ADVANCING SMART ENERGY INNOVATION:
A HIGH-TECH INDUSTRY BLUEPRINT
2012 is an important year for the sustainability of our planet and the tech sector is committed to playing a central role in preserving the majesty and beauty of our earth. Twenty years after one hundred seventy-two governments gathered in Rio de Janeiro for the first Earth Summit, governments will be gathering again for Rio + 20, to secure renewed political commitment for sustainable growth and development, to assess the progress to date, and to address new and emerging challenges to sustainability.

In the years since that first meeting in Rio de Janeiro, the tech sector has changed society for the good. The digital economy did not exist back in 1992. Digital gadgets were for techies, not the essential element of our world that they are today. Most consumer computers didn’t have built-in audio beyond the ability to beep, and they largely lacked any way to communicate—dial up modems and services like AOL were just emerging. There were no search engines. A mobile phone that could fit in your pocket had just arrived, though it cost over $1,500. Social networks, e-mail, e-commerce, data centers, digital music and video, digital sharing, and the rest of the digital revolution had not yet arrived.

The productivity and creativity that have been unleashed since 1992 by the digital economy have truly transformed our lives.

Our expectation is that tech will play a similar role over the next twenty years in achieving the future sustainable growth and development to which governments across the globe aspire. We will play a role in developing not only green IT, but in using IT to green the entire economy. As some have said, “technology is not just a slice of the pie. It’s the pan.”

Improvements in efficiencies of all types will be key to addressing sustainability challenges, enabling us to do more with less. This will be accomplished through regular, continuous improvement of existing technologies and through the emergence of new transformative innovations.

In the pages that follow you will see what our companies are accomplishing today to ensure our future and that of our planet. It is impressive, to say the least. Featured are the innovations that are making the products themselves more sustainable, the innovations that are making the facilities and operations of these companies more sustainable, and—most significantly—the innovations that are enabling sustainability throughout the rest of the economy. These innovations will help create healthy and sustainable communities in every sense—health, education, food security, clean and efficient energy, civic engagement, and economic strength.

While we are proud of our industry’s achievements over the last twenty years and excited about the contributions that we can make in the next twenty, we have no illusions that we can do this alone. We need governments to serve as a partner. How will they do this? The same way they have done so to date—by creating a policy and regulatory environment that encourages sustainability innovation and scientific and technological advances. This policy and regulatory environment needs to include both public and private investment in research and development, as well as supportive regulatory frameworks. Governments should also serve as green customers. Governments can and should help drive the marketplace through procurement policies that reward more sustainable products and solutions.

Please enjoy reading about the sustainability, ingenuity and innovation that our companies are offering today. And do so realizing that this is only the beginning. We’ve just begun to innovate!

Sincerely,

Dean Garfield
ITI President & CEO
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Accenture Sustainability Services helps organizations achieve substantial improvement in performance and value for their stakeholders. We help clients leverage their assets and capabilities to drive innovation and profitable growth while striving for a positive economic, environmental and social impact. We work with clients across industries and geographies to integrate sustainability approaches into their business strategies, operating models and critical processes.

SMART SOLUTIONS

A global sustainability leader:

- We collaborate with the World Economic Forum to develop important sustainability research on topics such as smart grid investment, sustainable production and consumption, supply chain decarbonization and clean energy.

- Accenture has served the Carbon Disclosure Project as a strategic advisor, program manager and solutions integrator for the new Global Climate Change Data and Reporting Platform.

- We are working with the World Business Council for Sustainable Development to define the role of business in creating a more sustainable future.

- Accenture teamed with the UN Global Compact to explore top CEO views on the future of corporate sustainability, and the role that the United Nations can play over the next decade to help businesses move from strategy to execution.

Comprehensive skills and consulting approaches set Accenture apart. We handle the full spectrum of sustainability-focused initiatives, from market analysis and strategy development through implementing and managing a sustainability solution. Our approach is based on four pillars:

- **Sustainability Strategy**: We help our clients develop their sustainability strategy and comply with sustainability regulations.

- **Operational Excellence**: We help our clients improve cost effectiveness and efficiencies in core operations.

- **Emissions Management**: We help our clients reduce energy consumption, waste and emissions.

- **Intelligent Infrastructure**: We help our clients improve energy efficiency and reduce emissions through large infrastructure projects, across energy, and transportation.

**Sustainability Strategy**

- **Sustainability Policy and Regulation**
  Strategic advice for planning and assessing corporate sustainability programs, as well as the development of sustainability business opportunities as a result of regulation, technology, consumer trends and/or the broader economy.

- **Sustainability Strategy & Journey Management**
  Strategic advice to help organizations identify, develop
and implement sustainability strategies that not only address their most pressing needs, but also take advantage of the tremendous opportunities.

■ Innovation & New Businesses
The growth of sustainability as a priority area for businesses and governments provides an opportunity for new sources of revenue through the development of new business capabilities.

■ City Growth & Strategy Management
Cities are home to more than half the world’s population—and emit the vast majority of the world’s CO₂ emissions. Pressures from a broad group of stakeholders, including regulatory bodies and citizens, are forcing municipalities to rethink how they can grow and remain attractive by meeting the sustainability mandate of the 21st century.

Operational Excellence
■ Sustainable Consumption
Consumption is a key driver of growth, but also a major source of waste and emissions, as resources consumption grows faster than GDP. The challenge for business is to invent a new consumption model, which still increases consumer utility but is more conservative with resources—leveraging drivers such as circular economics and economics of functionalities.

■ Sustainable Supply Chain
For many businesses, extended supply chain activities make up most of their carbon footprint. To develop a more sustainable supply chain, companies must balance its potential rewards against cost, reliability, timeliness and customer service.

■ Trust & Stakeholder Management Services
Stakeholder engagement is a critical, yet often overlooked, aspect of many organizations’ sustainability efforts. Companies today need to extend their reach to all stakeholders, including employees, suppliers, regulators, consumers and communities.

■ Sustainable Talent, Organization and Learning
Sustainability success calls for an organization-wide understanding of the value of sustainability and a commitment of all employees to “live” the organization’s strategy for sustainability.

■ Sustainability Performance & Risk Management
Organizations often find it difficult to assess the performance of their sustainability initiatives and the value of those initiatives on the bottom line. Effective performance management should determine what metrics to apply and how accurate measurements can drive better decision making.

■ Environmental Health & Safety Management
Detailed analytics are an important component of sustainability programs because they help quantify sustainability challenges and create data-driven modeling solutions.

■ Green Six Sigma
The proven improvement methodologies of Lean (Speed) and Six Sigma (Quality), that have been used by many organizations for nearly 30 years to help cut waste and costs—and boost profits—also provide a marked advantage when it comes to sustainability.

■ Green IT
Companies looking to improve their sustainability performance are often advised to focus on IT operations. Significant opportunities can be found within an organization’s IT infrastructure to reduce energy consumption and costs.

Intelligent Infrastructure
■ City IT & Communication Network Solutions
Cities are home to more than half the world’s population—as well as the vast majority of world CO₂ emissions. Pressure from a broad group of stakeholders, including regulatory bodies and citizens, are forcing urban centers to deliver sustainability improvements in key infrastructure areas.

■ Intelligent Transport
Many cities and automotive companies are evaluating and developing solutions for smart urban mobility, including electric vehicles, related vehicle recharge networks and electrified mass transit options: these initiatives are a key component of transportation
emissions reduction, especially as part of intelligent cities programs.

**Smart Building Solutions**
Accenture Smart Building Solutions is a formal offering that uses open-IP and advanced data analytics to provide enterprise energy management services and enable commercial building owners to cut energy usage and reduce building operating costs.

**Smart Grid Services**
Utilities and consumers alike are searching for fresh ideas on how to conserve energy, ensure reliable delivery, enable new services and enhance environmental stewardship—all leveraging a power grid that’s already strained by the demands of modern society.

**Infrastructure Analytics Services**
Detailed analytics are a key lever to track and explain sustainability performance and are therefore an important component of sustainability programs. We aim to create data-driven modeling solutions that enable the owners of commercial property to design appropriate responses to sustainability challenges and opportunities.

**Waste, Water & Recycling Solutions**
Accenture helps cities, businesses and governments effectively manage and control the waste and pollution generated by commercial, private and municipal activity. Our water, municipal waste and recycling solutions cover waste collection and disposal strategies, as well as recycling and conversion of waste into alternative energy sources.

**Interactive eServices**
Accenture’s Interactive E-Services are helping pioneering cities and governments to improve citizen communications and transform the way services are delivered. Through innovative use of information and communication technology (mobile devices, cloud computing, universal access gateways and social software) we are helping provide local government and community services greater reach.

**Emissions Management**

- **Climate and Energy Management Services**
  A great many organizations and governments are looking for solutions that can help them better manage—and ultimately reduce—their energy demands. Our insights, solutions and capabilities can help clients focus their investments on efficiency programs that deliver the greatest value.

- **Clean Energy Solutions**
  Demand for clean energy is growing extremely fast, and organizations that are able to generate or effectively use clean energy sources could enjoy a powerful and enduring competitive advantage.

- **Carbon Markets and Carbon Trading**
  The carbon market has the potential to become one of the world’s largest commodity markets within the next few years.

- **Waste and Water Management Services**
  For business, any scarcity or uncertainty around water—now or in the future—presents a major operational and strategic concern. Lack of an accessible and reliable supply of water, the ability of businesses to function and grow is severely compromised. Recognizing this, many organizations are pushing sustainable water management higher on the corporate agenda.

**SMART FOOTPRINT**

Accenture has a strong track record with our own sustainability programs. Our environmental footprint consists primarily of carbon emissions generated from business travel and office energy use.

**Operational Efficiency**

- **Renewable Energy:** We procure more than 10 percent of our office electricity from renewable sources. In several of our locations, including in Germany, Italy and the United States, we have been able to replace nonrenewable with renewable energy. Based on the successes learned in those locations,
we have developed a global energy procurement strategy which we plan to execute opportunistically in additional locations over the next two years.

**Telepresence:** We have increased our use of this technology which is now implemented in more than 60 Accenture locations worldwide, including at a number of client sites, to connect our people and our clients.

**Recognition**

- **Dow Jones Sustainability Index**—Accenture has been a component on the North America (NA) Index for the seventh consecutive year since the launch of the index in 2005—September 2011.

- **FTSE4Good Global Index**—Accenture included for the seventh consecutive year; Accenture also included on the “reserve” list for the FTSE4Good Global 100, composed of the largest 100 companies by market capitalization within the FTSE4Good Global Index—September 2011.

- **Carbon Disclosure Project's 2011 Global 500 Report**—Accenture included on the Carbon Disclosure Leadership Index (CDLI) for the second consecutive year and received a score of 93 (out of 100), up from 91 in 2010; further, Accenture received a carbon performance score of B, same as 2010; 2011 marks Accenture’s third consecutive year on the Global 500—September 2011.

- **Tomorrow's Value Rating**—Accenture rated in band B in Two Tomorrow's survey of corporate sustainability practices among leading companies worldwide—October 2011.

- **Newsweek's third annual Green Rankings**—Among America’s 500 largest corporations, Accenture ranked No. 7, up from No. 11 in 2010; Accenture also ranked No. 31 on the inaugural Global 500, which includes the largest companies worldwide; among Information Technology and Services companies, Accenture ranked second in the US and fifth globally—October 2011.

- **CR Magazine's 10 Best Corporate Citizens by Industry**—Accenture ranked No. 1 in the Business Services category—October 2011.
“At AMD, our company’s vision is “A world where the amazing power of AMD technology improves the quality of people’s lives.” By designing some of the world’s most advanced semiconductor products, we are helping to improve medical science, education and environmental protection in ways that were not possible before. Highlighted in the summer 2011 issue of our Corporate Responsibility Update are just a few examples of how AMD’s products are used to improve our society and our planet.”

—Dr. Chekib Akrout, Senior VP of AMD’s Technology Group

SMART SOLUTIONS

In 2011, AMD launched a new class of processor, the AMD “Fusion” Family of Accelerated Processing Units (APUs,) An APU is a single die (chip) design that integrates multi-core central processing unit (CPU) (x86) technology, discrete-level graphics with a parallel processing engine, a dedicated high-definition video acceleration block, and a high-speed bus that moves data across the differing types of processor cores.

AMD’s APUs are being used to power emerging high definition and accelerated media technologies used in “smart” solutions such as:

- Telepresence; new high definition—quality videoconferencing applications that provide telepresence capabilities in personal computers, for business travel substitution;
- Digital imaging for improved medical diagnostic technology in applications such as remote health care;
- E-security technology based on fast, low-power object classification for face and object recognition

SMART PRODUCTS

Cloud computing is a method of computing where applications, data, and other IT capabilities are provided “as a service” using Internet technologies. One of the key benefits for users is that data resides in the cloud and is accessible anywhere, anytime, rather than being stored on one particular computer.
An essential component of the cloud computing environment is the ability to balance performance with low energy consumption. Cutting-edge energy efficiency can be a competitive advantage for cloud service providers. AMD Opteron 4000 Series and AMD Opteron 6000 Series processors provide the low power consumption needed, without sacrificing key features such as cache and memory speed.

AMD Opteron processors also include AMD-P 2.0 technology, a suite of advanced features that can help to significantly reduce energy usage. Among these features are:

- **C6 power state** that reduces processor power consumption by up to 46 percent during low utilization periods adding the capability to handle peak workloads and stay within established service level agreements.
- **TDP Power Cap** which gives users the ability to dial-in their processor power consumption, allowing them to maximize system density at the rack level, making the most of floor space and power budgets.
- **These new power efficiency features** allow for 33 percent more cores in the same power and thermal footprint, resulting in better efficiency for applications like web and cloud where power is a critical component.

New AMD Opteron processors also include enhanced AMD Virtualization (AMD-V) technology to heighten virtualization efficiency. The higher core counts of these products allows loading of 33 percent more virtual machines (VMs) per server, thereby reducing data center server counts for lower power and cooling costs.

### OTHER SMART SOLUTIONS

AMD's newest class of processor, the AMD "Fusion" family of APUs, incorporates three chips that were previously manufactured separately (a central processing unit, a graphics processing unit, and the Northbridge chipset) into a single die (chip) design. This combination of an integrated design, as well as a greater than three-fold reduction in overall product volume, results in less energy and resources needed from material extraction and manufacturing, as well as less material to recycle or dispose at the end of the product’s useful life.

A carbon footprint evaluation of AMD's E-350 APU, introduced to the market in 2011, demonstrated a significant reduction in the overall product “carbon footprint” as compared to the previous generation AMD technology. The study concluded that the APU products would provide an average 40 percent carbon footprint benefit over the life of the APU, and an estimated 27.2 kg reduction in carbon equivalent emissions, compared to the non-APU product. The lower carbon footprint of the AMD E-350 APU largely results from the efficiencies gained through integration of the computing and graphics processors onto a single piece of silicon.

Assuming AMD E-350 APU products were installed in approximately one-third of the 2011 portable PC market—or 77 million units—that could result in a total carbon dioxide emission equivalents savings of nearly 500,000 metric tons annually. That is the same amount of annual GHG emissions from 95,160 passenger vehicles, or the same amount of electricity used by 60,399 homes for one year. Additional information on the AMD carbon footprint study is available on the [AMD website](https://www.amd.com).
Apple Inc.

SMART PRODUCTS

Energy Efficiency
A significant portion of greenhouse gas emissions Apple accounts for are produced when you plug in our products and start using them. That’s why we design our products to be as energy efficient as possible. Because we design both the hardware and the operating system, we’re able to make sure they work together to conserve power.

ENERGY STAR Qualification
Unlike other manufacturers who may have one or a few products that are ENERGY STAR qualified, every single Apple product not only meets but exceeds the United States Environmental Protection Agency’s strict ENERGY STAR guidelines for efficiency. Apple is the only company in the industry that can make this claim.

SMART FOOTPRINT

We know that the most important thing we can do to reduce our impact on the environment is to improve our products’ environmental performance. That’s why we design them to use less material, ship with smaller packaging, be free of toxic substances used by others, and be as energy efficient and recyclable as possible.

OTHER SMART SOLUTIONS

Apple reports environmental impact comprehensively. We do this by focusing on our products: what happens when we design them, what happens when we make them, and what happens when you take them home and use them.

In 2009, we became the first company in our industry to report comprehensive calculations of our total carbon footprint—including environmental reports for every product—giving the public an opportunity to judge our efforts and track our progress in detail.
“The question of how we will create, store and use energy is the great challenge of the 21st century. It threatens our economy, our security and our planet. By rising to meet this challenge, we’ll help preserve our planet, reduce our dependence on finite, foreign sources of energy and create hundreds of thousands of American jobs. Like the challenges of the past, the solution will depend on government, industry and citizens working together. As the world’s largest supplier of solar photovoltaic manufacturing equipment, Applied Materials is working towards solutions. Our strategy is to bring significant change to the industry by enabling lower cost-per-watt solutions for solar cell manufacturing—with the goal of making solar a more meaningful contributor to the global energy supply.”

—Mike Splinter, CEO Applied Materials
of the interactions between processes across the entire manufacturing flow. Applied Materials provides its customers with integrated solutions that combine extendable equipment platforms with process optimization knowledge in order to accelerate industry efficiency and cost roadmaps.

SMART PRODUCTS

Emerging Technologies

Applied Materials is heavily focused on turning next generation technology into profitable new market opportunities for our customers. Some examples of new and emerging technologies with incredible potential for reducing energy consumption and increasing energy efficiency are:

Organic Light-Emitting Diodes (OLED)

Lighting remains one of the least efficient forms of electricity used in the world today. As much as 20 percent of the world’s total electricity is used just to create light. A typical incandescent lamp uses less than 10 percent of the energy it consumes to produce light. Compact fluorescent lamps perform better, but still waste 75 percent of the energy consumed.

Organic light-emitting diodes (OLEDs) are based on organic semiconductors and consist of stacks of organic layers (~100 nanometers in total thickness) which are connected by electrodes. The organic layers are inserted between a cathode and an anode. Next to conventional inorganic LEDs, OLEDs are considered the second solid state lighting technology for new flat, large area efficient lighting solutions for the future.

Potential uses for solid state light technology, although not completely defined, are expected to be broad, especially where power conservation is important such as cell phones, smart phones, hand-held movie devices and laptop computers. OLEDs, which can be made on a number of substrates including flexible materials, generate light up to 10 times more efficiently than conventional bulbs.

SMART FOOTPRINT

In 2010, NEWSWEEK published its second “Green Ranking” of the largest publicly traded companies in the U.S. and Applied Materials was in the #8 spot, following up on being the #9 ranked company in 2009. A company’s overall green score is the sum of scores on environmental impact, environmental policies and a component based upon reputation.

