloud software to help our partners gauge the job readiness and career fit of military-to-civilian job seekers. Since Kenexa is used by a wide network of recruiters, our partners' use of the software results in thousands of job placements for veterans like Alex — who joined IBM after being certified as an Advanced Data Analyst.

[Learn about IBM's recruitment of veterans.](#)

Helping young people relate STEM skills to everyday life

IBMer Anneliese Gegenheimer founded the [Chicago Student Invention Convention \(CSIC\)](#) four years ago to encourage public school students in grades K through eight to use their STEM (Science, Technology, Engineering, Mathematics) skills to solve real-world problems creatively. In 2015, Anneliese partnered with a nonprofit foundation, recruited three new corporate sponsors and engaged more than 75 additional IBM volunteers as mentors

Veterans Employment Accelerator Impact Grant

150

U.S. and U.K. military veterans trained

97%

Advanced Data Analyst certification rate for trainees

25

Graduates that IBM and partner companies have hired

and contest judges to help expand CSIC to 28 schools. Teachers in the program have used IBM Activity Kits to facilitate the innovation process, and IBM Community Grants have enabled CSIC to create additional materials for teachers, students, mentors and others. A White House initiative to promote STEM education recognized CSIC for its innovative, hands-on approach to teaching — an approach that has garnered a satisfaction rating from parents and teachers of greater than 90 percent.

Energizing small businesses

In the United States, small businesses create more than 50 percent of all new jobs each year. That's why helping them succeed and grow is essential to a healthy economy. IBM's [Supplier Connection](#) program consolidates access to the supply chain spending of more than 30 large businesses to provide a single point of contact for small business engagement with this critical market. The easy-to-use Supplier Connection portal has been instrumental in enabling small businesses to sell their goods and services, and in connecting large companies with innovative and diverse suppliers. Large business supply chain spending with small businesses via Supplier Connection approached \$2 billion in 2015. And with each new supply chain connection, smaller businesses become larger and hire new employees.



President Barack Obama greets members of IBM's Supplier Connection program.

Disaster preparedness, response and recovery

When it comes to responding to crises, there are those who make a show, and those who show up. IBM always has engaged in crisis response in the communities where we live, work and do business. We arrive early and stay for the long haul — calling upon an integrated portfolio of advanced technologies and global expertise to deliver what it takes for affected individuals and communities to regroup, rebuild and recover. IBMers have the desire, the leadership support and the training to serve. We get systems up and running, create new systems where needed, and help people get back to the business of life. Through the delivery of integrated solutions by mobilized teams and inspired individuals, IBM reaches out to communities in their times of need.

Assisting Nepal in the wake of tragedy

The massive earthquakes that struck Nepal and surrounding areas in April and May 2015 [killed more than 8,000 people](#), injured more than 21,000, and [affected more than 8 million](#). In the immediate aftermath of the first tremor, a four-member IBM India team was invited to join Indian government officials in Nepal to assess needs, determine options, and begin immediate implementation of technology and business solutions to speed recovery. IBM India has long-standing relationships with the Indian and Nepalese governments through our involvement with numerous disaster relief efforts. In this instance, the team collaborated to develop solutions to:

- Improve and analyze missing persons data for heavily damaged border regions
- Track distribution of relief materials
- Establish an integrated response and relief reporting process
- Evaluate the appropriateness of technological assistance offers
- Work with long-term partner the Global Peace Foundation to support a youth disaster rebuilding initiative, using Sahana Eden open-source software

The integrated relief team used Sahana and other technologies to facilitate long-term rebuilding efforts, including youth leadership training in citizenship and service as part of a broadly based community mobilization effort.

Responding to massive flooding in India

In the last two months of 2015, heavy rains and extensive flooding inundated eight of 22 districts in the city of Chennai, part of a metro area that is home to more than 12 million people — including more than 5,000 IBMers. Though affected by the flooding themselves, 17 IBMers were among the first to participate in search and rescue operations. Then, after the first phase of response, the IBM team worked to deliver basic relief supplies, including food and medicine. IBMers in Chennai shared the community's needs online via IBM digital channels, and employees from throughout India responded with desperately needed supplies and funds — assisting more than 3,000 impacted residents of Chennai.

IBM also developed and deployed both shorter- and longer-term disaster recovery solutions for Chennai. Experts from across our business designed and donated an installation of one of the world's most sophisticated disaster recovery solutions. IBM awarded a grant to the state of Tamil Nadu (of which Chennai is the capital) to establish a cloud-based IBM Intelligent Operations Center for Emergency Management. The solution integrates critical weather, power, traffic, health service and shelter information from municipal sources, and displays their real-time status on a map. Emergency management personnel can run test scenarios as conditions evolve — enabling them to optimize resources delivery.

Essential to the ongoing effectiveness of the Intelligent Operations Center will be forecast data from The Weather Company®, the digital assets of which IBM acquired in 2015. The same types of data analysis of weather patterns that will streamline logistics in the for-profit sector will help Chennai anticipate developing crises, instead of simply reacting to them.

“The Weather Company will play a critical role in strengthening IBM’s analytics and client service capabilities. In the for-profit sector, this means giving clients enhanced visibility across logistics, weather-based fluctuations in customer demand, and other differentiators that can enable a business to operate more profitably. And in the nonprofit sector, we are gratified to know that our cloud-based Intelligent Operations Center for Emergency Management will use weather data to help predict and prepare for natural disasters, and to speed life-saving recovery after a disaster by giving decision makers the critical information they need to allocate resources where they are needed most.”

— Cameron Clayton, General Manager, The Weather Company

IBM also built and provided a mobile application to enable crowdsourced reporting of real-time needs directly to the appropriate government agencies. The IBM mobile “Citizen Reporter” app feeds data to the Intelligent Operations Center as part of a multi-faceted system that uses predictive analytics and cloud computing to help Chennai residents stay ahead of the next crisis.

Disaster response in Nepal

13k

Number of Nepalese families supported with emergency food, healthcare, sanitation and hygiene, and housing

2k

Number of youth organized by IBM project management training to build 600 shelters for earthquake survivors

25

Organization partners trained on Sahana disaster management software to prepare them for future events

Critical responses to the European migrant crisis

- IBM built a custom mobile app for Italian nonprofit INTERSOS that enabled doctors to collect medical data from nearly 1,000 arriving migrants. IBM is customizing another version of the app for use by French authorities in partnership with Médecins Sans Frontières (Doctors Without Borders).
- IBM's Cloud implementation of Sahana disaster recovery software enabled the German Red Cross (Deutsches Rotes Kreuz) to register more than 4,000 migrants.
- IBM has coordinated nearly 1,500 volunteers (IBMers and others) in Germany and Austria — including volunteers in Vienna who are mentoring and tutoring migrant children in German language and culture to help minimize the disruption to their educations.

Preparing for future challenges

We can't stop natural disasters, but we can do our best to be prepared. In 2015, IBM Corporate Citizenship & Corporate Affairs sponsored a global digital conference and hackathon to inform and inspire employees to apply their expertise and IBM technology to managing future challenges. The Open Development for Disaster Response hackathon attracted thousands of IBMers to participate in live and recorded discussion sessions on key disaster relief topics. Subject-matter experts from inside and outside IBM addressed topics ranging from first-responder information to communications networks in a crisis environment to crowdsourcing damage assessments. These virtual education sessions laid the foundation for a greater understanding of technology's role in disaster relief and recovery, and inspired more than 30 innovative projects to integrate IBM technologies into disaster response protocols. IBM Corporate Citizenship & Corporate Affairs also helped host a public contest to encourage the use of IBM's Bluemix development platform to create disaster relief solutions.

Responding to global refugee crises

IBM continues our long-term response to the persistent crisis in Europe, border states and other countries where hundreds of thousands of people have sought refuge after fleeing their homes in Syria, Afghanistan and countries in northern Africa. In 2015, the Italian NGO INTERSOS asked for IBM's assistance with registering the medical conditions of arriving refugees. Data for these records needed to include images, video and audio, and providing the ability to search content while protecting patient confidentiality necessitated a powerful and sophisticated IT system. IBM deployed an existing media management solution that enabled secure storage of sensitive information with field access via mobile and desktop devices. The INTERSOS system was launched at the end of 2015, and IBM is developing a similar solution for Médecins Sans Frontières (Doctors Without Borders).

“Thanks to IBM's mobile and cloud expertise, we have been able to transform how INTERSOS supports and processes migrants [to our] region of Italy. In time, we hope to incorporate the use of the app to other regions and organizations, so that even more migrants can be served.”

— Kostas Moschochoritis, General Director, INTERSOS

IBM also worked with the German Red Cross (Deutsches Rotes Kreuz) to develop intake and service solutions for refugees from around the world — especially those from Syria and Afghanistan. A version of the Sahana disaster management system helped the Red Cross in Mannheim manage their resources in the face of a constant stream of migrants whose records needed to be accurate, secure and available for ongoing resource planning and management. Our implementation of Sahana on the IBM Cloud enabled distributed and mobile access to migrant registration, health, security and location records.

The Sahana system is supporting employee and volunteer decision making by providing a single view of data across a variety of devices. IBM is making additional grants in France and Turkey to support organizations serving the needs of refugees and migrants. We are providing pro bono consulting for the development of data strategies, and support for matching refugees with housing and job skills training. In addition, IBM volunteers are helping refugees with language training, general literacy and finding employment. Of particular note is the effort of 60 IBM Austria employees who worked through the Vienna School Council to tutor 20 children from Afghanistan, Iraq and Syria in German. This was an essential effort to help the children assimilate into Austrian culture, and to mitigate their educational disruption.

Developing “apps for social good”

In 2015, IBM launched Apps for Social Good, a collection of signature mobile apps developed to complement the IBM Impact Grants program. Built on a standard IBM platform that uses Bluemix and SoftLayer, Apps for Social Good provide volunteer engagement, disaster response and other capabilities that governments, nonprofits and other types of organizations can use to coordinate efforts, monitor progress and improve the timeliness and effectiveness of life-saving relief.

Skills-based volunteering and community support

IBM's global reach gives us insight into the complexities of global problems. Our expertise enables us to develop innovative technologies and services to help manage complex challenges and effect large-scale positive change. The willingness of IBMers around the world to contribute badly needed skills and essential funding to advance humanitarian efforts is a testament to the company's culture of service, and to the fact that IBM attracts service-minded people who seek to balance community involvement, family and career.

Bridging a cultural divide

Cultural differences and comparatively low levels of education make it tough for Ethiopian immigrants to compete for higher-paying jobs in Israel. To help address this challenge, IBMer Davidi Boyarski worked through our On Demand Community skills-based volunteering program to collaborate with Israeli NGO Tech-Career — an organization specializing in technology training and placement. Together, they developed and implemented a program to provide technical training and career guidance to students of Ethiopian origin. Davidi and other IBM volunteers provided personal mentoring to complement the students' intensive, eight-month training to become computer system and network administrators. All of the students mentored by IBMers received job offers in the technical field, and the volunteer team also used an IBM Community Grant to help provide temporary financial support for graduates so they would not have to accept unskilled labor jobs while waiting for their first tech-sector paychecks. In addition to IBMers' contributions of skills and industry insight, their understanding of the personal challenges faced by young Ethiopians in Israel made all the difference.

On Demand Community

275k

Registered active and retired IBMers

~20m

Hours of skills-based volunteer service contributed

\$470m+

Market value of skills-based contributions since program inception

Preventing needless blindness

Nearly 6 million low-income Indians lose their sight each year. That's why the Sankara Eye Foundation has spent the last 40 years bridging the cultural, geographical and socio-economic divides that can prevent people from seeking and receiving needed treatment. Sankara's community outreach programs have benefited more than 67 million people across nine states — treating 80 percent of patients free of charge. In 2014, IBM provided Sankara with skilled volunteers and two computer servers to help the organization manage growth while maintaining outstanding levels of patient service. Two IBM Corporate Service Corps teams worked with Sankara to develop and deploy a knowledge management portal to handle patient and administrative data — the latest effort in IBM's long-term commitment to the organization.

Volunteering through On Demand Community, IBMers launched the Rainbow Preventative Eye Care for Children initiative in 2011, and remain active today. Through the program, IBM volunteers have participated in various levels of eye screening for underprivileged children through a network of 43 government agencies (including orphanages), nonprofit organizations and schools. Volunteers help educate children on eye health, identify children in need of vision care (including eyeglasses), and guide them through any needed surgery and recovery — all free of charge.

Gauging the effectiveness of CSR initiatives

In 2015, an IBM Social Media Analysis Impact Grant to the U.S. Chamber of Commerce Foundation enabled the organization to conduct an in-depth analysis of attitudes toward corporations, and the impact that their Corporate Social Responsibility (CSR) programs have on their brands. The goal of the study was to help companies gauge the reputational impact of their citizenship

initiatives, and to determine the direct value of using social media to support CSR. The survey was conducted by analyzing digital information — blogs, websites, online mentions and other social media — for 24 companies over a six-month period. Survey findings enabled the foundation to identify developing trends in public sentiment toward companies that engage in CSR, and to determine which types of citizenship programs garnered the most goodwill. The benefit to this type of analysis is that CSR practitioners are better able to quantify their impact, align their efforts with overall corporate strategy, and broaden the practice of CSR by demonstrating its value to other companies.

“One of the many tools we were able to create through IBM's Social Media Analytics Impact Grant was a Reputation Index that provides data and insights that show the direct value of using social media to support your company's CSR strategies. We found that for impacting a company's reputation, social media impressions about a company's CSR efforts were 10 times more effective than impressions about all of the company's activities. CCC hopes that findings and tools like the Reputation Index will inspire companies to engage in more corporate citizenship efforts.”

— Marc DeCoursey, Vice President, Corporate Citizenship Center, U.S. Chamber of Commerce Foundation

Impact Grants

\$12m+

Value of the nearly 400 grants awarded in 2015

\$53m+

Value of 1,900 grants awarded over program lifetime

\$6m+

Value of IBM software donated to more than 200 organizations since 2012

Supporting essential causes

The IBM Employee Charitable Contribution Campaign (ECCC) in the U.S. and Canada makes it easy for IBMers to contribute their time, talent and financial support to a wide range of charitable organizations — including those that employees nominate. ECCC contributions crossed the \$1 billion threshold in 2015, a year in which hundreds of IBMers also met with dozens of community service agencies, conducted nonprofit beneficiary workshops in such vital areas as project management and social media, collected and donated food and winter clothing, assisted veterans' groups, and volunteered to assemble such donations as charitable food backpacks and children's dental health kits. Company-wide, IBM employees also engaged in a variety of "We Care" projects such as house building through Habitat for Humanity.

Driving efforts to sustain the environment

Beginning in late 2014, IBM volunteers Daniel Flores, Francisco Elera and Sergio Zarate worked with Peru's Minister of Environment to develop a digital environmental awareness campaign to coincide with the United Nations' COP20 Climate Change Conference in Lima. The IBMers used the IBM Bluemix cloud-based development platform to construct a web and social media presence for the campaign. Their long-term goal was to engage 1 million Peruvians in environmental sustainability awareness and commitments to take action. International NGOs and local companies helped sponsor the initiative, which required the technical capabilities to manage data, analytics and social sharing, and the professional expertise to make it work. More than 150 IBMers helped launch the campaign, which was recognized internationally for its excellence, and which engaged more than 600,000 Peruvians (60 percent of target) after just a few months. Pon de tu parte ("Do your part") was an outstanding example of how IBM and IBMers effected transformative change through skills-based volunteering, through collaborating with governments, NGOs and other corporations, and by deploying breakthrough technologies.

Program overview

In this report, we have shared examples of how IBM's integrated portfolio of corporate citizenship programs enables us to create innovative solutions to societal challenges, bring them to scale and make them sustainable. We set out to solve — and help others manage — the world's greatest challenges in such areas as education, economic development, global health and environmental sustainability. Below, you will find brief descriptions of our citizenship programs, with highlights of their 2015 achievements.

Community Grants

IBM made a total of 3,100 Community Grants in 2015, with a combined market value of \$4 million.

Corporate Service Corps

340 top-talent IBMers from 45 countries deployed in 29 teams to 20 countries in 2015, to work on more than 100 projects with a combined market value of \$12 million. Since 2008, 2,800 IBMers from 60 countries have contributed their time and talent to more than 1,000 projects with a combined market value of nearly \$70 million.

Employee Charitable Contribution Campaign

The ECCC offers IBM employees in the U.S. and Canada an opportunity to contribute their time, talent and financial support to the communities in which they live and work. Through the program — which consolidates all local community fund drives into a single, national fundraising event — IBMers have contributed more than \$1 billion since 1978.

IBM Health Corps

Piloted in 2015 and officially launched in March 2016, IBM Health Corps is a global program designed to tackle health challenges. It will bring IBM's best talent in healthcare consulting, data analytics and cognitive computing in small teams to help public- and civil-sector health organizations address critical health disparities. Engagements in South Africa and the U.K. in 2015 demonstrated the viability of the Health Corps approach to tackling large-scale public health issues such as community nutrition, physical fitness and wellness, and skilled healthcare delivery to severely underserved populations.

IBM University Relations

Around the world, IBM plays an active role in helping universities, university students, and emerging innovators and employees prepare for the job markets of today and tomorrow. Engaging established academics and young scholars is critical to the future development and sustained success of IBM's breakthrough technologies. In 2015, we issued more than 133,000 Bluemix development platform codes to university faculty and students, and registered more than 10,000 faculty members to download free IBM software. In total, our academic skills development program engaged nearly 57,000 faculty and students in such areas as analytics, IBM Watson cognitive computing, security and Internet of Things (IoT). In addition, our developer skills program reached more than 30,000 established and emerging innovators worldwide in 2015. Finally, IBM University Relations collaborated with other IBM business units to invest more than \$13 million in awards and engagement programs, including volunteer initiatives that attracted more than 200 executives and thousands of employees in more than 20 countries throughout 2015.

Impact Grants

Impact Grants enable IBM's agile delivery of enterprise capabilities to schools and nonprofit organizations around the world. In 2015, we delivered nearly 400 grants with a combined value of more than \$12 million. Over the life of the program, IBM has made 1,900 Impact Grants worth more than \$53 million. Since 2012, we also have donated more than \$6 million in software to more than 200 organizations. Our donations of Cloud, Analytics, Security and Business Operations solutions — including industry-leading products such as Cognos, Connections on Cloud, Curam, i2, Kenexa, SPSS and Watson — have helped nonprofit organizations advance their work in such essential areas as education, health and human services, and disaster relief and recovery. IBM employees have delivered more than 1.2 million hours of high-value pro bono consulting through the Impact Grants program.

Disaster recovery and relief

IBM expanded its engagement in disaster management around the world in 2015 — working with internal and external partners to deploy some of the most effective and sophisticated approaches to disaster relief available today. IBM provided and deployed our software, hardware, services and research assets (bringing in experts from across the company) to deliver solutions that were essential to helping organize the chaos of displaced people and their often unstructured data. In the process, we also leveraged a truly remarkable and passionately focused group of global volunteers to help people in times of dire need. These dedicated volunteers significantly amplified the impact of our program by working in the field, developing new technologies on their own time, and providing invaluable help to relieve the pain and stress of disaster survivors.

SafetyNet

IBM's SafetyNet application assists nonprofits with the compliance and record-keeping capabilities required to attract and retain private and government funding. The program kicked off in partnership with United Neighborhood Houses and resulted in four initial grantees in New York City: Hudson Guild, Stanley M. Isaacs Neighborhood Center, Jacob A. Riis Neighborhood Settlement, and BronxWorks. SafetyNet supports these nonprofits in serving more than 60,000 clients annually.

On Demand Community

Active and retired IBMers coordinate their contributions of skills-based volunteering through On Demand Community. The program has 275,000 registered users and has delivered nearly 20 million hours of volunteer service since inception. We aspire to have delivered 50 million hours of volunteer service by 2030. IBM's volunteer activities align with the United Nations Sustainable Development Goals.

P-TECH

Created by IBM, P-TECH grades 9 to 14 public schools concentrate the power of school districts, states, community colleges and industry partners to connect education to jobs, while changing the life trajectories of historically underserved youth. Launched with one school in 2011, the P-TECH network will encompass 60 schools across six U.S. states and Australia by fall 2016. P-TECH's first graduating class of six students — all of whom completed their "six-year" program in just four years (June 2015) — moved on to entry-level professional jobs with IBM or matriculation at four-year colleges, with scholarships. Two of the graduates who took jobs with IBM also are working on their four-year degrees.

Smarter Cities Challenge

In its sixth year of operation, IBM's Smarter Cities Challenge will have deployed nearly 800 top experts to deliver pro bono services worth more than \$66 million to 130 cities worldwide — including 16 new cities announced in 2015.

Supplier Connection

IBM's consortium helps more than 2,000 small businesses grow and create jobs by connecting them to large companies' supply chains. Since program inception, large company members have spent more than \$6 billion with Supplier Connection registered small businesses — including more than \$2 billion in 2015.

Teacher Advisor, Powered by IBM Watson

Powered by IBM Cognitive Computing to serve as a virtual mentor to teachers, Teacher Advisor will launch in August 2016 as a free, web-based resource. Our development team held panels and workshops with expert educators throughout 2015 to ensure that Teacher Advisor will fulfill its promise to help teachers enhance their content knowledge and strengthen their lesson-planning and classroom skills. As a resource for teachers, by teachers, Teacher Advisor, Powered by IBM Watson will incorporate expert teacher input and feedback into its functionality and design.

Teachers TryScience

IBM's free, web-based resource and repository for STEM (Science, Technology, Engineering, Mathematics) lesson plans and instructional resources drew 275,000 visits in 2015. New lessons, languages and resources added in 2015 raised program totals to 589 lessons in 15 languages, and 69 videos and tutorials — with 20 lessons mapped to U.S. Next Generation Science Standards. Across India, Singapore, Thailand and Vietnam alone, nearly 11,000 teachers took advantage of Teachers TryScience training — benefitting an estimated 552,500 students.

Veterans

In 2015, IBM launched the Veterans Employment Initiative to train military veterans on IBM i2® Analyst's Notebook® software, prepare them for the advanced data analyst certification exam and assist them with job placement. In coordination with nonprofit and enterprise partners, the initiative trained 150 veterans in the U.S. and U.K. Ninety-seven percent of trainees attained certification, and 25 trainees have accepted job offers with IBM and our partner companies.

World Community Grid

IBM World Community Grid aggregates donated, unused computing power computers and Android devices into a "virtual supercomputer" available free of charge to humanitarian researchers. In 2015, more than 16,000 new volunteers contributed 150,000 years of computing time. Overall, 3 million devices have contributed to World Community Grid's ability to help researchers on critical issues of global health and environmental sustainability.

The IBMer

At IBM, we recognize the significant role IBMers play in helping to transform the company. Our personal and professional development programs continuously evolve so that we hire, support, train and retain people who embrace our values and engage in our increasingly collaborative and agile environment. In this section, you will learn how we empower IBMers around the globe so that they can bring about positive change for our clients and our communities.

Supporting IBMers

To achieve something new, you must do things differently. IBM is reinventing itself by working in new ways, with IBMers acquiring new skills, adopting new habits and applying new practices. Our annual Employee Engagement survey shows scores up significantly in 2015, with IBMers recognizing their role in helping IBM to transform and emerge as a cognitive solutions and cloud platform company.

Empowering employees to transform processes

Checkpoint — In 2015, we set out to shape a whole new approach to performance management, built by IBMers, for IBMers, on the foundation of our Purpose, Values and Practices. By engaging IBMers as co-creators and employing IBM Design Thinking for an agile, iterative approach, we created an experience together. We received tens of thousands of ideas, comments and input from IBMers around the world and, in just a few months, we arrived at Checkpoint.

With Checkpoint, we create short-term goals and document progress against those goals on a regular basis as we embrace more agile ways of working. Quarterly, or more frequent, feedback sessions allow us to review progress and realign or update goals as necessary, as priorities evolve.

As IBM continues to change, Checkpoint will help us to create a culture of feedback and open communication that empowers each of us to find better ways of working, live our Practices and be our best every day.

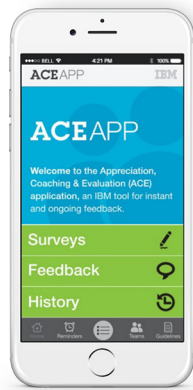
Blue Matching — One of the defining characteristics of IBMers is our willingness to adapt to the realities of an ever-changing world. We continuously rethink how we work — always eager to try something completely new and different with the goal of improved performance. A new program, introduced in 2015, makes it easier for IBMers to discover and navigate the opportunities at IBM to build a career.

Using analytics, Blue Matching surfaces jobs that fit the employee's experience, role, performance and location. IBMers played an integral role in Blue Matching development through their participation and feedback in beta tests, focus groups and community collaboration discussions.

Creating a culture of feedback

ACE app — More than 85,000 IBMers are giving and receiving feedback quickly and easily with our new ACE app. ACE stands for Appreciation, Coaching and Evaluation, and all three forms of feedback have the potential to enhance experiences and behaviors that drive performance and business results.

Available for both desktop and mobile devices, ACE fosters new ways of working as we continue to build a culture of open, honest and continuous feedback at IBM. For example, after meetings, IBMers are using ACE to ask for input on how they ran the meeting to increase efficiency and derive more value. By soliciting feedback, they are letting their colleagues know that they are confident, care about the views of others and appreciate their support as they strive to improve.