Applied Materials is naturally pleased to be in the top 10 of this ranking again, but there is always room for improvement as far as sustainability is concerned. Newsweek’s profile on Applied stated: “This supplier of manufacturing systems and services to the global semiconductor industry made great strides in reducing CO₂ emissions and water use last year, cutting each by 21 percent and 18 percent, respectively, compared to 2006 levels. Both those reductions exceeded Applied Materials’ greening goals, but Applied also acknowledges 2009 was an ‘unusual’ year and says it is reviewing internal data to try to maintain and improve on those numbers.” The process of setting new company-wide goals entails a close review of past performance, benchmarking and analysis of potential future projects and we are hard at work on that presently. The challenge for Applied Materials and all of the companies on Newsweek’s list is to continue growing our companies, creating jobs and value for shareholders, while reducing or minimizing environmental impacts at the same time.
"We’re in the midst of a 21st Century Communications Economy where increased access to broadband and wireless networks is enabling companies to increase their economic output while simultaneously minimizing their impact on the environment. As society’s economic demands continue to increase, all businesses must embrace smarter, more sustainable and energy-efficient options to keep pace. That means doing more virtually—and more over a state-of-the-art broadband network.”

—Charlene Lake, Chief Sustainability Officer, AT&T

SMART SOLUTIONS

Information and Communication Technology (ICT) solutions—comprising hardware, software and broadband technologies—enable people and businesses to make more energy-efficient choices and reduce both environmental impact and costs by:

■ Moving work to people rather than people to work
■ Connecting rather than traveling
■ Managing business remotely and in real time
■ Improving transportation and distribution systems

AT&T’s wired and wireless broadband networks power the solutions that make this possible. AT&T offers products and services that enable its customers to be more productive, energy efficient and less wasteful:

■ Consumer broadband services and applications offer our customers access to a world of information, e-commerce opportunities and the ability to connect in real time with people across the globe.
■ AT&T Telepresence Solution℠ uses “life-size” ultra-high-definition video, digital-quality audio, interactive technologies and a specially designed environment to enable people around the world to collaborate as if they were in the same room, dramatically reducing the need for expensive, time-consuming and energy-intensive business travel.

■ AT&T’s fleet management solutions help our customers make their commercial fleets more efficient via our portfolio of fleet management products and services. Using our nationwide mobile broadband network and GPS partner solutions, we provide fleet managers with the ability to actively manage their vehicles, increase efficiency and reduce fuel and insurance costs. Specifically these solutions can lead to reduced idle time, better management of miles driven per day, improved route planning, improved inventory management and reduced travel time and costs with real-time dispatching.

■ AT&T is helping modernize the nation’s electric grid by combining the same broadband and wireless communication technology we use to connect people with their world every day with additional virtual networking and security features. Smart grids depend on two-way communications between virtually all devices producing, distributing and consuming electricity. As of spring 2011, AT&T provided the
communication for over 13 million smart meters. AT&T’s smart grid solutions increase the efficiency of existing utility networks, enable automated, real-time grid monitoring, connect smart meters—and look forward to the day when consumers will have greater insight into and control over their energy usage.

According to the Global e-Sustainability Initiative (GeSI) Smart 2020 report, ICT-enabled solutions could cut annual CO₂ emissions in the U.S. up to 22 percent in year 2020 from current projections. This translates to a gross energy and fuel cost savings of as much as $140 billion to $240 billion annually.

SMART PRODUCTS

At AT&T, we’re taking steps to help make our products more environmentally sustainable.

- AT&T ZERO Charger is the first automatic zero-draw charger that doesn’t waste power when it’s left plugged into a wall. It also improves charging efficiency when powering a device.

- Samsung Evergreen is a quick-messaging device whose casing is made of 70 percent post-consumer waste recycled plastic. The phone’s packaging uses 80 percent post-consumer recycled paper and soy ink for printing, and a CD replaces the traditional paper guide. The phone meets EU RoHS standards and is free of PVC, BFR and beryllium.

- AT&T began using plastic which is composed of up to 30 percent plant-based materials sourced from ethanol harvested from natural sugarcane in AT&T-branded accessory packaging starting October 2, 2011. The sugarcane used in this plant plastic is a rapidly renewable agricultural crop and replaces nearly a third of the fossil fuels traditionally used in this accessory packaging with material made from plants.

AT&T is also deploying innovative technologies that empower people to improve our world.

- AT&T ForHealth is a practice area that will accelerate delivery of new wireless, and advanced networking services to help the healthcare industry improve patient care and reduce costs nationwide. The healthcare industry is an industry particularly well-suited to take advantage of wireless technologies that can allow caregivers to have immediate, real-time information about a patient’s condition and response to treatment. Mobile technologies can be used to remotely monitor patients, potentially preventing unnecessary ER visits or hospitalizations. They also make it possible for patients to receive and send bidirectional personalized healthcare text and email messages and coaching in low-cost ways. Mobility can also enable physicians with smartphone applications to be more efficient and more effective as they make their patient rounds in hospitals. Under the AT&T ForHealth umbrella, AT&T is developing and delivering advanced IT solutions in four areas: mHealth, telehealth, cloud-based healthcare solutions and Healthcare Information Exchange. AT&T is conducting several pilots of new technology with hospitals, doctors, health plans, institutions and agencies responsible for providing medical services and patient care.

- In 2010, AT&T teamed up with clean energy technology company Petra Solar to provide communications and information technology support for nearly 200,000 solar power generating stations atop utility poles throughout New Jersey. The units are expected to generate 40 Megawatts of solar-driven power, and these systems will communicate with the power grid using AT&T’s wireless network.

- Cloud computing is a strong example of how investing in an advanced communications network can generate more economic value while reducing carbon emissions. We have embedded cloud capabilities directly into the AT&T-managed network so that we can manage and deliver cloud services and applications as part of a total solution straight down to any device; our cloud capabilities
are the latest milestone in our ongoing network transformation efforts. In parallel, we’re rolling out an enterprise-grade portfolio of cloud solutions that offer customers tremendous flexibility and shared economics for their computing and storage needs and are protected by our industry-leading network-based security solutions.

SMART FOOTPRINT

In 2010, AT&T built on its ongoing effort to better manage energy use, reduce the amount of energy needed to carry data over its network and invest in alternative energy. Highlights from 2010 include:

- Realizing $44 million in annualized energy savings from implementing 4,200 energy-savings projects
- Reducing the electricity intensity of our operations by 16.6 percent. Building on the electricity intensity metric established in 2008, we reduced the electricity associated with a terabyte of data from 498 kWh/terabyte in 2009 to 418 kWh/terabyte in 2010.
- Deploying 3,487 alternative-fuel vehicles in 538 cities since AT&T’s 2009 commitment to roll out approximately 15,000 alternative fuel vehicles through 2018
- Avoiding the purchase of more than 1 million gallons of traditional petroleum due to AT&T’s use of compressed natural gas vehicles in its 73,500-vehicle corporate fleet
- Working with students at Vanderbilt University’s Owen School of Management to conduct an assessment of AT&T’s water usage and publish the company’s first-ever water footprint

AT&T’s Strategic Site Optimization Plan (SSOP) for data center optimization has demonstrated cost savings, power savings, and operational efficiencies. It allowed AT&T to rank in the top 100 of the 2011 Information Week 500 list. The Information Week 500 celebrates the best of North American enterprise IT. The theme for 2011 focused on IT data center optimization.

To help minimize our own environmental impact, we use many of the same technologies we provide our customers such as Telepresence, Web conferencing, teleconferencing, network-based Virtual Private Networks, and wireless products that help reduce travel and improve the potential of our employees to work anywhere and anytime.

- By more than doubling its internal deployment of Telepresence from 50 rooms in 2009 to more than 130 rooms at the end of 2010, AT&T realized more than $6 million in travel dollars avoided, and more than 3,500 metric tons of CO₂ emissions avoided from January 2009 through January 2011—the equivalent of removing 622 passenger vehicles from the road for a year.

- We use the same services in our data center operations that we provide our customers to help reduce energy consumption in their data centers. This includes unifying business applications and eliminating redundant solutions whenever practical, improving the utilization and efficiency of
resources in data centers, and lowering costs by consolidating less efficient data centers.

- AT&T has implemented a comprehensive telecommuting program with arrangements for our employees for whom it makes the most sense, saving time, reducing fuel consumption and helping reduce office real estate. The program also reduces greenhouse gas emissions: telecommuters avoided 175 million commute miles per year, with annual fuel savings of approximately 8 million gallons and a net annual emissions reduction of 76,273 metric tons of CO$_2$-equivalents (CO$_2$e). Last year, AT&T also opened its first tPlace flexible workstation, which allows AT&T employees who primarily work from home access to an office environment. The workspace allows team members to collaborate when needed and take advantage of the latest office technology and high-tech tools.
“Our core business is providing design software to our customers, including millions of architects, designers, and engineers worldwide. Using our products, customers can build 3D models of their designs and optimize those designs on the computer instead of in the physical world. This enables smarter, more sustainable decisions, whether designing a building, a car, a utility network, or a consumer product.”

—Carl Bass, Chief Executive Officer, Autodesk

**SMART SOLUTIONS**

**Green Building**
Using Building Information Modeling (BIM), extended design, engineering, and construction teams share consistent, reliable information. Teams can more easily and rapidly analyze, evaluate and implement green building options in new and existing buildings. BIM is also useful in visualizing design changes and simulating how various scenarios will affect building performance. With this direct feedback, designers can analyze alternatives that will improve energy efficiency, optimize for natural light and ventilation, evaluate viability and placement of solar panels, and more.

**Sustainable Infrastructure**
Plan, design, build, and manage more efficient, sustainable infrastructure. Autodesk solutions for BIM can help cities improve environmental performance, transportation and utility networks, and the impact of construction and maintenance.

**Smart Utilities**
Using digital models, utilities and their engineering and construction firm partners can plan facilities with less environmental impact. Creating more complete and accurate models for electric and water infrastructure enables utilities to manage operations more efficiently while allowing consumers to make more informed choices about their own consumption. Electric utilities can use geospatial technologies to more efficiently plan and manage the quickly growing number of renewable energy resources into their networks. Autodesk enables utilities and engineering and construction firms to plan, design, and manage more efficient, sustainable infrastructure.

**Sustainable Manufacturing**
Autodesk offers BIM solutions for production facilities that work together with digital prototypes of production equipment. This uniquely enables manufacturers to design, visualize, and simulate production lines in the context of their manufacturing facilities. Key sustainability concerns such as energy consumption, emissions, and raw material usage in the construction of the manufacturing facility can also be simulated and better optimized. By utilizing these key technologies from Autodesk, manufacturers can more closely collaborate with equipment suppliers and contractors to more effectively address environmental and compliance issues.
Green Consumer Products

Digital Prototyping enables manufacturers to design, visualize, and simulate the real-world performance of a consumer product, digitally. This enables customers to create more sustainable designs for products and packaging and design products that are easier to manufacture and recycle at end-of-life, further reducing waste and cost.

SMART PRODUCTS

Autodesk Digital Prototyping solutions enable our customers to explore the real-world performance of designs, digitally in manufacturing. This helps them create more cost-effective and sustainable designs that are optimized for material selection and energy efficiency, and that are easier to manufacture and recycle at end-of-life, reducing waste and cost.

Autodesk Building Design Suite Premium provides tools to help design, analyze, and visualize more innovative and energy-efficient building designs, including:

- **Autodesk Revit Software for BIM**
  To more easily create building models using intelligent objects and integrated conceptual energy analysis.

- **Autodesk 3ds Max Design Software**
  For natural and artificial daylighting simulation and powerful visualizations of green designs.

Autodesk Infrastructure Design Suite Premium provides tools to support planning and design of sustainable infrastructure projects, including:

- **AutoCAD Map 3D Software**
  Model-based GIS software for infrastructure planning helps to better understand site selection options.

- **AutoCAD Civil 3D Software**
  The BIM solution for civil engineering design.

- **Autodesk Storm and Sanitary Analysis**
  Comprehensive hydrology and hydraulic analysis application.

Autodesk Product Design Suite provides designers and engineers a complete set of product design and visualization tools for Digital Prototyping in a convenient, cost-effective package:

- **Autodesk Inventor Software**
  Design, test, and validate products with integrated product simulation tools.

- **Autodesk Vault Software**
  Create and manage crucial parts lists and bills of materials (BOMs).
**Autodesk 3ds Max Design Software**
Easily create renderings and animations that help convey ideas to managers, explain designs to manufacturers, and persuade customers.

Autodesk® Factory Design Suite is a 2D and 3D factory layout and optimization solution that can help users make better layout decisions by creating a digital model of their factory:

**Autodesk Inventor Software**
Create intelligent 3D models of custom factory equipment.

**Autodesk Navisworks Products**
Explore factory layouts with interactive 3D virtual walk-throughs.

**AutoCAD Architecture Software**
Simulate movement and flow of material through the factory.

**SMART FOOTPRINT**
Our environmental performance is increasingly important to long-term business success and to being a credible and preferred provider of sustainable design tools.

Progress in this area has led to substantial environmental and financial savings. For example, through activities such as reducing the need for business travel with virtual collaboration technology, investing in energy-efficiency efforts, and minimizing the footprint of our customer events, we have decreased our carbon footprint in absolute terms by more than 34 percent over the past two years.

This also fosters top-line growth by demonstrating Autodesk’s sustainability leadership and expertise to customers.

**OTHER SMART SOLUTIONS**
Beyond offering tools that enable sustainable design, we also recognize the need to educate our customers about how to use those technologies to radically rethink the design process and make the outcome better and more sustainable. For example, the Autodesk Sustainability Workshop is an online public-facing portal of free educational content that explains in simple terms what we mean by sustainable design and how to use Autodesk Inventor software and other tools to make better decisions. With videos, tutorials, quick reference guides, and data sets, it offers tips, techniques, and tools that teach actionable strategies to incorporate sustainability.

The Autodesk Clean Tech Partner Program, founded in 2009, supports the efforts, innovations, and environmental advancements of clean technology pioneers by providing world-class software to design, visualize, and simulate their ideas through the creation of digital models and prototypes. Clean tech companies in North America, Europe, and Japan that can benefit from Autodesk solutions for Digital Prototyping are invited to apply to the Autodesk Clean Tech Partner Program, which provides participants with up to US$150,000 worth of software for only US$50. With digital prototypes, clean tech innovators can explore and communicate ideas, test multiple concepts, and accelerate improvements, while reducing potentially costly errors.
As one of the world’s leading technology innovators, Broadcom strives to provide its customers with highly integrated solutions that offer the lowest power consumption, smallest footprint and greatest energy efficiency. Our commitment not only to customers but to the planet is to reduce each of our products’ overall environmental impact.”

—Scott McGregor, CEO, Broadcom Corporation
Broadcom is also committed to providing the greenest possible “connected home.” Broadcom’s set-top box technology features integrated dynamic power management capable of managing and shutting down unused system components in real-time for a reduction in overall power requirements in the home. Even in the lowest power modes, Broadcom’s set-top box technology can continue to remain aware of network events both in the home and from broadband servers, enabling these Broadcom-based devices to quickly respond to network and user inputs. Additionally, deep sleep modes keep only a small amount of power active to significantly minimize passive standby power consumption.

Broadcom’s set-top box technology supports key home networking devices to enable a whole-home connected entertainment environment in the home. By coupling a central video media server set-top box with low power compact client set-top boxes throughout the home, consumers will benefit from reduced energy usage and power savings while also enjoying in-home media distribution services like multi-room DVR. Additionally, all of Broadcom’s latest set-top box designs feature its Full-Band Capture (FBC) digital tuning technology that reduces power consumption by more than 50 percent by directly digitizing the entire 1GHz downstream spectrum, replacing the need for a large number of tuners with only one FBC digital tuner.

SMART FOOTPRINT

Broadcom’s newly built headquarters in Irvine’s University Research Park exemplify the company’s continued efforts to reduce its environmental impact, not just with its products, but with the way in which it conducts its business. Designed with the environment in mind, Broadcom’s new campus seeks to redefine energy and resource efficiency.

Broadcom’s new headquarters were designed with the following environment-friendly features:

- **Motion Lighting**—Each office is also configured with energy-saving infrared motion detectors, which activate office lighting when people are present and deactivate when they are not.

- **Recycling**—Broadcom actively encourages its employees to recycle by providing recycling
containers throughout common areas of the new campus for materials such as paper, batteries, aluminum cans and plastic bottles.

- Dual Plumbing for Water—Broadcom’s new campus is designed with a dual plumbing system that separately allocates for both potable (drinking water) and recycled water. Commended by the Irvine Ranch Water District, and representing the largest conversion ever in the local area, Broadcom has gone “above and beyond” set requirements to reduce costs for both the company and Orange County overall, as the need to import water from the Colorado River and Northern California is dramatically reduced.

Environmental Management System (EMS) Policy

Broadcom is committed to reducing its environmental impact while conserving natural resources and it is the company’s policy to meet all applicable regulatory standards, including those in support of EPA and OSHA requirements.

Broadcom has committed to:

- Create a clean, healthy and safe work environment for employees, customers and the community.
- Comply with all applicable environmental, health and safety regulations, including EPA and OSHA standards for emissions, solid waste disposal, safe storage and handling of hazardous materials.
- Require supplier certification of environmentally friendly policies and practices through compliance with ISO 14001, OHSAS 18000 or equivalent standards.
- Ensure that Broadcom products are available without banned substances and are RoHS compliant.

Environmentally Preferred Procurement and Waste Reduction

It is Broadcom’s policy to purchase and acquire goods and services that have a lesser or reduced effect on human health and the environment. This comparison takes into consideration raw materials acquisition, production, manufacturing, packaging, distribution, reuse, operation, maintenance, disposal, energy efficiency, product performance, durability, safety and cost.

It is also the company’s goal to minimize waste, maximize recycling efforts, reduce consumption, and ensure that products and materials are reused, repaired or recycled. As a result, Broadcom minimizes energy consumption while supporting a healthy, productive and comfortable work environment. When feasible, the company purchases ENERGY STAR compliant or more efficient equipment and maintains energy conservation features, and continually reviews energy efficiency procedures and language for developing procurement and service contracts for electronic office equipment. When purchasing equipment, Broadcom evaluates energy and materials efficiency, and strives to reduce toxins that include end-of-life management and direct emissions.

OTHER SMART SOLUTIONS

How Broadcom EEE Technology Helps the Planet

Estimates show that more than 150 million metric tons of CO₂ are used to power IT equipment (10 percent of overall electricity demand) with a global price tag of approximately $16 billion per year. Power demand may increase as more systems, from business servers and network printers to home IPTV set-top boxes, are left powered on all the time 24/7.

Broadcom’s award-winning proprietary AutoGrEEEn technology, allows system designers to reduce power consumption in the physical layer of the network by more than 70 percent per port. This could help reduce CO₂ emissions in the U.S. alone by up to 2.85 million metric tons.

Key Facts

The potential of reducing CO₂ emissions by 2.85 million metric tons translates to the following equivalencies according to the EPA official website:

- Annual greenhouse gas emissions from 495 thousand passenger vehicles.
- CO₂ emissions from 291 million gallons of gasoline.
- The electricity use of 314 thousand homes for one year carbon sequestered by 66 million tree seedlings grown for ten years.
- Carbon sequestered annually by 551 thousand acres of pine or fir forests.

Broadcom supports the current industry initiatives to remove or reduce lead and other potentially hazardous materials from all of its products. The company is committed to providing products that satisfy the industry directives and market demands to reduce the potential impact that electronic components have on human health and the environment.

For many years, lead has been used in many aspects of electronic products and in the manufacturing of electronic products. Recent concerns about the health and environmental impact of lead used in electronic products has prompted various industry and legislative initiatives targeted towards the reduction of Pb and other materials perceived to be potentially hazardous to human health and the environment. Although the amount of lead typically used in electronic products is small, its use is pervasive throughout the electronic manufacturing process and the reduction or elimination of lead has involved significant industry effort. As part of this effort, Broadcom has worked extensively with its suppliers and customers to develop cost-effective lead-free product solutions that satisfy the appropriate industry initiatives and enable the low-risk integration of these solutions into customer end-products.
CA ecoSoftware, from CA Technologies, is a solution designed to help you meet energy and sustainability goals such as reducing carbon emissions, managing consumption, and cutting energy costs. It helps you become more efficient when using power and natural resources. CA ecoSoftware helps you do this by providing you with valuable, up-to-date information captured from your environment about energy use and sustainability performance, and by supporting your efforts with a systematic governed approach. This information can be communicated to staff and stakeholders and used to drive continuous improvement.

Businesses talk about sustainability: they want to become environmentally friendly, yet they also want to improve their bottom line by becoming more efficient when using energy and other natural resources. Rising energy costs, an increasing demand for power, and the expanding scope of regulations mean that energy efficiency has changed from a minor concern to a corporate imperative. CA ecoSoftware can help provide the information and the governance needed to make better sustainability choices and to deliver improved results. Organizations often undertake initiatives while lacking good insight into the patterns, trends, risks, and opportunities that may apply. In the absence of reliable information—and a means of managing and tracking progress—sustainability programs can under-deliver. Unintended consequences such as technical failure, missed targets, and sub-optimal choices can mean that less is achieved than is possible. CA ecoSoftware is designed to help organizations increase energy efficiency, control costs, cut carbon, enhance reputation, and meet your sustainability goals. CA Technologies has close relationships with leading consulting partners who can provide implementation and consulting assistance.

CA ecoSoftware solutions address the following areas:

- Sustainability Management
  - Strategy and Program Management
  - Initiative and Project Optimization
- Enterprise Energy and Carbon management
  - Carbon Management and Accounting
  - Energy, Water, Waste and Resources
- Sustainability Assessments
  - Supplier Assessments
  - Facility Assessments
- Operational Energy Management
  - Data Center Power Management
  - Facility Energy & Resource Management
CA ecoSoftware solution is a software solution for Energy and Sustainability for both public and private sector organizations. CA ecoSoftware is currently comprised of two products: CA ecoGovernance and CA ecoMeter.

**CA ecoGovernance** is an enterprise carbon and sustainability management product that enables organizations to pursue a systematic and governed approach towards energy, carbon, and environmental initiatives. It helps account for energy and carbon emissions and helps operationalize sustainability programs more effectively to deliver on sustainability objectives. It also helps organizations communicate their sustainability outcomes more effectively to stakeholders. The product is designed to help:

- Analyze enterprise-wide energy and resource use.
- Account for carbon emissions for disclosure and reporting. The product is accredited by the Carbon Disclosure Project (CDP) for the ability to meet the CDP's standards for calculating and reporting carbon.
- Track sustainability metrics and performance. The product is certified as a tool incorporating Global Reporting Initiative (GRI) verified content.
- Engage suppliers and vendors, measuring and analyzing their energy and sustainability performance.
- Track sustainability and energy reduction projects across the enterprise.

**CA ecoMeter** is an operational energy management solution that captures detailed real-time information about energy use across data centers and facilities, enabling organizations to measure, trend, alert, and take action. This provides a baseline from which organizations can reduce costs, make better use of capacity, and enhance operational reliability and performance, as well as deliver continuous information for ongoing improvement. The product is designed to help:

- Collect energy and resource consumption data from facilities and IT systems. Data can concern power use, cooling and a variety of other measures such as humidity, temperature and air flow. It integrates with meters and sensors, collecting information from PDUs, CRAC units, chillers, UPS units and Generators, building management systems and a variety of other systems and devices.
- Analyze energy and resource use with drill-down views of the IT and facility environment. It provides real time and historical analysis of energy consumption and power use, Power usage effectiveness (PUE) and other custom metrics.
- Report in real time—and with historical analysis—on energy consumption and power use, PUE and other custom metrics. It can report energy costs for chargeback or “show back” to end users or customers.
- Alert via intelligent alerting of power and other environmental conditions using time-over threshold and deviation from norm algorithms.
- Control physical equipment such as VFD-enabled cooling fans, as well as control virtual IT environments by triggering the movement of virtual machines between physical host environments in response to power or environmental conditions.
SMART FOOTPRINT

Labs on Demand

As of 2007, CA Technologies R&D activities were supported by thousands of servers in more than 50 labs worldwide. We clearly needed a more sustainable way to grow. The answer was Labs on Demand, our own private cloud. It is a shared service available to our software developers and service and support technicians around the world 24/7. Demand varies considerably, so we use CA Spectrum Automation Manager and other CA Technologies software to automate server provisioning, system builds and reservations.

In 2008, Labs on Demand performed code generation for more than 20,000 automated software builds, as well as 17,000 automated software installations. This is projected to save more than 25 years of developer time, which adds up to $4 million in savings from improved productivity. We estimate we will save an additional $12 million over five years through the rationalization of 40 lab environments. One facility saved approximately 250,000 BTUs and an estimated $100,000 per year on electricity. Since FY2008, results include:

- Eliminated 16,000 square feet of data center floor space and associated energy consumption needed for cooling and power.
- Eliminated 6,200 metric tons of greenhouse gas emissions.
- Projected $16 million savings in facilities costs and productivity gains over five years.

Follow Me Print Solution

CA Technologies is firmly committed to reducing the amount of paper we use in our operations. When we needed to replace a fleet of old printers, as well as reduce paper waste, we developed the Follow Me Print Management solution, partnering with Canon multifunction printers (MFPs) integrated with Pharos Blueprint® Enterprise software. Our print strategy has been rolled out in the U.S. and is in the process of being implemented companywide.

Employees submit print orders from their computers as usual. But to print, they go to any integrated MFP (iMFP) in any CA Technologies facility and select their print job. Cover pages aren’t needed because jobs only print when the job owner is there. Unnecessary printing is reduced because users can easily cancel and resubmit jobs. And two-sided, black-and-white printing is the default for all print jobs.

This program reduced our carbon footprint and saved an estimated 21.9 million sheets of paper (the equivalent of 2,630 trees, and 2.9 million liters of water) from its implementation in April 2009 to May 201.

The Follow Me Print Management solution also eliminated all the rogue printers that had been present throughout the organization. Consequently, we now use just eight types of printer toner cartridges in our network printers, versus the more than 50 different types we needed before. We can even track paper usage per employee. Follow Me represents the state of the art in printer management, which many companies are now looking to deploy.

OTHER SMART SOLUTIONS

Building a successful business in today’s world requires more than sustaining our financial performance. It requires a broad commitment to sustainability—to doing the right thing for the environment, the economy and the communities where we work and live. At CA Technologies, we believe doing the right thing attracts the best people, builds our brand value and deepens our relationships with customers and partners. In other words, it’s smart business—good for people, good for the planet and good for our company.

Some of our technological innovations, like CA ecoSoftware, have been inspired by the goal of improving our own environmental sustainability. Although we drive sustainability efforts from the top down, they are energized from the bottom up through the creativity and innovation of our employees. For example, we’re a leading supplier of software that helps organizations monitor and manage corporate sustainability. We are also helping customers deploy
and manage more sustainable IT solutions like virtualization, automation and cloud computing. These new products and services will contribute to our future growth. And since we use these solutions ourselves, the resource efficiencies and cost savings they deliver also benefit our bottom line.

For our sustainability strategy to work, it must be monitored and managed across the corporation. To do this, we have put in place a Sustainability Governance Model led by our Executive Vice President, Risk, and Chief Administrative Officer and our Chief Sustainability Officer. In concert with our Sustainability Advisory Council, they are responsible for identifying, planning and executing measurable sustainability initiatives that meet our business objectives and stakeholder expectations.

We are already realizing significant returns on our own energy-saving investments and have a growing business in helping customers do the same. Providing responsive tools for sustainable business is part of the agility we make possible through our wide range of IT management solutions. Staying agile enables us to innovate with new products that can quickly respond to customer needs as new challenges emerge. Our goal is to inspire and encourage employees, customers, partners, governments and nongovernmental organizations to join us in our sustainability efforts.

**SMART MEDIA**

Please visit our website for our full sustainability report.
“Since the company’s founding 160 years ago, Corning has always understood that we have a responsibility to the communities in which we operate. Today those communities are global, and responsible energy practices are an essential part of being a good citizen. Over the past six years, Corning’s Global Energy Management program has helped us improve our manufacturing processes, significantly cut energy costs, and reduced Corning’s carbon footprint. GEM is one way we Live our Values and help ensure that Corning’s impact on the world is always a positive one.”

—Kirk P. Gregg, Executive Vice President and Chief Administrative Officer

SMART SOLUTIONS

Photovoltaics
Corning is leveraging its experience in LCD glass substrates, materials science, and light management to develop photovoltaic (PV) glass solutions—accelerating the way the world collects and uses solar energy. A PV cell is a device that converts solar energy into electricity by converting photons into electrons. Conversion efficiency is a major hurdle to wider adoption of solar energy. Corning is evolving the technology used to collect solar energy to allow thin-film panels to be more efficient and cost effective through the development of specialty glass solutions.

SMART PRODUCTS

Corning Environmental Technologies
As global concern about air quality intensifies, Corning continues to provide vehicle and engine manufacturers with new and more effective ways to prevent harmful emissions from polluting the air. Our expertise in process, materials, and market understanding has made us a leader in this field for more than three decades. Our high-performance ceramic substrates and filters set the standard for use in all transportation exhaust systems. Since 1975, advances in emissions control technologies have helped reduce pollution globally by more than three billion tons.

EAGLE XG® Glass Substrates
Knowing that environmental regulations were tightening and additional regulations were on the horizon, our researchers anticipated the needs of customers and designed the revolutionary glass composition known as EAGLE XG®—the industry’s first LCD glass to contain no added arsenic, antimony, barium, or halides. By meeting all existing and impending environmental regulations, EAGLE XG® helps Corning’s customers future-proof their products. As a result, this revolutionary glass composition gained rapid acceptance from panel makers around the world.
SMART FOOTPRINT

Global Energy Management
Corning started the Global Energy Management (GEM) program in 2006 to reduce energy consumption and costs, as well as to lessen the company’s impact on the environment. GEM has helped Corning cut energy costs by more than $100 million and has reduced the company’s carbon footprint by funding projects to improve our manufacturing processes.

CoGen Facility
In 2008, Corning’s combined heat and power (cogeneration) facility went online in Corning, N.Y., providing electricity, heat, and hot water to eight buildings on the Corning campus. The facility uses natural gas to operate a generator which, in turn, creates electricity. Heat produced by the generator is captured and recycled into steam, which is pumped into a distribution system for heating and hot water. The facility provides a reliable energy source and offers great environmental performance by cutting down on the company’s greenhouse gas emissions.

OTHER SMART SOLUTIONS

LEED Certifications
The United States Green Building Council’s Leadership in Energy and Environmental Design (LEED) standards are aligned with our corporate goals of energy and cost management. In the Corning, N.Y., area, the company received LEED certification for its Decker Building renovation, and LEED standards are being met with the company’s expansion at our Sullivan Park research and development facility. Corning also pursues LEED certification through company-owned community projects, like its LEED Silver Certification for the Corning Children’s Center and the LEED expansion at The Alternative School for Math and Science.
eBay, Inc.’s business strategy is focused on shaping the future of retail—one in which connected consumers access what they want, when they want it, wherever they are, and divisions between online and offline commerce continue to blur. We recognize that with change comes a unique opportunity to embed sustainability principles into this new commerce landscape. And we believe that in doing so, we can drive more innovation and build stronger relationships with our customers. From helping people make smarter buying decisions, to encouraging our selling community to run more efficient, less wasteful businesses, we’re testing out new ways of thinking and talking about sustainability within commerce experiences.

**SMART PRODUCTS**

Two products in particular demonstrate how sustainability drives innovation at eBay:

- With the 2010 launch of the eBay Instant Sale electronics trade-in platform, eBay tackled one of the great environmental costs of a tech obsessed society: e-waste. With over 4.3 million offers made to date, Instant Sale is a fast, easy way for consumers to cash in on their electronics. In just the first few months of the program, we found the combined impact of trading in iPhones, iPads and iPods avoided the emissions of 1,550 tons of CO₂: the equivalent of flying a commercial airplane around the world 155 times.

- One of the biggest environmental impacts of the eBay marketplace is the transport of items from sellers to buyers. Our Green Team recognized this and developed the eBay Box. The box is a durable, eco-friendly shipping container designed to be used over and over again. Buyers and sellers can also track their boxes’ journey and environmental impact. We’ve

“eBay sits in a unique position to see and shape the future of retail. From promoting re-use to harnessing the efficiencies of the internet to reduce waste, our businesses start from a greener place. We’re committed to building on this foundation to accelerate the next generation of sustainable commerce.”

—John J. Donahoe, President & CEO, eBay Inc.
estimated that if every box gets reused at least five times, we could protect nearly 4,000 trees, save 2.4 million gallons of water and conserve enough energy to power 49 homes for a year.

SMART FOOTPRINT

A number of projects demonstrate how we are ensuring eBay is as green and efficient as possible:

■ Our data center team is constantly pushing the envelope in data center management, allowing us to process more activity with less energy. In Utah, our newly built LEED-Gold facility takes advantage of the crisp, arid climate to cool the data center and shut down energy-intensive chillers, and features a long list of sustainable elements that help it run as efficiently as possible. In steamy Arizona, where we have an older data center, we’ve implemented some innovative retrofits that allow for hot-air cooling.

■ We are also experimenting with renewable energy: our smaller Colorado data center features a 100 kW solar array on the roof. Our first-ever construction project—the Mint Building at our San Jose headquarters—earned LEED-Gold certification for its sustainable features, which include a 650kW solar panel installation on the roof and five fuel cell Bloom boxes (fuel cells made out of sand and not the environmentally-harmful products they are normally made out of). Because of these efforts, we’ve brought down the energy we use per transaction on eBay by 55 percent since 2008.

SMART MEDIA

For more information, visit us at green.eBay.com and ebay.com/greenteam.
The explosion of data in many industries is driving significant investments in data warehousing hardware, which in turn brings a cost to the environment: large data warehouse systems can consume significant amounts of power and require equally costly cooling resources. The Greenplum Database solution combines smart design with innovative, flexible hardware configurations to enable users to squeeze a great deal of data into a small space. Not only does a Greenplum solution deliver a lower footprint for the same amount of data as competitive offerings, but it delivers the query speed and the extremely high data I/O rate demanded by the new generation of customers with enormous data sets.

For example, during its vendor selection process, a very large internet service company determined that it would require 37 racks of a competitor’s hardware to store their immense data set, while they could store and manage the same quantity of data using Greenplum Database with just seven racks. Beyond the clear savings in hardware costs, this customer’s Greenplum solution takes up less space, has lower power and cooling costs and is more environmentally friendly.

Greenplum’s standards-based technology runs on commodity hardware. This configuration makes it easier than ever for companies to invest in energy-efficient database solutions, which is good for the environment and good for the bottom line. Greenplum will continue to innovate in ways that further decrease energy usage and reduce the carbon footprint of our data warehousing solutions.

Our Ionix software suite delivers utilities a view of all their components in the smart grid. The software provides trending information about failing or failed components. If an outage occurs, the utility can quickly identify the location of the failure, and the likely causes, virtually through Ionix, improving decision-making and avoiding sending people on trucks to search for the problem.

In addition, EMC’s IT helps utilities store and manage the volumes of data that are coming into their data centers through new meter data management systems. Not only...
will the data be well-managed and accessible, it will be stored efficiently using EMC technologies such as FAST and deduplication.

EMC provides the back-end infrastructure for meter data management systems (MDMS) that utilities use to collect, analyze, and report on the electricity use of their customer base. EMC optimizes the performance of the MDMS and provides efficient and secure technology to protect this mission-critical data in the most cost-effective manner.

**SMART PRODUCTS**

EMC was the first in the industry to use Enterprise Flash, or solid state, drives in enterprise storage. Enterprise Flash drives offer energy efficiency in high-performance computing, using up to 97.7 percent less energy in operations per second than FC/SAS drives, and 38 percent less energy per terabyte of data stored. The energy savings comes from their solid state nature—they do not spin like conventional disk drives—and from the potential to reduce the total number of drives required across an entire system to achieve a customer performance target. They are available in the VNX family, Celerra, CLARiiON, and Symmetrix systems.

The disk spin-down feature stops disks from spinning when they are not being accessed, further reducing energy use. This feature is available in the VNX family series, CLARiiON, Celerra, and EMC Disk Library, as well as the Iomega Compact StorCenter ix2-200.

Digital information is stored on drives. EMC offers a variety of drive types to meet varying needs of capacity, performance, cost, and energy efficiency. Multiple drive types can be used concurrently in a single storage platform. Our software assigns digital information in storage tiers to the “just-right” type of storage to meet performance requirements while maximizing energy efficiency.

Disk drives are used across our storage platforms and come in a range of capacities and rotational speeds. High-capacity/low speed SATA type drives use less power but have slower performance. Low-capacity/high speed FC/SAS drives are better for more frequently accessed information. SATA type drives have up to four times the storage capacity of FC/SAS drives, and can use up to 96 percent less energy per terabyte of data stored. SATA type drives are available in the VNX family series, Celerra, CLARiiON, EMC Disk Library, and Symmetrix systems.

Beyond drives, there are three other key initiatives to reduce power use in our storage platforms. One is the use of more efficient power supplies to reduce energy losses as power is delivered to the storage platform. Our recently released VNX and VNXe platforms have power supplies with more than 90 percent energy efficiency.

A second initiative is the incorporation of instrumentation to measure power use and ambient temperature, and capabilities to report that information to users. With this capability, users can monitor and measure the power use of individual storage platforms.

Finally, adaptive cooling saves energy by reducing blower and fan speed in a storage platform to cool in proportion to the room ambient temperature. Today, all EMC storage platforms have adaptive cooling in place. In a typical 240 drive array, this saves a customer 480 watts in cooling power.

In 2004, EMC began an internal server virtualization process to leverage our own technologies, to achieve operating efficiencies as well as energy efficiency.

By the end of 2010, our EMC IT division has virtualized 75 percent of OS images and 100 percent of our x86 server environment. We have realized a 75 percent gain in storage utilization and a 170 percent improvement in storage administration productivity. In addition, we have reduced the number of Oracle data base servers from 55 to 4—and the number of databases from 51 to 6.

In 2009, we launched a Virtual Desktop Infrastructure (VDI) pilot to improve information security and client services across our organization, and energy efficiencies. We are on track to meet our goal of 100 percent virtualized desktops by 2012.

Overall, EMC IT initiatives have decreased our energy consumption by 34 percent and reduced our carbon footprint nearly 100 million pounds of CO₂.
These initiatives have realized savings of approximately $23 million in data center operating expenses. Implementation of cloud services into our operations has achieved savings of approximately $80 million in data center capital expenditures for equipment.