Maintaining a focus on education

IBM Design Thinking and becoming Agile — Design is not new to IBM. Our company became an icon of business and technology design in the 1950s. What is new is our design-centered strategy to build products and services based on user needs at rapid speed — and to infuse our entire company with IBM Design Thinking. Agile represents a new way of working, and in 2015 we trained over 60,000 IBMers at all levels of the company in this philosophy. We have hired more than 1,000 professional designers, embedding them at client sites and in 23 IBM Studios around the world. Today, they are working on more than 100 projects to shape the future of IBM's products and services and to reimagine how IBMers work and innovate.

Think Academy — IBM recognizes that its most valuable assets are its people. In 2015, we invested approximately \$500 million in IBMer education programs and IBMers dedicated approximately 25 million hours to personal professional development. At a time of such rapid and disruptive transformation in our business and our industry, Think Academy helps IBMers to stay one step ahead of change and be ready to share knowledge and expertise in a way that drives value for the company and our clients.

Think Academy, the world's largest online open course for the enterprise, was first introduced in 2013. Now 29 course topics strong, it helps IBMers learn about topics critical to clients as well as share stories about courses and how they are applying what they learn.

Awards

- Think Academy won a Ragan Communications “Best Employee Advocacy Program” award for excelling in building employee engagement, trust and an authentic passion for the company to create the organization's biggest advocates.

Employee well-being

IBM's culture of health reflects our belief that we are only as strong as our people. Our ability to better serve our clients and our communities depends upon employee well-being. Health and safety must span every aspect of our global business. Our systems and programs are widely accessible and reflect the changing needs of IBMers — how and where they work and live.

We continue to transform our total health management system to evolve with employees' needs, global environments and technology advances to deliver demonstrable value to our employees' lives. In 2015, we achieved this goal by adding new elements to established successful methods.

Supporting health through a cognitive experience

IBM became one of the first companies to offer wellness incentives to employees back in 2003, and has continued to devise novel ways to encourage IBMers to tackle their individual health goals with ease and convenience. In 2015, this commitment to innovative incentives took a leap into the cognitive era when IBM launched a new benefit option for U.S. employees: no-cost Apple Watches or Apple Watches at a reduced price, depending on the health plan selected, and two Watson-powered programs. The first, Welltok, has a Benefits Navigator tool for employees that is provided by Watson and allows employees to ask general questions about their benefit plan via mobile. It also provides fitness and nutrition navigation and recommendations for local activities. The second, Best Doctors, is a pilot program that allows employees and family members to ask health-related questions and get connected to second-opinion and expert physician services.

“Cognitive systems like Watson are able to understand, reason and learn. Interactions with this Watson-powered app will grow smarter over time and become an invaluable personalized health resource.”



— Kyu Rhee, MD, MPP, Vice President and Chief Health Officer, IBM Corporation

India builds on a history of program excellence

IBM India's large, dispersed population of young employees (average age of 28 years) operates in a unique growth market faced with issues such as road safety and infection prevention, rapidly increasing chronic disease and mental health needs. To address these challenges, IBM India has a multi-faceted approach to employee well-being. This strategy was a key factor in IBM's recognition by the National Business Group on Health (NBGH) for health promotion excellence in emerging markets. India's programs include a wellness checkpoint, a driving safety program, stress management training, a maternity support program, biometric screening camps and wellness advisory clinical support.

Reaching IBMers globally

IBM's Well-Being Management System (WBMS) reaches IBMers globally with coordinated and consistent delivery of health and safety objectives across all geographies and time zones. First implemented in 1999, this foundational architecture is framed around IBM's corporate policy of responsibility for employee well-being and product safety. Following [International Organization for Standardization \(ISO\)](#) consensus standards, system components include proactive planning, execution excellence, measurement, and continuous improvement in the areas of employee health and well-being.

To address evolving business priorities, WBMS global objectives are reviewed as part of an annual strategic planning process. New objectives are distilled into initiatives that can be adapted to accommodate localized well-being and safety requirements. In 2015 objectives were implemented in two key areas including improved web-based delivery of employee-centric information, and the design of globalized, accessible training modules on health, safety and aspects of well-being.

Continued external certification of IBM's WBMS through the Occupational Health & Safety Advisory Services (OHSAS) 18001 [certification process](#) has helped improve the quality and consistency of our global implementation of well-being. This global certification has also allowed IBM to fulfill marketplace demands and foster business opportunities through the ability to demonstrate a standardized approach to managing employee well-being to existing and potential clients.

Additionally, all of IBM's hardware research and development operations in the United States were recognized once again as Occupational Safety and Health Administration (OSHA) [Voluntary Protection Programs](#) star sites. Designed to promote worksite-based safety and health, OSHA's highest honor recognizes outstanding programs and results.

Awards

- IBM received the Best Employers for Healthy Lifestyles Global Distinction award in the Emerging Markets category from the Global Business Group on Health (GBGH), and the Best Employers for Healthy Lifestyles.
- The Workplace Safety and Health Council recognized IBM IPDL Singapore with the Workplace Safety & Health (WSH) Silver Award 2015 for contributions to exceptional safety, health standards and systems.
- IBM Germany was awarded Germany's prestigious Corporate Health Award (CHA) for the second time since 2012.

Employee inclusion

Diversity is an essential component of our corporate values and is tightly integrated into our business strategy. Our leaders strive to continually manage employees in line with our values and beliefs to enable them to develop their full potential and to move beyond inclusion to a world of engagement. But we don't stop there — we also endeavor to engage governments, communities and other corporations in our efforts.

In 2015, IBM continued to demonstrate leadership in its support of constituent groups. Below are some examples.

LGBT (lesbian, gay, bisexual, transgender) workplace equality

IBM has a long history with LGBT workplace equality. As early as 1984, we included sexual orientation in our nondiscrimination policy. In 1995, we established an LGBT executive task force that today is known as the Global LGBT Council and is focused on making IBM a safe and desirable workplace for all people.

In 2015 IBM was named, for the second year in a row, the world's most LGBT-inclusive company by [Workplace Pride](#), based in Amsterdam. This announcement was the result of the foundation's [Global Benchmark](#) survey that scored large international employers for their LGBT workplace inclusion policies and practices around the world.

In addition, for the 13th consecutive year, IBM scored 100 percent on the Human Rights Campaign's [Corporate Equality Index](#), the national benchmarking tool for corporate policies and practices related to LGBT employees. The index, released each autumn, provides an in-depth analysis and rating of large U.S. employers and their policies and practices pertinent to LGBT employees, such as equal-employment opportunity policies that include sexual orientation and gender identity or expression, employment benefits for all benefits-eligible U.S. employees, and ongoing LGBT-specific engagements that extend across the company.

IBM is also one of eight "star performers" in Stonewall's [Global Equality Index 2015](#).

Advancement of women

More than 23 percent of IBM's global executive population is made up of women. About two-thirds of IBM's women executives across the world are working mothers, demonstrating that women can pursue a career and motherhood at our company.

IBM was recognized by Working Mother Media as one of the Top 10 Companies on both its [2015 100 Best Companies](#) for the 30th consecutive year and [Best Companies for Multicultural Women](#) lists. In addition, the [National Association of Female Executives](#) recognized IBM among the top 10 of its Top 50 Companies for Executive Women, and [DiversityInc](#) named IBM number one on its Top 10 Companies for Global Diversity.

As part of IBM's ongoing commitment to advancing women in the workplace, we invest in programs like Building Relationships and Influence for Women, designed for high-potential women leaders with experiential and action-centered learning to help participants develop skills in building, developing and maintaining business relationships and influence. Additionally, we offer "Creating Your Leadership Journey" for mid-level career women. The content for both of these courses is based on the three themes that emerged from our [Advancing Women at IBM](#) study:

- Be visible
- Plan your career
- Integrate work and life

Our continued focus on building IBM's technical women leaders prompted a social media campaign called [Technologistas](#) that showcases many of IBM's talented innovators as role models in the industry.

We also work to build the pipeline of women in the technical industry by supporting and partnering with external programs dedicated to inspire, educate and connect women to excel in technology careers.

People with disabilities

The skills and capabilities of the workforce must keep pace with a constantly evolving world as the competition for talent intensifies. Including people with different abilities in IBM's workforce is based on sound business judgment and anchored in IBM principles and HR strategy.

IBM's recruiting teams play an essential role in identifying and interviewing skilled people with disabilities. Through a training module and a recruitment guide, IBM helps recruiters understand how to effectively provide reasonable accommodations when recruiting people with different abilities and to know what support is available within IBM for employing people with disabilities. In 2015, we developed a new, contemporary hiring brochure that focused on people's talents.

Work-life flexibility

IBM is committed to creating a supportive, flexible work environment that provides principles, guidelines and workforce options to help our employees effectively manage their work and family responsibilities. In fact, that understanding is a cornerstone of our employment value proposition; we know that IBMers need time to cultivate personal interests and integrate the demands of the job with the demands of their personal lives.

In 2015, IBM introduced new programs to further our commitment to work-life integration, including:

- Access to breast milk delivery for women on business travel
- Increased paid time off for parental leave in the United States

Business Resource Groups

As we refine our employment and leadership practices to continuously attract and develop global thought leaders, it is imperative that our diversity strategy enables us to meet the company's business objectives and talent requirements. IBM's Business Resource Groups (BRGs) tie directly into our diversity strategy and voluntarily bring together talented groups of diverse IBM professionals with the ultimate goal of enhancing the success of IBM's business objectives by helping members succeed in the workplace. As part of their charter, BRGs align their programs and initiatives with at least one of four IBM business and talent workstreams: recruitment and hiring, talent development, employee retention and market development.

IBM has more than 250 BRG chapters registered in 45 countries supporting 13 constituencies or focus areas:

- Asian
- Black
- Cross-cultural
- Cross-generational
- Hispanics
- LGBT
- Men
- Native Americans
- New hires
- People with disabilities
- Veterans
- Women
- Work-life integration

Diversity and inclusion education

IBM continues to invest in education and development programs for diverse talent. The award-winning Building Relationships and Influence (BRI) program now has over 3,000 women in its alumni network. In addition, in 2015 we rolled out workshops focused on unconscious bias to help educate our employees on the way bias can impact business decisions and impede inclusion. IBM has also integrated unconscious bias awareness into our leadership offerings and new-hire education. We appreciate the differences in our employees because we know that these differences help to drive innovation.

Leadership development

IBM's leaders are central to our transformation journey. Leaders can be found at all levels of the company and it is through their efficacy, influence and ability to inspire that our company is reinventing itself to lead in the era of cognitive computing and to drive new business value.

As we develop leaders from aspiring managers to senior executives, we strive to create innovative, experiential and practical learning opportunities and resources that foster an understanding of their role and purpose, while preparing them for an environment that is increasingly collaborative, self-directed and agile. With this in mind, we introduced a number of landmark innovations in leadership development in 2015.

Transformational leadership

In 2015, we defined what it means to be a transformational leader in IBM. Based on thought leadership from senior leaders, trends identified by external experts and expertise from the Executive and Leadership Development teams, we identified a set of behaviors that will help IBM redefine itself. We made the conscious decision to step away from the competency models that we have used in the past and move to a framework that is dynamic, fluid and fits where we are in our transformational journey. As we progress, the behaviors will change. We believe that the types of behaviors described in the Transformational Leadership Framework (TLF) are essential to building an agile culture and pivoting our company to cloud and cognitive solutions.

We launched the TLF with IBM's top executives so that they could lead by example and then instill these behaviors within their organizations and across IBM. We embedded the TLF into existing and new development programs and developed tools for the IBM community to assess themselves against the behaviors. We are energized by the rapid progress we have made and how TLF has mobilized leadership development.

IBM Leadership Academy

In December 2015, IBM launched the IBM Leadership Academy, a portal to all leadership development content and activities. Open to all IBMers, this new resource features cutting-edge content, micro-learning videos featuring IBM leaders and external thought leaders, practical tools to help IBMers draft goals they can share with their manager, and a personal bookshelf to save the resources most meaningful to them.

We wanted to create an open, single-point-of-access portal to all leadership development content and activities. The IBM Leadership Academy has become an invaluable resource as we introduced the Transformational Leadership Framework and other content that is helping our leaders build an agile culture. For example, IBMers can find content on engagement, feedback, coaching, creating purpose and meaning, focus and energy, and mindfulness.

ACE app

In support of IBM's increasingly collaborative and agile environment, we introduced the ACE app in 2015, allowing IBMers to give and receive feedback anytime, anywhere. Managers can ask their team to complete a quick survey to gain insights into their work experience. Questions include:

- Are you receiving enough feedback?
- Are you doing meaningful work?
- Are you satisfied with your work-life balance?

Managers can use these results to identify ways in which to help team members thrive. Insights from the ACE app help IBMers to identify strengths and development opportunities as they evolve as leaders.

The purpose of the ACE App is to foster a culture of open, honest and continuous feedback. This culture will help Agile to thrive and IBMers to focus on how they can get better.

Well-being and resilience

IBM recognizes that a leader's well-being has an impact on their effectiveness. Like high-performance athletes, we want our leaders to have the tools and support to bring their best selves to the demanding roles that they hold. This year we began to incorporate a focus on wellness and resilience into select leadership and management development programs and have included early morning exercise and yoga sessions.

Awards

- IBM was named a 2015 Excellence in Practice Award winner by the Association for Talent Development.
- IBM received two gold Brandon Hall Awards in 2015: Best Advance in Measuring the Impact of Leadership and Best Advance in Learning Measurement.

Environment

Our long-standing commitment to environmental protection encompasses all our business activities worldwide, from conserving energy to minimizing waste and much more. We are also applying technological innovation to the critical challenge of creating a more environmentally sustainable world.

Commitment to environmental leadership

IBM's corporate environmental programs date from the 1960s. In 1971, IBM CEO Thomas J. Watson Jr. formalized the company's commitment with our Corporate Policy on IBM's Environmental Responsibilities. Updated a number of times over the years, that policy and the breadth of environmental programs supporting it have defined and driven IBM's long-standing commitment to environmental leadership in all of our business activities.

Throughout our operations — whether conserving energy in our data centers; developing environmentally preferable materials for use in our research, development and manufacturing processes; designing products with environmental considerations; or applying our products and solutions to solve environmental problems and advance sustainability — we have seen first-hand what can be achieved with a sustained focus on all aspects of the environment.

- Since 1990, IBM's energy conservation actions have saved 7 million megawatt-hours (MWh) of electricity consumption, avoided 4.3 million metric tons of carbon dioxide (CO₂) emissions and saved the company \$579 million.
- In 2015, we established our third-generation CO₂ emissions reduction goal, further building on more than 20 years of sustained results in this area.
- For more than four decades, we have demonstrated leadership by prohibiting or restricting substances of concern from our processes and products before regulatory requirements were imposed.
- From 1995 through the end of 2015, IBM documented the collection and processing of approximately 2.15 billion pounds of end-of-life products and product waste worldwide.
- Our cognitive solutions, delivered on a cloud platform, are helping clients discover how they can operate more efficiently and become more sustainable.

With the new cognitive era upon us — one that combines digital business with digital intelligence — we are discovering and developing cognitive-based technologies to help address our world's environmental and sustainability challenges. We are able to assess air emissions sources and profiles to recommend

cost-effective approaches to reduce pollution in real time, forecast and balance energy demand and production to minimize CO₂ emissions associated with electricity generation, and explore better ways to identify less toxic materials to use in products. And this is only the beginning. The combination of cognitive and Internet of Things technologies can be a difference-maker in addressing our world's environmental and sustainability challenges. It is indeed an exciting time, and we are proud to share highlights of our work with you.

Global governance and management system

IBM implements its environmental, energy and chemical management programs through a global environmental management system that integrates corporate directives that govern IBM's conduct and operations worldwide.

Global environmental management system

Our [corporate environmental affairs policy](#) objectives range from workplace safety, conserving natural resources, pollution prevention, and energy conservation and sourcing, to product design for the environment and the application of IBM's technology and expertise to help address some of the world's most pressing environmental problems.

IBM's corporate environmental affairs policy calls for environmental affairs leadership in all of the company's business activities. This leadership is achieved through implementation of a global [environmental management system](#) (EMS) that integrates corporate directives governing IBM's conduct and operations worldwide. These directives cover areas such as energy conservation and climate protection, product stewardship, pollution prevention, chemical and waste management, and environmental evaluation of suppliers, as well as incident prevention, preparedness, response and reporting. It is through the consistent implementation of this global EMS that IBM ensures operations are executed with the same protective standards for the environment in every country where business is conducted. Highlights of our management system and resulting environmental performance are outlined throughout the sections that follow.

Employee and management responsibility

As noted in IBM's [Business Conduct Guidelines](#), all IBMers have a role to play in protecting the environment. IBM's corporate policy on environmental affairs and its supporting global EMS provide more specific detail on IBM's environmental requirements. Every employee is expected to follow IBM's corporate environmental policy and report any environmental, health or safety concerns to IBM management. Managers are expected to take prompt action when faced with a potential violation of the policy or directives. IBM executives are responsible for the environmental performance of their businesses functions or locations.

Our environmental programs and performance are routinely monitored and results are reviewed annually by all levels of management, up to the Directors and Corporate Governance Committee of IBM's Board of Directors, to ensure the ongoing suitability, adequacy and effectiveness of IBM's global EMS for IBM's activities, products and services. Formed in 1993, the Directors and Corporate Governance Committee reviews IBM's position and practices on significant issues of corporate responsibility, including protection of the environment.

Environmental goals

Environmental goals are an important part of IBM's EMS. We maintain a range of environmental goals designed to address significant environmental aspects and impacts of our operations and to drive continual improvement of our environmental performance, including goals on energy and water conservation, renewable electricity sourcing, carbon dioxide emissions reduction, product stewardship and waste management. These voluntary goals and our performance against them are discussed in their respective sections of this report, and a summary of key goals and their outcomes are provided in the listing of IBM's environmental [key performance indicators](#).

ISO 14001 standard on environmental management systems

In 1997, IBM became the first major multinational company to earn a single global registration to the International Organization for Standardization (ISO) 14001 environmental management systems standard. We achieved this credential within just one year of the finalization of the first edition of the standard, in part due to the results already delivered under our environmental policy, first issued in 1971, and the early implementation of our environmental management programs.

The initial registration covered IBM's manufacturing, product design and hardware development operations across our business units worldwide. We have since expanded our global ISO 14001 registration to include additional entities such as our research locations that use chemicals, several country organizations and their non-manufacturing locations, as well as our Global Asset Recovery Services, Global Procurement and Global Logistics organizations.

As our business model has evolved to include more services offerings, we have updated our EMS to address environmental opportunities and challenges in the services area. IBM's single global ISO 14001 EMS accreditation, with a complete list of registered entities worldwide, can be viewed on IBM's [ISO 14001 webpage](#).

IBM is currently working to update its management system to achieve conformity with the recently issued ISO 14001:2015 standard.

ISO 50001 standard on energy management systems

IBM issued a formal corporate policy in 1974 that called for the conservation of energy and materials in all of IBM's activities. Over the intervening years, we improved our global energy management program and integrated it into the company's global EMS.

When ISO issued the ISO 50001 standard on energy management systems in June 2011, IBM set forth a strategy to achieve verification of conformity of our EMS against this newly published standard.

Within one year of the issuance of the ISO standard, we achieved ISO 50001 registration of our energy management program at the corporate level as an integral component of IBM's global EMS. Our approach recognizes and leverages the fact that IBM's existing EMS addresses both environment and energy management.

Following our successful ISO 50001 EMS registration at the corporate level, many of IBM's major energy-consuming locations and one country organization received registration of their specific energy programs under IBM's single global ISO 50001 certification. As of year-end 2015, 16 entities were registered under IBM's global ISO 50001 accreditation — 12 in the Americas, three in Europe and one in the Asia Pacific region.

Public disclosure

IBM's Corporate Policy on Environmental Affairs also calls for the company to publicly disclose information on our environmental programs and performance. This report marks IBM's 26th consecutive year of annual corporate environmental reporting.

In addition to providing information on our environmental programs and performance in this report, we provide a report based on the Global Reporting Initiative and supply information through a number of other voluntary reporting programs and tools, such as CDP, EcoVadis and OneReport. For more details on IBM's environmental reporting, see the IBM [environmental reporting, disclosure and verification webpage](#).

Stakeholder engagement

IBM has a variety of outreach programs to engage various groups and individuals on the subject of the environment. Our community outreach programs range from open houses and emergency preparedness drills with local organizations, to the support of and participation in local environmental projects and environmental education efforts.

IBM also has ongoing dialogues with many stakeholders. Engaged stakeholders include socially responsible investors and other shareholders, environmental nongovernmental organizations (eNGOs), governments, employees, clients, suppliers and others. We consider these relationships to be very valuable, as they allow us to share ideas and obtain various perspectives, input and feedback regarding our programs, activities and performance. They also inform our reporting, enabling us to better meet the information needs of a wide variety of interested people and entities.

IBM Stockholder Relations holds an annual [call and webcast](#) for financial analysts, in which executives from a range of IBM organizations are available to discuss all aspects of our corporate responsibility programs and performance, including environment.

Another example of engagement is collaborative innovation. We believe that integrating different expertise and unique perspectives can accelerate new solutions to long-standing problems. You will find examples of IBM's collaborative innovation — in research and solutions, with business partners, clients, universities and other entities — throughout this report and in the section on solutions for environmental sustainability on [page 72](#).

Voluntary partnerships and initiatives

IBM is strongly committed to participation in voluntary programs, and we have founded or joined many voluntary initiatives and partnerships with governments and eNGOs over the years.

Some current governmental examples include the U.S. Environmental Protection Agency's (EPA) ENERGY STAR and SmartWay programs, the European Union (EU) ENERGY STAR program, and the EU Code of Conduct for Energy Efficiency in Data Centres.

Examples of partnerships with eNGOs include our membership in the Center for Climate and Energy Solutions, our participation in Best Workplaces for Commuters, and our collaboration with The Nature Conservancy and the World Resources Institute. We also work with and support organizations such as The Conservation Fund, the Environmental Law Institute and the World Environment Center.

In addition, we partner with other companies and institutions to foster solutions for environmental sustainability.

Two examples of IBM's voluntary partnerships and initiatives are:

- IBM has been a long-standing member of the Wildlife Habitat Council (WHC) and promotes habitat conservation and management. Four IBM sites in the United States have had their land management and wildlife habitat programs certified by the WHC — our corporate headquarters in Armonk, New York; IBM's Research Triangle Park (RTP) site in North Carolina; and two sites in San Jose, California: IBM Research–Almaden and our Silicon Valley Laboratory. Following are highlights of some projects and activities in 2015:
 - At IBM Research–Almaden, IBM partnered with a local beekeeper to bring six beehives to the orchard located on-site. Millions of bees are dying off, with alarming consequences for the world's environment and food supply. We rely on bees to pollinate everything from almonds to strawberries to the hay used to feed dairy cows. By working with the beekeeper, IBM is hoping to help pollinate the native plants in the area and to restore a bee population devastated in the past few years.
 - At our RTP site, IBM partnered with local Eagle Scouts to build a self-guided, interpretive nature trail with guideposts identifying species encountered along the trail. Employees also worked with the local Boy Scouts to sink approximately 20 employee-donated Christmas trees into the site's 3-acre pond to improve the fish habitat. During nesting season, employees help monitor the site network of 40 bluebird houses. The first houses were established in 2001 to provide a habitat as the numbers of bluebirds were sharply declining due to the rise in development activity in the area.
- In 2014, IBM and AECOM, a global engineering company, completed a collaborative effort with the publication of a Disaster Resilience Scorecard for the United Nations based on the U.N.'s "10 Essentials for Making Cities Resilient." Since then, the scorecard has been updated a number of times and deployed by many cities around the world. The scorecard is designed to facilitate iterative assessments of, and drive continual improvements in, an organization's resilience to disasters and other forms of impacts such as climate change. It is available in the public domain and can be used free of charge by any organization, including communities, governments and corporations. The Disaster Resilience Scorecard was awarded a 2015 ND-GAIN Corporate Adaptation Prize by the University of Notre Dame Global Adaptation Index.

Environmental investment and return

Over the past five years, IBM has spent \$82.3 million in capital and \$456.1 million in operating expense to build, maintain and upgrade the infrastructure for environmental protection at its plants and labs, and to manage its worldwide environmental programs.

Environmental capital and expense worldwide

(\$ in millions)

	2011	2012	2013	2014	2015
Capital	\$18.4	\$9.9	\$17.0	\$20.3	\$16.7
Expense	\$96.1*	\$98.2	\$92.3	\$86.4	\$83.1
Total	\$114.5	\$108.1	\$109.3	\$106.7	\$99.8

IBM has tracked environmental expenses related to our facilities, corporate operations and site remediation programs for more than 25 years, and began publicly disclosing this information in our environmental report for 1992. In 2015, the total environmental spending associated with IBM's operations was \$99.8 million.

IBM also estimates savings it has realized from its policy of environmental leadership. These include savings from energy, material and water conservation; recycling; packaging improvement initiatives; and reductions in waste. Ongoing savings from previous years' initiatives are not carried over in this calculation, yielding very conservative estimates.

In addition, IBM realizes avoidance of costs that likely would occur in the absence of its environmental management system. These savings are not measurable in the same way that expenses are, but avoiding these environmental costs does result in savings for IBM and a reasonable attempt has been made to estimate them. In 2015, IBM's combined, estimated environmental savings and cost avoidance worldwide totaled \$114.1 million.

IBM's experience has shown that annual savings from its focus on conservation, pollution prevention and design for the environment consistently exceed environmental expenses, thereby demonstrating the value of proactive environmental programs and leadership performance.

2015 environmental expenses worldwide

(\$ in millions)

Personnel	32.5
Superfund and former IBM site remediation	20.3
Waste treatment and disposal	6.4
Surface water and wastewater management operations	5.6
Waste and materials recycling	5.4
Consultant and legal fees	2.5
Laboratory fees	1.5
Groundwater protection operations	1.0
Permit fees	0.7
Product takeback and recycling costs	0.6
Air emission control operations	0.2
Other environmental operations	6.4
Total	83.1

2015 estimated environmental savings and cost avoidance worldwide

(\$ in millions)

Energy conservation and cost avoidance	54.2
Location pollution prevention operations	24.4
Compliance cost efficiency*	16.6
Corporate operations**	5.6
Spill remediation cost avoidance***	4.9
Packaging improvements	4.3
Potential fines, penalty and litigation avoidance****	2.1
Superfund and site remediation efficiencies	2.0
Total	114.1

* Compliance cost efficiency considers costs avoided through proactive efforts to stay ahead of environmental regulations and requirements.

** Savings or costs avoided by having internal professional staff and tools, versus using external consultants and tools.

*** These savings are estimated considering IBM's actual experience with remediation costs.

**** The estimate for the avoidance of potential fines, penalties and litigation does not include cost avoidance of potential business interruption or fines related to noncompliance with product environmental laws and regulations (e.g., E.U. REACH or RoHS requirements).

Chairman's Environmental Award Program

IBM established the Chairman's Environmental Award Program in 1991 to encourage leadership and recognize achievement and progress in environmental affairs on the part of IBM's organizations. For 25 years, the Chairman's Environmental Award has promoted the contributions of IBM's business units toward the objectives of IBM's Corporate Policy on Environmental Affairs.

Recipients of the Chairman's Environmental Award are selected based on their degree of leadership, initiative and results in contributing to IBM's [environmental affairs policy](#) objectives. Performance against these criteria is evaluated against each nominee's opportunity to contribute given its mission and operations. IBM's chairman presents the award to an executive from the recipient business unit at a gathering of IBM senior executives from all business units.

IBM's Sales and Distribution (S&D) organization received the 2015 Chairman's Environmental Award. This organization delivers value by understanding clients' business needs and bringing together capabilities from across IBM to develop and provide innovative solutions leveraging cloud, analytics, mobile and social, underpinned by security. During the three years covered by the Chairman's Environmental Award nomination, S&D engaged with more than 30 clients across 14 countries on a diverse set of challenges involving the environment, bringing together IBM's expertise in business and technology to implement leading-edge solutions, including:

- The Green Horizons initiative in China, targeting the critical issues of air quality, renewable energy forecasting and energy optimization
- A new information control center in São Paulo, Brazil, built on IBM intelligent transportation technology, to analyze data from 4,000 miles of highways for improved traffic flow and reduced air emissions

- An analytics project in Kenya to better understand the health and sustainability of groundwater resources by identifying illegal bore holes and indiscriminate dumping of poorly treated waste water
- A Smarter Energy® Solutions project in the city of Setouchi, Japan, supporting that country's largest solar power project
- IBM's Building Management Center solution at a major private engineering university to harness data and analytics delivered via cloud computing for more energy-efficient building management

S&D also leveraged IBM programs such as Smarter Cities Challenge, People4SmarterCities.com and blogs to promote environmental awareness, education and social collaboration among our clients.

While only one organization is selected each year to receive the Chairman's Environmental Award, the competition highlights the company's worldwide commitment to environmental leadership.



Left to right: Erich Clementi, senior vice president, Sales and Distribution (S&D), Ginni Rometty, IBM chairman, president and CEO, Colleen Arnold, senior vice president, S&D, and Bruno Di Leo, senior vice president, S&D.

Energy conservation and climate protection

IBM recognizes climate change is a serious concern that warrants meaningful action on a global basis to stabilize the atmospheric concentration of greenhouse gases (GHGs). We believe all sectors of society and the economy, as well as governments worldwide, must participate to address climate change.

Climate change

IBM has been a leader in [addressing climate change](#) through our energy conservation and climate protection programs for decades. IBM's leadership is defined by our:

- Long-standing global commitment
- Comprehensive and multifaceted programs covering the company's operations, products and services
- Leading-edge innovations and client solutions
- Significant results, both early and ongoing, benefiting IBM, our clients and the world

6.3%

In 2015, and including the contribution from our semiconductor manufacturing operations, IBM's energy conservation projects delivered annual savings equal to 6.3 percent of its total energy use — surpassing our goal of 3.5 percent.

7m MWh

From 1990 through 2015, and including semiconductor manufacturing operations, IBM conserved 7 million MWh of electricity, avoiding 4.3 million metric tons of CO₂ emissions and saving \$579 million.

A five-part strategy

We have a long-standing commitment to [climate protection](#) and execute a five-part strategy to reduce the GHG emissions related to our operations:

1. Designing, building, updating and operating facilities, including data centers and product development and manufacturing operations, that optimize their use of energy and materials and minimize GHG emissions
2. Purchasing electricity generated from low carbon dioxide (CO₂)-emitting and renewable sources where it makes both business and environmental sense
3. Requiring our suppliers to maintain an environmental management system that includes inventories of energy use and GHG emissions, and reduction plans
4. Reducing employee commuting and business travel
5. Increasing the efficiency of IBM's logistics operations

In addition, for our hardware and software products and services, IBM's strategy includes designing and providing clients with energy-efficient solutions that also help reduce their climate impact.

IBM considers energy and materials conservation to be the cornerstone of our climate protection efforts. IBM does not have plans to use emissions offsets to become "carbon neutral" for all or part of our operations. Our efforts to reduce IBM's GHG emissions are focused on delivering results by devoting available resources to actions, products and solutions that actually increase energy efficiency and reduce GHG emissions for both IBM and our clients, rather than merely offsetting them.

IBM divested its semiconductor manufacturing business on July 1, 2015, eliminating the use and emissions of perfluorinated compounds and other GHGs associated with manufacturing operations.

Conserving energy

IBM formalized its energy conservation and management program in 1974 and has continued it unabated ever since. Energy conservation is a major component of our comprehensive, multifaceted climate protection program because the release of CO₂ by utility companies powering our facilities, or from our use of fuel for heating or cooling, represents the greatest potential climate impact associated with our operations.

In 2015, and including the contribution from our semiconductor manufacturing operations, IBM's energy conservation projects across the company delivered annual savings equal to 6.3 percent of our total energy use, versus the corporate goal of 3.5 percent.

IBM formalized its energy conservation and management program in 1974 and has continued it unabated ever since. Energy conservation is a major component of our comprehensive, multifaceted climate protection program because the release of CO₂ by utility companies powering our facilities, or from our use of fuel for heating or cooling, represents the greatest potential climate impact associated with our operations.

These projects saved and avoided the consumption of 272,000 megawatt-hours (MWh) of electricity and 172,000 million British thermal units (MMBtu) of fuel oil and natural gas, and an associated 122,000 metric tons of CO₂ emissions. The conservation projects also saved \$28.9 million in energy expense. These strong results are due to our continued, across-the-board focus on energy demand reduction, efficiency, and the implementation of standard, global energy conservation strategies at our facilities.

Excluding the contribution from our semiconductor manufacturing operations, our 2015 energy conservation savings were 264,000 MWh of electricity, 150,000 MMBtu of fuel and \$28.1 million, with an avoidance of 119,000 metric tons in CO₂ emissions. The associated energy conservation projects delivered annual savings equal to 6.9 percent of our adjusted energy use.

IBM's energy conservation goal recognizes only completed projects that actually reduce or avoid the consumption of energy in our operations. Reductions in energy consumption from downsizings, the sale of operations and cost-avoidance actions such as fuel switching and off-peak load shifting are not included in the results for measuring performance against achieving this goal. Moreover, the conservation results cited above are conservative in that they include only the first year's savings from the projects. Ongoing conservation savings beyond the first year are not included in the results. Accordingly, the total energy savings and CO₂ emissions avoidance from these conservation actions is actually greater than this simple summation of the annual results.

Electricity and fuel use and related CO₂ emissions

Scope 1 and Scope 2 CO₂ emissions

	Electricity and fuel use (1,000 MMBtu)	CO ₂ emissions (estimated) metric tons x 1,000	
		Calculated with grid emissions factors	Reduced by the CO ₂ avoided by renewable electricity purchases
2015	17,974	1,836	1,584
2014	20,842	2,092	1,842
2013	21,190	2,186	1,962
2012	21,613	2,404	2,195
2011	21,758	2,397	2,182

Notes: (1) The 2015 inventory has not been calculated in accordance with the GHG Protocol Scope 2 Guidance, issued in 2015, to enable consistent year-to-year comparisons. (2) Figures in this table include energy consumption and CO₂ emissions associated with our semiconductor manufacturing operations.

Between 1990 and 2015, and including semiconductor manufacturing operations, IBM saved 7 million MWh of electricity consumption, avoided 4.3 million metric tons of CO₂ emissions (equal to 63 percent of the company's 1990 global CO₂ emissions), and saved \$579 million through its energy conservation actions.

Managing IBM's energy program

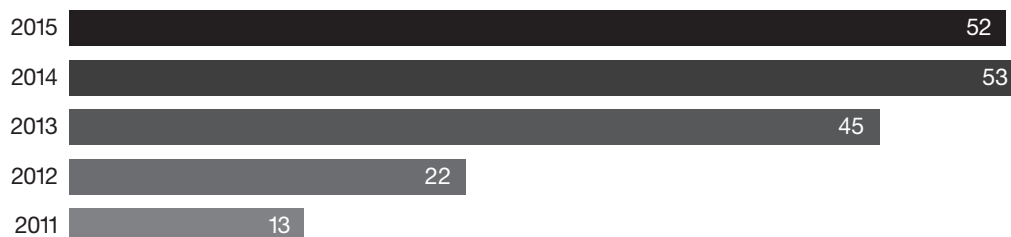
Our global energy management program leverages the expertise of more than 50 IBM energy management professionals deployed around the world. The team has created best-practices checklists that set minimum expectations for building systems and operations, including controls and equipment for lighting, heating/ventilating/air conditioning (HVAC), central utility plants, compressed air, data center and information technology (IT) systems, cafeterias and office systems.

All IBM locations using 2,000 MWh/year or more of energy must complete the checklists, perform a gap analysis and develop an energy conservation implementation plan a minimum of every four years. The program is buttressed by several enterprise-level databases that collect, store and analyze energy-use data, results of conservation projects, completed checklists and key performance indicators. These analyses enable monthly metrics reporting to management and the identification of opportunities for improvement. The continuous review of energy use and conservation performance has driven the strong results noted above.

More than 2,100 energy conservation projects involving a range of energy efficiency initiatives delivered savings by 312 IBM locations globally in 2015. Examples include:

- Projects to match building lighting and HVAC with occupancy schedules, or upgrade equipment efficiency through re-commissioning equipment or installation of new equipment, were implemented at 223 locations, reducing energy use by 73,100 MWh and saving \$5.4 million.
- Central utility plant projects were implemented at 52 locations, reducing energy use by 37,500 MWh and saving \$2.3 million.
- Energy benchmarking analyses of office locations were conducted across geographic regions. Comparisons were made among similar IBM locations and with publicly available benchmarks. Locations with energy consumption of more than 100,000 Btu per square foot (100 kBtu/ft²) are required to establish and execute an action plan beyond any work already done to reduce energy use and cost. Since 2013, the median energy consumption per square foot for all office locations has been reduced by 15.5 percent.
- Data center cooling projects and server and storage virtualization and consolidation projects saved nearly 157,700 MWh of electricity consumption and \$16.7 million.

Analytics-enabled energy conservation projects* (% of projects using analytics)



*Energy conservation projects at IBM's top 10 energy consuming sites

Applying analytics to drive further efficiencies

The IBM energy management and data center teams are expanding their use of analytics to minimize energy use and optimize operating performance. Over 50 percent of 2015 conservation projects executed at IBM's top 10 energy consuming sites utilized analytics to drive energy savings. The lessons learned at these larger sites are being transferred to other IBM locations.

IBM's TRIRIGA Real Estate Environmental Sustainability (TREES) Impact Manager has been deployed at more than 145 buildings (representing 45 percent of IBM's global energy consumption) realizing savings of 32,300 MWh of energy and \$1.7 million in 2015. IBM has sustained an average 10 percent reduction in energy use annually since 2011 for the buildings and systems monitored and managed by the TREES solution. TREES Impact Manager is an IBM-designed software product that integrates existing controls infrastructure across a location, collecting data on an hourly basis and analyzing it for anomalies to minimize the energy consumption required to operate a building.

IBM has installed chiller optimization software (COS) at eight locations. COS balances the operation of all the system components under its rules, maximizing cooling delivery while minimizing energy use. Deployment of COS saved IBM 6,000 MWh of energy and \$0.4 million in 2015, and has realized annualized savings of 49,000 MWh and more than \$4.4 million at the eight locations, including the semiconductor manufacturing locations, where it has been deployed beginning in 2011.

Data centers

IBM manages a diverse portfolio of data centers, consisting of both IBM-owned and IBM-managed facilities (for IBM and customers) worldwide. IBM operates additional IT lab raised-floor spaces that support internal hardware and software development and testing operations.

\$2.6m

325 energy conservation projects at more than 100 data center locations reduced cooling energy use by almost 25,800 MWh in 2015, saving more than \$2.6 million.

We take a holistic approach to managing our data centers — building new, high-efficiency data center space required to meet the needs of our clients, and retrofitting and improving existing data center space to derive more workload per area, equipment and energy resources utilized.

In 2015, we completed 325 projects to improve cooling efficiency at more than 100 existing data center locations, reducing energy use by almost 25,800 MWh while saving over \$2.6 million. Actions IBM took in 2015 include:

- Installed thousands of blanking panels and cable cutout plugs, reducing the mixing of hot and cold air and increasing cooling efficiency within data centers.
- Increased the average temperature of raised-floor space by 0.5 degrees Celsius. For the period 2011-2015, IBM increased the average raised-floor temperature by 2.5° C with work continuing to further raise temperatures toward an average of 24° C.
- Shut down additional computer room air conditioning (CRAC) units, reducing energy use. IBM shut down more than 33 percent of total installed CRAC units from 2010 to 2015.

Achieving these savings while maintaining the reliability of the data center operations required the use of IT and analytics-based systems to monitor the data center temperature profile and mitigate hot spots.

39

IBM data centers in 18 countries are registered under the EU Code of Conduct for Energy Efficiency in Data Centres.

Data center power usage performance

IBM measures or uses estimating protocols to determine the power usage effectiveness (PUE) at many of the data centers we manage. PUE is the ratio of the total energy consumed by the data center, divided by the energy consumed by the IT equipment. The closer the value is to 1, the more efficient the cooling delivery. Using data collected from 63 percent of IBM data center and IT lab raised-floor space, we calculated our average PUE by aggregating the total energy consumption of these spaces during 2015 and dividing it by the aggregated energy consumption of the IT equipment in the same space for the same period.

The average PUE for IBM's raised-floor space is 1.71, the same as 2014, with a range of 1.4 to 3.2. Data centers are highly complex systems that experience changes in equipment layout and type as clients move in and out of the data center and decrease or increase their IT workload, and as existing server, storage and network equipment is replaced or refreshed with new technologies. Depending on how cooling delivery is adjusted in response to these changes, PUE can increase or decrease. In 2015, gains made in increased temperatures were offset by equipment type and layout changes, causing the PUE to remain constant year-to-year.

Because the majority of the data centers in IBM's portfolio consist of spaces that are between 10 and 30 years old and contain IT equipment varying in age from new to 10 years, improving the energy efficiency of these data centers requires thoughtful planning and execution to meet operational objectives and commitments to clients.

The overall performance of IBM data centers is comparable to the average PUE of 1.7 as reported in the Uptime Institute [2014 Data Center Industry Survey](#) of 1,000 data center users predominately located in North America, and compares favorably with the average PUE of 2 as reported by a February 2014 [Forrester Consulting Survey](#) commissioned by Digital Realty Trust. IBM has made — and will continue to make — significant investments to reduce energy demand and improve energy efficiency in our data centers.

Voluntary data center energy efficiency initiatives

In January 2012, the European Commission awarded 27 IBM data centers in 15 European Union (EU) countries "Participant" status in the EU Code of Conduct (CoC) for Energy Efficiency in Data Centres program. Over the last three years, we have registered additional data centers, bringing the total number of data centers participating in this program to 39 in 18 countries. Year-to-year, the number of IBM-registered data centers decreased from 46 to 39 because we consolidated some and closed others. IBM's registered data centers represent the largest portfolio from a single company to receive the recognition to date. The registered locations include more than 70 percent of IBM's IT delivery and resiliency services data center space in the EU. The EU CoC for Energy Efficiency in Data Centres is a voluntary initiative that aims to promote energy efficiency performance standards for data centers.

In addition to the EU CoC for Energy Efficiency in Data Centres program, IBM is involved in the U.S. Environmental Protection Agency's ENERGY STAR and The Green Grid (industry collaboration) data center energy efficiency initiatives. These programs set operating criteria or metrics that inform and encourage data center operators and owners to reduce energy consumption in a cost-effective manner without compromising the objectives of mission-critical operations.

System virtualization and cloud computing

Virtualizing server and storage systems allows individual systems to support multiple applications or images, making greater use of the full capabilities of the IT equipment and executing more workloads in less space with less energy.

IBM continues to virtualize and consolidate workloads from multiple servers and storage systems with low utilization onto single systems, reducing energy use and expense. In 2015, IBM virtualized more than 30,000 applications and increased the capacity utilization of storage systems in our owned and leased data centers, avoiding almost 132,000 MWh and \$14 million in energy expense. Implementation of server and storage virtualization has been a key contributor in reducing the overall electricity consumption of our data centers over the past four years.

IBM is also expanding its cloud computing offerings. At year-end 2015, SoftLayer, an IBM company, and IBM's Cloud Managed Services operated 46 data centers in 16 countries worldwide. Cloud computing can be an efficient model for providing IT services that optimize hardware utilization and virtualization technologies across the server, storage and network infrastructure.

Renewable energy

In 2015, and including our semiconductor manufacturing operations, IBM contracted with its utility suppliers to purchase over 679,000 MWh of renewable electricity over and above the quantity of renewable energy provided as part of the mix of electricity that we purchased from the grid. This amount represented 16.2 percent of our global electricity purchases and resulted in the avoidance of 252,000 metric tons of CO₂ emissions.

Our contracted renewable electricity purchases as a percent of our global electricity consumption increased by over 2 points, year-over-year. These results move the company toward meeting its goal to procure electricity from renewable sources for 20 percent of IBM's annual electricity consumption by 2020.

16.2%

Contracted renewable energy represented 16.2 percent of IBM's global electricity purchases in 2015, including our semiconductor manufacturing operations, or 679,000 MWh.

Excluding semiconductor manufacturing operations, IBM contracted for 660,000 MWh of renewable electricity over and above the quantity of renewable energy provided as part of the mix of electricity that we purchased from the grid. The 660,000 MWh represented 17.5 percent of IBM's adjusted global electricity consumption.

IBM's contracted renewable electricity purchases occurred in 18 countries: Australia, Austria, Belgium, Brazil, Denmark, Finland, France, Germany, India, Ireland, Italy, Netherlands, Spain, Sweden, Switzerland, Taiwan, United Kingdom and the United States. As a result of these purchases, approximately 30 percent of IBM's locations with data centers or IT labs, and 29 percent of our cloud data centers, currently obtain some or all of their electricity from our contracted renewable-generation sources.

IBM procures renewable electricity generated from wind, large and small hydro, biomass and solar installations around the globe. We report all of our contracted renewable electricity purchases — be they from new, "additional" or existing generation sources, and without discriminating against large hydro installations — and their associated CO₂ avoidance. Our rationale is that all purchases signal to our suppliers our desire for them to maintain and broaden their renewable electricity offerings. We value all economically accessible renewable generation sources and their availability from our utility suppliers.

Our procurement of renewable energy must meet our business needs. Not only should the offerings be cost-competitive with market prices over time, but also, the electricity supply must be reliable in providing uninterrupted power for our critical operations. IBM's strategy of contracting for defined renewable energy has been most successful in Europe, although we substantially increased our contracted purchases in Brazil and India during 2015. We continue to request the inclusion of electricity generated from renewable sources as an option in our contracts in all geographies.

Procuring electricity from renewable sources remains complicated by the relatively low energy density and intermittent nature of wind- and solar-generated electricity; limitations and choke-points in the electricity transmission system; and by international treaties and national, state, and local regulatory and legislative requirements. Continued advances are needed in renewable electricity generation, distribution systems, grid management and storage technologies, as well as in contracting and delivery mechanisms to truly increase the availability of economically viable renewable electricity in the marketplace and supply it directly to consuming locations.

We are pursuing a range of options to further increase our renewable electricity purchases. IBM is working with industry peers, utilities, nongovernmental organizations and other renewable-energy industry participants to identify, develop and capture opportunities to procure electricity generated from renewable sources. The current environment of low natural gas prices in North America, and the associated low electricity prices, make almost all currently available renewable power purchase contracts uneconomical, but we are continuing to work to find opportunities to procure renewable electricity that make business sense.

In addition to our contracted renewable electricity purchases, 16.2 percent of IBM's electricity purchases from the grid were generated from renewable sources (5.6 percent from non-hydro and 10.6 percent from hydro generation sources) — bringing our total renewable electricity purchases to 32.4 percent of our global consumption in 2015. These figures include the semiconductor manufacturing operations. Excluding the semiconductor manufacturing operations, IBM's total renewable electricity purchases equaled 33.7 percent (17.5 percent directly contracted by IBM plus 16.2 percent via grid purchases) of the company's adjusted global energy consumption.

IBM also endeavors to incorporate co-generation, tri-generation and fuel cell systems at individual locations where it makes business sense. Three facilities in Europe have co-generation/tri-generation systems that provide electricity, heating and cooling to support building operations. In addition, one U.S. location has a fuel cell system that provides electricity. In all four cases, the systems provide 10-20 percent of facility energy use. These systems utilize over 60 percent of the energy value of the input fuel, compared to 25-40 percent utilization of the energy inputs for electricity purchased from the grid.

Research and solutions to advance the use of renewable energy

In addition to procuring renewable energy for our own use, IBM is working to further the availability and affordability of renewable energy by investing in IT-related research and development. IBM has used advanced cognitive computing and Internet of Things (IoT) technologies, combined with world-class analytics, to create some of the world's most accurate energy forecasting systems, improve the management of the electric grid and enable the dispatch of higher quantities of renewable electricity to the grid. In 2015, IBM announced the expansion of its [Green Horizons](#) initiative with a range of projects and collaborations involving the deployment of intelligent grid and distributed generation management systems around the globe. For additional information, see the Solutions for environmental sustainability section on [page 72](#) of this report.

These projects make significant improvements in the availability of renewable electricity on the electric grid. The combination of weather and demand forecasting with the optimization of renewable electricity delivery, coupled with the minimization of conventional reserves necessary for grid reliability, can increase the dispatch of renewable electricity to the grid while reducing the overall grid CO₂ emissions factor. The environmental benefits resulting from IBM's investment in these technologies, which are in use in over 30 projects worldwide, exceed the benefits from isolated large purchases of renewable electricity by fundamentally enhancing the quantity and availability of renewable electricity from existing and planned projects.

Operational CO₂ emissions management

IBM's CO₂ emissions associated with the use of fuel and electricity at its locations were reduced 6 percent from 2014 to 2015 (when the energy use from the divested semiconductor manufacturing business from January through June 2015 is excluded). There were three main factors that drove this reduction:

1. Energy conservation actions and a reduction in our energy consumption drove a 62,000 metric ton (MT) reduction in CO₂ emissions. This represents an approximate 4 percent reduction in our overall CO₂ emissions.
2. The average CO₂ emissions factor associated with our grid-supplied electricity reduced by over 0.005 MT/MWh, reducing CO₂ emissions by 22,000 MT. This represents a 1.5 percent reduction in our overall CO₂ emissions.
3. An increase in renewable energy purchases avoided 8,000 MT of CO₂ emissions — an approximate 0.5 percent year-over-year reduction.

6%

IBM's operational CO₂ emissions associated with the use of fuel and electricity at our locations were reduced by 6 percent from 2014 to 2015, excluding the semiconductor operations.

28.7%

IBM's 2015 CO₂ emissions were reduced by 28.7 percent versus the 2005 baseline, adjusted to exclude the divested semiconductor manufacturing operations, as specified in our third-generation CO₂ reduction goal.

Third-generation CO₂ emissions reduction goal

We continue to make progress toward our third-generation CO₂ emissions reduction goal: to reduce CO₂ emissions associated with our energy consumption 35 percent by year-end 2020, against base year 2005 and adjusted for acquisitions and divestitures. This goal represents an additional 20 percent reduction, from year-end 2012 to year-end 2020, over the reductions achieved from 2005 to 2012 under IBM's second-generation goal.

Adjusting the baseline to remove emissions from our divested semiconductor manufacturing operations, IBM has reduced its CO₂ emissions by 28.7 percent since 2005, and we are on track to achieve the 35 percent reduction by 2020.

Overall CO₂ emissions inventory

IBM tracks and manages Scope 1 and 2 CO₂ emissions across its operations. As discussed in the previous sections, IBM executes a range of programs and processes to reduce GHG emissions.