**SMART FOOTPRINT**

With our existing U.S. corporate data center quickly running out of capacity—and after exploring multiple options—we decided to build a new energy-efficient, and 100-percent virtual data center.

We completed Phase 1 of our new data center in Durham, NC in October 2010. This phase included construction of a 20,000 square foot Data Center (expandable to 30,000 square feet in a full build scenario) and 55,000 sq. ft. Development Lab. The project is on track for meeting stringent PUE objectives of 1.3 and obtaining LEED Corporate Interiors (CI) certification. Efficiency innovations include a rooftop water collection system, free air cooling for much of the year, and flywheel technology that eliminates the need for batteries in uninterruptable power systems (UPS).

The refurbished 450,000 square foot building will also house our first U.S.-based Center of Excellence. The Durham COE will consolidate regional EMC research, development, and proof-of-concept labs; offer a wide range of executive briefing, consulting, development, and technical services; and showcase EMC and partner solutions.

EMC Durham Data Center highlights include:

- UPS modules utilize flywheel technologies that eliminate the need for battery storage
- White paper: *EMC Durham Cloud Data Center: energy efficient design and construction*
- White paper: *EMC Durham Cloud Data Center powering EMC IT cloud vision*

**OTHER SMART SOLUTIONS**

In 2010, EMC collaborated with many different partners and industry groups, including:

- EMC provided leadership to organize The Green Grid’s approach working with the ENERGY STAR program to improve the process via improved communication with the industry
- EMC provided leadership via the Energy Star Working Group at the Information Technology Industry Council to ensure the process changes being developed for the ENERGY STAR program Enhanced Qualification Procedures were fair to industry and provided manufacturers with multiple approaches for achieving qualification.
- With the Storage Networking Industry Association, EMC contributed to the developing Storage Power Efficiency Measurement Specification and Green Storage Initiative efforts.
- EMC participated in the Irish Government High-Level Strategic Workshops on Data Centers and Cloud Computing to discuss strategy on use of technology in the Irish government

**SMART MEDIA**

Video: *How IT helps companies become more sustainable*, Kathrin Winkler, Ceres Conference, May 2011

Video: *EMC Consulting Smart Metering demonstration*
The Fujitsu Group has pursued “operating in harmony with nature” since its founding in 1935. Environmental conservation is one of our highest priorities, and our environmental management is guided by corporate values enshrined in the Fujitsu Way, that “in all our actions, we protect the environment and contribute to society.”

**SMART SOLUTIONS**

**Environmentally Conscious Solutions**

We use environmental impact assessments to evaluate the burdens when customers use Fujitsu Group’s ICT solutions. The ICT solutions that achieve a defined reduction in CO₂ emissions are given “Environmentally Conscious Solution” status.

For assessing the environmental impact of ICT solutions, we utilize techniques developed by Fujitsu Laboratories to quantitatively assess how much our customers’ environmental burdens have been reduced by introducing our ICT solutions products.

Since FY 2004, we have been increasing the number of Environmental Conscious Solutions, and now we have certified over 230 solutions. These solutions have contributed in various areas.

Points of assessment:

- Resource use
- Travel
- Supply chain and transportation
- Office space
- Warehouse and other storage space
- Power consumption of ICT equipment
- Data communication

Environmentally Conscious Solutions have contributed in such areas as factories, office buildings, data centers, various modes of transportation, homes, hospitals, schools and agriculture.

**Green Data Centers**

We are also conducting activities for green data centers. For example, at Tatebayashi Data Center in Japan, technologies such as solar panels, high efficiency power and cooling systems, real-time temperature and air flow monitoring and data center energy monitoring are all delivering significant reductions in energy consumption. The greenhouse gas (GHG) emissions saved is up to 40 percent, compared to conventional data centers. In the UK, our North London facility is the first accredited Tier III data center in Europe.

**Green ICT Consulting**

We are also working with our customers. Toyota Australia’s Green ICT strategies were formulated with Fujitsu Australia’s consultants to meet the targets of its five year environment plan. Fujitsu conducted in depth interviews and advanced modeling to build a clear picture of the current ICT strategy against its environmental impact. Based on this assessment, a number of actions, projects and programs were specified to achieve a potential 43 percent cost reduction and greenhouse gas emission saving.
Results
A savings potential of 43 percent with respect to cost, GHG and electricity consumption through the implementation of office-based ICT equipment initiatives in the first year with no capital investment

- A long term plan to achieve further reductions through investment in assets and infrastructure.
- Promotes the key role ICT will play in meeting Toyota’s corporate environmental objectives, including GHG emission reduction targets.
- Business has a greater understanding of and emphasis on Green ICT.

SMART PRODUCTS
Through our procurement directive and development of our own energy efficient products, we aim to supply a comprehensive list of highly rated products that provide low energy consumption, use of eco-friendly materials and technologies, and that are designed under the principles of reduce, reuse and recycle. We have been at the forefront of designing and producing products which are built to trusted international standards such as ECMA, EPEAT and ENERGY Star.

Our technology labs in Japan and Germany are developing some of the leading innovations in green technology. This includes the Green IT 2009 award winning Blade Server PRIMERGY BX900, which features 90 percent+ PSU-efficiency, ServerView power-management software, and Cool-safe cooling technology, to generate 40 percent savings in power consumption through server consolidation when compared to traditional rack mounted servers.

Fujitsu was also first to market with a true 0 Watt PC in off/hibernate mode which offers up to 89 percent efficiency improvements, and its switched monitor provides savings of up to 10 percent of display energy consumption. These are just a few examples of the energy efficient products we have brought to market.

SMART FOOTPRINT
We are also working to reduce emissions of greenhouse gases associated with all our Group business activities.
These efforts include reducing emissions of CO₂ due to energy consumption and other greenhouse gases at our factories and offices and reducing emissions associated with transportation.

We have set “reducing our total greenhouse gas emission by 6 percent by the end of FY 2012 compared with FY 1990 (the breakdown for total emissions is a 5 percent reduction in CO₂ due to energy consumption and a 20 percent reduction in emissions other than CO₂)” as a goal of the Fujitsu Group Environmental Protection Program.

Our actual total emissions for FY 2010 globally were about 1.185 million tons, which is a reduction of about 128 thousand tons from the previous fiscal year and an 11.7 percent reduction from FY 1990.

CO₂ emissions due to energy consumption are responsible for about 85 percent of the Fujitsu Group’s greenhouse gas emissions.

Therefore we continuously work to improve the following energy-saving measures to reduce CO₂ emissions.

- Energy-saving equipment, focusing on motive-power facilities (introduction of free cooling, inverters, energy-saving facilities, fuel conversion, etc.)
- Increased efficiencies through revised manufacturing processes, accompanied by proper motive-power facility operation and improvement of management
- Adjusting appropriate room temperature for office air conditioning, saving electricity for lighting and office automation equipment
- Promotion of the measurement and visualization of energy consumption and proactive use of that data
- Use of natural energy sources such as solar power

We are also working on “green logistics activities” which strive to reduce CO₂ emissions associated with transportation by coordination among the distribution divisions of all group companies and cooperation between manufacturing and sales divisions. Furthermore, we collaborate with our business partners and strive to reduce the environmental burden associated with distribution across the whole supply chain.

Our goal was to reduce CO₂ emissions in distribution across Japan by 11 percent compared to FY 2008 by the end of FY 2012 as proposed in the Fujitsu Group Environmental Protection Program. However, by expanding modal shifts and reducing the number of trucks, we were able to achieve an 18 percent reduction (this includes fluctuations in amounts distributed and the effects of the March 2011 earthquake) compared to FY 2008 in FY 2010. We have therefore increased our target for FY 2012 to a 15 percent reduction compared to FY 2008. We have also started to measure the CO₂ emissions in international transportation and the transportation CO₂ emissions at overseas sites and thus are promoting green distribution activities globally.

OTHER SMART SOLUTIONS

As a framework for the consistent practice of environmental activities in all business fields, we formulated the Fujitsu Group Environmental Policy, which clearly sets out our philosophy and guidelines for action. We also drafted the Green Policy 21 environmental concept that serves as the foundation for all environmental activities, as well as Green Policy 2020, our medium-term environmental vision with targets to meet by 2020. In addition, we are implementing Green Policy Innovation, an initiative to reduce environmental burdens using Green ICT, along with the Fujitsu Group Environmental Protection Program. Through these measures we aim to reduce the burden the Fujitsu Group, its customers and society put on the environment.

The Green Policy Innovation is a green ICT project which aims to contribute to The Fujitsu Group’s efforts in fulfilling its roles and responsibilities as an ICT entity in solving climate change issues. This project is aimed at assisting customers and society as a whole in reducing their environmental burden by providing green ICT products and solutions. The Fujitsu Group aims to achieve this by effectively utilizing the know-how that we have accumulated in various Fujitsu Group activities and our cutting-edge technology. The target of the
Green Policy Innovation is to reduce our customers’ CO₂ emissions worldwide by more than a cumulative 15 million tons over the fiscal 2009-2012 four-year period. We achieved 3.23 million tons of CO₂ emissions reduction in FY 2010, and we contributed to reducing CO₂ emissions for a cumulative total of 5.6 million tons since FY2009.

As we enter a new era, humanity faces many challenges including climate change, oil supply crisis, aging societies, increasing population, increased demands for energy, natural disasters, water issues and loss of biodiversity.

We are focused on how ICT can help tackle such issues and enable the transition to a prosperous and low carbon society.

Fujitsu’s concept of a Human Centric Intelligent Society makes full use of intelligent social applications sitting in the cloud, to counter challenges facing humanity. Smart Grids and intelligent systems of all kinds will create smart cities combining energy conservation with innovation.

In a smart city, sensors and networks collect the vast quantity of data produced by residents’ daily activities. This data collected can be collected, analyzed and transformed into intelligence by ICT products and services. This intelligence can save energy, through enhanced networks, provide a convenient and secure society.

By example our solutions for the ‘Human Centric Intelligent Society’ using cloud-based sensor-networks include:

**Smart Traffic Cloud**

Sensor networks gather real-time information on road and traffic conditions allowing greater efficiency and safety of vehicle and pedestrian flows.

**Smart Agriculture Cloud**

By capturing data on the climate, soil and water, as well as crop conditions through field located cameras and sensors, it will become possible to devise new business models that secure better harvest yields with lower expenditures of labor and energy.

**Smart Grid**

In the energy sector, we are working to optimize power generation and distribution through solutions based on our sensing and artificial technologies in the cloud. The combination of distributed autonomous networking and middleware technologies, collectively named “WisReed”, are designed to meet high quality communications, flexibility, scalability and cost efficiency requirements. By introducing smart metering services, using the autonomous formation of networks, with millions of sensors to predict the use of electricity, we are maximizing network capability, efficiency and reliability.

**Smart Water Cloud**

Like Smart Grid for energy networks, this facilitates improves capacity management by compiling intelligence about supply and demand, allowing optimum efficiency of water production and use, and facilitates real time information gathering on environmental aspects such as water quality and drainage.”

**SMART MEDIA**

You’ll find photos and videos at these sites:

- Fujitsu Group’s environmental activity
- Fujitsu Group Sustainability Report
- Green ICT Project, Green Policy Innovation
- Fujitsu Sustainability (activities of Fujitsu Australia)
Hewlett-Packard (HP) is a company with a history of strong global citizenship. Social and environmental responsibility are essential to our business strategy and our value proposition for customers and they are also at the heart of an obligation we all share to help create a sustainable global society.

—HP Global Citizenship Report

**SMART SOLUTIONS**

At HP, energy efficient and energy reducing solutions are always a priority. The company’s efforts to bring attention to the need for reduced carbon footprints, improved energy efficiency and sustainable practices are constant.

HP Energy and Sustainability Management (ESM) is a complete portfolio of enterprise services that increase business value from energy and resource efficiency. HP ESM helps measure and manage a company’s network of resources, from facilities to supply chain, in order to boost efficiencies. HP ESM helps enterprises integrate sustainability directly into their business plans and gain control over their consumption of energy, water and other resources.

HP Managed Print Services (MPS) enables organizations to reduce their energy and paper use, and cut costs related to printing. MPS is a comprehensive, scalable suite of services that includes imaging and printing devices, software, supplies, support, professional services and solutions—with flexible procurement, transition and management options to help companies meet their business and environmental goals.

Using MPS has enabled some HP customers to achieve energy savings of between 30 percent and 80 percent in their imaging and printing operations, and reduce paper consumption by millions of pages. In addition, MPS can help customers achieve more efficient workflows and increase recycling of used print supplies and old hardware.

The Sustainable Ecosystems Research Group at HP Labs continues to transform IT with technologies that lead to less energy and materials usage through innovative data research, while the HP Home Energy Manager was developed with an end goal of helping people better understand, and as a result reduce, their energy consumption. This research in home energy management will give individuals awareness into the actual energy use of their homes by monitoring everything from the dishwasher to the TV.

The HP Data Center Smart Grid creates an intelligent, energy-aware data center equipped with a sea of sensors that detect when servers are wasting power, allowing IT managers to make adjustments in real time. This information management solution can reduce a facility’s power and cooling costs by up to 30 percent. HP is applying this idea on a much broader scale as well.

HP has also unveiled the world’s most efficient modular data center that can be deployed faster than any competitive offering—in just 12 weeks—and at a quarter of the cost when compared to a traditional brick-and-mortar data center. Utilizing 95 percent less facilities...
energy, the HP POD 240a, also referred to as the “HP EcoPOD,” extends HP’s leadership in modular data centers and represents a new class in the company’s family of HP Performance Optimized Data Centers (PODs). The HP EcoPOD exemplifies decades of real-world experience and the most advanced engineering in the industry from HP.

HP’s Carbon Emissions Management Service (CEMS) enables businesses to respond to regulations requiring accurate reporting and to manage and reduce emissions. Users can calculate, record and analyze their carbon emissions across an entire organization. CEMS users apply HP’s C-Counter (patent pending) to measure, monitor and store data related to energy use and GHG emissions in real time, over a period of eight weeks. Accurate measurements enable users to manage energy use and emissions in every aspect of the IT infrastructure, from the desktop to the mainframe.

SMART PRODUCTS

HP designed the HP TouchSmart 610 series with the environment in mind. It cuts energy use via power management technology and provides up to 45 percent energy savings compared with PCs without power management enabled. This energy-efficient PC also improves reliability by reducing heat output. All HP TouchSmart PCs are ENERGY STAR® 5.0 qualified and are EPEAT® Silver registered in the United States and Canada.

HP ProCurve networking products, including network management and switches, complement energy-efficient servers to save even more energy. With ProCurve Manager Plus (PCM+) users can schedule shutting off idle devices when they are not in use, realizing up to 73 percent in energy savings.

The HP 2310e Ultra-thin WLED backlit LCD monitor uses white LED (WLED) technology to reduce the number and overall size of components, resulting in lower power consumption. WLED backlights contain no mercury and help conserve power, making this monitor ENERGY STAR 5.0 qualified, EPEAT Gold registered and winner of PC Magazine’s 2010 GreenTech award.

The HP Z Workstations family saves energy with the energy-efficient Intel Xeon processor and includes 85 percent efficient power supplies—reducing both overall energy use and waste heat. The family includes the new HP WattSaver—an HP exclusive feature that manages power in the “off” state between 0.5 and 1 watt when activated by the customer, compared with 2 to 6 watts for a typical product. The HP Z Workstations immediately qualified for the ENERGY STAR 5.0 standard in July 2009.

All HP Z Workstations are more than 90 percent recyclable by weight, and the line is EPEAT Gold registered—the highest rating available.

The HP Compaq 8200 Elite Ultra-slim desktop PC is designed to help reduce environmental impact and help businesses lower their operating costs. It’s one of HP’s highest performing and most energy-efficient business PCs to date, with up to 50 percent greater energy efficiency compared with similarly configured HP models. The limited expansion options and smaller size of the chassis allow for a highly efficient 135W external power adapter rated at 87 percent efficiency. ENERGY STAR qualified and EPEAT Gold registered, the HP Compaq 8200 puts customers in control of power settings with HP’s exclusive Power Assistant, which provides an easy-to-use desktop application that lets users control the PC’s energy use by scheduling various power settings throughout the day.

Finally, the company’s online HP Carbon Footprint Calculator helps customers build a baseline estimate of their HP computing and printing products’ carbon footprint.

SMART FOOTPRINT

Sustainability isn’t new to HP, it’s in our DNA. It started when Bill Hewlett and David Packard made environmental sustainability part of HP’s global citizenship objective in 1957. They didn’t talk about being green, they talked instead about making a positive impact and creating something that will last longer than the lifespan of any single person.
HP is taking aggressive steps to reduce the energy used through its own operations. In its 2010 Global Citizenship Report (http://www.hp.com/hpinfo/globalcitizenship), HP set a goal to reduce GHG emissions from HP owned and leased facilities by 20 percent by 2013 (with 2005 as a baseline). HP decreased energy consumption 9 percent in 2010 compared with 2009. Between 2005 and 2008, HP completed a three-year program to consolidate 85 HP internal IT data centers into just six locations in three U.S. cities: Atlanta, Austin and Houston. Consolidation helped HP cut its internal IT data centers’ energy consumption by 60 percent from 2005 levels.

In 2010, HP committed to serve as the sole sponsor of a research report from the Center for Climate and Energy Solutions regarding how certain companies innovate to develop low-carbon solutions. The report includes survey results from more than 50 Fortune 500 companies, case studies from four leading companies—including HP—and best practices for establishing management structures and financial mechanisms that reward innovative behavior in this area.

The Environment@HP internal website educates employees about environmental issues and encourages them to reduce their impact at work and at home. Employees can learn how to get involved with their local HP Sustainability Network, tap into training opportunities, receive updates on new HP employee and customer programs, and find resources to measure and reduce their environmental impact. For example, employees can borrow an HP Green Home Kit, a set of tools to evaluate indoor temperature, energy consumption and water use. HP has several programs that educate and empower employees to become ambassadors of the company’s environmental initiatives.

In 2009, HP launched the Power to Change campaign to encourage employees and customers to turn off their PCs when not in use. The campaign used an online community, referral networks and a collective tally of savings to illustrate that small changes can make a large impact. During the campaign, more than 32,000 people—5,800 of whom were HP employees—downloaded a desktop widget, also available free to the public, helping them track energy savings generated by powering down PCs when not in use.

HP employees also use the Power to Change website to connect with and recruit additional participants around the world. Collectively, HP employees have successfully referred 3,700 friends and family to join the campaign.

In addition, 14 HP sites across four continents representing 30,000 employees joined the Power to Change@Work Challenge, which encouraged employees to save energy by turning off conference room lights and office equipment. More than 100 volunteers conducted two energy audits four months apart, checking lights and equipment in 7,000 cubes and 1,100 conference rooms. The HP San Diego campus led all the other competing sites and achieved a 48 percent reduction in lights and equipment left on after hours.