IBM's overall Scope 1 and 2 emissions decreased by 18.8 percent from 2014 to 2015. Over 80 percent of this reduction is the result of the divestiture of IBM's semiconductor operations in July 2015. The remainder resulted from the reductions in our energy consumption and reduced emissions factors for our electricity purchases, which were discussed above. To enable consistent year-to-year comparison, the 2015 inventory has not been calculated in accordance with the GHG Protocol Scope 2 Guidance (issued in 2015). A summary of our total 2014 and 2015 emissions inventory is provided in the following table:

IBM 2015 Scope 1 and 2 emissions inventory

(Metric tons [MT] of CO₂ equivalent)

Scope 1 emissions	Emissions type	2014	2015
Fuel use	Operational	226,187	187,553
Perfluorinated compounds	PFC	215,893	108,867
Nitrous oxide	Other	23,724	14,086
Heat transfer fluids	Other	83,566	30,556
HFCs	Other	7,283	12,984
Total Scope 1 emissions		556,653	354,046
Scope 2 emissions			
Electricity: Using grid and location MT CO ₂ /MWh emissions factors	Operational	1,847,141	1,638,067
Purchased energy commodities	Operational	34,871	36,266
Total Scope 2 emissions		1,882,012	1,674,333
Total Scope 1 and 2 emissions		2,438,665	2,028,379
CO ₂ avoidance: Renewable electricity purchases	Operational	(250,345)	(252,231)
Total Scope 1 and 2 emissions adjusted for renewable electricity		2,188,320	1,776,148

Transportation and logistics initiatives

Employee commuting and leased/rental vehicles

IBM has been active for decades in promoting programs that reduce employees' work-related commutes. Key contributors to this effort are IBM's two flexible work programs that are available to many employees:

- Work-at-home — Enables employees to work from a home office
- Mobile employees — Enables employees to work from home for a designated number of days each week

In 2015, 97,000 of our approximately 380,000 global employees participated in one of these programs. In the United States alone, IBM's work-at-home and mobile programs are estimated to have conserved 7.2 million gallons of fuel and avoided 56,500 MT of CO₂ emissions in 2015.

IBM is a member of the Best Workplaces for Commuters (BWC) program. Currently, 20 IBM locations in the United States, where approximately 43 percent of the company's U.S. employees report to work, are registered as BWC sites. Many locations actively work with their local or regional transit commissions to integrate IBM's programs with regional programs, increasing commuting options for our employees. Globally, many of our locations provide support for the use of public transit systems, including shuttles from locations to mass transit stations and alternate transportation or "loaner" cars for business trips during the workday.

In some countries, IBM provides leased vehicles for employees that they may use for both business and personal purposes. For these vehicles, we continue our effort to move to more fuel-efficient models by setting standard guidelines for vehicles with lower emissions profiles. These guidelines enable reductions in average car emission levels as the car fleets are renewed. For the cars our employees rent while traveling for business, we have worked with rental car companies to require or offer more fuel-efficient vehicles.

Reducing business travel

Through the rapid adoption of the IBM Connections social business platform, collaboration via social technologies grew significantly in 2015. This included 494,000 communities, 245,000 Wikis housing 3.8 million pages with 351 million views, and 3.9 million shared files that were downloaded 163 million times. Blogs, activities and forums saw similar levels of social interaction. As a business platform, we have over 100 internal integration partners leveraging IBM Connections via their applications in a socially collaborative fashion. We also conducted 750 million minutes of online meetings during the year.

These knowledge-sharing technologies bring employees together without travel to collaborate on topics of business interest.

Efficiency of logistics

IBM is optimizing logistics operations and increasing packaging density and strength to reduce the CO₂ emissions generated by the transport of IBM products and their components.

IBM has been an active participant of the U.S. Environmental Protection Agency's SmartWay Transport Partnership since 2006. SmartWay is a voluntary initiative to improve fuel efficiency and reduce GHG emissions associated with logistics operations.

Since 2009, 100 percent of IBM's spending on shipments of goods within the United States and from the United States to Canada and Mexico went through a SmartWay logistics provider. IBM voluntarily applies specific SmartWay requirements to our distribution operations globally.

IBM also develops product packaging that minimizes material use and package volume while optimizing package strength. This helps reduce transport-associated CO₂ emissions. Accomplishments in this area are discussed in the product stewardship section of this report.

Energy and climate protection in the supply chain

IBM is committed to doing business with environmentally responsible suppliers. One of the areas we focus on is our suppliers' energy efficiency and climate protection programs.

We require that all of our "first-tier" suppliers (those with which we hold a direct commercial relationship) establish and sustain a management system to address their corporate and environmental responsibilities — including their use of energy and Scope 1 and 2 GHG emissions — and to cascade IBM's requirements to their suppliers who perform work that is material to the goods or services being supplied IBM. Our suppliers are also required to establish voluntary goals in these areas, measure their performance and publicly disclose their performance against those goals. We manage this requirement through two processes: IBM's own supplier environmental management system requirements, and our membership in the Electronic Industry Citizenship Coalition (EICC).

IBM has continued to work with first-tier suppliers to further our requirement that all IBM suppliers have a social and environmental management system in place and disclose information on goals and performance. More information may be found in the environmental requirements in the supply chain section. The IBM Global Procurement organization assesses suppliers (existing and new) regarding their compliance with the IBM Social and Environmental Management System requirements as a component of its overall supplier management and assessment process.

IBM's requirements for our suppliers rest on the foundational belief that real results in GHG emissions reduction are made possible by actionable information about a company's energy use and GHG emissions, and that each company is best positioned to assess and implement actions to address its own emissions in a way that is meaningful and sustainable. In short, each enterprise must take responsibility to reduce its own energy use and GHG emissions.

IBM has been an active participant in the [EICC Environmental Reporting Initiative](#), which asks EICC members and suppliers in the global electronics supply chain to measure and report key indicators on energy consumption, GHG emissions, water and waste. We believe, as do the other EICC members, that as companies gain an understanding of their energy use and GHG emissions, they are more likely to take actions to improve their performance. EICC and its member companies have developed education modules to assist suppliers in tracking their energy use and GHG emissions. Companies in the electronics industry share many suppliers, and the EICC GHG emissions disclosure process enables efficiency associated with information disclosure. We use the EICC reports completed by our component and parts suppliers to augment and validate our internal supplier assessment work.

IBM's position on the determination of Scope 3 GHG emissions

Approximations of Scope 3 GHG emissions can help entities recognize where the greatest amounts of GHGs may occur during the lifecycle of a typical process or general product or service on a macro level. This can be helpful when assessing, for example, what phases of a general product's design, production, use and disposal are ripe for improved energy efficiency and innovation. However, IBM does not assert the specific amount of Scope 3 GHG emissions associated with our value chain. The necessary estimating assumptions and corresponding variability simply do not allow for adequate credibility, let alone calculations that could be perceived as deterministic.

Like many companies, IBM has thousands of suppliers around the world. They are in all types of businesses and very few, if any, work solely for IBM. Furthermore, the sources of energy used by these suppliers vary, and IBM does not believe we could generate a credible estimate or apportionment of the energy used by these suppliers that would be associated with the products or services provided to IBM alone, versus those emissions associated with products or services provided to their other customers. In addition, IBM's specific scope of business with any given supplier remains dynamic, as it is driven by business need.

Moreover, one company's asserted Scope 3 emissions are another company's Scope 1 and 2 emissions. Since the ultimate goal for climate protection is for global societies to achieve demonstrable reductions in actual GHG emissions, IBM believes real results in GHG emissions reduction are directly achieved when each enterprise takes responsibility to address its own emissions and improve its energy efficiency. This is reinforced by IBM's announcement in 2010 that all of our first-tier suppliers are expected to develop a management system, identify their significant environmental impacts — including GHG emissions — and develop reduction plans for those impacts.

Product stewardship

IBM established its product stewardship program in 1991 as a proactive and strategic approach to the environmental design and management of our products. The program's mission is to develop, manufacture and market products that are increasingly energy efficient, that can be upgraded and reused to extend product life, that incorporate recycled content and environmentally preferable materials and finishes, and that can be recycled and disposed of safely.

Framework

IBM's product stewardship objectives and requirements are implemented through our global environmental management system (EMS), internal standards, product specifications and applicable IBM offering management processes. Information on product environmental attributes such as energy efficiency, materials content, chemical emissions, design for recycling, end-of-life management and packaging must be documented in IBM's Product Environmental Profile (PEP) tool and reviewed at various checkpoints during the development process.

Compliance management tools like the [Product Content Declaration for IBM Suppliers](#) support the assessments required for a complete PEP prior to product release. IBM's design and compliance controls — including a specification for [Baseline Environmental Requirements for Supplier Deliverables to IBM](#), Product Content Declarations (PCDs) and compliance assessment protocols — are managed by an interdisciplinary team with representatives from IBM organizations that design, manufacture, procure, deliver and service our product offerings. The team's activities are coordinated by IBM's Center of Excellence for Product Environmental Compliance.

Product environmental compliance process

Regulatory and legislative requirements affecting electrical and electronic equipment continue to proliferate globally. Integrated within IBM's global EMS, IBM has programs — underpinned by robust processes and state-of-the-art tools — that ensure our continued compliance with worldwide environmental laws and regulations without impacting business. In 2015, we identified 127 new or modified product-related regulations and acted upon them to meet the milestones defined by the regulations.

Frequent verification of product data is required to maintain compliance of parts and products relative to both IBM's product environmental requirements and the latest regulatory requirements, such as the expiration schedule for exemptions in the European Union Directive on the Restriction of Hazardous Substances (RoHS, 2011/65/EU). In 2015, IBM automated key elements of its PCD process. For example, the PCD refresh process was automated to help ensure that PCDs are current. Additional enhancements included a help function that provides IBM's suppliers with real-time assistance should they have questions regarding IBM requirements for submission of a PCD.

IBM conducts quality audits of PCDs to drive improvements in the content of the declarations and the supporting administrative processes. The improvements in product material content data management ensure that IBM's technical documentation for product hardware meets the quality requirements described within European Norm 50581: "Technical documentation for the assessment of electrical and electronic products with respect to the restriction of hazardous substances."

IBM has also deployed analytical tools for managing environmental compliance of products. As an example, one such tool identifies, in real time, which IBM part numbers (among thousands) are impacted by expiring exemptions for the European Union RoHS Directive. This information, coupled with supply chain information, assists engineers and procurement staff with part-number transition management to ensure compliance while avoiding a negative impact on IBM's business. Prior to the tool's deployment, engineers spent extensive amounts of time analyzing complex bills-of-materials to identify which IBM parts were impacted by changing RoHS requirements.

Product energy efficiency

Product energy efficiency was formalized as one of the company's corporate objectives when IBM's product stewardship program was established in 1991. Through collaboration of IBM Research and our product development teams, we have combined hardware and software technologies to improve the energy efficiency of IT equipment and data centers.

Following are some examples of new products IBM has developed with increased performance and improved energy efficiency. Additional information about these products, and how they are being used by clients to improve their operations, reduce energy use and costs, and lower the greenhouse gas emissions associated with their operations, can be found on IBM's [energy efficient products, services and solutions](#) webpage.

2015 product stewardship goals and performance

Recycled plastics

In 2015, 5.05 percent of the plastic resins procured by IBM and its suppliers for use in IBM's products contained some recycled content. Comparing only the weight of the recycled fraction of these resins to the total weight of plastics (virgin and recycled) purchased, 2.75 percent of IBM's total plastic purchases in 2015 were recycled plastic versus the corporate goal of 5 percent. The significant decline in the use of recycled plastics in 2015 is largely attributable to the divestiture of IBM's x86 server business in 2014. Given the diminishing amount of plastics contained in IBM's current product portfolio, we are re-evaluating the goal to determine how it should be modified to better align with IBM's current business.

Use of landfills

IBM's product end-of-life management operations worldwide processed 29,800 metric tons (65.7 million pounds) of end-of-life products and product waste, and sent only 0.7 percent of the total to landfills or incineration facilities for treatment, versus IBM's corporate goal of sending no more than 3 percent of the total amount processed to landfill or incineration facilities for treatment.

Product energy efficiency

One of IBM's product energy efficiency goals is to continually improve the computing power delivered for each kilowatt-hour (kWh) of electricity used with every new generation of server. In 2015, the IBM Power Systems™ S812LC, S822LC and E850 — the three servers for which typical watts consumed per relative performance are available from the comparable, previous-generation systems — achieved improvements ranging from 23 to 73 percent on this metric.

IBM also has a goal to qualify its new server and storage products to the U.S. Environmental Protection Agency's (EPA) ENERGY STAR program criteria where practical, and where criteria have been developed for the specific server or storage product type. In 2015, the IBM Power Systems S812LC, S822L, S822LC and E850 were certified to the ENERGY STAR server requirements (Version 2). The IBM FlashSystem® 900, IBM XIV® Gen3 storage system, and IBM Storwize® V3700 storage products had some of their available configurations certified against Version 1 of the ENERGY STAR data center storage requirements.

As of May 2016, IBM had six Power® server and three storage machine types certified to the ENERGY STAR requirements. The Power servers meet the EPA's requirements for power-supply efficiency, idle power limits or power management capability, and Standard Performance Evaluation Corporation (SPEC) Server Efficiency Rating Tool (SERT) metric data reporting. The storage products meet requirements for power-supply efficiency and reporting of Storage Network Industry Association (SNIA) Emerald Power Efficiency Measurement Specification results.

For links to the data sheets for ENERGY STAR certified IBM servers and storage products, see our [ENERGY STAR certified products](#) webpage.

IBM Power Systems

IBM's Power Systems provide enterprise-class server capabilities for traditional and cloud applications, with an emphasis on data-centric and highly virtualized operations that require high reliability and availability. IBM POWER8® servers offer a broad range of specialized functional capabilities that may not be available in other servers. From an energy efficiency standpoint, Power Systems servers can deliver the most workload for unit of energy consumed of any server when the system is configured to achieve maximum utilizations of up to 85 percent and EnergyScale™ power management capabilities are employed. EnergyScale matches energy use of the server to its workload levels.

IBM released five models of IBM Power Systems servers in 2015: the one-socket S812LC; the two-socket S822L, S822LC and S824L; and the four-socket E850. These Power Systems servers continue to use 80 PLUS Platinum certified power supplies, one grade above ENERGY STAR requirements and two grades above requirements established pursuant to European Union Directive 2009/125/EC, which provides ecodesign requirements for computer servers. Of these systems, the S812LC, S822L, S822LC and E850 have been certified to ENERGY STAR server requirements (Version 2), bringing the total number of ENERGY STAR servers offered by IBM to six. Depending on the products and their configurations, the two-socket servers reduce idle power 25 to 67 percent below maximum power, and the four-socket servers reduce idle power 32 to 41 percent.

IBM Power Systems servers can make material improvements in the efficiency of data center operations. One client consolidated the workload of 300 x86 servers onto one IBM Flex System® chassis populated with six S822L servers and three IBM Storwize V3700 storage systems, reducing the space requirements from six racks to one and annual energy use by 480 megawatt-hours (MWh) while avoiding 275 metric tons of CO₂ emissions. Another client installed IBM POWER8 servers to deliver 30 percent more transactions per hour with server utilization improvements of 20 to 80 percent. The improved operation over the previous system reduced energy consumption by 24 MWh, avoiding 10 metric tons of CO₂ emissions annually. Similar productivity and energy efficiency improvements can be achieved across the thousands of IBM Power Systems that IBM sells each year.

In 2015, IBM introduced a water-cooling option for the IBM Power System S822 and 822L two-socket servers. The water is channeled directly to a heat exchanger on the processors, offering increased cooling efficiency and server performance.

z Systems mainframes

IBM z Systems™ mainframe servers provide a unified, secure infrastructure for cloud, enterprise mobility, and analytics operations and applications. The IBM z13™, announced in January 2015, has the ability to support hundreds of images and operate at utilizations of 90 percent or better to enable the consolidation of multiple workloads onto a single, highly efficient server platform. With its high utilization rates, the z13 offers one of the most efficient computing platforms when measured by the workload delivered per unit of energy consumed.

IBM offers a water-cooled version of the z13, which provides 8 percent more computing capacity per kilowatt consumed when compared to the air-cooled model.

High-performance computers

IBM offers a full range of purpose-built and “off the shelf” technical computing (supercomputer) solutions. IBM's supercomputers are found in both the [TOP500](#) and [Green Graph 500](#) supercomputer lists. As of November 2015, IBM had four Blue Gene®/Q supercomputers that appeared among the top 25 in the TOP500 list as well as the top 50 of the Green Graph 500. The TOP500 list ranks computers based on their ability to solve a linear set of equations, while the Green Graph 500 compares high-performance computing systems based on a “performance per watt” metric. Technologies developed through IBM's high-performance computing (HPC) development efforts are leveraged across the entire IBM product line to improve performance and energy efficiency.

The speed and expandability of IBM's HPC products and solutions have enabled users — in the business and scientific community as well as governments — to carry out complex simulations and address a wide range of problems on topics such as life sciences, astronomy, climate and many other applications. IBM is partnering with NVIDIA Corp. and the U.S. Department of Energy to construct two OpenPOWER supercomputers based on IBM's Data Centric computing architecture. The “Sierra” supercomputer at Lawrence Livermore and “Summit” at Oak Ridge will

become operational in 2018. Access time will be available to researchers to execute scientific and research projects in the areas of energy, national defense, healthcare, genomics, economics, financial systems, social behavior, and visualization of large and complex data sets.

Storage systems

IBM continues to enhance its portfolio of storage systems, utilizing and improving various software-based data management capabilities such as Easy Tier[®], thin provisioning, data compression and de-duplication, and storage virtualization. These capabilities can reduce the storage hardware and energy footprint as well as the number of terabytes required to accomplish a given storage task.

In 2015, IBM expanded its range of flash-based storage systems, announcing the IBM FlashSystem V9000. Flash storage reduces energy use by 60 percent or more compared to disk drives, and significantly improves server and storage performance by minimizing the latency associated with data transfer within the data center.

Utilizing a combination of IBM XIV Gen3 and IBM FlashSystem 900 storage systems, IBM System Storage SAN volume controllers and various optimization software offerings, two clients were able to eliminate three and four racks of storage, reduce power consumption by 30 and 40 percent, respectively, improve the capacity utilization of their storage hardware and absorb future business growth in their existing infrastructure.

The IBM XIV high-end, grid-scale disk storage system offers excellent economic benefits, achieving an 80 percent reduction in space footprint and power consumption over previous-generation technologies configured to handle and store comparable amounts of data. Its grid-scale architecture automatically enables 95 percent utilization of storage capacity with no performance degradation. One client implemented an IBM XIV Gen3 storage system to upgrade its storage infrastructure, reducing power consumption by 65 percent and hardware footprint by 45 percent while improving overall workload performance and storage capacity utilization.

The IBM Storwize family disk storage systems include built-in functions such as Real-time Compression[™] and Easy Tier technology, combining flash and hard-disk drives to deliver extraordinary levels of efficiency and high performance. These capabilities enable the Storwize hardware to manage more data than previous-generation systems, decreasing the hardware and energy consumption footprint required to manage a given amount of data by 20 to 80 percent, depending on the application.

IBM has continued to expand its software-defined IBM Spectrum Scale[™] storage offerings, which enable storage automation and virtualization in both traditional and cloud environments. Spectrum Scale storage enables the reduction of storage energy consumption and costs through data consolidation and the use of data placement technologies to optimize the use of available storage devices, including tape storage. The ultimate outcome is to maximize the amount of data stored on a minimum number of storage products, in turn minimizing energy use.

Development of energy efficiency standards

IBM actively assists in the development of external product energy efficiency standards. In 1992, IBM became a charter member of the U.S. Environmental Protection Agency's ENERGY STAR computer program and helped to develop the first ENERGY STAR criteria for personal computers. Since then, we have continued our support for the ENERGY STAR program, assisting in the development of new criteria and certifying products that comply with the criteria. Today, IBM engineers are actively participating in the development of updates to the ENERGY STAR requirements for server and storage products.

We are providing technical assistance regarding the assessment of the Standard Performance Evaluation Committee (SPEC) Server Efficiency Rating Tool (SERT) and the Storage Network Industry Association (SNIA) Emerald Power Efficiency Measurement Specification. In addition, we are:

- Performing extensive evaluations of SERT test data and other industry metrics in support of creating a single metric that can be used to effectively assess the energy efficiency of server products in terms of minimizing the deployed server power required to deliver a given workload.

- Working in collaboration with The Green Grid, the Information Technology Industry Council, and Digital Europe to evaluate the SERT and Emerald results and to advocate for SERT and Emerald as the harmonized energy efficiency test metrics for server and storage products.
- Assisting the EPA and regulatory bodies in the European Union and China with the development of server energy efficiency criteria based on the SERT metric.

Product recycling and reuse

As part of our product end-of-life management (PELM) activities, IBM began offering product takeback programs in Europe in 1989 and has extended and enhanced them over the years. In addition, IBM's Global Asset Recovery Services organization offers Asset Recovery Solutions to commercial customers in countries where we do business. These solutions include:

- Management of data security and disk overwrite services
- Worldwide remarketing network for product resale
- State-of-the-art refurbishing and recycling capability for IT equipment
- Optional logistic services such as packing and transportation

In many countries and U.S. states, we offer solutions to household consumers for the end-of-life management of computer equipment, either through voluntary IBM initiatives or programs in which we participate. While IBM has not offered products to household consumers in more than a decade, many countries and states require IBM to maintain these programs to address the diminishing amounts of returned personal computing products and monitors once sold by IBM.

IBM's voluntary environmental goal is to reuse or recycle end-of-life products such that the amount of product waste sent by our PELM operations to landfills or incineration facilities for treatment does not exceed a combined 3 percent of the total amount processed. In 2015, IBM's global PELM operations sent approximately 0.7 percent by weight of end-of-life products and product waste directly to landfill or incineration as a disposal treatment. The total weight of end-of-life products and product waste

0.7%

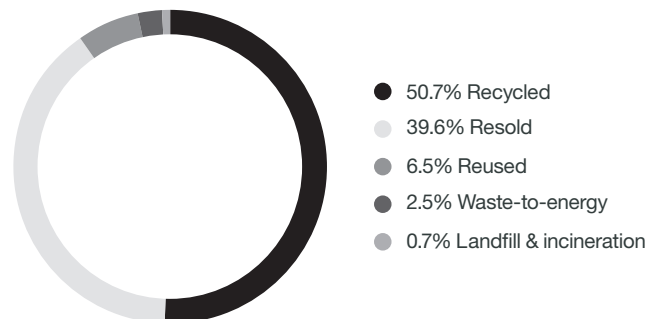
In 2015, IBM's PELM operations sent 0.7 percent of product waste directly to landfills or incineration as a disposal treatment — performing better than our goal of 3 percent maximum.

processed by these operations was 29,800 metric tons (65.7 million pounds). Of the 29,800 metric tons processed by IBM PELM operations worldwide, 50.7 percent was recycled as materials, 39.6 percent was resold as products, 6.5 percent was product reused by IBM and 2.5 percent was incinerated for energy recovery.

IBM's corporate-wide requirement for the environmental evaluations of the company's PELM suppliers was established in 1991, expanding our supplier environmental evaluation program introduced in 1972. We evaluate these suppliers prior to doing business with them and every three years thereafter. Our objective is to use only those suppliers that have a strong focus on environmental management, including complying with laws and regulations as well as sound management practices. More about IBM's requirements for our PELM suppliers may be found in the environmental requirements in the supply chain section of this report.

2015 product end-of-life management operations

(% by weight of 29,800 metric tons processed)



Product packaging

IBM's corporate environmental requirements for product packaging are included in our environmental packaging guidelines, which were first published in 1990 and have been updated as needed over the years.

IBM has had a program focused on the environmental attributes of its product packaging since the late 1980s. Under the program, IBM packaging engineers design solutions that minimize toxic substances by specifying nontoxic materials and inks. We keep packaging to a minimum while achieving protection to the product being shipped. We also collaborate with suppliers to use recycled and recyclable materials and promote reuse. The design of rugged products, the efficient use of protective packaging, and the environmental benefits resulting from improvements in transportation efficiency are addressed and tracked through this program. Key elements of IBM's packaging guidelines have also been embedded in various engineering specifications and procurement documents, which can be found on IBM's [information for suppliers](#) webpage. This helps to extend the reach of IBM's packaging program to include our supply chain and business partners.

IBM's environmental packaging requirements incorporate a list of the most commonly used packaging materials. Each is evaluated on a variety of environmental criteria. When options are available, suppliers are required to choose the material that has the least adverse effect on the environment. The materials listed are based on practical and regulatory experience and customer feedback. Other environmental areas addressed in the packaging requirements include:

- Ozone-depleting substances
- Restricted heavy metals and other materials of concern
- Source reduction
- Reusable packaging systems
- Recyclable packaging
- Conserving natural resources

All product packaging suppliers that pack or ship products to customers on behalf of IBM worldwide must submit packaging environmental data to IBM, along with other relevant compliance and performance data, through web-enabled tools. Any suppliers with a non-conformance must submit and implement improvement plans to close out the identified issues within an agreed timeframe. Applying this process to packaging suppliers worldwide ensures ongoing compliance with IBM's product packaging requirements.

Packaging reduction and improvements

In 2015, our global packaging engineering team saved an estimated 790 metric tons of packaging materials through the implementation of packaging redesign projects for parts and assemblies shipped to manufacturing locations, and for packaged finished products supplied to clients worldwide. These projects delivered an estimated annual materials and transportation cost savings of \$4.3 million.

The following are highlights of two projects implemented:

Supplier packaging redesign for IBM Storwize V7000 hybrid storage systems — The IBM Storwize V7000 hybrid storage system was originally sent from the supplier in individually packaged units on a pallet. IBM's packaging team worked with the supplier to design and validate a bulk package that could hold 10 units per single package on a pallet, which resulted in a 60 percent reduction in packaging materials (eliminating corrugated and plastic cushioning) and a 55 percent reduction in pallet size, which significantly reduced shipping costs. In total, the project will save an estimated 520 metric tons of packaging materials and \$3.8 million in cost.

IBM z13 shipping and packaging improvements — The industry standard for shipping large high-end products such as mainframes normally requires the product to be palletized in a wooden crate to protect the product during transit. Although a successful method, this results in a very large and heavy (280 kilograms) solution that uses large amounts of wood, metal, neoprene rubber, and plastic (cushions). In order to reduce environmental impact and cost, the packaging team designed a process to ship

the product on its casters (no pallet or crate) using a “white glove” shipping process (i.e., dedicated padded van) for U.S. domestic shipments. The shipping process utilizes less material — only a plastic bag to keep off moisture and dust during shipping, and a cushioned endcap made using a new compostable mushroom-based material called Restore Mushroom Packaging. Overall, the shipping and packaging design improvements saved an estimated 150 metric tons of packaging materials and \$690,000 in cost per year compared to traditional palletized rack crate packaging methods. This package design also received a 2016 AmeriStar Award in the electronics category from the Institute of Packaging Professionals.

Sourcing of paper and paper/wood-based packaging materials

IBM established its voluntary environmental goal for the responsible sourcing of paper and paper/wood-based packaging in 2002. It stated that the paper and paper/wood-based packaging directly acquired by IBM should be procured from suppliers that source from sustainably managed forests, where such sources exist.

When this goal was first established, sufficient quantities of sustainably sourced paper and packaging materials were not available to meet our needs. In 2015, after a continued focus on this objective by IBM and our suppliers over the years, 97 percent of the paper and paper/wood-based packaging IBM procured worldwide came from suppliers that warranted that the source was derived from forests managed in an ecologically sound and sustainable manner. This figure excludes a portion of supply from recycled content. This requirement is now incorporated into our standard supplier specification for paper/wood-based packaging.

Materials research and process stewardship

As an integral part of its global Environmental Management System, IBM routinely and consistently monitors and manages the substances used in its development and manufacturing processes, and in its products.

Environmentally preferable substances and materials

Our precautionary approach includes the careful scientific review and assessment of substances prior to their use in processes and products. When the weight of scientific evidence determines a potential adverse effect on human health or the environment, we have proactively prohibited the use of certain substances, restricted their use or found alternative substances to use in our processes and products — even when current laws permit such use.

When IBM develops new processes or significantly modifies existing processes, we conduct a scientific assessment of all substances in the process, including those that have been approved previously. Through these scientific assessments, we seek to identify potential substitutes that may be environmentally preferable. We believe that the same scientific rigor is required to investigate the human health and environmental effects of potential substitutes as was applied to investigate the substances in use.

IBM has a long history of taking proactive steps to evaluate the chemicals used in our processes and products — first by identifying potential substitutes that may have less impact on the environment, health and safety, and then by eliminating, restricting and/or prohibiting the use of substances for which a more preferable alternative is available that is capable of meeting quality and safety requirements of our processes and products.

The following is a sampling of IBM's 40-plus years of leadership in voluntarily prohibiting or restricting substances of concern from our processes and products, even before regulations required that we do so. For a more complete list, see our [materials use](#) webpage.

- Polychlorinated biphenyls (PCBs)
IBM initiated a multi-year effort to eliminate PCBs from use in our products in 1974 and achieved elimination in 1978.
- Chlorofluorocarbons (CFCs)
In 1989, IBM became the first major IT manufacturer to announce a phase-out of CFCs, a Class I ozone-depleting substance, from our products and manufacturing and development processes.
- Class I and II ozone-depleting substances
IBM completed the phase-out of Class I ozone-depleting substances in 1993. Subsequently, IBM eliminated Class II ozone-depleting substances from our products and processes in 1995.
- Trichloroethylene (TCE), ethylene-based glycol ethers and dichloromethane
Examples of other chemicals that IBM voluntarily prohibited from our manufacturing processes include TCE in the late 1980s, ethylene-based glycol ethers in the mid-1990s and dichloromethane in 2003.
- Polybrominated biphenyls (PBBs) and polybrominated diphenyl ethers (PBDEs)
IBM prohibited PBBs and PBDEs from its product designs in the early 1990s and then extended the prohibition to purchased commodities through our procurement specifications in 1993.
- Cadmium
IBM prohibited the use of cadmium in inks, dyes, pigments and paints in 1993, in plastics and plating in 1994, and in CRT monitors along with nickel cadmium batteries in the mid-1990s.
- Polyvinyl chloride (PVC) and tetrabromobisphenol A (TBBPA)
IBM ceased the specification of PVC in our IT system enclosures in 2000 and prohibited the use of TBBPA as an additive flame retardant in IT system enclosures for newly released products in 2007.
- Specific perfluorinated compounds (perfluorooctane sulfonate [PFOS] and perfluorooctanoic acid [PFOA])
IBM prohibited the use of PFOS and PFOA in the development of new materials in 2005 and in new manufacturing applications in 2007, and eliminated their use in existing manufacturing, development and research processes as of Jan. 31, 2010.

We communicate IBM's restrictions on specific substances and other environmental requirements for our products through our [Engineering Specification: Baseline Environmental Requirements for Supplier Deliverables to IBM](#).

Nanotechnology and horizon materials

By definition, nanotechnology is the application of scientific and engineering principles to make and utilize very small things (dimensions of roughly 1 to 100 nanometers), creating materials with unique properties and enabling novel and useful applications. It involves an ever-advancing set of tools, techniques and unique applications involving the structure and composition of materials on a nanoscale.

Nanotechnology is already part of a wide variety of products – from cosmetics and sunscreens to paints, clothing and golf equipment. It can make products lighter, stronger, cleaner, less expensive, more precise and more energy-efficient. Nanotechnologies have been critical to advancements in the IT industry.

IBM Research became involved in the world of nanoscience in 1981 when Gerd Binnig and Heinrich Rohrer invented the [scanning tunneling microscope](#), revolutionizing our ability to manipulate solid surfaces the size of atoms. Since then, IBM has achieved numerous developments in the field – from moving and controlling individual atoms for the first time, to developing logic circuits using carbon nanotubes, to incorporating sub-nanometer material layers into commercially mass-produced hard disk drive recording heads and magnetic disk coatings.

We were also one of the first companies to create safe work practices and health and safety training for our employees working with nanoparticles. Further development of nanomaterials presents the potential to reduce the overall materials use footprint of microelectronics manufacturing as well as produce advanced materials that reduce impact on both human health and the environment.

While IBM does not directly manufacture most components used in our current products, we continue to make significant new investments in research and development for “7 nanometer and beyond” silicon technology that will address physical challenges that are threatening current semiconductor scaling. In addition, we are focused on developing alternative technologies for post-silicon-era chips using entirely different approaches that are required because of the physical limitations of silicon-based semiconductors.

In 2015, IBM scientists demonstrated a new way to shrink transistor contacts without reducing performance in carbon nanotube devices, opening a pathway to dramatically faster, smaller and more powerful computer chips beyond the capabilities of traditional semiconductors. IBM’s breakthrough overcomes a major hurdle that silicon and any semiconductor transistor technologies face when scaling down. In any transistor, two things scale: the channel and its two contacts. IBM had previously shown that carbon nanotube transistors can operate as excellent switches at channel dimensions of less than 10 nanometers — the equivalent to 10,000 times thinner than a strand of human hair and less than half the size of today’s leading silicon technology. IBM’s new contact approach overcomes the other major hurdle in

incorporating carbon nanotubes into semiconductor devices, which could result in smaller chips with greater performance and lower power consumption. Carbon nanotube chips could greatly improve the capabilities of high-performance computers, enabling big data to be analyzed faster, increasing the power and battery life of mobile devices and the Internet of Things, and allowing cloud data centers to deliver services more efficiently and economically. By advancing research of carbon nanotubes to replace traditional silicon devices, IBM is paving the way for a post-silicon future and delivering on its \$3 billion chip R&D investment announced in July 2014.

In developing nanomaterials and other horizon materials and technologies, IBM takes care to ensure that we minimize the risks that new materials may pose to employees and the environment. As a part of our upstream chemical review process, materials intended for core technology development are reviewed prior to their use in IBM processes and products. This rigorous review not only prevents specific chemicals from being used in IBM-developed manufacturing processes, but also sets the conditions and settings in which other materials can be used, including engineering, administrative and personal protective controls. In addition, we continue to assess the environmental, health or safety impacts of our manufacturing processes, even after they are put into production, versus newly developed scientific information to determine if process and material changes are necessary.

Pollution prevention

Pollution prevention is an important aspect of IBM's long-standing environmental efforts and it includes, among other things, the management of hazardous and nonhazardous waste.

Hazardous waste

The best way to prevent pollution is to reduce the generation of waste at its source. This has been a basic philosophy behind IBM's pollution prevention program since 1971. Where possible, we redesign processes to eliminate or reduce chemical use or to replace chemicals with more environmentally preferable substitutes. We maintain programs for proper management of the chemicals used in our operations, from selection and purchase to storage, use and final disposal.

The total hazardous waste generated by IBM worldwide in 2015 decreased by 32 percent from 2014, to 2,740 metric tons. This reduction was primarily associated with the divestiture of IBM's semiconductor manufacturing operations in July 2015. Excluding hazardous waste from those operations, IBM would have seen a 0.2 percent reduction in the generation of hazardous waste in 2015.

For the hazardous waste that is generated, we focus on preventing pollution through a comprehensive, proactive waste management program. Of the total 2,740 metric tons of hazardous waste IBM generated worldwide in 2015, 58 percent was recycled, 25 percent was sent off-site for treatment, 10 percent was sent by IBM directly to regulated landfills and 7 percent was sent for incineration.

58%

Of the total 2,740 metric tons of hazardous waste IBM generated worldwide in 2015, 58 percent was recycled.

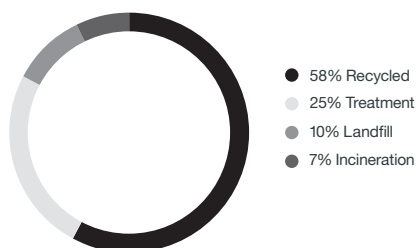
Nonhazardous waste

IBM has also focused for decades on preventing the generation of nonhazardous waste, and where this is not practical, recovering and recycling the materials that are generated. Nonhazardous waste includes paper, wood, metals, glass, plastics and other nonhazardous chemical substances.

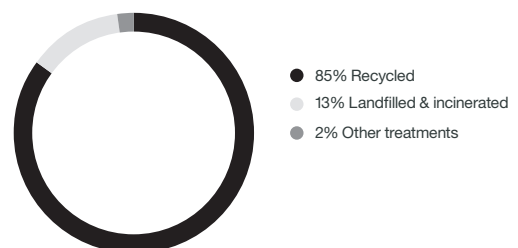
We established our first voluntary goal to recycle nonhazardous waste streams in 1988. The goal has since evolved on two fronts. The first expanded on the traditional dry waste streams to include nonhazardous chemical waste and end-of-life IT equipment from our own operations, as well as IBM-owned equipment that is returned by external customers at the end of a lease. The second expansion was made to include nonhazardous waste generated by IBM at leased locations meeting designated criteria.

Our voluntary environmental goal is to send an average of 75 percent by weight of the nonhazardous waste generated at locations managed by IBM to be recycled. In 2015, we sent 85 percent of the nonhazardous waste generated by IBM worldwide to be recycled.

2015 total generated hazardous waste worldwide by treatment method
(2,740 metric tons)



2015 total nonhazardous waste worldwide by treatment method
(53,000 metric tons)



Treatment methods that are credited toward the waste recycling target included: reuse, recycle, energy recovery, composting, reclamation and land farming. Treatment methods that result in a non-beneficial use and that are not credited toward our recycling target included incineration, landfilling, and treatments such as aqueous treatment, biodegradation of organics, filtration, neutralization and stabilization.

Total annual nonhazardous waste quantity and recycling performance
(Metric tons x 1,000)

	2011	2012	2013	2014	2015
Total sent for recycling	55	60	56	92	46
Total generated	70	69	65	107	53
Percent recycled by weight	78%	87%	86%	86%	85%

In 2015, our worldwide operations generated approximately 53,000 metric tons of nonhazardous waste, a decrease of 54,000 metric tons from 2014. This significant reduction was largely due to a decrease in the generation of construction debris from construction projects as compared to 2014. In addition, the divestiture of IBM's semiconductor manufacturing operations in July 2015 resulted in further decreases in nonhazardous waste generation. Excluding construction debris and wastes associated with divested semiconductor manufacturing operations, IBM would have seen a reduction of 5,000 metric tons of nonhazardous waste generation in 2015.

Source reduction and waste prevention initiatives implemented by IBM worldwide were estimated to have prevented the generation of over 5,800 metric tons of nonhazardous waste in 2015, with estimated annual handling, treatment and disposal cost savings and revenue returns totaling \$3 million.

85%

In 2015, IBM sent 85 percent of its nonhazardous waste to be recycled — surpassing our goal of 75 percent.

21.3m

In 2015, IBM's PELM operations sent 0.7 percent of product waste directly to landfills or incineration as a disposal treatment — performing better than our goal of 3 percent maximum.

Water conservation

The preservation of water resources and protection of watersheds are important areas of focus for IBM.

IBM established its first water conservation goal in 2000, focusing on the significant use of water in our microelectronics manufacturing operations. Since then, IBM's water conservation efforts avoided the accumulated use of 21.3 million cubic meters of water in those operations.

With the divestiture of IBM's semiconductor manufacturing operations, our direct water use has reduced substantially. IBM's remaining water use is primarily associated with cooling at our large facilities and data centers, and with irrigation and domestic water uses at facilities occupied by IBM.

In 2015, IBM set out to better quantify and understand the environmental impacts of our water use after the divestiture of our semiconductor manufacturing operations. In particular, we identified those data centers and other IBM locations in water-stressed regions with the highest potential water consumption. Many of these locations have already undertaken significant projects to reduce their water use. For example, IBM's Watson Research Center in Yorktown Heights, New York, has implemented a rooftop rainwater harvesting system that captures more than 1 million gallons of water for reuse in the site's cooling towers annually.

In early 2016, IBM established a new goal to achieve ongoing year-to-year reductions in water withdrawals at these locations in water-stressed regions. We are currently collecting baseline water withdrawal information for these facilities, and will begin reporting on our progress against this goal in the next report.

Solutions for environmental sustainability

At IBM, we believe that our greatest opportunity to contribute to the sustainability of our planet comes from the application of our knowledge, technologies and solutions to address the sustainability challenges of our clients and the world. IBM's products and solutions have enabled our clients to improve their efficiency and reduce their environmental impact. But now, through a combination of new cognitive technologies and an ever-more-instrumented planet — what some call the Internet of Things (IoT) — we are unlocking never-before-seen insights into, and solutions for, the relationships among business, society and our natural environment.

Water

More than ever, saving and protecting bodies of freshwater around the world is critical. Freshwater comprises only 3 percent of all water on earth, and two-thirds of it is frozen. The profound impact of freshwater — underscored by severe drought or devastating floods — vividly demonstrates how closely water is linked to the world economy and the welfare of people and all living things.

The Jefferson Project at Lake George

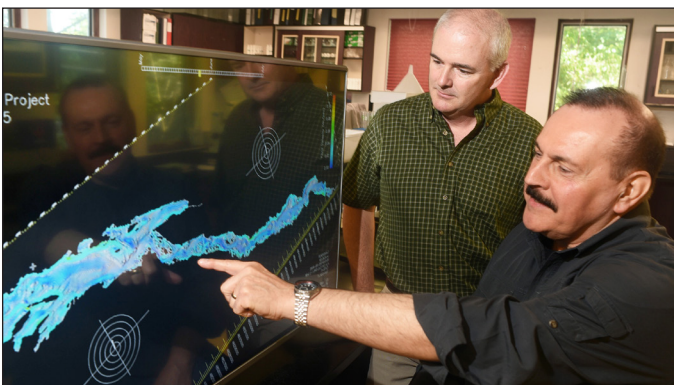
Rensselaer Polytechnic Institute, IBM and The FUND for Lake George launched [The Jefferson Project](#) in June 2013, in an ambitious effort to model Lake George in New York — its depths and shoreline — to get a holistic and accurate view of everything happening in and around one of the United States' pristine lakes.

The goals of the project are multifold and include understanding and managing the complex factors impacting the lake from invasive species, pollution and other factors, as well as developing a template to use in other freshwater bodies around the globe.

The three partners initially developed preliminary models of key natural processes within the watershed. As part of the first phase of the project, a network of 12 sensor platforms, including vertical profilers and tributary monitoring stations, were deployed around Lake George and its tributaries in late 2014.

Now, the Jefferson Project is entering a new phase in which enormous amounts of data will be captured from the sensors and analyzed. The computing infrastructure powering the Jefferson Project involves multiple computing platforms, ranging from an IBM Blue Gene/Q supercomputer to intelligent-computing elements and IoT technology situated on various sensor platforms in and around the lake.

The potential impact of the project extends well beyond the shores of Lake George. By capturing and pooling data from all sorts of sensors and swiftly analyzing it, scientists and policy makers around the globe could soon accurately predict how weather, contaminants, invasive species and other threats might affect a lake's natural environment. Armed with these new insights and a growing body of best practices, corrective actions could be taken in advance to protect freshwater sources anywhere in the world.



Jefferson Project Director Rick Relyea (left) and IBM Research Distinguished Engineer Harry Kolar examine a visualization of a computer-generated model of Lake George.

Waterfund Insight Service for better water management

EnerTech, a wholly owned subsidiary of the National Technology Enterprises Company — itself a subsidiary of the Kuwait Investment Authority — selected the Waterfund Insight Service to model and prioritize its strategic water technology investments. IBM developed the Waterfund Insight Service, an IBM Cloud Business solution, to provide national and local governments the ability to better understand and forecast the actual costs of water under different hydrological and financial scenarios, creating the financial transparency required to stimulate capital investment in freshwater.

Waterfund Insight Service provides a data visualization decision support service, enabling water utilities, corporations and government agencies around the world to make informed, data-driven decisions for effective water management. The service provides a better understanding of the impact on local water costs from changing climate conditions, capital spending and business factors, with “what-if” scenario analysis and data visualization.

Waterfund Insight Service is based on the Water Cost Index (WCI), an innovative financial benchmark developed by Waterfund. It partnered with IBM Research to calculate the true cost of water production in cities that represent over one-quarter of global combined gross domestic product (GDP). EnterTech will use the Waterfund Insight Service to analyze, forecast and measure the financial performance of competing new technologies that can benefit Kuwait and the broader Middle East.

IBM's World Community Grid: clean water

World Community Grid®, launched in 2004 as a philanthropic initiative of IBM Corporate Citizenship, is the biggest volunteer computing initiative devoted to humanitarian science and is as powerful as some of the world's fastest supercomputers. World Community Grid enables anyone with a computer or Android device to donate their unused computing power to advance cutting-edge scientific research on topics related to health, poverty and sustainability.

In one research study ([Computing For Clean Water](#)), a global team of researchers led by Tsinghua University in Beijing used World Community Grid to simulate water flow through carbon nanotubes at an unprecedented level of detail. Their study revealed a phenomenon, known as diffusion, that can increase a type of water transport through nanotubes by 300 percent. This breakthrough discovery has many possible applications — including the potential to improve water filtration technology, make seawater desalinization more efficient and affordable — and it may even shed light on how drugs pass through tiny channels in human cell walls. The team published its findings in the prestigious journal *Nature Nanotechnology*. The nearly 100 million calculations performed on IBM's virtual, crowdsourced supercomputer would have taken more than 37,000 years to perform on a single-processor PC, and would have cost millions of dollars. Instead, the work was completed in a fraction of the time, thanks to the massive computational power donated by 150,000 World Community Grid volunteers around the world, at no cost to the scientists.

Learn more about World Community Grid and how you can contribute to scientific research at worldcommunitygrid.org.



[New potential for access to clean water](#)

Cities

Consider the rate at which cities are changing and growing today. Rapid urbanization, strained infrastructure and enormous amounts of data are placing new demands upon — and creating opportunities for — cities. IBM is working with cities around the world to use advanced technologies to help identify ways to tackle urbanization challenges, improve sustainability and deliver better services to their citizens.

Green Horizons initiative and air pollution

In 2014, IBM Research launched a 10-year initiative with the city of Beijing called Green Horizons. It uses advanced machine learning and IoT technologies to improve prediction of pollution events, enabling officials and businesses to take preventive action. As part of this initiative, IBM's China Research lab is working with the Beijing Environmental Protection Bureau (EPB) to provide one of the world's most advanced air-quality forecasting and decision support systems, able to generate high-resolution 1 kilometer (km)-by-1km pollution forecasts 72 hours in advance, and pollution trend predictions up to 10 days into the future. It models and predicts the effects of weather on the flow and dispersal of pollutants as well as the airborne chemical reactions between weather and pollutant particles. In the first three quarters of 2015, the Beijing government was able to achieve a 20 percent reduction in ultra-fine particulate matter (known as PM 2.5), bringing it closer to its goal of a 25 percent reduction by 2017.



Helping to fight air pollution with cognitive computing and IoT

In December 2015, we announced the expansion of Green Horizons. That included:

- An agreement with the Delhi Dialogue Commission to understand the correlation between traffic patterns and air pollution in India's capital, and provide the government with “what-if” scenario modeling to support more informed decision making for cleaner air.
- A pilot program with the city of Johannesburg and South Africa's Council for Scientific and Industrial Research to model air pollution trends and quantify the effectiveness of the city's intervention programs in support of Johannesburg's air quality targets and long-term sustainable development.
- Additional clean air projects in China, with the EPB in Baoding to support that city's environmental transformation; the city of Zhangjiakou (host to the 2022 Winter Olympics) to improve air quality for the outdoor sporting event; and Xinjiang Province in northwest China.

Intelligent transportation

Cities around the world face common transport challenges — from increasing congestion, safety concerns and aging infrastructure, to a lack of funding and increasing environmental impacts. Avoiding vehicular idle time and delays, such as those caused by weather conditions, road obstructions or accidents, reduces fuel consumption and associated greenhouse gas (GHG) emissions.

IBM's Intelligent Transportation solutions provide traffic analysis and prediction capabilities, and a comprehensive, scalable platform for traffic management. Data from sensors, cameras and status reports are used to monitor traffic and road conditions. The captured data is analyzed to identify traffic bottlenecks and unsafe conditions. Based on the analysis, these solutions propose recommendations to reroute traffic and generate orders to address specific unsafe conditions or maintenance problems.

The city of São Paulo, Brazil, implemented an IBM traffic management solution to monitor and manage 6,000 kilometers of roads. The solution facilitated a reduction of 99 percent — from hours to minutes — in the time required to identify and address traffic problems. It also identified and prioritized needed repairs and maintenance to reduce unsafe conditions.

Energy

Addressing climate change will require actions from all sectors of society and governments to conserve energy and increase the use of renewable energy sources. IBM solutions and technologies are enabling our clients to improve their efficiency and reduce the environmental impacts associated with their energy use.

Green Horizons increasing renewable energy sources into the grid

In addition to the work noted above regarding air pollution, the Green Horizons initiative is also expanding its offerings of analytic and cognitive tools to improve the management of the electric grid and enable the dispatch of higher quantities of renewable electricity into it. New customer engagements include:

U.K. energy company SSE is piloting IBM technology to help forecast power generation at its wind farms in Great Britain. The system is able to forecast energy for individual turbines and includes visualization tools to show expected performance several days ahead.

In Japan, IBM is working with the Toyo Engineering Corporation and renewable energy company Setouchi Future Creations LLC on the Setouchi solar project — one of the largest in the country. IBM's monitoring systems will help Setouchi manage and control energy from the plant's 890,000 solar panels.

IBM is working with China's largest wind power solution provider — Xinjiang Goldwind Science & Technology Co., Ltd. — to use IoT, cloud computing, big data analytics and other advanced technologies to drive innovation and transform Goldwind's business and technological models. Also in China, Shenyang Keywind Renewable Company is using cognitive forecasting technologies to help integrate more energy into the grid.

The Zhangbei Demonstration Project, managed by China's State Grid Jibei Electricity Power Company, is tapping the power of Green Horizons renewable energy forecasting technology to integrate 10 percent more alternative energy into the national grid, enough to power more than 14,000 homes.

U.S. Department of Energy's SunShot Initiative

IBM researchers are working with academic, government and industry collaborators to develop a self-learning weather model and renewable forecasting technology, known as SMT, through a program supported by the U.S. Department of Energy's SunShot Initiative. The SMT system uses machine learning, big data and analytics to continuously analyze, learn from and improve solar forecasts derived from a large number of weather models. These refined forecasts, when combined with a grid management system that balances supply and demand, can be used to increase and optimize the output of solar and other renewable resources. By using state-of-the-art machine learning and other cognitive computing technologies, IBM scientists are generating solar and wind output and demand forecasts that are up to 30 percent more accurate than ones created using conventional approaches, whether minutes or days in advance.

Using IBM Watson IoT to drive transformation in the electricity industry

Fingrid, Finland's main electricity transmission grid operator, has selected IBM Watson IoT technology to help drive transformation in the electricity industry and ensure uninterrupted service for customers. Using networks of sensors and IBM's advanced analytics, Fingrid has pioneered a new solution called ELVIS, which provides system operators with a consolidated view of the entire electricity transmission grid.