OTHER SMART SOLUTIONS

In addition to the tools HP offers to help enterprise customers understand and reduce the environmental impact of their IT, the company developed The HP Green Procurement Guidance white paper. This vendor-neutral guide helps enterprise customers develop environmental
procurement criteria for IT products and services. It outlines criteria, including eco-labels, product attributes, packaging, end-of-use services and supply chain responsibility, and includes a sample questionnaire for evaluating IT vendors.

HP Labs is continuing work on its Sustainable Data Center project, which is focused on reducing the carbon footprint of data centers by 75 percent while simultaneously reducing the total cost of ownership. As part of this project, research will study how energy is used and managed for the entire lifetime of a data center, from its design, synthesis, operation and end-of-life for its components.

Additionally, the company continues to bring attention to energy efficiency through its global Unlock Your Energy Tour. This initiative emphasizes designing and applying more innovative technologies that will get the most from the energy used today while moving the world toward more sustainable energy consumption, management and growth.

SMART MEDIA

Video links:

**HP Unlocking Your Energy Tour**

Take a spin through the UYE event, which demonstrates the depth of HP’s technology portfolio. Hear from HP executives and customers about today’s energy challenges and how HP can help.

**HP Wynard Data Center**

Tour the HP Wynyard Data Center in the United Kingdom featuring an energy-efficient and sustainable design that incorporates recycled materials as well as harvested rainwater.
“When we rolled out IBM’s smarter planet thesis, we said early on that the way the world works isn’t smart enough to be sustainable. But that’s the kind of grand challenge that energizes IBM. We’re integrating expertise in technology with business across diverse global industry sectors and governments to drive innovation—not just innovation for the sake of something that’s cool or hip—but innovation that matters for our world in the context of big problems and grand challenges. We’re relentlessly pursuing innovation that delivers value because that’s how one can sustain sustainability.”

—Wayne Balta, IBM Vice President
Corporate Environmental Affairs and Product Safety

**SMART SOLUTIONS**

**Planet Offerings**

Through its application of its Information Technology (IT) expertise in hardware, software & systems, and deep consulting capabilities, IBM has been a leader in providing energy efficient IT solutions, enabling clients to implement systems management of activities such as logistics, buildings and other assets, water systems, traffic systems, utility grids, and other similar systems to optimize activity flows and minimize resource use.

**Cloud Computing**

Systems provide clients a shared, virtualized computing service which optimizes the computing operations delivered per unit of energy used.

**Traffic Systems**

Solutions such as the Stockholm and London smart traffic solution reduce traffic congestion, optimize infrastructure use, and reduce CO₂ emissions by 10–20 percent.

**Logistics Planning**

IBM hardware and software solutions can be combined to solve complex planning, scheduling, and management problems, reducing trips, optimizing equipment utilization, and reducing transport related GHG emissions by 2–15 percent.

**Vehicle to Grid Charging and Storage**

This solution involves developing the hardware and software components of the infrastructure system required to facilitate large scale adoption of electric vehicles. IBM is working with partners in utilities, automobile manufacturers, academics and governments to determine the outline of the infrastructure system required to enable large scale adoption of electric vehicles.

**Smart Utility Grids**

As a member of the Global Intelligent Utility Network Coalition, IBM is helping clients around the world to deliver on the vision of a smart grid through its
comprehensive approach of end-to-end solutions, informed policy and regulatory and standards initiatives, IBM’s solutions address the entire energy value chain: water, electricity, gas, renewable energy, and others.

**Collaboration Solutions**

IBM LotusLive offers a full suite of integrated, online collaboration solutions and social networking services which enable enterprises, small to large, to work together internally and with external clients and partners in a securely designed, on-line environment.

**Network management**

IBM offers a set of software solutions, Tivoli Netcool solutions for wireless, which provides an end-to-end service assurance suite to manage wireless networks to maximize system utilization and resources under changing demand conditions and minimize resource requirements by sharing system resources and enabling remote management/repair of system operations.

**SMART PRODUCTS**

**Enterprise IT Products:** IBM designs increasingly more energy efficient IT products to help clients be more productive and efficient.

- Power management capabilities in x86 and POWER7 processors and system components, are utilized to reduce server idle power by 20 to 50 percent.

- Storage systems utilizes software-based data management capabilities such as Easy Tier, thin provisioning, and virtualization to reduce the number of terabytes and amount of energy required to accomplish a given storage task.

- IBM products utilize high efficiency power supplies, reducing system losses.

- IBM continues to innovate in server and storage component technology and the use of virtualization and other software solutions to increase the system utilization and performance for each unit of power consumption.

- IBM is an active participant in the ENERGY STAR programs for server and storage systems providing technical assistance and equipment operating data to assist in the development of criteria and to inform EPA on IT equipment capabilities. IBM currently has 10 server products ENERGY STAR qualified.

**Data Center Services**

IBM offers data center services which assist clients in delivering more workload for each unit of power consumed. It uses these capabilities across its own data system portfolio. See the discussion of Data Center thermal management and virtualization offerings in the “Smart Footprint” section below.

**SMART FOOTPRINT**

IBM focuses on its energy use footprint through a single, global department of professional energy engineers which leverages IT throughout its operations to drive energy efficiency. A single, global, enterprise level energy data management and reporting system collects data from over 500 locations and an internet connected energy monitoring system collects real time data from 26 locations. Over 95 percent of IBM’s actual operational energy use is tracked and reported, enabling rapid identification and exploitation of efficiency and conservation opportunities.

From 2008 to 2010, energy efficiency and conservation efforts resulted in 3,800 conservation projects that delivered 747,000 MWH of electrical savings, 1,642,000 MMBTU of fuel savings and reduced expense of $88 million. IBM makes extensive use of ICT solutions in achieving operational energy efficiency improvements. An array of ICT based systems is enabling the next generation of conservation savings:
Smart Buildings
IBM implemented 3 smart building pilots in 2010, including at its Armonk Headquarters, reducing energy use by an average of 8 percent on buildings where the smart systems were installed. IBM is proceeding on a broader implementation plan at its large facilities.

Measurement and Management Technology (MMT)
IBM research developed a sensor based thermal management and analytics system (MMT) for data center (DC) raised floors. The system monitors the performance of critical data center systems and floor temperature, enabling the optimization of system operation to achieve energy use reductions of up to 10 percent with improved DC reliability.

Virtualization
IBM is implementing virtualization technology for both internal and external accounts across its DC portfolio. A Software Group data center implemented 5 major server and storage consolidation projects in 2010, reducing the DC energy use by 7.8 percent.

OTHER SMART SOLUTIONS
IBM has a longstanding commitment to environmental leadership. The company first issued its corporate policies on environmental responsibility and energy conservation in 1971 and 1974, respectively. IBM set a formal, corporate energy conservation goal in 1996. IBM’s commitment drove real, measureable reductions in energy use and greenhouse gas (GHG) emissions across its operations portfolio.

- Between 1990 and 2010, IBM’s energy conservation actions saved 5.4 billion kWh of electricity and avoided nearly 3.6 million metric tons of CO₂ emissions (52 percent of IBM’s 1990 global CO₂ emissions), saving $399 million.

- In 2006 IBM set a 2nd generation corporate goal: reduce its operational GHG emissions by 12 percent by 2012 against its 2005 baseline. As of year-end 2010, IBM had achieved a reduction of 16.7 percent.

IBM set and exceeded its 2nd generation goal to reduce perfluorinated compound (PFC) emissions by 25 percent by 2010 against the 1995 baseline, achieving a reduction of 36.5 percent. The company is evaluating a next generation goal.

IBM is also committed to its clients’ success, using its research, IT and services expertise, and deep industry knowledge to solve business and climate change challenges they face. IBM produces energy efficient products; applies its products and solutions to improving data center efficiency, intelligent energy grid, smart transportation systems, smart buildings and infrastructure, safer and more efficient energy production, water, energy and other resource use analysis and optimization, logistics planning, and other applications.
“Throughout Intel’s history, we have pushed the boundaries of what’s possible to improve how people work, live, and play. Our vision for the next decade is even more ambitious: to create and extend computing technology to connect and enrich the lives of every person on earth. A key determinant of our success will be our ability to innovate and advance our leadership in sustainability.”

—Paul S. Otellini, President and CEO

**SMART SOLUTIONS**

**Applying Technology to Environmental Challenges**

People are using technology to help solve environmental challenges around the world. Through technology, individuals, families, companies, and governments gain information that can empower them to drive more sustainable practices in homes and across industries—helping to reduce the environmental footprint of cities and countries.

**Intelligent Home Energy Management System**

In 2010, we released the Intel Intelligent Home Energy Management System proof of concept based on the Intel Atom processor. The system’s central dashboard helps family members stay connected and make informed decisions about energy use, home maintenance, and home security.

**WEST**

The Intel Labs research group completed a reference design for a wireless energy sensing technology (WEST) to help consumers better understand their electricity bills, identify devices that consume high amounts of energy, and better manage and reduce energy costs. The WEST reference design was demonstrated in multiple research forums in 2010, and 100 beta test units have been produced for pilots in 2011.

**SmartBay**

Intel Labs Europe drives collaborative sustainability research projects across a number of domains, including smart grids, electric vehicles, smart buildings, smart cities, smart manufacturing, data center energy efficiency, and marine ecosystems. One of the group’s projects, the SmartBay project, in partnership with the Marine Institute, focuses on understanding and managing oceans in a sustainable manner through technologies that can detect pollution or naturally occurring toxins and monitor long-term shifts in ocean conditions that may be caused by global climate change.

**“Water Wars”**

Intel Labs, together with researchers at Sandia National Laboratories, used gaming technology to help teach people about water consumption and encourage their participation in public policy discussions on sustainability. The “Water Wars” game enables players to assume the roles of water systems managers and users, farmers, gardeners, retailers, and consumers, and take actions when faced with water scarcity. The gaming simulation
can help policymakers understand how decisions affect diverse stakeholders.

**Eco-Technology Program Office Research**

The Eco-Technology Program Office conducted research in 2010 into assessing technology opportunities related to water. The group will complete pilot studies in 2011 in partnership with water utilities and agricultural users in India and other locations to explore opportunities to apply Intel technology to the global water challenge.

**West Oakland Environmental Indicators Project**

In West Oakland, California, Intel Labs teamed up with a local environmental group, West Oakland Environmental Indicators Project (EIP), to test new platforms for environmental monitoring. West Oakland residents are exposed to poor air quality and particulate matter, yet the area has only one air-quality monitoring system. The Common Sense project aimed to add multiple mobile phone sensors to act as air-quality monitoring devices throughout the area. EIP volunteers and local students helped test device prototypes and collected data that was uploaded to Intel servers for analysis.

**New Mexico Green Grid Initiative**

In New Mexico, Intel Labs has established a collaborative energy systems research center with participants in the New Mexico Green Grid Initiative. One of the center’s first projects involves installation of a high-efficiency direct current lighting proof of concept, which is 200–400 percent more efficient than current practices. Project findings will be published in a white paper comparing DC lighting to AC lighting in commercial spaces, and will be shared with Intel facilities managers for potential use in our office redesigns.

**SMART PRODUCTS**

**Energy-Efficient Performance and Product Ecology**

Through our Design for the Environment principles, we strive to minimize the environmental impact of our products at all phases in their life cycle: development, production, use, and ultimate disposal. Energy-efficient performance is a key element of our product design and overall environmental footprint reduction efforts.

**Improving Product Energy Efficiency**

Transistors are the building blocks of the electronics industry, so the creation of more energy-efficient transistors leads to more energy-efficient computers. With each new generation of process technology, we can fit more transistors onto Intel® processors, while also reducing the energy required to power them. Moore’s Law describes the pace of these trends, which—when combined with Intel® architecture and circuit design innovations—have enabled us to reduce the amount of energy consumed per transistor by a factor of approximately 1 million over the past 30 years. Our goal is to drive energy-efficient performance
across all of our major product lines—from netbook and embedded processors to those used in laptops, desktops, and servers. We estimate that Intel technology will enable the billion PCs and servers installed between 2007 and 2014 to consume half the energy and deliver 17 times the compute capacity of the first billion PCs and servers (installed between 1980 and 2007).

Our new second-generation Intel Core processors, launched in early 2011, represent the largest increase in computing performance, capabilities and energy efficient performance over any previous generation in our history.

SMART FOOTPRINT

Performance Summary and Goals
In 2010, we continued to take steps to reduce our carbon footprint. We remained the largest purchaser of green power in the U.S., according to the U.S. EPA, made new investments in energy-saving projects in our operations, and linked variable compensation to energy reduction goals to further encourage our employees to take action. We continued to face challenges in achieving reductions in both water use and chemical waste generated, and continued to take steps to reverse these trends. We achieved our product-related environmental goals, including energy-efficiency targets, and collaborated with others in our industry to develop a new energy-efficiency performance metric.

OTHER SMART SOLUTIONS

Role-modeling Information Technology (IT) Sustainability
IT’s Sustainability Framework uses data center, compute, and office infrastructure, as well as our client compute offerings, to collectively contribute to Intel’s emissions reduction goal. Our IT organization has met growing computing demands while reducing Intel’s consumption of IT-related and office energy—resulting in energy cost savings of $5.8 million in 2010 (up from $4 million in 2009) and the avoidance of more than 60,000 metric tons of CO₂ emissions. In recognition of Intel IT’s sustainability achievements, Intel was named to Computerworld’s 2010 list of “Top Green-IT Organizations.”

Climate Leadership Activities and Public Policy
According to Gartner Research, about 2 percent of the world’s emissions come from the information and communications technology (ICT) industry. In addition to the need to drive greater computing-related energy efficiency, the ICT industry has an important role to play in reducing “the other 98 percent” of global emissions. The “Smart 2020: Enabling the Low Carbon Economy in the Information Age” report, published in 2008 by The Climate Group and the Global e-Sustainability Initiative, estimated that the ICT sector could reduce up to 15 percent of business-as-usual emissions globally by 2020. A follow-up report put the potential reduction in the U.S. even higher—to as much as 22 percent by 2020. Intel collaborates on initiatives with multiple stakeholders to reduce ICT-related emissions, and to identify ways that the ICT industry can help reduce energy consumption and carbon emissions across other sectors of the global economy.

SMART MEDIA

Video highlighting Intel Architecture based products & technology energy efficient performance leadership.

Intel’s 2010 Corporate Responsibility Report
Microsoft delivers solutions that will help our customers reduce their energy demands, manage their energy and environmental footprint, and rethink their business practices. Energy efficiency is a foundational principle in the design of our products, helping our customers run a more efficient IT infrastructure. People and organizations can also use Microsoft technology to support sustainability in other aspects of their business, whether by monitoring and managing their energy use, reducing travel, or minimizing their reliance on paper.

A recent study by Accenture and WSP Environment & Energy showed that energy use and carbon emissions are reduced by at least 30 percent per user when organizations use Microsoft Business Productivity Online Services (such as Microsoft Exchange Online and Microsoft SharePoint Online) or Microsoft Dynamics CRM Online instead of on-premises installations of those applications. For small organizations, the study showed up to a 90 percent reduction in energy use and emissions. Similar efficiencies are likely achievable when running applications on the Windows Azure cloud computing platform.

We are creating energy savings through technology

- **Anywhere Connectivity and the Paperless Office**
  Microsoft has developed cloud solutions, such as Microsoft Office 365, which help customers use less energy. Additionally, Microsoft unified communications—including online conferencing, desktop sharing, and digital information-gathering programs—streamline communications and collaboration, reducing the need for business travel and commuting.

- **Providing Guidance for Developers and IT Decision Makers**
  We published new guidance to help developers ensure that applications work well with Windows Power Management, a key step in reducing how much energy ICT products consume. Our IT Energy Efficiency white paper assists technology decision makers in increasing the energy efficiency of their operations by highlighting best practices.

- **Tracking their Energy Use**
  Microsoft has partnered with the European Environment Agency to create Eye on Earth, which enables citizens in more than 32 countries to visualize both water and air quality across Europe in real time. We also partnered with automakers such as Toyota.

“It accounts for about 2 percent of the world’s energy use, but that percentage is growing as demand for IT services increases. The cloud will allow us to rethink the role of IT and energy, so that we’re not just thinking about how to reduce the impact of IT, but also about how IT can reduce the impact of the other 98 percent of the energy consumed.”

—Rob Bernard, Chief Environmental Strategist
and Ford, and sponsor the Acterra’s Drive Less Challenge, to provide technologies for cars that allow drivers to track and reduce their power consumption.

- **Developing Environmental Tracking Software**
  Small and medium-sized businesses can measure and manage their carbon footprint from greenhouse gas emissions using Microsoft Dynamics AX and its integrated Environmental Sustainability Dashboard. The Dashboard helps users track not only carbon emissions, but also water and waste data, to help them make more informed decisions about their resource use.

- **Improving Energy Management**
  Microsoft collaborated with companies including Alstom Power, Johnson Controls, Sensus Machine Intelligence—to improve the management and measurement of energy in buildings, data centers, and entire cities.

- **Fostering Partnerships**
  We committed to working with governments to use information technology to reach emission targets through the Guadalajara ICT Declaration for Transformative Low-Carbon Solutions. Microsoft co-chaired a working group of the ICT4EE forum in the EU and worked with organizations such as Green Grid to develop methodologies, policy solutions and energy reduction targets for the ICT industry.

### SMART PRODUCTS

- **Windows 7 operating system**
  Energy efficiency was a guiding principle in the design of this operating system. With Windows 7, businesses can achieve an average power savings of $35 per PC per year compared with Windows XP and Windows Vista.

- **Windows Server 2008 R2**
  With Microsoft’s Hyper-V virtualization technology, this operating system enhances power management. According to the U.S. Environmental Protection Agency, it can improve power efficiency by up to 18 percent over Windows Server 2003 running on the same hardware. In combination with a new ENERGY STAR server, it can consume 54 percent less power and save between $480 and $1,440 over the life of the server.

- **Microsoft System Center Configuration Manager R3**
  This manager provides new tools to help organizations ensure that their PCs use energy-saving power management settings. At Microsoft, we’ve seen a 27 percent drop in the power used by our managed desktop computers from using these tools, saving 12.33 kilowatt hours per computer per month, for a projected cost savings of U.S.$12–14 per desktop per computer per year.

- **Microsoft Office 365, Info-Path, and OneNote**
  Moving to Microsoft cloud services can help businesses reduce their carbon emissions by at least 30 percent per user versus running on premise as well as significantly reduce paper use.

### SMART FOOTPRINT

Sustainability is core to our business practices—from how we support our employees to make more sustainable choices, to how we operate, to how we continuously drive for better IT efficiency.

- **Our Commitment**
  We will reduce our carbon emissions per unit of revenue by at least 30 percent compared with 2007 levels by 2012. To reach our goal, we are focusing on three key areas of our business operations: data centers, travel, and facilities, as well as continuing to improve the energy efficiency of our products and the software built on our products. We voluntarily report our carbon impact through the Carbon Disclosure Project.

- **More Efficient Data Centers**
  Our new data centers consume 50 percent less energy for the same level of output than data centers built just three years ago, and we have aggressive goals for further improvements by 2012. Microsoft’s Dublin,
Ireland data center uses the outside air as a primary source to cool the facility.