Keeping the power flowing through Fingrid's 14,000-kilometer electricity grid is a daunting task that requires a holistic understanding of grid operations, maintenance and safety issues. In the past, Fingrid had to collect data from disparate systems and databases manually — which could take days, if not weeks, to get all the information required for root cause analysis. IBM's IoT-based solution increases the automation of the system, helping Fingrid to quickly identify issues and optimize maintenance scheduling and management. In addition, by connecting asset information with geographic location and financial data, the company can use sophisticated graphical visualizations to better understand maintenance and operating costs.

World Community Grid: clean energy

Another project supported by IBM's World Community Grid is the Clean Energy Project, led by a team of scientists from Harvard University. Its goal is to develop efficient and inexpensive solar cells using organic-based molecular materials that may serve as viable solutions for future energy needs. Taking a big data approach and harnessing World Community Grid's distributed computing power, Harvard researchers are screening millions of organic compounds to assess their effectiveness for solar cell use. In the largest quantum chemistry experiment ever conducted, the team screened over 2.3 million compounds, identifying over 35,000 predicted to perform at double the rate of efficiency of most organic solar cells in production today.

In 2013, the team released a [free database](#) that catalogs the ratings of the compounds screened on World Community Grid, and their work has been praised by the White House Office of Science and Technology Policy for its contribution to the field of materials science. Organic solar cells have the potential to be cheaply manufactured. They can be flexible enough to be painted or sprayed on roofs, windows and walls, and thin and light enough to be applied to portable devices and materials — making them useful to remote and impoverished populations. During 2015, Harvard researchers demonstrated that techniques from the field of machine learning can enable them to screen candidate molecules with less computational time while achieving a high level of accuracy. This, in turn, allows for the exploration of an increasingly



[Help power affordable solar energy research on World Community Grid](#)

large and diverse number of molecules. The research project is ongoing, and new compounds will be added to the database as they are analyzed.

Buildings

Buildings use about 40 percent of global energy and emit approximately one-third of GHG emissions. Building intelligence is evolving through emerging technologies in cloud computing, data analytics and intelligent field devices — effectively merging the virtual and real worlds within the built environment to optimize energy consumption and minimize environmental impact.

IBM Building Management Center solution for facilities management

The IBM Building Management Center solution mines and aggregates data from multiple sources across an enterprise, enabling operators to capitalize on new insights to manage operational, energy and space efficiencies within and across facilities while reducing cost and associated GHG emissions. Cloud-based analytics software helps identify anomalies and likely solutions, and issues prioritized work orders to assess and correct the problem. The solution enables maintenance teams to avoid time-consuming manual diagnostics, improve equipment longevity, optimize building energy consumption and minimize cost.

IBM is collaborating with a major university on a nine-building pilot of the IBM Building Management Center solution. The solution is delivered on the IBM SoftLayer cloud and monitors thousands of data points from building automation and control systems offered by several different manufacturers. After only four months of work, focused on 60-plus air handling units, annualized energy savings of over \$135,000 and 16,000 megawatt-hours of electricity, steam and chilled water have been identified. Subsequent work will focus on air handling systems across the campus and later will extend to lighting, water and other utilities.

IBM completed a similar collaboration with a large government entity, applying the solution to 81 buildings, which identified approximately \$14 million in energy savings in less than three years.

Environmental requirements in the supply chain

IBM does business with suppliers that are environmentally and socially responsible and requires their awareness of these responsibilities. IBM also routinely responds to requests from our clients and governments for information about the environmental attributes of our products. In many cases, the source for this information is IBM's suppliers.

The objectives of our requirements for suppliers and our supplier evaluation program include:

- Ensuring that IBM does business with environmentally responsible suppliers that are actively managing and reporting on their environmental impacts
- Helping our suppliers build capabilities and expertise in the environmental area
- Preventing the transfer of responsibility for environmentally sensitive operations to any company lacking the commitment or capability to manage them properly
- Reducing environmental and workplace health and safety risks of our suppliers
- Protecting IBM, to the greatest extent possible, from potential environmental liabilities or adverse publicity

Key milestones

1972

Established a corporate directive requiring the environmental evaluation of suppliers of hazardous waste services

1980

Expanded our environmental evaluations of suppliers by establishing a second corporate directive to require the environmental evaluation of certain production-related suppliers

1991

Further expanded our environmental evaluations of suppliers, adding a requirement that product recycling and product disposal suppliers be evaluated

1993

Established product environmental compliance specification 46G3772 with environmental requirements for parts and products IBM procures from suppliers

2002

Added a requirement to assess our suppliers and certain subcontractors they may use to handle recycling and/or disposal operations in countries outside the Organisation for Economic Co-operation and Development (OECD)

2005

Created a part and product compliance declaration form (referred to as Product Content Declaration or PCD) to facilitate transfer of part and product compliance information from the supply chain to IBM

2010

Required suppliers having a direct relationship with IBM to establish a management system that addresses their social and environmental responsibilities and to cascade these requirements to their suppliers

2013

Incorporated the assessment of product environmental compliance requirements into the supply chain audit process, and introduced reviews via a sampling approach of PCD forms for data integrity

Supplier social and environmental management system requirements

Since 2010, IBM has required that all first-tier suppliers maintain a management system to address their social and environmental responsibilities. Our objective is to help our suppliers build their own capability to succeed in this area. With this in mind, IBM suppliers are required to:

Define, deploy and sustain a management system that addresses the intersections of their operations with employees, society and the environment

- Measure performance and establish voluntary, quantifiable environmental goals in the areas of waste, energy and greenhouse gas emissions
- Publicly disclose results associated with these voluntary environmental goals and other environmental aspects of their operations
- Conduct self-assessments and audits, as well as management reviews, of their system
- Cascade these requirements to their suppliers who perform work that is material to the products, parts and/or services supplied to IBM

More information on these requirements may be found on IBM's [supply chain environmental responsibility](#) website.

Suppliers managing chemicals, wastes and end-of-life equipment

IBM has additional requirements for those suppliers where IBM:

- Specifies and/or furnishes chemicals or process equipment
- Procures hazardous waste and nonhazardous special waste treatment and/or disposal services
- Purchases product end-of-life management services
- Uses extended producer responsibility systems

Specific environmental requirements are documented in our contracts with suppliers conducting these types of activities anywhere in the world. These may include requirements related to chemical content, chemical management, waste management, spill prevention, health and safety, and reporting.

For hazardous waste and product end-of-life management suppliers, IBM conducts a supplier environmental evaluation, which may include an on-site review of the supplier facility. We evaluate these suppliers prior to entering into a contract with them, and then approximately every three years thereafter, to ensure their operations and commitment to workplace safety and sound environmental practices continue to meet our requirements. The evaluations are conducted by IBM's Corporate Environmental Affairs staff, or internal or third-party environmental professionals under the direction of this staff.

IBM's hazardous waste and product end-of-life management supplier evaluations are comprehensive in the scope of the environmental aspects covered, including:

- Facility operational activities, capabilities, capacities and services
- Corporate environmental and social responsibility
- Compliance with IBM's social and environmental management requirements and supplier's own social and environmental management system
- Applicable legal requirements and compliance
- Permits, licenses and other applicable regulatory requirements
- Environmental liability insurance and financial assurance

IBM also requires its hazardous waste and product end-of-life management suppliers to track the shipment and processing of any hazardous materials they handle for IBM — down to the final treatment, recycling or disposal location — and to report that information to us.

As with all of our environmental programs, IBM manages its hazardous waste and product end-of-life management programs to the same high standards worldwide. Doing so can be particularly challenging in some countries where processing infrastructure that meets IBM's requirements (for treatment, recycling and/or disposal) is limited or nonexistent.

Under IBM's waste management program, hazardous and nonhazardous special wastes are treated, recycled or disposed at IBM-approved facilities within the country where they are generated, whenever possible. IBM does not export hazardous and nonhazardous special wastes from the U.S. or any other country where suitable processing facilities are available within the country.

If there are no suppliers in a country that meet IBM's environmental and safety requirements for hazardous waste or product processing, the waste generated by IBM's operations is shipped to facilities in other countries where those requirements can be met. This shipping is done in compliance with country laws and regulations, and in accordance with international treaties such as the Basel Convention on the Control of Transboundary Movements of Hazardous Wastes and Their Disposal.

Though rare, there are sometimes situations in which local processing of waste is not possible and shipping to IBM-approved suppliers in other countries is not allowed due to legal requirements. In these situations, IBM will store wastes and product end-of-life materials in properly contained and managed storage facilities as allowed by law until suitable processing facilities are available.

IBM's supplier evaluation program was extended in 2014 to cover suppliers providing collective solutions (e.g., consortia) for the management of IBM's hazardous and special wastes. These suppliers have become more important as new extended producer responsibility regulatory schemes have been implemented in many countries. IBM evaluates the collective solutions we use to fulfill our responsibilities as a manufacturer of products covered by such schemes, as well as collective solutions that we use for the disposal of products purchased for our internal use.

Remediation

When groundwater contamination was first discovered at one of IBM's sites in 1977, the company voluntarily initiated groundwater monitoring at all of its manufacturing and development locations worldwide. Today, IBM has 2,408 monitoring wells and 111 extraction wells in place at its current and former locations.

In 2015, IBM's remediation wells extracted approximately 13,500 pounds of solvents from past contamination at four currently operating IBM locations and 14 former IBM locations in three countries. At six of these locations, an additional 2,414 pounds of solvents were removed by soil vapor extraction or other methods. IBM also has financial responsibility for remediation at two additional former locations.

Under the U.S. Superfund law, IBM is involved in cleanup operations at some non-IBM sites in the United States. The Superfund law creates retroactive responsibility for all the parties that may have sent waste or otherwise contributed to contamination at third-party-owned sites, regardless of whether those sites were complying with environmental laws at the time. As of year-end 2015, IBM had received notification (through federal, state or private parties) of its potential liability at 114 such sites since the beginning of the Superfund program in 1980. Of these, 63 are on the U.S. National Priority List. At most of the 114 sites, IBM has either resolved its liability or has proven it has no outstanding liability. Currently, IBM is actively participating in a cleanup or otherwise managing its potential liability at only 17 Superfund sites.

When environmental investigation and/or remediation at a current or former IBM location or a non-IBM facility is probable, and the costs for future activities can be reasonably estimated, IBM establishes financial accruals for loss contingency. IBM accrues for estimated costs associated with closure activities (such as removing and restoring chemical storage facilities) when IBM decides to close a facility. As of Dec. 31, 2015, the total accrual amount for all such environmental liabilities and associated activities was \$283 million.

Audits and compliance

IBM reviews its environmental performance against both external and internal requirements, and takes prompt and decisive action when any issues are identified.

Every year, IBM's manufacturing, hardware development and chemical-using research locations and organizations — such as product groups, Real Estate Strategy and Operations, Global Services, Global Logistics, Global Asset Recovery Services, and Global Procurement — complete a comprehensive self-assessment. IBM's Corporate Internal Audit organization may also conduct environmental, health and safety audits. Audit and self-assessment results are communicated to top management. Follow-up, accountability and closure of actions are clearly delineated.

In addition, independent audits are conducted as part of IBM's single, global registration to the ISO 14001 standard. Approximately 25 IBM locations and relevant business organizations (known as registered entities) are audited annually by an external ISO 14001 registrar. Our manufacturing, hardware development, chemical-using research locations and other registered entities are audited by the ISO 14001 registrar on a 12- to 30-month cycle.

As an integral part of IBM's global Environmental Management System, the ISO 14001 registrar also audits IBM's energy management program and the enterprise-wide database for recording and managing energy information (e.g., consumption, conservation, renewable energy purchases) against the ISO 50001 standard on energy management systems. Annually, between six and eight of our ISO 14001 registered entities are audited for conformance to the ISO 50001 standard.

On an annual basis, using a sampling approach, the registrar audits IBM's ISO 14001 registered entities covering 15 to 30 percent of IBM's global annual energy consumption. During these audits, the auditor tests energy consumption records in the enterprise-wide database, comparing the consumption values on the energy bill to the database entries, determining the accuracy of reported savings from energy conservation projects, and verifying that IBM's energy management program requirements are being implemented consistently. The results of this testing are used as inputs for a separate, third-party validation audit of IBM's corporate greenhouse gas emissions management and reporting process. The results of the latest audits can be found on the [IBM environmental reporting, disclosure and verification](#) webpage.

Accidental releases

IBM sites around the world report environmental incidents and accidental releases to IBM management through the company's Environmental Incident Reporting System (EIRS). IBM's environmental incident reporting criteria are equal to or exceed applicable legal reporting requirements, and every event meeting IBM's reporting criteria must be reported through EIRS. Each IBM location must have a documented incident prevention program (including provisions for preventing environmental incidents or their recurrence) and reporting procedure. In 2015, nine accidental releases of substances to the environment related to IBM operations were reported through EIRS — two releases to air, five to land and two to water.

Emissions to air were two releases of refrigerants due to minor leaks in refrigeration systems. Releases to land were two releases of cooling-tower water, one release of contaminated untreated groundwater, one release of wastewater, and one release of fuel where the soil was subsequently excavated. Releases to water were one release of chilled water and one release of untreated sewage due to a pipe defect. The root causes were investigated for all releases and corrective actions were taken as appropriate. None of the releases was of a duration or concentration to cause long-term environmental impact.

Fines and penalties

One significant measure of a company's proactive approach to pollution prevention and environmental performance is its record of fines and penalties. In 2015, IBM received 80 agency inspections at facilities worldwide with no resulting fines or penalties. Over the past five years, IBM has paid seven fines totaling \$81,939.

Fines and penalties worldwide

(\$ in thousands)

	2011	2012	2013	2014	2015
Number	0	3	0	4	0
Fines	\$0.0	\$74.8	\$0.0	\$7.1	\$0.0

Supply Chain

In relationships with approximately 14,000 suppliers worldwide, IBM requires a commitment to social and environmental responsibility — just as IBM's own clients expect of us. We establish requirements for suppliers and assess compliance, collaborate with industry groups to drive broader improvements, and work to expand the diversity of our supply chain.

Our supply chain

IBM incorporates social and environmental responsibility in our relationships with approximately 14,000 suppliers in nearly 100 countries. We understand the potential for progress in a supply chain of this scale, and invest in a range of initiatives to promote sustainable performance as a shared objective.

IBM's global supplier spending was \$25.8 billion, down \$4.5 billion in 2015, affected by decreased revenue across IBM's product and services lines, by the completed divestiture of our Microelectronics business to GlobalFoundries, and from leveraging market-place pricing opportunities. Production Procurement, Logistics Procurement and diverse-supplier spending had the largest percentage decrease owing to the divestiture. Geographic distribution of supplier spending remained consistent, as our supply base is positioned to serve the needs of our clients on a global basis.

The following lists of suppliers — and links to their responsibility reports and/or related websites — represent a significant portion of IBM's global expenditures.

In 2015, half of our suppliers listed below published corporate responsibility reports, and nearly 90 percent of those published are mapped to the Global Reporting Initiative guidelines — with most to the latest G4 criteria. Going forward, we encourage our suppliers without public reporting to take that step as a means to further expand the transparency of the supply chain.

In 2015, slightly over 85 percent of our global spending in Production and Logistics Procurement (in support of our hardware and logistics business operations) occurred with the following 50 firms:

- Acbel Polytech
- Altis Semiconductor
- Applied Materials
- Avago (acquired by Broadcom)
- Avnet
- BDT Media Automation
- Benchmark Electronics
- Celestica
- Cisco Systems
- Compro Business Services
- Delta Electronics
- Emerson Network Power
- Emulex (acquired by Avago)
- Finisar
- Flextronics
- Fuji Electric
- Fujifilm
- Geodis
- GlobalFoundries
- Hon Hai (Foxconn)
- i3 Technologies
- Intel
- Jabil Circuit
- KLA-Tencor
- Kyocera
- Lam Research
- Lenovo
- Mellanox Technologies
- Mercury Corporation
- Micron Technology
- Microsemi
- Molex
- NEC Platform Technologies
- NetApp
- QLogic
- Quantum
- Samsung
- SanDisk
- Seagate
- Shin-Etsu Handotai America
- SK hynix
- Soitec
- SunEdison Semiconductor
- Syncreon International Group
- Tel-Ad Electronics
- Tokyo Electron
- Toshiba
- Venture
- Western Digital
- Wistron

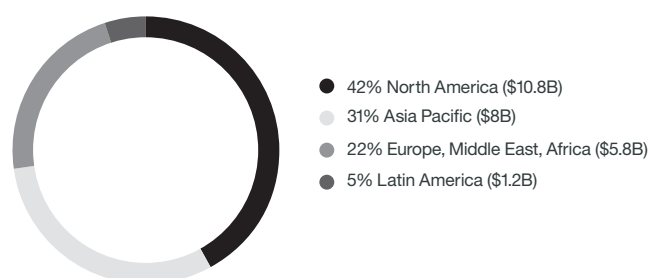
In Services and General Procurement (supporting our software, services and overall operations) approximately 45 percent of our global spending was with the following 50 firms:

- Adecco
- American Airlines
- American Express
- Apple
- Artech Information Systems
- AT&T
- Bilfinger
- BMC Software
- Camelot Information Systems
- CA Technologies
- CBRE Group
- CDI
- Cisco Systems
- Collabera
- Computer Task Group
- CVS Caremark
- Deloitte Touche Tohmatsu
- Delta Air Lines
- EMC
- Fluor
- George P. Johnson
- Hays plc
- Hewlett-Packard
- Hilton
- Hitachi
- Infinite Computer Systems
- Internet Initiative Japan
- IPsoft
- IT Holdings
- Jones Lang LaSalle
- Juniper Networks
- LeasePlan
- Lenovo
- Manpower
- Mitsubishi
- Nippon Systems Development
- Open Systems Technology
- Oracle
- Randstad
- Red Hat
- Rocket Software
- SAP
- SDI International
- SHI International
- Sumitomo Corp.
- Toshiba
- Virtela Communications
- Westcon Group
- WPP
- ZeroChaos

2015 supplier spending by category



2015 supplier spending by location



Supplier assessment and improvement plans

Commitment to continuous improvement is essential to sustained progress in supply chain social responsibility. Our concentrated effort to lead and encourage our supply chain to embrace positive change has generated many improvements. This section includes successes that IBM and our suppliers achieved in 2015, along with our approach to the challenges that still remain.

IBM's Social and Environmental Management System for its suppliers

In 2010, IBM established a requirement that first-tier suppliers create a management system to address their social and environmental responsibilities. Our objective in establishing this requirement was to help our suppliers build their own capability to succeed in this area. Suppliers are required to:

- Define, deploy and sustain a management system that addresses intersections with employees, society and the environment, and that addresses integration with and compliance to the Electronic Industry Citizenship Coalition (EICC) Code of Conduct.
- Measure performance and establish voluntary, quantifiable environmental goals in the areas of waste, energy and greenhouse gas emissions.
- Publicly disclose results associated with these voluntary environmental goals and other environmental aspects of their management systems.
- As part of their social and environmental management system, conduct self-assessments, audits and senior leadership reviews of their system.
- Cascade these requirements to their next-tier suppliers.

1,858

full-scope audits measuring supplier compliance from 2004 through 2015

In 2015 over 1,200 new suppliers — primarily from the Services and General Procurement sector of our supply chain — were afforded a period not to exceed 12 months to demonstrate compliance with these requirements. Suppliers are tracked monthly and action taken by purchasing to ensure plans reach acceptance.

More information on these eight supplier requirements may be found on IBM's [supply chain environmental responsibility](#) webpage.

Supply chain social responsibility

Supply chain social responsibility has been an element of IBM's procurement strategy since 2004. We have witnessed this aspect of business protocol grow, both within our company and across our industry, as the EICC continues to expand and mature each year. As a founding member of the EICC, IBM endorses the EICC Code of Conduct for its internal operations and requires the same of our first-tier suppliers. IBM communicates our requirement for EICC code compliance at the initial stages of supplier engagement, as well as progress on any plan implemented to achieve compliance as part of regular business reviews. Continuous focus on social responsibility and the commitment of our suppliers has helped lead to many improvements over the past decade. Audits and re-audits continue to play a valuable role in providing our suppliers with objective, third-party evidence to determine if their operations are code-compliant or need further improvement.

Annually we assess a cross-section of our supply chain in the developing world. In this report we are highlighting the outcomes of these audits and sharing the results of improvements made by our suppliers, which have positively affected working conditions for thousands of people employed in our extended supply chain.

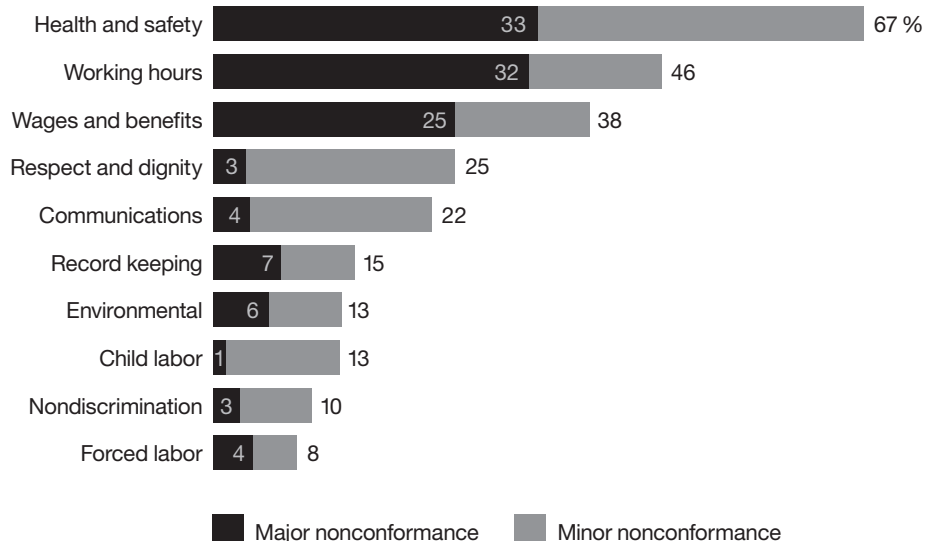
In 2015, audits to the EICC Code of Conduct took place simultaneously for both our Production and Logistics Procurement suppliers, and those in the Services and General Procurement supply chain. IBM continued its long-standing use of the EICC's Validated Audit Process (VAP), the standardized social responsibility audit developed by the electronics industry. In 2015, we provided a long-range outlook to suppliers in order to give them time to plan and contract with the EICC for these assessments, as part of their ongoing social responsibility work.

By year-end 2015, the total number of full-scope audits (not counting re-audits) in the 11-year time frame reached 1,858. These assessments measured supplier compliance to the EICC code and in earlier years — prior to 2010 for Production Procurement suppliers, and 2012 for Services and General Procurement suppliers — to IBM's Supplier Conduct Principles. Since 2013, IBM has been using the EICC's Validated Audit Process exclusively for all of its supply chain social responsibility assessments.

In order to accurately depict this transition, this year we are separating our audit history to show results prior to full EICC audit usage, as well as after. Audit results from 2004 through 2012 are shown in a heritage chart, and audits from 2013 in a new cumulative chart, which is attenuated exclusively to the EICC code and its provisions. This change allows us to present suppliers' audit results exclusively against the EICC code without any lingering influence from audits performed to the legacy IBM Code of Conduct.

The following chart depicts supplier audit performance from 2004 through 2012. The noncompliant provisions are primarily from IBM's legacy Code of Conduct, with a portion from the EICC Code of Conduct. These 1,591 audits gave us a strong foundation in understanding the issues in our supply chain and helped to influence the development of the EICC code and its VAP, which went into use in 2010.

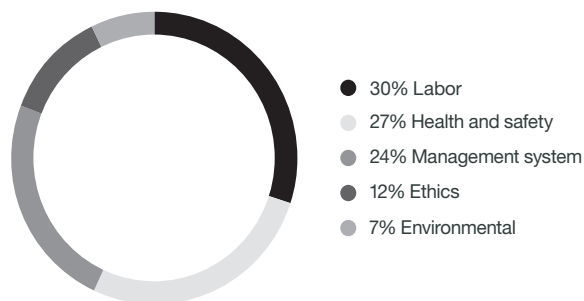
Full audit results: 1,591 total, cumulative 2004 – 2012
(Top 10 nonconformances to IBM Code of Conduct by %)



Since 2013, IBM has used the EICC code and VAP exclusively for supplier assessments. From 2013 through year-end 2015, IBM's suppliers were engaged in 267 full-scope EICC audits. Data included in the 2013 – 2015 cumulative chart includes second-, third- and fourth-cycle full-scope audits (versus only initial full-scope audits), reflecting IBM's practice of including social assessment as part of its ongoing engagement with suppliers. For the EICC audit results, we are showing two levels of data. The first level depicts the percentage of major and minor nonconformance (for the 267) to the EICC code based on the five pillars of the code: labor, health and safety, environmental, ethics, and management system. (For reporting purposes, incidents of priority nonconformance found during IBM commissioned audits to the EICC code are consolidated into major nonconformance depicted in the charts.)