**Necessary Travel**

Our flexwork policy and unified communications and online collaboration tools enable employees to work from home and work together from far-flung offices effectively. This cuts back on daily commuting and corporate travel. Through Microsoft’s Connector bus system, free public transport passes, subsidized van pools, and virtual meeting and online conferencing, **Microsoft eliminates 8,000,000 miles of commuting and 100,000,000 miles of air travel per year.**

**Using Renewable Energy, Wasting Less, Recycling More**

A number of our facilities use hydro and solar power; our new buildings are built to LEED standards. Each month, we recycle an average of 208.78 tons of materials at our Puget Sound Campus, including glass, plastic, aluminum, electronics, cardboard, paper, and organic waste. From fiscal year 2008 to 2010, we reduced the percentage of trash that we send to the landfill from 78 percent to 37 percent, and we have an internal goal to reduce that by a further 5–10 percent. Through our European offices, we recycled 10 million kilograms of consumer electronics from European households between 2006 and 2009 (equivalent to 4.2 million laptops).

**Microsoft’s IT and Supply Chain**

We saved 18.57 million kilowatt hours in fiscal year 2010 by using power management settings in Windows® 7 and using Group Policy to manage display timeout settings. Newly purchased IT hardware at Microsoft must be EPEAT registered and meet ENERGY STAR 5.0 standards. Our suppliers must sign and adhere to our Vendor Code of Conduct, which covers environmental compliance, and we have set policies on using suppliers based on social and environmental performance metrics.

Microsoft recognizes “sustainability champions.” These volunteers promote sustainable work habits to their peers and focus on reducing plug load energy consumption 3-5 percent.

**OTHER SMART SOLUTIONS**

FY2011 was the first year in which we recognized a **Sustainability Partner of the Year** as part of the Microsoft annual business partner awards. The inaugural winner was OSIsoft. OSIsoft developed the PI System, built using Microsoft technology, to help companies reduce and manage their energy and water consumption.

Microsoft has also been recognized as a leader in energy efficiency. In fiscal year 2010, Microsoft data centers in **Chicago and Dublin, Ireland**, received industry awards for energy efficiency. A Microsoft building in Hyderabad, India, was the first IT building in India to receive LEED Gold certification. We have the first U.S. corporate campus to achieve **Certified Green Restaurant™** status.

Effectively managing the Earth’s ecosystem and its limited resources can be thought of as a data and business intelligence problem. One specific custom solution we’ve developed with the European Environment Agency, called **Eye on Earth**, was released for the first time over three years ago. Eye on Earth is a hub for experts, governments, and the public to exchange information about their environment, transforming millions of citizens into active participants in their local environments.

Microsoft recently published the **results** from a building energy management pilot on our corporate campus in Redmond, Washington. The results demonstrate how many organizations do not need to physically retrofit buildings in order to realize significant energy savings, and how our upfront investment of less than 10 percent of annual energy expenditure is driving an expected payback less than 18 months.

For several years, we have championed the need for optimizing the energy-efficiency of information technology and this year, we released our most comprehensive guidance to date: **“The IT Energy Efficiency Imperative”** including **guidelines** for developers to design energy-smart applications. We’ve provided this framework for driving energy efficiency at every level of the IT environment to our wide partner
and customer community, ranging from software developers and hardware manufacturers to Chief Information Officers.

**Microsoft Research** recently showcased a project, called PreHeat, which is designed to save energy by automatically controlling a home’s thermostat based on predictions of when the occupants will be home. In the U.S. and U.K., home heating uses more energy than any other residential energy expenditure. In the U.S., fewer than half the houses have programmable thermostats, and many of those are used as a manual on/off switches for the furnace. Pre-Heat uses occupancy sensors to log when a space (room or whole house) is occupied. The system then runs a new pattern-matching algorithm to predict when the space will be occupied so it can turn on the heat in anticipation of the occupant’s arrival. Their experiments found that it often takes about 90 minutes for a house to heat up to the target temperature in the winter.

Dan Jørgensen, Member of the European Parliament, Vice-Chair, Committee on the Environment, Public Health and Food Safety wrote, “In recent years I have been pleased to notice that the technology sector is becoming more aware of its impact on the environment and is acting decisively to cut its carbon footprint. By reducing power and water usage in its Dublin data center, Microsoft and its peers are truly leading the way and showing how innovation can both foster economic growth and create a cleaner, more sustainable future for people everywhere.

“These efforts are critical as we are facing some of the most serious issues of global warming caused by increasing carbon emissions. In addition, we are experiencing some of the worst economic setbacks in living memory. I have always had a commitment to the environment and I believe that information and communications technology (ICT) will play a crucial role in enabling solutions to address these challenges, whilst also enabling the creation of a revitalized economy for Europe. It is increasingly clear that ICT—and especially cloud computing—can help people and businesses increase energy efficiency and drive down carbon emissions.”
“Oracle helps companies and organizations sharpen their business practices and employ our industry-leading technology to increase efficiency and reduce costs. And while these bottom-line benefits are what most often inspire customers to use Oracle products, our database, middleware, applications, server, and storage technologies are also helping them meet their sustainability goals.”

—Safra Catz, President and CEO

SMART SOLUTIONS

Leading businesses recognize that environmental responsibility is good business. Well-structured environmental practices deliver triple bottom line benefits to people, planet and profits. Oracle operates our own business according to environmental best practices, and we use our own sustainability products, achieving significant benefits to our own bottom line.

Oracle's greatest positive impact is through the delivery of practical, concrete solutions that help our customers with their own sustainability initiatives.

As both a global high technology manufacturer as well as the world's leading business software vendor, Oracle is uniquely positioned to deliver these solutions, leveraging the power of hardware and software, engineered to work together. Oracle, in collaboration with our partners, provides sustainability solutions that are integrated with your core business activities across the value chain. Oracle’s sustainability-related solutions cover an unmatched breadth and depth of capability and we are continuing to invest and to innovate.

For the most complete and current information available, including case studies on how Oracle products are helping customers meet their environmental objectives, please visit this website.

SMART PRODUCTS

Oracle develops a range of software and hardware solutions that help companies better execute and measure their sustainability initiatives. Solution areas include: Risk and Performance Management, Business Operations and IT Infrastructure.

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SMART FOOTPRINT

Oracle maintains its facilities, runs its business operations, and develops products with a focus on sustainability.

Oracle reduces its environmental impact through a multi-faceted approach that includes decreasing energy and water consumption, minimizing waste and travel, adopting green procurement practices, delivering sustainable marketing events, and—most importantly—developing products that help customers achieve their sustainability goals.

Oracle’s sustainability accomplishments include the following:

- Electricity usage at Oracle headquarters in Redwood Shores, California, has dropped 31 percent over the last 10 years.
- In calendar year 2010, over 96 percent of Oracle’s worldwide green house gas (GHG) emissions resulted from purchased electricity. We therefore focus on reducing purchased electricity, which also reduces our GHG emissions, as follows:
  - 2010 Scope 1—Direct emissions from natural gas, diesel and refrigerant loss totaled 15,208 metric tons CO₂e, including 59 metric tons CO₂e from loss of refrigerant used in air conditioning.
  - 2010 Scope 2—Oracle’s indirect emissions as a result of purchased electricity were 433,523 metric tons CO₂e
  - Oracle runs its Austin datacenter cooling and power distribution systems at energy levels 60 percent lower than the industry average.
  - Oracle’s hardware manufacturing facilities are environmental management system certified.
  - Oracle received LEED-NC silver certification at its new 190,000 square foot building in Hyderabad, India.
  - Oracle employees dedicate volunteer time to more than 120 environmental projects, annually.
  - Oracle drastically reduced its travel-related footprint by requiring that, when appropriate, meetings take place using Oracle Web Conferencing.
  - At Oracle OpenWorld, 60 percent of menu ingredients are sourced from within 100 miles of the event venue.
  - Oracle develops thousands of products that help customers reduce their environmental impact.

For more information, visit our official corporate citizenship.
“Qualcomm was built on the commitment to improve the communities in which we work and live.”

—Paul Jacobs, Chairman and CEO

**Smart Solutions**

**Enabling the Smart Grid**

The Smart Grid will require ubiquitous wireless broadband communications capability, and cellular technologies provide just that. This technology provides the core communications needed for intelligent energy solutions that promise to improve the reliability, cost effectiveness and de-carbonization of the electric grid. As applications drive the value of the smart grid, cellular communications will enable such applications. Cellular networks enable widely available, secure, reliable and standards-based communication systems, which allow for the interoperability and economics of scale that the smart grid requires. Mobile networks provide real-time communications that are critical for many smart grid applications.

**Smart Grid Communication Nodes**

Qualcomm has partnered with Duke Energy, a leading U.S. utility company that chose to use 3G cellular communications as one of the primary telecommunications systems for the new smart grid network it is in the midst of deploying. That network will consist of tens of thousands of 3G-enabled communication nodes.

**Energy Management Systems**

Qualcomm has also partnered with Consert, a provider of home energy management systems. Consert empowers consumers to manage their energy usage without compromising control, comfort or convenience through the use of online lifestyle profiles and smart home device controllers. It uses cellular technology to offer a fully integrated energy-conservation solution: residential users set their energy preferences in an easy-to-use web portal, and the system takes care of the rest. By reducing ghost consumption (kilowatt usage with no consumer benefit), pilot programs demonstrated energy savings ranging from 7 percent to 54 percent, with an average savings of 17 percent.

**Electric Vehicles**

In the Electric Vehicle (EV) area, Qualcomm has partnered with ECOtality, a leader in clean electric transportation technologies. ECOtality uses existing mobile broadband networks to manage its charging station operations, transfer usage data and download firmware updates. ECOtality is also the leader of The EV Project, the largest deployment of electric-vehicle (EV) charging infrastructure in the United States. The project includes 15,000 EV charging stations across six U.S. states and Washington, D.C. Qualcomm provides comprehensive support for this initiative, including cellular technology, engineering expertise and advice on the optimal location for public chargers. We are also installing charging stations at our own facilities to accommodate our employees who drive EVs.
For more information about how Qualcomm works to enable the electric vehicle charging infrastructure, please click here.

To view a video presentation on the importance of communications in the EV ecosystem, please click here.

Smart Metering Solutions
Qualcomm has partnered with SmartSynch, an established provider of smart metering solutions that use existing cellular networks, which are already built to a massive scale and serve tens of millions of users around the country. This model allows many partners to join SmartSynch in building a complete smart grid ecosystem.

SmartSynch’s technology is changing the smart energy landscape, affording utilities the ability to communicate and interact with grid devices through the use of existing commercial cellular networks.

Smart Products
Qualcomm makes vast investments in R&D to bring smart and efficient products to the market. In the smart grid space, for example, our Gobi multi-mode technology enables anywhere, anytime connectivity to smart meters.

Qualcomm’s Snapdragon processors are a complete system of chip solutions that adapt to users’ needs to deliver a superior user experience and longer battery life. With the advanced processing power and concurrency capabilities of Snapdragon processors, you can run multiple advanced apps simultaneously with minimal drag on performance on your battery.

Qualcomm’s mirasol display solution combines best-in-class energy efficiency with substantial performance benefits. Rather than generate illumination which consumes power, the mirasol solution is a reflective technology that harnesses ambient light for the source of illumination.

This solution creates color by mimicking the phenomenon that makes a butterfly’s wings shimmer, providing a superior viewing experience even in bright sunlight.

Additionally, in 2010, Qualcomm introduced the first lead-free chip integrated circuit (IC), and, as of January 2009, all of Qualcomm’s ICs are bromine and chlorine free.

Smart Footprint
In terms of reducing its carbon footprint, Qualcomm continues to make huge strides. In 2010, Qualcomm was designated for the sixth straight year a Climate Action Leader by the state of California for voluntarily reporting its greenhouse gas (GHG) emissions. Qualcomm’s energy-efficiency efforts to date have saved 23.7 million kilowatt hours of electricity and prevented approximately 7,805 metric tons of GHG emissions per year—the equivalent of eliminating the annual emissions of 1,419 cars. Qualcomm continues to seek out new ways to minimize its energy use and environmental impact, and we are recognized every year as a result.

Because we generate carbon dioxide (CO₂) emissions primarily through energy consumption, we continue our efforts to reduce the amount of energy we use and purchase from utilities. We’ve achieved this in large part through the use of two 4.5-megawatt cogeneration turbine plants at our San Diego facilities. Powered by natural gas, these very efficient twin turbines enable us to generate some of our own electricity and release fewer pollutants. We also capture the heat the turbines generate and use it to power two large chillers in the campus air-conditioning system, thus reducing the need for electric-powered water chillers.

Green Restaurants
Qualcomm also operates six corporate cafés for the convenience of our employees. All cafés on the San Diego campus are Green Restaurant Association recognized.
Certified Green Restaurants. To achieve restaurant certification, our food services team completed a rigorous 18-step process that resulted in improved water efficiency, a comprehensive program for recycling and use of recycled materials, use of chlorine-free paper products, elimination of polystyrene foam containers and a commitment to sourcing local, sustainable and organic foods. In 2010, we took additional steps to meet Green Restaurant Certificate 4.0 standards, including the following:

- Starting a Community Supported Agriculture Program, which currently has 400 members.
- Increasing our purchases of local, organic and sustainable products.
- Switching to 100 percent toxin-free cleaning chemicals.
- Ensuring that 100 percent of all oil and grease—more than 1,000 gallons in 2010—is converted to biofuel.

Recycling and E-Waste

Each year, the San Diego Environmental Services Department recognizes the waste reduction and diversion achievements of local businesses with its Waste Reduction and Diversion Awards. In 2011, Qualcomm was honored with the Recycler of the Year Award for recycling paper, cardboard, plastic, mixed metals and more, in our San Diego offices. The Company takes great pride in this award, as it has been recognized as one of San Diego County’s recycling leaders for several years.

In 2010, Qualcomm recycled more than 244 tons of electronic waste worldwide. On a single day in January, as part of a special e-waste recycling event, employees at the Santa Clara campus turned in more than 3,300 pounds of e-waste, including 1,225 pounds of cathode ray tubes from televisions, 685 pounds of computers, 378 pounds of consumer electronics and more than 1,000 pounds of tin. Qualcomm continues to design and operate sustainable facilities as the company grows worldwide. In 2010 alone, Qualcomm’s facilities in Bangalore and Beijing were LEED certified, a distinction the company will continue to strive for as it expands to every corner of the world. The Leadership in Energy and Environment Design (LEED) Green Building Rating System is the nationally accepted benchmark for the design, construction, and operation of high performance sustainable building. LEED promotes a whole-building approach to sustainability by recognizing performance in five key areas of human and environmental health: sustainable site development, water savings, energy efficiency, materials selection, and indoor environment quality.

![Year over Year IT e-Waste Collection](image-url)
Additionally, Qualcomm has earned the distinction of LEED Gold Certification for the buildings on its W campus in San Diego.

**Responsible Supply Chain**

Qualcomm has also implemented various measures to ensure that its supply chain is both environmentally and socially responsible. Qualcomm’s CDMA Technologies (QCT) business unit works with integrated circuit (IC) manufacturing suppliers in all stages of design and development to ensure their compliance with global environmental legislation and initiatives.

Additionally, Qualcomm is striving to ensure that its supply chain is free of DRC-conflict minerals and supports industry-wide efforts to implement due diligence standards.

Please click [here](#) to read more about Qualcomm’s environmentally responsible supply chain management.
“Sustainability is transforming the business world in the 21st century. As a business software leader, we have an important role to play as this transformation unfolds. At SAP, sustainability is our overall business strategy. We are improving our own operations to be more sustainable and deliver customer solutions that can help improve sustainability on a grand scale.”

—Peter Graf, Chief Sustainability Officer, SAP

**SMART SOLUTIONS**

Our greatest potential to create positive impact lies with our customers. SAP technology enables companies around the world to turn risk into opportunities for greater efficiency, new value creation, and greater profitability. We have designed sustainability solutions that fall into five key areas: sustainability reporting and analytics, energy management, operational risk management, sustainable supply chain and products, and sustainable workforce.

Our energy and environmental resource management solutions help companies obtain more energy efficient and cleaner operations. According to our estimates, SAP energy management solutions for manufacturers are already helping customers avoid approximately 2.5 million tons of carbon emissions while saving $470 million in energy expenditures. SAP customers are deploying smart grid solutions that will help 30 million households use energy more responsibly, saving them an estimated $390 million for every percent gained in efficiency.

Managing energy efficiency starts with gaining a real-time view into energy consumption, comparing usage across enterprise operation, creating target reductions, and sending proactive alerts when there are unexpected spikes in energy use.

**SMART PRODUCTS**

The following help companies measure and manage their energy and carbon use across the enterprise and the supply chain.

**SAP Carbon Impact OnDemand**

SAP’s Carbon Impact OnDemand software enables businesses to manage carbon and energy in facilities and product lifecycle assessments. Global organizations can credibly report and profitably reduce their enterprise carbon footprint by accurately measuring and comparing carbon intensity across entire operations. SAP Carbon Impact OnDemand also enables companies to create their own carbon abatement plan, identifying the most profitable projects and mapping them to the targeted reduction.

More specifically, with **SAP Carbon Impact OnDemand**, companies can:

- Establish a credible inventory and benchmark of a company’s global environmental performance across all facilities with automated data collection from multiple sources and systems, including metering systems, utilities, on-premise SAP ERP software, and third-party applications
Quantify and compare energy and environmental intensity across operations—by process, product, and/or facilities

Achieve consistent cost savings by prioritizing optimal opportunities for energy and emissions reductions—based on financial and operational parameters

Manage performance of the entire project portfolio with detailed insight into the key performance indicators of each initiative

Accelerate achievement of internal sustainability goals by engaging the global workforce to drive changes toward a more sustainable enterprise with collaboration and rewards program tools

Monitor and benchmark enterprise performance against both internal goals and best practices

SAP BusinessObjects Sustainability Performance Management Application

SAP’s Sustainability Performance Management Application is designed to help companies track energy consumption, emissions, use of water and raw materials, worker hours and safety, and economic impacts such as community investment and purchasing of local content.

Organizations can reduce data collection costs and errors, measure and communicate performance, and set sustainability goals and objectives for the entire organization. It is the first solution of its kind to be certified by the Global Reporting Initiative (GRI), and it automates over 85 percent of quantitative GRI indicators through integration to core SAP software.

SAP Manufacturing Integration and Intelligence Application (MII)

The SAP Manufacturing Integration and Intelligence application helps customers identify and track new opportunities for energy reduction by providing real-time access to energy use data. The visibility enables performance comparison across assets, plants, regions, and business divisions. Additionally, companies can set thresholds and integrate alerts with underlying operational systems, such as plant maintenance. The combination of visibility and alerts provides the timely information required to drive down energy use.

SAP Advanced Metering Infrastructure Integration

SAP is supporting the rapid technological expansion of energy providers with the SAP Advanced Metering Infrastructure Integration for Utilities solution. SAP software and services help utility companies streamline customer meter data to make it available instantly to back-end systems for Customer relationship management, billing, and analysis.

SAP Environment, Health, and Safety Management Application

The SAP Environment, Health, and Safety Management application (SAP EHS Management) helps companies reduce costs and risks associated with environmental compliance across global operations. This includes product content regulations, such as REACH, RoHS, and WEEE (Waste Electrical and Electronic Equipment). Companies can integrate compliance checks into standard enterprise business processes. By leveraging the environmental compliance functionality of this application, companies are able to standardize compliance management across the enterprise with consistent, auditable, and transparent processes; reduce the risk of non-compliance through automated detection of exceptions, escalation processes, incident handling with corrective actions, and audit trails; enable global compliance processes addressing increasingly complex requirements.

SMART FOOTPRINT

In the last year, SAP demonstrated that strong environmental results and strong business results go hand-in-hand. SAP’s total emissions in 2010 reached a total of 425 kilotons, representing a drop of 25 percent from their peak in 2007. The emissions per SAP employee went down in 2010 by about 8 percent and per Euro of revenue by 19 percent. SAP remains on track to meet the 2011 year-end emissions target of 460
kilotons, in line with its long-term target to reduce GHG emissions to year-2000 levels by 2020.

SAP has identified five key areas for footprint reduction: electricity usage, corporate cars, business flights, and employee commuting. We continued energy efficiency projects and introduced alternative forms of employee commute. Our data centers became more energy efficient by measuring and managing the energy use of the data center on a per employee basis. We also increased the purchase of renewable energy, which helped reduce the overall footprint by 11 percent.

SAP provides quarterly updates for its sustainability performance. Greenhouse gas (GHG) emissions for the quarter ended September 30, 2011 totaled 112 kilotons (not including Sybase), a two percent increase compared to the third quarter of 2010. The company’s focused sustainability initiatives led to a cost avoidance of approximately EUR 195 million between the start of 2008 and the third quarter of 2011, in comparison to a “business as usual” extrapolation. In the third quarter of 2011 SAP also signed on to be one of the first companies who will adhere to the Corporate Value Chain (Scope 3) Standard to assess its entire value chain emissions impact. The new standard was launched by the Greenhouse Gas Protocol in partnership with the World Resources Institute (WRI) and the World Business Council for Sustainable Development (WBCSD).

Our goal is to drive our sustainability performance internally as a company and externally with our solutions to help the world run better. SAP solutions target key sustainability challenges including, lowering greenhouse gas, resource constraints (water and energy) and a sustainable supply-chain.

OTHER SMART SOLUTIONS

As market leader in enterprise application software, SAP is committed to help the world run better, and sustainability is at our core. SAP applications and services enable more than 176,000 customers to operate profitably, adapt continuously, and grow sustainably. 95 percent of companies listed in both Corporate Knights Global 100 and Dow Jones Sustainability World Index run SAP. From back office to boardroom, warehouse to storefront, desktop to mobile device—SAP empowers people and organizations to work together more efficiently and use business insight more effectively to stay ahead of the competition.

SAP solutions for sustainability help companies to align their business performance with their sustainability performance. They enable companies to proactively manage sustainability performance, automate data collection for credible reporting and improve performance by providing insight into performance and by supporting the cascading of goals across the organization.

SAP’s commitment to sustainability is woven throughout all elements of the company including the business strategy, operations and the company culture. SAP’s Chief Sustainability Officer Peter Graf reports directly into the SAP Sustainability Council, which is comprised of the SAP Management Board. This links the business strategy to the sustainability strategy and ensures that one complements the other. We monitor our commitment on a quarterly basis and align our strategy based on our sustainability performance.

The SAP sustainability report—provides detailed information about our efforts in corporate environmental, social, and economic performance, and about products and services that support sustainable operations. The report also describes how SAP solutions help our customers become more sustainable and, thereby, extend our own impact on a global scale.

SMART GRID INITIATIVE & RESEARCH

SAP has been named the 2010 Smart Grid Integrator of the Year by the readers of the New Economy—World News Media. SAP is undertaking significant research and development in smart grids and related innovative energy services. We are participating in six European and five national collaborative energy research projects. According to the SAP white paper “Smart Grids for Europe: Benefits, Challenges, and Best Practices,” pervasive application of digital information
and communication technologies can help the European Union achieve its 2020 goals of increased energy efficiency, lower carbon emissions, integration of renewables and greater energy security. According to the report, countries around the world are upgrading and digitizing their energy infrastructures, moving from centralized energy systems to a decentralized model permitting the large-scale integration of renewables and small decentralized power generation.

**Carbon Maturity Matrix**

Our SAP Carbon Impact website offers a Carbon Maturity Matrix. By taking a quick survey, any organization can evaluate how their carbon reduction plan stacks up against their peers. They will obtain easy-to-read, concise reports, scatter charts and other tools to evaluate their current carbon reduction efforts.

**SAP Environmental Policy**

Issued in July 2009, the Environmental Policy is part of SAP’s strategy to become a role model for sustainability. SAP is committed to continuously improve the company’s environmental performance and protect the environment.

**SMART MEDIA**

Video: Discovery Channel, The Green Room, Sustainability at SAP

Video: Why SAP Carbon Impact
“Energy and environmental responsibility lies at the core of the Schneider Electric culture and strategy. Sustainable development is a real and essential opportunity for mobilization, growth, and differentiation. As a pioneer in the new environmental economy, Schneider Electric did not wait for sustainable development and ecological awareness to become fashionable to take action. Every day, we prove that business, environmental, societal and social interests all converge. Consuming less, producing more effectively, improving energy efficiency and protecting the environment by offering solutions with a limited environmental footprint—all of these issues are central concerns for Schneider Electric.”

—Jean-Pascal Tricoire, President and CEO

SMART SOLUTIONS

At Schneider Electric, we are experts in Energy Management.

Efficient & Productive
- Measure and control energy, automate, provide relevant diagnosis
- Manage processes
- Make all the utilities of any infrastructure more efficient

Reliable
- Prevent from power outage & quality variance

Safe
- Protect people and assets
- Transform and distribute power safely

Green
- Make the connection of renewable energy sources easy, reliable and cost-effective

For global enterprises, Schneider Electric offers its innovative EcoStruxure solution architecture, an approach which unites its unique expertise in power, datacentres, industrial process and machines, building control, residential energy management and physical security to enable intelligent energy management solutions for those seeking to optimise energy efficiencies across multiple domains of their business. EcoStruxure relies on two main principles:

First; EcoStruxure is based on the most comprehensive portfolio of purpose specific software applications in five domains of expertise that are essential to solve the energy equation:

- **Power**—Complete power management solutions for facilities, plant and large sites operations that enable efficient, safe and reliable electrical distribution.

- **Data Centers**—APC by Schneider Electric’s award-winning InfraStruxure architecture for data centers uses a modular, scalable approach to optimise power and cooling utilization and mitigate inefficiencies from overbuilding.
Process and Machines—Automation solutions dedicated to industrial and infrastructure companies or machine builders with focus on flexibility, scalability, performance and ease of use.

Building Control—Management solutions that focus on reducing installation and operational costs while enhancing end-users’ comfort through real time temperature, lighting and shutters control.

Physical Security—Architectures include Pelco by Schneider Electric, with industry leading technology in access control, intrusion detection and video surveillance to minimize costs and efficiency losses from unplanned downtime while providing comprehensive risk analysis.

Secondly, EcoStruxure is able to connect these five domains of expertise within an open and flexible ecosystem of technology that relies on the use of IP and web services, allowing purpose specific applications to connect whenever needed, at the right level.

These systems are simplified, save money, and most importantly, reduce waste by enabling a guaranteed compatibility between the management of power, IT white space, industrial process and machines, building control, and security. Relying on a stronger and more efficient collaboration between the key stakeholders (facility and building managers, IT managers, factory supervisors and plant engineers) enables a completely integrated approach designed for the reality of the digital economy.

EcoStruxure enables enterprise wide energy management regardless of geography or complexity. Through a single pane of glass, EcoStruxure makes it possible for you to see, measure and manage energy along three principles; 1) Simplicity: This level of management is compatible across all systems through web-based interfaces you can control from anywhere and from any web-enabled device. 2) Transparency: making your energy visible, traceable and accountable from the supply plant (utility) to your plug and 3) Savings: where modular solutions allow you to scale up or down with simple scalable hardware installations; as well as video and GUI verification.

SMART PRODUCTS

The following products will help you by:

StruxureWare Integrated, management software systems that add a layer of Energy intelligence to EcoStruxure solution architecture. StruxureWare works as a central energy management system for a variety of building types such as Data Centers, Industry, Commercial Buildings and Residences. More than a BMS system, StruxureWare allows you to actually manage your energy based on the demand requirements at a given time.

StruxureWare for Data Centers: StruxureWare for Data Centers is an integrated management software suite designed to deliver the right information to the right users in real-time from an ordinary PC or remotely from your smart phone or tablet computer. Unlike other vendors who focus solely on either the Facility or the Infrastructure Operations applications, StruxureWare for Data Centers provides the expert tools that each user-type needs to manage and operate a Data Center for both high availability and energy efficiency.

StruxureWare for Data Centers management software addresses all aspects of the Data Center physical infrastructure and facility needed to maximize availability and efficiency. Key Data Center energy capacity parameters on power, cooling, space, and network as well as high level values on data center utilization can be easily managed remotely from your smart phone or tablet.

StruxureWare for Data Centers includes StruxureWare Central, Schneider Electric’s DCIM Suite combined with a robust Data Center Facility Management (DCF) Suite including StruxureWare Operations, Facility Power Management, and Facility Cooling Management.
StruxureWare Central:
This end-to-end data center infrastructure management software enables monitoring and control of power, cooling, physical threat and energy usage from the building down through IT systems and components. Offering connectivity as an open, vendor-neutral software system StruxureWare Central provides a unified view and analysis of the Data Center physical infrastructure communicating with building, power, enterprise and network management systems to ensure quality, and increase both energy and cost efficiencies throughout the enterprise.

StruxureWare Operations:
Schneider Electric’s DCIM Software Suite is a second generation DCIM framework enabling customers to gain control of their day-to-day operations where either physical or virtual capacity limitations, frequent changes and availability are ongoing challenges for data center managers.

Facility Power Monitoring:
monitors the facility and data center electrical infrastructure from the utility feed through to rack power. Core functions of this system include the ability to profile power and energy consumption and trends, characterize power quality events, and visually drill down from the overall view of the electrical network to the equipment level.

Facility Cooling Monitoring:
maintains and automates the fully integrated environmental control system for the core facility, including the thermal energy plant, with specialized monitoring of the data center chilled water sub-system, including cooling towers, chillers, pumps, and computer room and rack air handlers.

Symmetra PX250/500kW Uninterruptible Power Supplies (UPS)
This scalable, modular UPS offers ultra-high efficiency with the flattest efficiency curves available in the industry—96 percent efficiency down to 35 percent of load.

The APC Symmetra PX 250/500 kW is a world class, ultra-high efficiency power protection system designed to cost effectively provide high levels of availability while simplifying right-sizing of your data center. Symmetra PX250/500 kW is a true modular system consisting of hot-swappable dedicated and redundant power, intelligence, and battery modules that facilitate easy and efficient service. This architecture can scale power and runtime as demand grows or as higher levels of availability are required. The Symmetra PX 250/500 kW systems can scale in increments of 25 kW up to 500 kW, and four systems can be paralleled to deliver up to 2000 kW of power protection (1.5 MW with N+1 system-level redundancy).

StruxureWare for Data Centers further enhances Corporate Energy and Sustainability efforts with these additional software and services.

Environmental Sustainability Application:
by establishing and tracking your environmental footprint and communicating the results of your reduction efforts to key stakeholders. A managed, comprehensive and customized solution for collecting and reporting greenhouse gas emissions, water, waste and other environmental data.

Energy Dashboard Application:
key performance indicators and advanced analytics help you manage energy in financial terms and gain unique insight into the impacts of efficiency planning and change on your business and all energy assets.

Remote Energy Monitoring Application:
a web hosted application that allows you to understand how your organization uses energy. Armed with that understanding, you can then take steps to reduce costs through implementing conservation measures, investing in more efficient equipment, or participating in new pricing or load curtailment programs.

Remote Data Center Monitoring Services:
a remote Data Center equipment monitoring service to predict, track and remediate site problems in a timely and efficient manner. This secure service will interpret events and activate the proper response mechanism with user defined notification rules, including e-mail or a phone call.
Schneider Electric Data Center Facility Modules

Containerized Power and Cooling Modules for Data Centers—These standardized, pre-assembled and integrated data center facility power and cooling modules are at least 60 percent faster to deploy, and provide a first cost savings of 13 percent or more compared to traditional data center power and cooling infrastructure. Facility modules, also referred to in the data center industry as containerized power and cooling plants, allow data center designers to shift their thinking from a customized “construction” mentality to a standardized “site integration” mentality.

Schneider Electric has revolutionized large data center build projects with the scalable, easy-to-deploy Data Center Facility Modules. You can grow your power and cooling capacity in 500 kW increments as you need it. These pre-engineered modules can be deployed according to the data center’s specific redundancy needs.

After pioneering modularity within the data center’s traditional IT space, Schneider Electric’s data center modular approach to the facility domains of data center physical infrastructure transfers the time-intensive engineering and pretesting of facility-related data center components to the “factory,” in turn making large and mega-sized data center deployment fast and easy. Schneider Electric Facility Modules, which include a power unit and two types of cooling (water chiller or air) units, complement IT containers to give companies the complete infrastructure support they need to turn available space (e.g., former warehouses or manufacturing plants) into highly available, energy-efficient, world-class data centers in just weeks. They also can be deployed to add capacity to existing data centers. This approach speeds up deployment, lowers costs, and simplifies the build process. Schneider Electric Data Center Facility Modules represent the future of large data centers—delivered today!

EcoBreeze

Introducing the world’s only modular, indirect economizer: EcoBreeze provides indirect evaporative cooling or air-to-air heat exchange in one footprint. Right-sized cooling is made possible by individual 50 kW modules that can be grouped up to 400 kW per frame. The IT airstream is isolated from the outdoor ambient airstream. This provides flexible and cost-effective deployment since the unit uses no data center space.

Schneider Electric Trade Off Tools:
Free and online, these TradeOff Tools are simple, interactive tools, based on data and science that make it easy to vary parameters, experiment with “what if” scenarios and make tradeoffs during data center planning. Used early in the planning process, TradeOff Tools help avoid planning roadblocks by making informed and accurate decisions. TradeOff Tools help show quantifiable, tangible benefits of implementing certain technologies and justify project decisions.

Data Center Carbon Calculator:
Impact of changes in data center efficiency on energy costs and carbon footprint. Illustrate how data center changes impact carbon emissions, determine savings in electricity as PUE improves, estimate equivalent number of cars removed from road, and demonstrate 15-year cost and carbon savings.

Data Center Power Sizing Calculator:
Defines basic characteristics of a data center’s IT load such as server quantity & mix, mainframes, storage, and quantifies your PUE. This calculator also estimates data
center IT load capacity, and/or how much utility power is required to support IT load and ultimately demonstrates allocation on total power requirement.

**Data Center Growth Plan Calculator:**
Shows how uncertainty of IT growth plans impacts costs. This calculator demonstrates how scaled build out reduces data center TCO IT load profile, step size, redundancy and power & cooling architecture. This tool also allows the user to compare PUE over data center lifecycle and for the financial community to compare run-rate and cash-flow analysis further defining the impact of physical infrastructure technology and growth plan strategies on TCO.

**Data Center Capital Cost Calculator:**
Quickly set data center budget expectations (+/-20 percent) cost breakdown by subsystem or cost breakdown by type of cost (material, labor, installation). Decide priority among competing IT requirements, such as capacity, budget, growth plan, criticality or efficiency. All costs have been derived from actual configuration costs, quotes from 3rd party suppliers & partners.

**Data Center Efficiency Calculator:**
Estimate annualized data center efficiency of new or existing data center power usage effectiveness (PUE), data center infrastructure efficiency (DCiE), power consumption by subsystem, energy cost breakdown, the efficiency curve of the data center, efficiency impact of key design decisions, redundancy, cooling and power architecture, data center capacity vs. IT load (percent load on data center).

**UPS Efficiency Comparison Calculator:**
Determine the impact of UPS efficiencies on energy costs and carbon footprint. Compare efficiencies of 2 UPS systems including electricity cost and carbon footprint. Assess UPSs from list of varied UPSs (measured data) or define your own unique UPS. Demonstrate how scaling UPSs to match load impacts efficiency curve. See efficiency, electricity cost, and carbon as function of IT load.

**IT Carbon & Energy Allocation Calculator:**
Determine the impact of efficiency, load characteristics, and location on carbon and energy allocation for IT users. Assign carbon and energy costs to IT users, based on data center attributes, PUE, IT load and Location. See annual energy and carbon allocations on an IT per-server basis (servers, storage, networking, physical infrastructure) and Illustrate 15 year allocations.

**Virtualization Energy Cost Calculator:**
Determine the impact of server virtualization and data center design choices on energy and space savings. Illustrate energy savings resulting from server virtualization. Compare pre-and post-virtualization percent energy savings (Annual electric bill, Efficiency (DCiE), Space required). Demonstrate where energy savings comes from the Entire data center.

**Data Center AC vs. DC Calculator:**
Determine the impact of data center efficiency of various AC and DC power distribution architectures. Compare energy efficiency of four different power distribution architectures including Legacy 208 V AC, Best practice 208 V AC, 415 V AC, 380 V DC. Demonstrate how 415 V AC and 380 V DC have virtually same efficiency.

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**SMART FOOTPRINT**

In its own operations, Schneider Electric has implemented the following solutions to reduce its own electrical usage by 73 million kilowatt hours (saving more than $6 million), natural gas usage by 184,000 decatherms (saving more than $2.1 million), and realizing a complete payback of upgrades and projects within three years or less:

- **Square D Total Energy Control**
  Examine usage patterns and demands of all facilities of an enterprise, and prioritizes opportunities based on cost and payback.

- **Square D PowerLogic circuit monitors**
  Allow for up-to-the-minute energy usage and power quality readings, as well as long-term trending.
■ **PowerLogic ION EEM software**  
Manages operations in three areas: energy conservation, operational optimization and environmental sustainability.

■ High efficiency lighting fixtures and lighting controls from Schneider Electric’s Juno Lighting Group.

■ **Altivar variable frequency drives (VFDs)**  
Reduces the power consumption of motors used in HVAC systems and in the manufacturing processes.

Schneider Electric is currently taking further innovative actions to improve its sustainable development performance, which are divided into three segments: Planet, Profit and People.

**Planet**

- 30,000 tons of annual reduction of Schneider Electric’s carbon dioxide equivalent emissions
- Two-thirds of Schneider Electric’s product revenues to be achieved via Green Premium products
- Two-thirds of Schneider Electric’s employees to work in ISO 14001 certified sites

**Profit**

- Seven points above Schneider Electric’s annual growth should be gained by energy efficiency activities
- Ten countries set up a recovery process for SF6 gas

- 1 million households in developing countries to have access to energy via Schneider Electric solutions
- Sixty percent of Schneider Electric’s purchases to come from suppliers who support the Global Compact—launched by the United Nations to bring companies and non-governmental organizations together in order to unite the power of market with the authority of universal idea.
- Four major socially responsible investment index families select Schneider Electric

**People**

- Ten percent annual decrease in Schneider Electric’s frequency rate of occupational accidents
- Fourteen points increase in Schneider Electric’s employee recommendation score
- 2,000 of Schneider Electric’s employees to be trained on energy management solutions
- 10,000 young people in developing countries trained in the electricity professions
- 500 new entrepreneurs in developing countries set up their activities in the electricity sector

While launching these global initiatives and helping its customers work towards reduced consumption, as well as environmental and energy efficiency goals, Schneider Electric has also undertaken a comprehensive energy optimization project over the past seven years on its largest customer—itself.