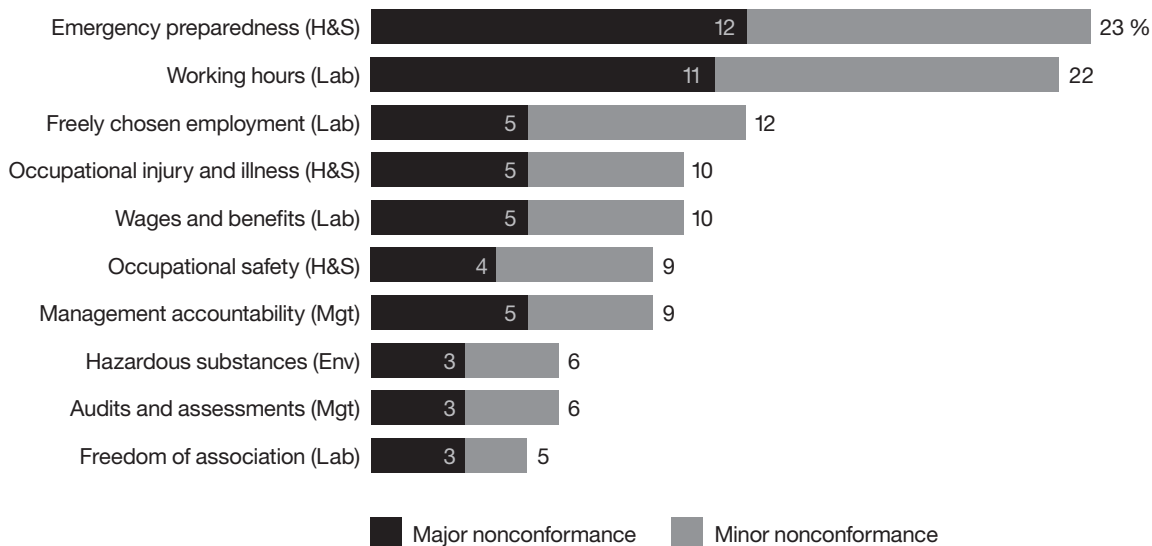
Going one step further, the second-level data reporting presents the 10 most frequent code nonconformance (major and minor) for these same 267 full-scope audits, showing both major and minor breakout for each provision of the EICC code (For reporting

2013 – 2015 full audits: distribution of nonconformances (by section of EICC Code of Conduct)



purposes, incidents of priority nonconformance found during IBM commissioned audits to the EICC code are consolidated into major nonconformance depicted in the charts). For linkage of the provisions to the five code sections, we have noted this via abbreviation: Lab (labor), H&S (health and safety), Env (environmental), Eth (ethics) and Mgt (management system).

Full audit results: 267 total, cumulative 2013 – 2015 (Top 10 nonconformances to EICC code provisions by %)

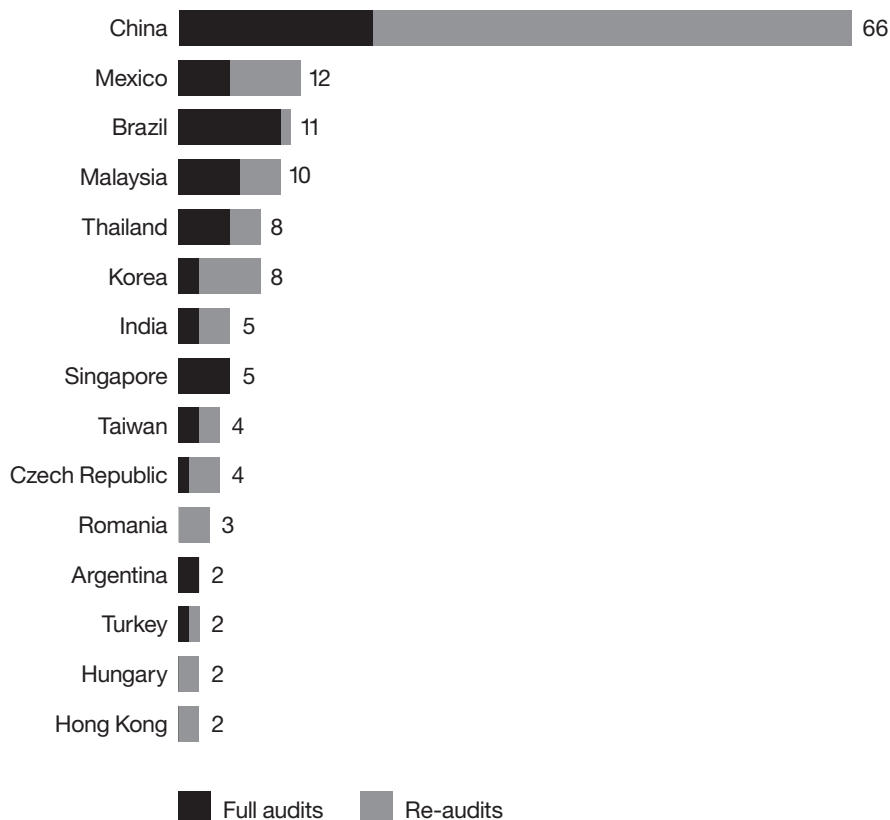


Code sections include Health and safety (H&S), Labor (Lab), Environmental (Env) and Management system (Mgt).

Each nonconformance is treated with equal attention by IBM's Supply Chain Social Responsibility team, working with the audited suppliers. As described in the annual data, Corrective Action Plans (CAP) are formulated to address these nonconformances. Beyond these top 10, another 34 code provisions had major or minor code nonconformance — all have been addressed with the audited suppliers.

In 2015, IBM engaged its suppliers in 63 full-scope audits and 86 re-audits for a total of 149 assessments in 20 countries or territories. China was the most active for audits and re-audits, followed by Mexico, Brazil, Malaysia, Thailand and Korea. Of these audits, 63 percent were with our Production and Logistics suppliers, and 37 percent with our Services and General Procurement suppliers. Fifteen countries had re-audit activity, following audits conducted in the prior two years, as we aim for re-audits to follow any full-scope audits with noncompliance. Year-to-year, total audits performed decreased 40 percent as a result of

2015 completed audits by country (149 conducted*)



*Chile, Russia and Slovakia each had one full audit in 2015; Indonesia and the Philippines each had one re-audit.

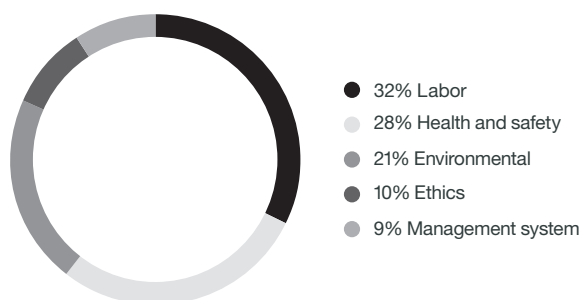
changes in business with suppliers caused by the divestitures of System x servers and Microelectronics group business units. Full audits were commissioned only with suppliers having continued IBM business; re-audits were completed with divested suppliers in order to complete the EICC recommended cycle. By comparison with aggregated data from the 2015 EICC annual report (page 21), IBM's 63 full-scope audits comprised 18 percent of all full-scope EICC audits conducted, while IBM's 86 re-audits represented 53 percent of all EICC re-audits performed in 2015.

Of the 63 full-scope audits, reports were completed for 51 by the end of first quarter 2016. Representing full-audit results for those 51 suppliers, we continue with two levels of audit result reporting. The following chart depicts the 2015 results mapped to the five sections of the EICC code.

In 2015, the largest two contributors to noncompliance were labor, and health and safety. The management systems category improved its compliance level as a result of continued dialogue with our suppliers — as described earlier, relating to our requirement for suppliers to have a social and environmental management system in place. Examining 2015 audit results at the second level of data reporting, the following chart depicts the 10 most frequent nonconformances found in the 51 full-scope audits.

2015 full audits: distribution of nonconformances

(by section of EICC Code of Conduct)



Among the 51 full-scope EICC audits in 2015, 32 were from Production Procurement suppliers and 19 were from Services and General Procurement suppliers; in the latter group, these often were the first time suppliers were assessed to the EICC Code of Conduct. IBM is one of the pioneering companies in the extensive use of EICC audits in the so-called indirect supply chain (services and software).

In 2015 full-scope audits, five of the top 10 nonconformances were labor-oriented and four were related to health and safety. These 2015 results were notably improved, compared to audits in 2004 — 2012. Often, audits are criticized as ineffective for driving long-term change. Our experience has been the opposite: Audits are a valuable tool, and if combined with long-term supplier relationships and suppliers' agreements to invest in improvements toward code compliance, they can help drive relative long-term improvement. For example, consider working hours. In the 2004 — 2012 time frame, combined major and minor nonconformance for working hours was 46 percent for audits conducted; in 2015 it was 26 percent. Other areas, such as health and safety, have seen improvements to a lesser degree. Many of the findings in the top 10 provisions uncovered weaknesses in the supplier's management systems relating to health and safety, such as frequency of conducting emergency drills, planning for all manners of emergencies, egress signage, training of first-aid personnel and first-aid kit supplies. Although we require a complete post-audit CAP, suppliers typically address the health and safety findings with expediency, often during the course of the audit itself. The EICC Code (by design) is very robust in management systems relating to an organization's structure to attain and maintain long-term compliance to the code provisions. Suppliers with nonconformance were often lacking one or more elements of a strong management system — having documented goals, objectives, metrics, periodic reviews with in-line management and tracking of closure actions. Other code provisions with nonconformance are related to the proper establishment of policies and practices, such as in freely chosen employment (having an implemented and communicated policy on human

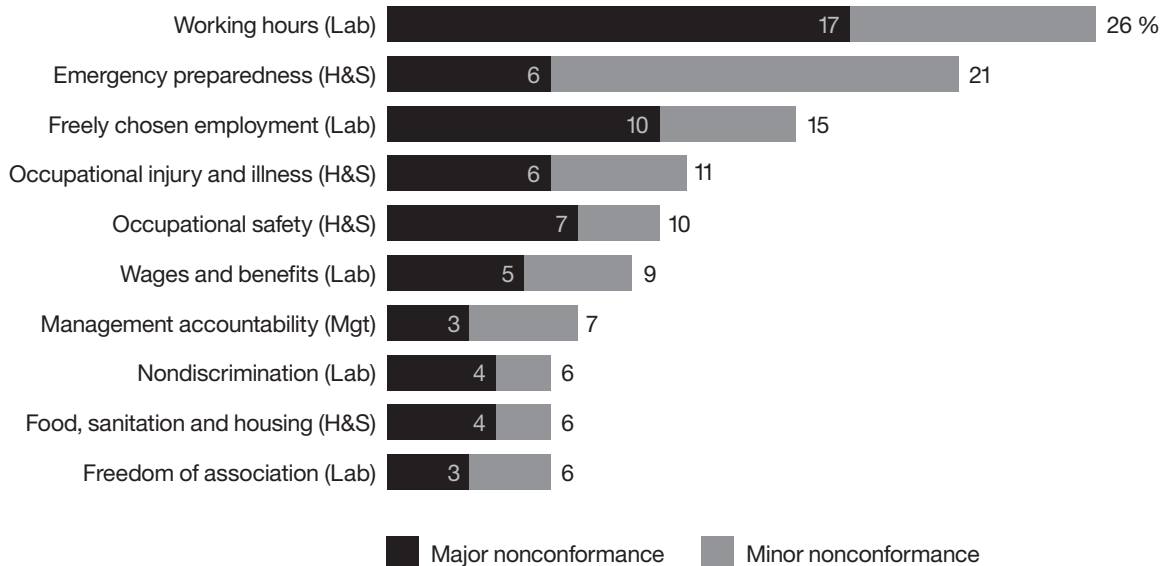
trafficking, for example). For each nonconformance found in an EICC assessment, the EICC audit report provides a description of the finding — and very importantly, a cross-reference to the specific provision of the EICC code and/or the local law or regulation. This level of detail is an important feature of an EICC audit and enables suppliers to isolate the root cause of any finding and work on lasting improvements.

IBM's supplier assessment activity stringently follows the methodology developed by the EICC, whereby audited suppliers create and submit a CAP for all nonconformance discovered in an assessment. This requirement is a core tenet of IBM's supplier management system and is fully supported by IBM Global Procurement and its executive team. The CAP enables the audited company to create meaningful targeted improve-

ments — and later, test their effectiveness by means of a re-audit. During 2015, 161 supplier CAPs were reviewed and accepted within 90 days of submission, reflecting audits and re-audits that occurred in late 2014 and throughout 2015.

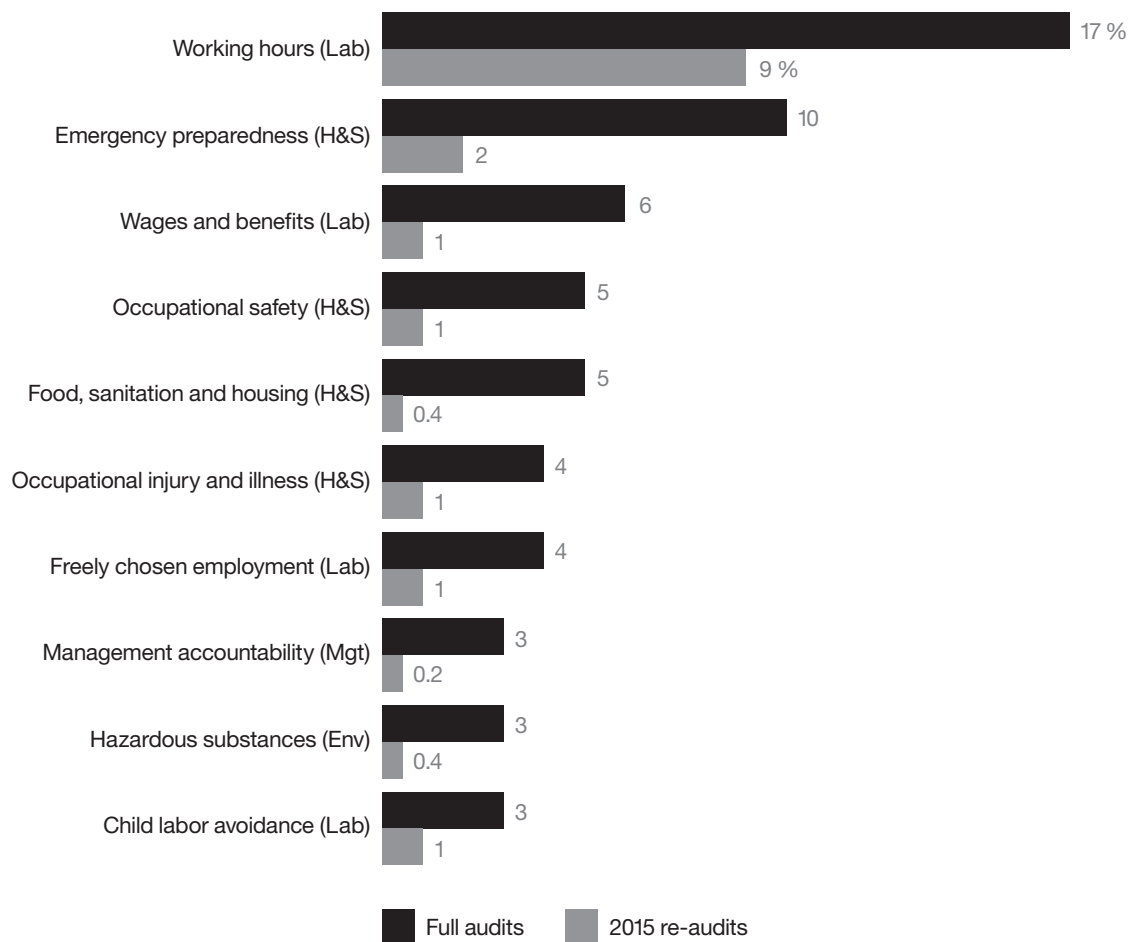
The effectiveness of our audit/CAP/re-audit system is depicted by comparing “before and after” results of suppliers undergoing a complete assessment cycle, as shown by the following chart. Re-audits conducted during 2015 at 77 Production and Services and General Procurement suppliers are compared with their full-scope audits (conducted over the 2013 – 2015 timeframe). For ease of reading and comparison, only major noncompliance results are depicted.

Full audit results: 2015, 51 total
(Top 10 nonconformances to EICC code provisions by %)



Code sections include Labor (Lab), Health and safety (H&S) and Management system (Mgt).

Improved nonconformance rates from 2015 re-audits
 (% nonconformance to EICC code provisions*)



* Code sections include Labor (Lab), Health and safety (H&S), Management system (Mgt) and Environmental (Env). Data is based on the results of 77 re-audits vetting Corrective Action Plans generated from audits conducted in 2013 – 15. Provisions shown are the 10 most frequent major findings from the full audits preceding the re-audits.

Among the 77 re-audits, there were 42 code provisions from the full-scope audits with major or minor nonconformance. The CAPs drove compliance improvement across all 42 code provisions. The above chart shows a sample of these improvements focusing on the 10 provisions having the highest relative nonconformance in the full audits that preceded the 77 re-audits. All 10 provisions registered significant improvement, including working hours (47 percent improvement), emergency preparedness (80 percent) and wages and benefits (83 percent). For the following 17 code provisions, all prior major and minor noncompliance were fully rectified in the CAP / re-audit process:

- Humane treatment (Lab)
- Non-discrimination (Lab)
- Physically demanding work (H&S)
- Pollution prevention and resource reduction (Env)
- Wastewater and solid waste (Env)
- Air emissions (Env)
- Material restrictions (Env)
- Storm water management (Env)
- Intellectual property (Eth)
- Non-retaliation (Eth)
- Responsible sourcing of minerals (Eth)
- Privacy (Eth)
- Company commitment (Mgt)
- Legal and customer requirements (Mgt)
- Training (Mgt)
- Worker feedback and participation (Mgt)
- Audits and assessments (Mgt)

Analyzing the 2015 re-audit data further, nearly 60 percent of the re-audited suppliers resolved all major code noncompliance after completion of their re-audit cycle — a sizable accomplishment and testament to the results of following the full EICC process as well as the commitment of our suppliers to invest in lasting improvements. IBM Global Procurement has contingency plans for suppliers that remain noncompliant after a re-audit, and each is handled with executive involvement. Our procurement executive team reviews the results of all supplier assessments (full-scope and re-audits) on a monthly basis, and quarterly with IBM's chief procurement officer.

From the results of 2015 EICC full-scope audits and re-audits, IBM is able to attenuate its communication plans with suppliers for the following year of assessments. Our 2016 audit plan includes full-scope audits aligned with the newly released EICC Code of Conduct version 5.1 (effective January 1, 2016), and re-audits stemming from audits conducted during 2014 (which will be vetted to code version 5.0).

Center of Excellence for Product Environmental Compliance

IBM's Center of Excellence (CoE) for Global Product Environmental Compliance enables IBM to meet the environmental regulations in all the countries in which IBM does business, by rolling out consistent methodologies to deliver environmentally compliant products. The CoE's mission includes comprehensive and detailed review of regulations, the development of compliance strategies, processes and deployment plans, as well as education and training materials for IBM's employees and suppliers. The CoE is also an active member on many industry and regulatory bodies around the world.

As governments worldwide become increasingly concerned about the environment and health and safety of their citizens, the number of product environmental laws has grown exponentially over the last several years and looks set to continue this trend. Not only are such laws growing in number year over year, but they are also increasingly more detailed, and the scope of what constitutes an environmental law has continued to expand. The product-oriented laws directly pertain to all hardware products IBM designs, manufactures or contracts to manufacture, and/or purchases for resale, and the scope of IBM's product environmental compliance work includes but is not limited to:

- Validating that all IBM hardware products do not contain prohibited substances, or do not exceed certain maximum thresholds of reportable substances, as called out by EU RoHS and REACH regulations, in addition to non-EU RoHS and REACH-type regulations.
- Meeting eco-design directives as well as power and energy reduction regulations and voluntary standards such as the U.S. Environmental Protection Agency's (EPA's) ENERGY STAR program.

- Complying with the U.S. Toxic Substance Control Act, nanomaterials reporting requirements, battery laws, product takeback regulations and annual reporting.
- Delivering supplier education via dedicated global webinars.

Globally, in 2015 the CoE identified 135 new or modified product-related regulations for review, of which 127 required implementation plans and all were successfully executed to meet their respective compliance dates.

Engagement and collaboration

Working with other parties who share our vision of making sustained improvements to transform the extended supply chain is central to our work.

Collaborating with industry groups, academics, nongovernmental organizations and other professional organizations is a way of leveraging individual efforts for the benefit of the whole. IBM openly shares our work and learns from these varied groups in order to make ongoing investments in supply chain social responsibility.

In 2015, IBM's involvement with the [Electronic Industry Citizenship Coalition](#) (EICC) remained strong in terms of support, participation and utilization of the organization's growing base of collateral. The EICC continues to expand its membership and make strides toward its ultimate goal of creating a sector that consistently operates in a socially and environmentally responsible fashion. As a founding member, IBM encourages its suppliers of products and services to join the group and participate in the development and deployment of resources aimed at driving improvements in social responsibility. At year-end, the EICC had grown to 109 member companies across retail, electronics brands, contract manufacturing, hardware components, software, logistics, communication and (new) automotive industries, representing multiple distinct tiers of the extended supply chain. IBM is also an active member of the [Conflict-Free Sourcing Initiative](#) (CFSI), which is focused on the topic of conflict minerals (detailed in the following section).

Each member of IBM's Supply Chain Social Responsibility team is part of one or more of the EICC's workgroups. This allows us to remain engaged in, contribute to and learn from other companies that constitute the various groups. IBM expanded its participation in a number of EICC or CFSI working groups, including:

- Code revision workgroup
- Validated audit process workgroup
- Capability building workgroup
- Indirect spend workgroup
- China smelter engagement team
- Europe smelter engagement team
- Asia/Indonesia smelter engagement team
- Global smelter engagement team
- Gold subteam
- Conflict minerals reporting template team
- Vlookup team
- Due diligence practices team

Building upon its long history of working with indirect suppliers (often in our services and software businesses), IBM co-leads the EICC's indirect spend workgroup. This group is engaging EICC members that deploy the EICC Code of Conduct to indirect suppliers that support the electronics industry. Suppliers in this sector are varied and range from large global firms to locally owned small enterprises, which presents a challenge in terms of communicating and assessing compliance to the EICC code. This workgroup is also engaging key suppliers to collaborate on determining the most effective means of deploying the code and assessments in this varied sector of the supply chain.

The [EICC annual report](#) provides an in-depth review of the organization's accomplishments. This report is highly recommended for anyone with an interest in the areas the EICC is engaged in and the collateral being developed for members and suppliers to use in making improvements across the five pillars of the EICC Code of Conduct. The report also publishes aggregate results for EICC audits commissioned by members and their suppliers during the course of the year.

Through the collective efforts of its members and external parties, the EICC attained these notable accomplishments in 2015:

- Created a cross-functional (stakeholders and EICC membership) sensing assessment map
- Launched an EICC public policy advisory group, and engaged international governments and bodies on topics covered by the EICC Code of Conduct
- Completed a thorough stakeholder and membership review of the [EICC Code of Conduct](#) and released Version 5.1 (effective January 1, 2016)
- Held outreach meetings in Belgium, China, Korea, Mexico, Malaysia and the United States
- Facilitated dialogue on trafficked and forced labor, at EICC meetings and conferences among industry, government and civil society groups in the United States, China and Malaysia
- In cooperation with nongovernmental groups, sponsored development of a student worker toolkit (vocational education and training) to help support responsible management of student interns by electronics manufacturing facilities in mainland China
- Expanded the geographic coverage of the [validated audit process](#) to 35 countries and deployed audit protocols for manufacturing, service suppliers and labor agencies
- Partnered with Verisk Maplecroft to create a new tool for members' supply chain risk assessment work
- Continued growing membership in the EICC/Global e-Sustainability Initiative CFSI and published updated rosters of [conflict-free smelters](#) for all four conflict minerals (tantalum, tin, tungsten and gold)
- Expanded its permanent office in Alexandria, Virginia, and opened a satellite office in Malaysia; hired additional staff to assist the organization in reaching its goals and objectives

In addition to its involvement with the EICC, IBM continues its engagement activities with local and nongovernmental organizations around the globe. As a key member of the electronic industry in Mexico, IBM collaborates with industry chambers and nonprofit organizations that share our passion for a sustainable and responsible supply chain. One example is the continuous collaboration for the last five years with [Red Activo Sustentable](#), a nonprofit organization that continues to help small and medium-sized enterprises to develop responsible practices.

IBM continues to build its relationship with [Centro de Reflexión y Acción Laboral](#), a nongovernmental organization located in Mexico. Through open communication, we are addressing in a constructive manner areas of mutual concern regarding working conditions in our regional supply chain.

In 2015, IBM furthered its broad-based external collaboration by attending and presenting on its various social responsibility supply chain initiatives in these important venues:

- Panel discussion speaker on indirect supply chain at the EICC's annual meeting (Responsible Electronics) in San Jose, California
- Presented at North Carolina State University, the University of North Carolina, Meredith College, The Wharton School Executive MBA program, Georgetown University and the Institute of Supply Management Conference on supply chain sustainability and the imperative for companies to adopt, implement and execute

Conflict minerals

In 2015, we continued working to achieve a supply chain free of minerals mined and processed in the conflict regions of the Democratic Republic of the Congo.

Throughout 2015, IBM and other members of the [Electronic Industry Citizenship Coalition](#) (EICC), in conjunction with over 300 companies from seven business sectors, continued working to achieve a supply chain free of conflict-originated Democratic Republic of the Congo (DRC) minerals. IBM participates in the [Conflict-Free Sourcing Initiative](#) (CFSI) industry group, where interested companies participate in working to resolve challenges associated with this issue.

Relating to the DRC, four minerals (tantalum, tin, tungsten and gold) are considered conflict minerals. With proper care, however, market access for legitimate sources of supply from within the DRC is possible to support a compliant supply chain. Like the majority of companies using these four materials, IBM is not a direct purchaser of conflict minerals and is four to six tiers downstream from the smelters or refiners of such minerals. As a result, we rely on processes developed by the CFSI and on information received from our in-scope direct suppliers relating to sources of supply.