Focused primarily on Schneider Electric’s North American Operating Division, the company used its own solutions within 27 of its facilities spread across the United States, Mexico and Canada. Starting out with an ambitious goal of reducing energy consumption per employee by ten percent, Schneider Electric has since achieved $8.1 million in energy savings since 2004.

These savings were realized by applying many of Schneider Electric’s Square D brand solutions, as well as those of its affiliate companies such as Juno Lighting.
Group. Schneider Electric successfully created one of the most energy efficient manufacturing companies anywhere. Additionally, the goal of reducing energy consumption per employee by ten percent by 2008 was met a full two years ahead of schedule.

**OTHER SMART SOLUTIONS**

Schneider Electric has developed the BipBop Program, a sustainable program to bring safe, clean electricity to the people who need it most worldwide. These 1.4 billion people, or 300 million households, have no access to electricity, and earn less than 2 dollars per day. With the strong willingness to involve local communities and local stakeholders in each country, the BipBop program addresses three key issues to provide sustainable access to electricity:

- The lack of appropriate equipment.
  - This is addressed through building an adequate set of offers/solutions to be a champion in the electrical distribution field.

- The lack of financial resources available for innovative energy entrepreneurs.
  - This is addressed through the creation of an investment fund to support companies dedicated to the electrical business.

- The skills and expertise shortage.
  - This is addressed through the electrical skills training and sponsorship of young people from the countries in need.

BipBop’s objectives by the end of 2011 are as follows:

- 1 million households in developing countries have access to energy, thanks to Schneider Electric solutions
- 10,000 young people in developing countries trained in the electricity field.
- 500 contractors in developing countries have set up their activities in the electricity sector.

**SMART MEDIA**

You’ll find photos and videos at these sites:

- [www.schneider-electric.us](http://www.schneider-electric.us)
- [tv.schneider-electric.com](http://tv.schneider-electric.com)
“Texas Instruments’ commitment to building a better future shapes our approach to everything we do. Throughout our company’s history, we have remained steadfast in our determination to deliver both profitability and sustainability, by being responsible in our operations and treating our customers, employees, communities and environment with respect.”

—Rich Templeton, Chairman, President and Chief Operating Officer

SMART SOLUTIONS

Energy has been at the core of TI’s innovation since the 1930s. The worldwide attention on energy efficiency provides our company with a great opportunity to shape energy technology design, reduce power consumption, and boost product longevity.

TI is developing smart solutions for an array of energy efficiency and energy-reducing innovations such as smart grids, solar energy systems and alternative transportation.

SMART GRIDS

Smart grids automatically harness and deliver power more efficiently. TI develops semiconductor solutions that significantly reduce energy by helping customers, businesses and power-supply manufacturers better monitor and manage energy demand across the grid.

Power Management

Power-management devices and digital power technologies improve the reliability of power supplies, letting our customers design systems where more energy from the power source is supplied to the product or device. These savings result in reduced cooling requirements, extended life spans, improved reliability through failure prediction, and more precise performance. TI provides various power-management design templates to make it easier and faster for customers to take energy-efficient product designs to market.

Electronics Energy Conservation

Some five percent of the electricity used by U.S. homes goes to devices that absorb and lose energy in standby mode. TI is helping reduce this waste of energy. In fact, some of our products consume as little as 500 nanoamps of current in standby mode—less than a watch battery.

Electric Motor Efficiency

TI chips decrease motor energy consumption as much as 60 percent by enabling, for example, variable speed drives and properly sized motors for a variety of applications, including heat and air conditioning systems, fans, blowers, pumps, and compressors. Aside from the tremendous energy savings, these motor drives extend product life spans and improve reliability.
Solar Energy Systems
TI’s Solar Energy Systems Lab is identifying technologies required for safety, power conversion, monitoring, and communications related to solar innovation. When combined, these technologies can reduce installation cost and complexity. These technologies also open up solar installation opportunities where the available area does not have uniform exposure to the sun. In 2010, TI’s technology enabled improvements in converting energy from the sun to stored energy in batteries, so that products like solar lanterns can provide lighting long into the night for thousands of villagers in India where nearly 400 million people lack electricity.

LED Lighting
As most of world will be illuminated by LEDs in coming years, TI’s LED Lab is investigating new technologies to drive more energy-efficient lighting options that will enable and accelerate mass-market adoption.

Alternative Transportation
TI began looking at the electric vehicle market space in 2006 and developed several e-bike applications using its existing technologies. Today, we continue to develop key technologies to improve e-bike performance and reliability. In addition to energy-saving motor solutions, TI is also looking at different technologies to extend battery life.

SMART PRODUCTS
TI chips play an important role in the more efficient generation, transmission and consumption of electricity.

Our CC430 battery-free sensors run off solar power, human body heat or vibrations. This type sensor technology helps reduce emissions and may be used in a variety of applications, including road safety. For example, by fastening a special group of sensors to a bridge, which can be powered by the vibrations caused by the cars crossing over it, the bridge could be easily monitored for potential structural problems.

SMART FOOTPRINT
For decades, TI has diligently worked to reduce our own energy consumption and invest in efficiency projects. We formed our original energy management team in 1973. In 2005, we dedicated a pool of capital funding toward energy projects and have
since implemented about 100 such projects annually, collectively saving $4 million to $5 million each year.

RFAB

In 2009, TI opened our Richardson, Texas, semiconductor fabrication facility, or RFAB, the world’s first Leadership in Energy and Environmental Design (LEED) Gold certified fab. That means the analog integrated circuits produced at RFAB will be made more efficiently than ever, with less waste and energy use. Further, the plant’s chips will enable energy harnessed from renewable sources such as the sun and wind, and a world that consumes less energy.

RFAB is the world’s first facility to use 300-mm (12-inch) silicon wafers to manufacture analog chips which allows TI to use its surface space more efficiently to produce more than twice as many chips as a 200-mm wafer. This increases TI’s analog manufacturing capacity, but is also a smart use of materials.

Energy-efficient Chillers

TI has made great strides in reducing its energy consumption with results that benefit customers, the environment and TI’s bottom line. In just five years, TI has reduced the amount of energy it takes to manufacture a chip by 39 percent. In 2010, TI’s single biggest gain in reducing energy use was made by addressing a single operating system at facilities worldwide: chillers which account for 20 percent of TI’s global energy use.

Sites worldwide took unique, tailored approaches to decreasing chiller energy use, including optimizing efficiency, replacing old components, and decreasing usage—each with substantial energy reduction and cost savings.

OTHER SMART SOLUTIONS

In 2010, Texas Instruments delivered record profit and opened three new manufacturing sites around the globe while substantially growing our business. We are expanding responsibly by considering the needs of our employees and communities, conserving resources, and limiting our impact on the environment.

Among our many successes, we:

- Opened Kilby Labs India to foster innovations in energy efficiency, bio-electronics and life sciences;
- Reduce water required per chip by 45 percent; and
- Recycled 95 percent of our waste;

Our continued improvements in operations will be guided by multi-year sustainability goals that we have set and reported for the first time. Over the next five years, we aim to design, market and manufacture our products to:

- Reduce energy required per chip by 45 percent;
- Reduce purchased water required per chip by 45 percent; and
- Reduce greenhouse gas emissions per chip by 30 percent.

SMART MEDIA

Kilby Labs/Kilby Center

Richardson Fab Exterior
The idea that broadband and information technologies boost economic productivity is well understood and accepted. Equally well documented is that broadband and information technology also have transformed the relationship between economic production and energy consumption. The American Council for an Energy Efficient Economy calculated that “for every extra kilowatt-hour of electricity consumed by information and communications technology (ICT), the U.S. economy’s energy savings has increased 10 times” in the last 20 years.

In its 2008 U.S. addendum to the SMART2020 Report commissioned by the Global eSustainability Initiative (GeSI) and The Climate Group, the Boston Consulting Group calculated that the concerted application of broadband and IT in four areas could result in energy savings to the U.S. economy of $240b in 10 years, or a reduction of 36 percent in imported oil:

- **Smart Power Grids**—Smart power grids involve putting a two-way communications network overlay on top of the electric grid to improve transmission efficiency, better enable bringing renewable energy sources onto the grid, and enable better real-time management of electricity consumption. Verizon is using its wireless and wireline networks and know-how to support the deployment of smart meters, sensors and secure control systems for electricity distribution grids.

- **Smart Transportation**—This refers to employing intelligent transportation systems and fleet management systems and building the infrastructure to support plug-in hybrid vehicles. Verizon is building on its machine-to-machine communications and cloud computing capabilities to develop smart transportation solutions, including the communications infrastructure for electric vehicle charging stations.

- **Smart Buildings**—Creating a smart building infrastructure means putting intelligence and broadband capability into homes, commercial buildings, and factories to improve the ability to manage their energy consumption. Verizon is

“At Verizon, we’re focused on finding practical and innovative ways to reduce the environmental impact of our global operations. But while we’re proud of all the ways we’ve made our company’s operations more efficient, we believe our greatest contribution to the environment is our technology. Our broadband and wireless networks are the backbone on which energy-saving services such as smart power grids, smart buildings, smart transportation and remote home energy management are built.”

—Jim Gowen, Verizon Chief Sustainability Officer and Vice President-Supply Chain Operations
building on its strength as a cloud computing services provider and as a broadband wireless, smart-phone and Internet service provider and the nearly 10 million home area networks installed by its customers to offer home energy management and other “smart-building” services.

**Travel Substitution**—This refers to using broadband and related information technology for telework, flexible work schedules and virtual meetings, thereby reducing the need for physical travel by road or air. Verizon’s wireline and wireless broadband networks, smart phones and tablet offerings enable people everywhere to work from remote locations, and Verizon services like TelePresence video conferencing offer a good alternative to using air travel to attend business meetings.

### SMART PRODUCTS

TV set-tops are one example of a “smart product” Verizon has brought to market. Verizon began introducing **green TV set-top boxes** in 2010. These use 30 percent less energy than traditional set-top boxes, but perhaps more significant than our current performance is our future direction for TV set-tops and video delivery.

Verizon and other video providers are currently working towards alternative methods for delivering video that will reduce the number of traditional set-top boxes (STBs) required by the typical household, if not eliminate them altogether. And our work is already paying off. For example, Verizon was the first significant video provider to offer whole-home
DVR service, which enables a standard STB in one room to access the recordings on a DVR in a different room. This reduces the need for subscribers to employ multiple DVRs (with their relatively higher energy usage) in their homes.

Verizon is currently testing a new software upgrade which will induce a power-saving sleep mode for multiple types of our STBs. In addition to reducing energy usage on millions of devices, this change will allow our Motorola 7100 P2 STBs to become Tier 3 ENERGY STAR certified, and is expected in the first quarter of 2012.

We are also working with consumer electronics manufacturers and other vendors to provide access to our FiOS TV service without the need for traditional STBs. In some cases this takes the form of game consoles, television sets, tablets, computers or other equipment performing the functions that today are commonly handled by dedicated STBs. Verizon has recently announced a partnership to deliver FiOS TV programming via X-Box game machines, for instance. In other cases, this could mean the use of video servers within the home capable of supplying video to multiple devices or the increased use of network-based functionality—all with less energy usage.

Another example of a “smart product” is the world’s first certified carbon-free smartphone—the Motorola Citrus—which Verizon began selling in 2010. The Citrus includes these features and specifications:

- Easy-to-use, on-screen QWERTY keyboard (available in landscape and portrait modes) for quick messaging
- Full HTML Web browser—Preloaded with Bing Search and Bing Maps and delivers a PC-like Web browsing experience with quick access to Web apps and services such as Facebook; Google services such as Gmail, Google Talk and YouTube
- Equipped with BACKTRACK, a touch panel located on the back of the device that enables users to navigate and scroll through websites, home screens, e-mails, music and more without obstructing the display
- Full capacitive touch screen display delivers fluid flick, swipe and pinch-to-zoom navigation
- Seven home screen panels that can be tailored with an array of available shortcuts; applications; and pre-loaded widgets such as sticky notes, weather, messages and calendar
- Android Market—Choose from thousands of downloadable apps, many of which are free
- CITRUS has a housing made from 25 percent post-consumer recycled plastic, is certified CarbonFree through an alliance with Carbonfund.org, and is PVC and BFR free. The packaging is made from 80 percent post-consumer recycled paper. The user manual is made using 100 percent recycled paper and soy-based ink.

SMART FOOTPRINT

When Verizon created the position of Chief Sustainability Officer in 2009, it was one of just 18 publicly-traded companies in the U.S. to have the CSO title in the Corporate Suite.

A lot has happened since then. In the two years since Verizon created its CSO office, the company has formed a team dedicated to sustainability. The team held its first electronics recycling event in Texas. This popular program is now held several times a year at Verizon offices and facilities across the country and has collected more than 500,000 pounds of used electronics and other recyclable materials from employees and communities. The Verizon Green Team, a group of employee volunteers passionate about environmental issues, was formed in early 2010 to help lead our sustainability initiatives around the world and now boasts nearly 6,000 members.

Measuring and Reducing Verizon’s Impact on the Environment

Verizon has been tracking its energy usage and efficiency since 2001. To gauge our performance, we’ve annually calculated and reported a standard
carbon-intensity figure—the ratio of our greenhouse gas emissions, or CO₂, per million dollars in revenue. But Verizon has found this traditional metric to be only marginally useful in tracking our progress, because it does not account for efficiency improvements that accompany growth in wireless, data and video services.

Therefore, in 2010, Verizon developed a new metric that shows the carbon emissions that result from moving a terabyte of information across our networks. In this way, we now can adequately assess how we are becoming more energy efficient, even as our business expands.

- Efficiency is improved by reducing the absolute amount of energy and by moving more information with the same unit of energy.
- Using this new measure, Verizon was able to document that it improved its carbon efficiency by more than 15 percent in 2010 versus 2009, and it is working to achieve another 15 percent year-over-year carbon efficiency improvement in 2011.
- Going forward, Verizon intends to report our carbon-intensity efficiency results every year in addition to energy usage and CO₂ emissions.

Cleaner Fleets

On April 1, 2011, Verizon showcased some of the newest energy-efficient additions to its motor vehicle fleet at an event attended by President Barack Obama. Verizon, which has one of the largest private fleets in the United States, was among five companies recognized by the President for adding substantive numbers of green vehicles.

Verizon displayed three of its latest energy-efficient vehicles at the event: a hybrid Chevrolet pick-up, an all-electric Chevrolet Volt and a first-of-its-kind hybrid aerial-splicing vehicle.

Over the past few years, Verizon has added hundreds of hybrid Toyota Priuses, as well as more than 500 compressed natural gas vans and 700 hybrid pickups.

Verizon is the first communications company to engineer and deploy a hybrid fiber splicing unit. Because of their weight, these vehicles (commonly known as “bucket trucks”) traditionally consume significant amounts of fuel. To reduce fuel consumption, the company incorporated a hybrid engine and innovative, onboard batteries that assist in the vehicles’ acceleration, and power the bucket lift and lighting units.
Verizon was also the first company in the nation to deploy hybrid pickup trucks on a large scale, in a commercial setting. Last year, Verizon deployed more than 700 of these vehicles—which improve fuel efficiency by 50 percent and reduce carbon dioxide by 43 percent—and plans to purchase up to 300 additional units in 2011.

The company also added several new all-electric Chevrolet Volts to its fleet in 2011. The Volts can travel up to 350 miles on a single charge.

Verizon has implemented other environmentally friendly programs in its fleet operations, including an energy-saving initiative that requires drivers to turn off vehicles instead of letting them idle. This program saved 1.7 million gallons of fuel in a single year, equivalent to eliminating more than 33 million pounds of CO$_2$.

Verizon’s “telematics” program leverages the company’s wireless LTE network to integrate fleet global positioning systems and on-board diagnostic data to monitor and further minimize fuel consumption, speeding and poor driver habits that contribute to energy waste and consumption.

Verizon now has nearly 2,000 alternative-fuel vehicles in its fleet, and plans to have up to 15 percent of the fleet operating with alternative fuels by 2015.

**Making Our Buildings Greener**

**Retail Stores**

In October 2010, Verizon Wireless was accepted into the U.S. Green Building Council’s Leadership in Energy and Environmental Design (LEED) Volume Program.

- Thirty-two Verizon Wireless stores have earned LEED certification.
- LEED certification indicates a building was designed and built to ensure energy savings, water efficiency, CO$_2$ emissions reduction, improved indoor environmental quality and effective stewardship of resources.
- Certification of these 32 stores is equivalent to diverting 763 tons of construction waste away from landfills, reducing water consumption by an estimated 864,000 gallons per year and saving an estimated 386,000 kilowatt hours of electricity per year.

Verizon Wireless has received the Environmental Protection Agency’s (EPA) ENERGY STAR® certification for upgrading 85 of its retail stores, earning the designation as an EPA Energy Star Partner.

**Data Centers**

Verizon tested a new system for regulating the temperature in three data centers during 2010. The new system uses sensors, wireless controllers and software to ensure optimum equipment cooling. Results from the trials suggest the new design can reduce energy consumption from 5 percent to 9 percent. Plans are to expand the new system to 23 additional data centers in 2011, which projects to a savings of approximately 42 million kilowatt hours at full implementation.

**Smart Buildings**

In 2010 we conducted trials of four different “smart” building systems at 16 Verizon locations. The result was a 26.7 million kilowatt hour reduction in energy usage and a savings of $2.1 million, projected annually. The “smart” building program expanded to a total of 250 buildings in 2011.

**OTHER SMART SOLUTIONS**

Verizon understands that its environmental footprint is significant. It takes a lot of energy to run networks that span the globe and serve hundreds of millions of customers. Verizon has operations in more than 150 countries, which include more than 31,000 facilities, more than 200 data centers in 22 countries, 42,000 cell sites and a fleet of more than 39,000 vehicles. The company used 10.3B kWh of electricity in 2010 to operate its networks and buildings.
But the scope of our operations is matched by our commitment to sustainability. Verizon’s Sustainability Team, led by our Chief Sustainability Officer, is responsible for implementing a comprehensive plan to increase our energy efficiency and reduce our environmental impact.

**SMART MEDIA**

See these clips from VZ Green TV and YouTube:

- **Verizon’s Jim Gowen on Alternative Fuel Vehicles**
- **Interview with Verizon CEO Ivan Seidenberg**
- **Business Roundtable Sustainability Report 2010**—featuring BRT Chairman Ivan Seidenberg
- **Verizon’s Jim Gowen at Digital Home Summit 2011**
- **Verizon Smart Home Makes Mom’s Life Easy**
- **Verizon and the “Power of Plus”**—Multiple videos and case studies