IBM's conflict minerals program is executed by a dedicated team of experienced supply chain professionals within the IBM Global Procurement organization. The Conflict Minerals Program team structure reports into IBM's vice president and chief procurement officer. Relative to IBM's use of conflict minerals, the following products designed and manufactured by IBM are within the scope of our conflict minerals work:

Servers — A range of high-performing systems designed to address capacity, security, speed and compute power needs for businesses, organizations and technical computing applications. The portfolio includes z Systems and Power Systems.

Storage — Data storage products and solutions that allow clients to retain and manage rapidly growing, complex volumes of digital information. The portfolio consists of a broad range of software-defined storage solutions, flash storage, disk and tape storage solutions.

Microelectronics — In 2014, IBM announced a definitive agreement to divest its microelectronics business and manufacturing operations. This transaction closed in 2015 with GlobalFoundries. Prior to the closing, all conflict mineral activities associated with the supply chain were included in our 2015 work. Consistent with the divestiture, IBM provided GlobalFoundries with training and records to enable them to continue working with the supply chain on conflict minerals.

In 2015, our results reflected the work of the past five years in preparing for the reporting documentation required to be filed with the U.S. Securities and Exchange Commission under the [Dodd-Frank Wall Street Reform and Consumer Protection Act](#), section 1502; specifically, the Specialized Declaration Form (Form SD) and related Conflict Minerals Report.

IBM's due diligence measures for conflict minerals conform to the framework set forth in the Organisation for Economic Co-operation and Development (OECD) [Due Diligence Guidance for Responsible Supply Chain of Minerals from Conflict-Affected and High-Risk Areas](#). Our work to date can be summarized in four categories: establishing a supply chain standard for conflict minerals; performing a Reasonable Country of Origin Inquiry (RCOI) regarding the potential sources of conflict minerals in our products; performing due diligence by surveying our in-scope direct suppliers using the CFSI Conflict Mineral Reporting Template (CMRT) to ascertain the smelters or refiners present in the supply chain, and working with those smelters and refiners to gain their engagement in the Conflict-Free Smelter Program (CFSP) or equivalent programs.

IBM's [conflict minerals standard](#) outlines our recognition of the importance of this issue and our plans to take definitive steps to keep conflict-sourced materials out of our extended supply chain. This standard is posted on our [Global Procurement](#) website and has been brought to the attention of our upstream suppliers through multiple avenues of communication.

We have repeatedly conducted our RCOI regarding potential sources of conflict minerals and concluded in good faith that — in the absence of complete visibility to the sources of these materials within our extended supply chain — IBM would need to conduct due diligence regarding its supply chain to better understand the sources of these four materials.

To determine information about its upstream sources of the four materials, IBM used multiple iterations of the CFSI CMRT with its in-scope direct suppliers. The CMRT was developed to provide companies with a common format for their upstream suppliers to identify the use of the four materials, the smelters or refiners used in the extended supply chain and, where possible, the country of origin of the four minerals. In the fourth quarter of 2015, IBM deployed the CMRT to 205 in-scope suppliers representing greater than 85 percent of our total supply chain expenditures for our covered products. We received responses from 100 percent of the 205 suppliers and learned the identities of 295 upstream tantalum, tin and tungsten smelters, and gold refiners, located in 38 countries and used by our direct suppliers. (The number of smelters or refiners increased from 264 the prior year as our suppliers reported a higher number of upstream entities in their CMRTs and additional entities were approved as eligible smelters by CFSI.) The specific names and locations of these smelters or refiners can be found in IBM's 2015 Conflict Minerals Report. Illustrating the interest that companies have in conflict minerals, during 2015 IBM shared its own consolidated CMRT with 52 customers in support of their work on this topic.

IBM and members of CFSI are working together to identify, vet, converse with and lead the entire portfolio of member-identified smelters and refiners to participate in the CFSP. The CFSP was created for smelters and refiners that play a crucial role in the extended supply chain, as they are the point at which concentrated ores are refined into the higher-level materials that cascade into technology products. CFSP frequently updates its [online list](#) of conflict-free smelters and refiners, and as of June 2016 has identified 46 tantalum smelters, 59 tin smelters, 34 tungsten smelters and 83 gold refiners. Included in the CFSP listing are smelters and refiners with CFSP cross-recognized conflict-free standards from the gold industry; in the spirit of collaborative work, IBM accepts these as proof of conflict-free stature.

By comparing the IBM-identified smelters and refiners to the CFSP list, we determined at the end of 2015 that 73 percent of the smelters and refiners identified by our upstream suppliers were conflict-free (up from 49 percent at year-end 2014), with 100 percent of the tantalum smelters, 73 percent of the tin smelters, 67 percent of the tungsten smelters and 66 percent of the gold refiners in IBM's supply chain conflict-free. Including smelters and refiners in the CFSP process, 86 percent are either conflict-free or waiting for their assessment.

Another aspect of our efforts to drive change is direct interaction with smelters and trade groups that are associated with the processing of these materials. Our global conflict minerals team works in association with the CFSI smelter engagement team to contact smelters and bring them into the CFSP process. In 2015, IBM along with other member companies of CFSI met with 12 smelters in China, Indonesia and the United States to advance their participation in CFSP. IBM also had a speaking engagement at the 2015 China Gold Forum in Shandong, where we presented material on the benefits of CFSP participation.

For more details on our overall conflict minerals work and plans to further our efforts, please see our [2015 Conflict Minerals Report](#).

Supplier diversity

Diversity among our suppliers has been a formal priority for IBM since 1968, when we established a program to build a supply chain that reflects the societies in which we do business worldwide.

IBM has long recognized that diversity is critical to fostering innovation and delivering value to clients — and that supplier diversity adds to our competitive advantage while stimulating growth in a global marketplace.

IBM created its supplier diversity program in 1968, before the existence of the U.S. Department of Commerce’s Minority Business Development Agency (MBDA). Our program’s goal is to provide opportunities to diverse suppliers who can add value in every region where we operate. Suppliers qualify by being at least 51 percent owned by people from an ethnic minority (as defined in each country or region), or by women, military veterans, people with disabilities or LGBT individuals.

In 2003, IBM expanded the program beyond the United States to promote relationships with diverse suppliers in every country where we operate. Each geographic region has its own program manager, and each has established locally relevant criteria for diverse suppliers. In all regions, our goal is to promote economic opportunities for historically disempowered groups wherever we operate.

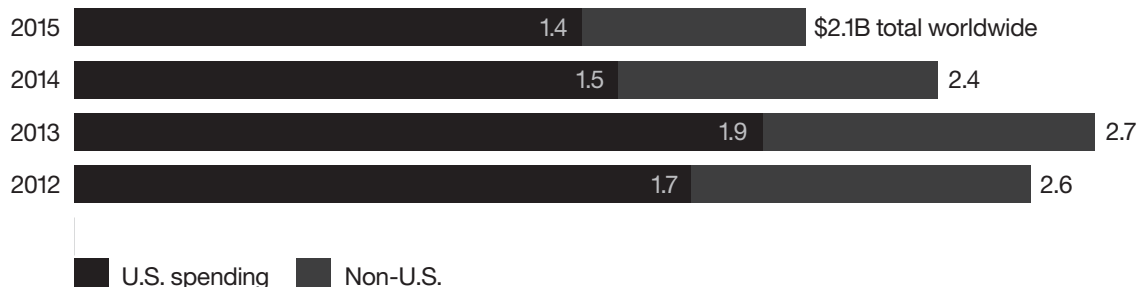
\$2.6b

IBM spent \$2.6 billion with first- and second-tier diverse suppliers in 2015, including \$718 million with non-U.S. first-tier suppliers.

IBM was the first information technology firm to join the [Billion Dollar Roundtable](#), an organization that encourages businesses to increase their spending with diverse suppliers. Since 2000, IBM has annually conducted greater than \$1 billion in business with first-tier diverse suppliers in the United States. With the growth of IBM’s diverse supplier initiative outside the United States, IBM since 2006 has conducted more than \$2 billion in business annually with first-tier diverse suppliers globally. In 2015, IBM purchased \$2.6 billion in goods and services from first- and second-tier diverse suppliers globally, of which nearly \$1.4 billion was with first-tier diverse suppliers in the United States and \$718 million with first-tier diverse suppliers in other countries.

IBM’s expenditures with first-tier diverse suppliers declined in 2015 due to procurement spending reductions and changes resulting from IBM’s business and product line evolution. A number of diverse suppliers were providing goods and services for business lines that IBM divested in 2014 and 2015 (ex. IBM’s System x server business and Microelectronics Division);

IBM business conducted with first-tier diverse suppliers worldwide
(\$ in billions)



spending associated with these suppliers is reflected in this report up to the point of divestiture. A number of these suppliers continue to supply IBM at reduced levels, while others are now in the supply chains of the companies that acquired IBM's divested businesses.

“IBM has one the most robust supplier diversity programs that we are aware of. The IBM team has worked with us on several programs and challenged us to be innovative and demonstrate continuous improvement. Their challenge spurred Artech management to perform at the highest possible standard, and there is no doubt that IBM's ongoing push for excellence continues to be a critical factor in our success.”

— Ranjini Poddar, Artech Information Systems

In 2015, IBM was selected for the 13th consecutive year as one of the [Women's Business Enterprise National Council's](#) top corporations, and was recognized internationally by the [Minority Supplier Development China's](#) Corporation of the Year award. In addition, Michael Robinson, IBM's program director of global supplier diversity, was given the William J. Alcorn Leadership Award by the Women's Business Enterprise National Council and was recognized as the 2015 Top Contributor in supplier diversity by the Minority Supplier Development China organization.

IBM will continue fostering diversity in its global supply chain as its business needs evolve, and work with external organizations to support the identification and development of diverse firms in countries where we have purchasing needs.

2015 spending with first-tier diverse suppliers by region



Governance

Guided by a rigorous system of corporate governance, IBM has a culture based on ethics and integrity but fluid to adapt to our changing world. It is through agility and innovation, grounded in our standards and values, that we are transforming IBM and addressing today's most pressing issues, challenges and opportunities. In this section you'll find examples of how we continue to enhance how we govern the conduct of the company, manage risk and contribute our expertise to public discourse.

Governance at IBM

The ultimate responsibility for our economic, environmental and social performance lies with IBM senior management, as does our adherence to IBM's overall compliance programs. Corporate responsibility at IBM is integrated across the business through the following forums.

Corporate Responsibility Executive Steering Committee

Integration of corporate responsibility activities across IBM begins with our Corporate Responsibility Executive Steering Committee, charged with providing leadership and direction on key corporate responsibility issues. The committee comprises senior executives from functional areas across the company and is chaired by the vice president for Corporate Citizenship and Corporate Affairs. Each functional area within IBM is responsible for the development of its own corporate responsibility goals and strategy, and organization-wide goals are approved by the steering committee.

Corporate Responsibility Working Group

Management of IBM's corporate responsibility activities and stakeholder engagement is handled by our Corporate Responsibility Working Group, which consists of representatives from 10 functional areas across the company, including global representation. Meeting at least monthly, the working group is responsible for reviewing key policy and strategic issues and making recommendations to the steering committee throughout the year.

Our daily activities are coordinated in the Corporate Citizenship and Corporate Affairs organization, which reports to the senior vice president for marketing and communications.

Ethics and integrity leadership

IBM's long history of ethics and integrity leadership continues to guide the way we do business as we transform our company. Creating a culture of ethics and integrity starts with our employees and leaders and extends to IBM Business Partners, our suppliers and the communities in which we live and work. To cultivate this culture, we teach, listen and collaborate as we continue to evolve and enhance our internal compliance, education and integrity programs.

Teaching — In 2015, as in prior years, 100 percent of active IBMers around the world participated in our online Business Conduct Guidelines (BCG) course and certification. First published in 1961, the BCG is currently available in 24 languages. For nearly 10 years we have provided an online, interactive BCG training program currently available in 14 languages. Refreshed annually, it includes timely, relevant business scenarios that employees may face when conducting business. IBM's trust and compliance officers, lawyers and management also provide compliance and ethics training to employees around the world in targeted group sessions.

Also in 2015, IBM senior business leaders worked to foster our culture of compliance by sponsoring integrity summits in 11 cities, in both emerging and major markets. These summits emphasized the role of leaders in creating an ethical culture and focused on key compliance risks in each region, along with specific actions that can mitigate these risks.

IBM's commitment to ethics and integrity leadership extends to the employees of our business partners and suppliers. In 2015, IBM provided online ethics and integrity education offerings to nearly 20,000 representatives from IBM Business Partners and our suppliers around the world as part of their partnership commitment. Since 2013, IBM's chief trust and compliance officer has delivered an annual address at our Global Business Partner Leadership Conference (PartnerWorld®) on the value of ethics and integrity. In 2015, the presentation "Business Integrity: It's About You!" was delivered to more than 1,300 IBM Business Partner employees, along with 800 IBM employees, at this event.

Listening — For more than 50 years, IBM has maintained an internal "Speak Up" reporting channel for employees, as well as channels for suppliers, business partners and others to report concerns or suspected violations to the company. These channels support anonymous reporting.

Since 2010, hundreds of thousands of IBM employees have provided their perspective on integrity at IBM by participating in our annual Global Integrity survey. In 2015, nearly 25,000 employee surveys were completed, providing valuable feedback on the perception of ethics and integrity within IBM. The insights from these surveys are used to enhance our global ethics and integrity programs.

Collaborating — Consistent with our commitment to the communities in which we do business, IBM collaborates with universities to deliver ethics and integrity seminars. In 2015, we partnered with U.S. universities to support the Young African Leadership Initiative (YALI) Fellow program. YALI is sponsored by the U.S. Department of State and hosts young African leaders for six weeks of networking and skills-building programs in business, entrepreneurship and public policy at U.S. universities. IBM visited two of the sponsoring universities — University of Texas and Clark Atlanta University — to conduct a seminar on ethical leadership and business integrity. IBM also conducted seminars on creating a culture of trust at other universities in the United States and in India.

Just as we have done for many years, IBM intends to continue its tradition of teaching, listening and collaborating with all our constituents around the world for many years to come.

Security and privacy

Every business today depends on technology, but with new technological capabilities come new vulnerabilities. At IBM, we not only carefully consider security when developing our technology solutions, but also examine our internal systems and processes to assess how we can best reduce risk and maintain the continuity of our business.

We know that security has a human element as well, and that education is among the best forms of protection. So we continuously strive to reinforce a cybersecurity-aware culture within our company and throughout the communities around us. Because threats continuously evolve, each of IBM's active employees is required to complete a mandatory, annual cybersecurity and privacy course that is regularly updated with new insights on the latest types of attacks and security best practices.

Privacy

IBM has transformed many times throughout its more than 100-year history. Our current transformation is driven by a focus on big data and analytics, cloud and engagement. Since 2010, IBM has invested approximately \$30 billion in these areas, built out the IBM Cloud on a global scale, established IBM Watson business units, announced 50 acquisitions and entered into major partnerships, including the landmark alliance with Apple to bring mobile to the enterprise. In short, IBM is transforming into a cognitive solutions and cloud platform company.

These developments and more are enabling new types of interactions among people, organizations and machines. At the heart of this profound transformation is data — much of it about people. Data and technology are coming together in ever more powerful ways to create new opportunities and new solutions to the world's most pressing problems.

As data becomes increasingly central to the life of the enterprise and the individual, it remains true that organizations must work hard to earn the public's trust in their ability to steward information.

At IBM, we are extending our long history of leadership in privacy and data protection to our new areas of strategic focus. For example, we have moved many of our software offerings to the cloud. IBM's information security standards and management practices for cloud services are aligned to the ISO/IEC 27001 standard for information security management and comply with the ISO/IEC 27002 Code of Practice for Information Security Controls.

In addition, IBM's Watson Health Cloud is HIPAA-enabled, allowing us to maintain and curate health data in accordance with HIPAA security requirements. Data stored on the Watson Health Cloud may, with proper permissions, also be used for research purposes or to improve offerings and services. We also use privacy-protective techniques such as de-identification wherever appropriate. In this promising but sensitive field, IBM employs some of the industry's most sophisticated, enterprise-level security capabilities to protect our clients and their data.

Enterprise risk management

Striking the right balance between opportunity and risk is the backdrop against which IBM approaches every business decision. We believe that innovation and leadership are impossible to achieve and maintain without taking risks, but we have a responsibility to manage these risks wisely. Our key stakeholders — shareholders, clients, business partners and employees — and the communities where we do business are affected by our decisions.

IBM has developed a consistent, systemic and integrated approach to risk management to help determine how best to identify, manage and mitigate significant risks throughout the company.

The IBM Risk Management Framework aligns to industry standards and good practices, focusing on leadership, programs and practices, enablement, and effectiveness supported by a strong risk-aware culture.

In 2015, we continued to enhance our approach with a greater focus on collaboration, emerging risks, broadening risk awareness, and increasing use of analytics including IBM's Watson cognitive system.

Leadership and collaboration

Senior management is responsible for assessing and managing IBM's various exposures to risk on a day-to-day basis, including the creation of appropriate risk management programs and policies. This leadership team continued its collaborative process of identifying, evaluating and managing enterprise-level risks in 2015. This includes periodic reviews and interaction with the board of directors and the audit committee, which oversee the company's enterprise risk management framework, program and associated processes. Risk management is also an element of executive compensation plans, designed to motivate our leaders to deliver superior business performance without encouraging excessive risk-taking.

A key aspect of senior management leadership in risk management is to identify and deploy a governance model and management system that fosters collaboration and transparency in managing risk across the entire enterprise. Our Enterprise Risk Management (ERM) Executive Council, comprised of 16 senior managers representing different units, functions and geographies, meets regularly to help improve the management of enterprise risks. Participants share risk-mitigating actions that are taken in one part of the business so that these best practices may be standardized and applied across units globally.

Programs and practices to address emerging risks

Throughout the company, the approach to identifying and managing risk is based on the [ISO 31000 Enterprise Risk Management](#) standard. In deploying this standard, IBM considers and assesses potential financial, operational, regulatory and other risks to our business, which could be driven by various factors such as where we do business, how we do business and the nature of our offerings.

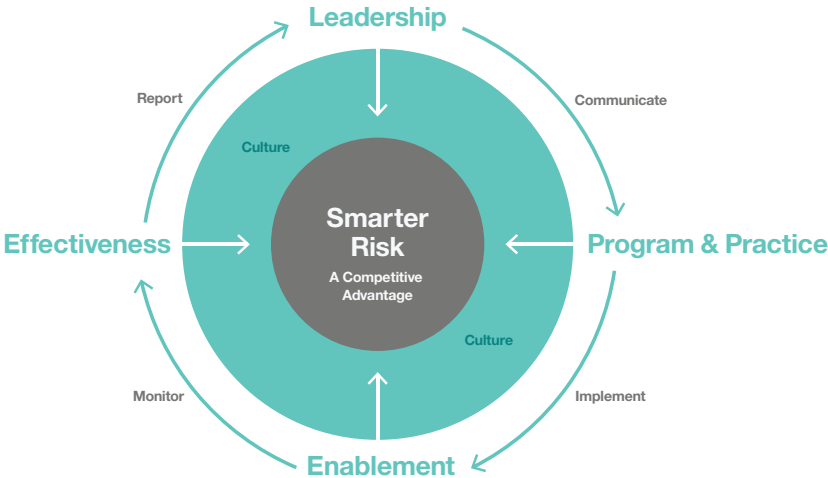
Over the course of the year, we held in-depth discussions with leading consultants on emerging risks and conducted a robust internal study that included polling, surveys, and interviews of approximately 150 top executives. As a result, we updated our enterprise-level risk map and refined senior management focus for 2016.

15,000

the approximate number of IBMers who collaborate in an internal social community, engaging on key risk stories, news and practices; identifying and connecting risk management experts; and participating in risk education.

In 2015, we enhanced our identification and management of emerging risks. The changing business context, including global expansion, integration and associated interdependencies has increased rapidly, changing the nature of the risk landscape. In response to these dynamics, we have established processes to identify emerging risks ahead of time, triggering analysis to better understand the potential exposure and initiate work on mitigation actions more quickly. After an initial implementation of these capabilities on global financial risks, we expanded to select countries in Asia, Africa, Latin America and Europe.

IBM Risk Management Framework



Enablement through analytics

IBM is focused on applying technology, tools and analytics to support risk management. This past year we built upon the success of the award-winning Country Financial Risk Scorecard, which leverages big data automation to monitor trends and help develop intelligent and actionable insights. We also continued our focus-country risk summaries that provide just-in-time, robust, end-to-end views of situations of emerging risk. Analytics is the next big frontier for risk management, which, when coupled with the abundance of data, provides the ability to infuse insight into risk management. In 2015, we expanded the analytics to assess the risks to our business partners within their respective countries and to assist our country leaders in maintaining responsible business controls. Additional internal capabilities have been developed to assist in managing other areas of risk using IBM's advanced risk solutions such as IBM Watson technology for reputation risk and Algorithmics® for treasury risk.

Effectiveness with more senior-level involvement

A risk management framework is most effective when it provides transparency, facilitates communication and monitoring of risks, and demonstrates success in mitigating enterprise-level risks. This level of effectiveness should ultimately lead to improved business performance and help the company protect its reputation while delivering on its social responsibilities. To measure the effectiveness of the risk management program and provide a guidepost to prioritization of activities, IBM continuously evaluates its ERM practices and in 2015 focused on more senior-level management, including its ERM council representatives. Additionally, we continued our benchmarking with other leading organizations.

Culture of broad awareness

The success of the framework is predicated on a strong culture of risk awareness, identification, analysis and mitigation. In support of this, IBM continued to expand its risk education and training, segmenting our population and providing customized resources for targeted audiences. For example, following risk workshops with geographic teams in Africa, Asia, Middle East, Latin America and Europe, we began holding sessions in 2015 with cross-geog-

raphy business teams such as our sales hubs. We are also leveraging IBM's social capabilities as a means to further ingrain risk management and risk consideration practices deeper into the fabric of the organization. For example, in 2015 we commenced regular video blogging to raise the general level of risk awareness to all employees.

External community engagement

IBM has engaged with academia, external risk management thought leaders and community organizations to help advance the risk management acumen of current and future business leaders. For example, we expanded our work with U.S. universities, enhancing curricula in risk analytics in order to help students develop advanced skills in the use of technology and developing materials to educate the next generation of business leaders.

Public policy

IBM contributes expertise on public policy issues with the goal of making a positive and meaningful impact on the countries and communities in which we do business. Building on a rich history of healthcare innovation, IBM is pioneering a new partnership among caregivers, individuals and technology with the aim of transforming global health. Collaborating with lawmakers, regulators, public officials and civic leaders around the world, we are working to democratize and scale the expertise of doctors with technologies that will improve everything from wellness to acute and chronic care.

IBM's "moonshot" in healthcare

Cancer researchers and oncologists are increasingly aware that speeding up the quest for cures and better treatment may hinge on the ability to make sense of vast, complex and ever-changing information. Researchers and clinicians alike are turning to technology to help access, analyze and draw insights from health data previously hidden. For example, researchers have made groundbreaking discoveries on the genetic drivers of cancer. Yet, even if a patient's genome is mapped, few doctors have access to the tools they need to turn that information into better treatment decisions.

IBM is creating cognitive systems that enable oncologists to help transform these genetic insights into personalized treatments for their patients — faster and easier than previously possible — and ultimately save lives. In April 2015, IBM Chairman Ginni Rometty declared that healthcare would be IBM's next "moonshot," in large part through Watson, IBM's cognitive computing system that made its public debut on "Jeopardy!" in 2011.

Since then, Watson has gone to medical school — digesting massive libraries of clinical trials, medical journals, textbooks and more. Watson has trained alongside some of the world's pre-eminent cancer researchers from Memorial Sloan Kettering, the Mayo Clinic, the New York Genomic Center, the Cleveland Clinic and M.D. Anderson Cancer Center to help cancer experts improve patient outcomes.

Watson Health

IBM has established [Watson Health](#), a new business unit that aims to dramatically improve the ability of clinicians, researchers, payers, employers and other healthcare stakeholders to innovate by surfacing new insights from the massive amount of personal health data being created daily. Watson Health is helping change how healthcare is taught, practiced and researched, with solutions designed to provide a complete picture of health that will enhance the quality and speed of care delivered to patients through individualized, evidence-based medicine.

Public-private collaboration

While innovative technologies can help to change the face of healthcare, IBM recognizes the need to educate elected officials, policy makers and regulators to fully understand the strengths and capabilities of exciting cognitive technologies. Outdated statutes and regulatory frameworks can inhibit technologies from entering the market and becoming available to doctors and researchers. IBM strongly supports the creation of a holistic healthcare life science ecosystem of solutions centered on the needs and safety of patients and consumers.

Some examples of IBM's related work in 2015:

- Built and implemented an educational campaign around Watson and its capabilities in healthcare to inform members of the U.S. Congress.
- Identified and briefed congressional members who are engaged in updating health regulations for advancement of new technologies.
- Advocated for a modern, risk-based health IT regulatory framework to promote innovation and patient safety.
- Upon the announcement of U.S. Vice President Joe Biden's [Cancer Moonshot Initiative](#), engaged directly with the vice president and president's staff to brief them on the benefits of cognitive health systems.
- Accepted participation in the President's Precision Medicine Initiative to announce a joint alliance with the New York Genome Center to build the world's most comprehensive, open cancer data repository of whole genome, exome and phenotypic data. Using cognitive insights from Watson, the data repository is expected to generate a new class of insights to accelerate cancer research and scale access to precision medicine.



IBM Chairman Ginni Rometty talks to Charlie Rose about the Watson Health project.



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