

## **Green Meets Telecom: Carrier Initiatives For A Greener Tomorrow and What Vendors Can Do to Help**

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Green technology has already intersected telecom technology in a big way. But we're still in the first inning of what looks like a long ball game. And just to make it more interesting, no one's quite sure what the rules are yet.

Greening information and communications technology (ICT) networks have been driven by the reduction of energy consumption, decrease in operating costs, greater efficiency of organization and network infrastructure, and better equipment. According to Gartner Inc., a worldwide information technology research and advisory company, as of 2007, 2% of global carbon dioxide (CO<sub>2</sub>) emissions are attributed to the ICT industry.

According to the Environmental Protection Agency, CO<sub>2</sub> is the largest contributor to greenhouse gas (GHG). Since the Industrial Revolution, global atmospheric concentrations of CO<sub>2</sub> have increased by 35%.

CO<sub>2</sub> is a gas that occurs naturally, of course, but it can also be the result of human activities such as burning coal, oil, and gas as well as deforestation.

Global e-Sustainability Initiative's (GeSI) *SMART 2020 Report* (June 2008), estimated that by 2020, ICT emissions will account for 2.8% of the global CO<sub>2</sub> emissions. But it also said the ICT sector could cut its annual emissions in the U.S. by up to 22% by the year 2020.

In addition to helping other industries reduce their emissions (for example, telecommuting reduces travel and e-services reduce paper consumption), the ICT industry is implementing strategies to reduce its own emissions and contribute to a more sustainable planet.

ABI Research, a company specializing in quantitative forecasting and trends analysis, conducted a study to see which North American wireless carriers are leading the charge in sustainable actions, initiatives, and goals.

Based on a number of criteria including network infrastructure, equipment, recycling programs, and corporate social responsibility (CSR), it ranked the top ten greenest carriers on the North American continent. They are:

1. AT&T
2. Sprint Nextel Corporation
3. Verizon Wireless: USA
4. T-Mobile: USA
5. Telus
6. Rogers Wireless
7. Bell Mobility: Canada
8. Metro PCS
9. Leap Wireless
10. US Cellular

Let's take a look at the top three carriers and examine their green actions and goals (a matrix comparing the green measures of the three carriers is provided in Appendix A: Carrier Comparison Matrix).

## **AT&T**

### General Goals and Initiatives

According to the AT&T corporate website, AT&T's Citizenship and Sustainability Initiative consists of carbon reduction, green innovation, research and development based on green goals, a device and accessory recycling program called Reuse and Recycle, and their newest release of an eco-friendly phone charger called the Zero-Charger. AT&T analyzed their GHG emissions and put them into three categories:

- **Direct:** Sources include ground fleet vehicles and generators that power the network.
- **Indirect:** Sources include steam used to heat various AT&T facilities and electricity purchased to power the network and operations within the company.
- **Other:** Sources include business travel, employee commutes, company product use, and vendor and supplier impacts.

### Alternative Energy Utilization

In response to this analysis, AT&T is focusing on alternative energy for vehicles and generators. In fact, there are now 2,000 alternative-fuel vehicles and 1,500 Compressed Natural Gas vehicles in AT&T's ground fleet, with 15,000 projected by 2019.

Although the ground fleet is the largest contributor to AT&T's GHG emissions, AT&T is also researching alternatives for powering generators, focusing largely on backup generators for emergency services. AT&T is working toward improving associated energy consumption by making systems more efficient and utilizing renewable energy resources.

Since 2008, AT&T has been purchasing wind power for 10% of the electricity consumed in all Austin, Texas AT&T facilities. This effort has reduced fossil-generated electricity by 7.2 million kilowatt hours (kWh) each year.

In 2009, the company completed a large-scale solar power plant at its Secaucus, New Jersey campus. The 841-kW system will produce 1 million kWh of electricity per year. Due to the success of these alternative energy power plants, AT&T has formed a National Solar Initiative and will install more solar energy collection systems starting this year. And according to Beth Shiroishi, AT&T's Associate Vice President of Corporate Citizenship and Sustainability, the carrier now has 100 cell sites with hydrogen fuel cell powered back-up generators and another 180 on the drawing board (Hill, 2010).

### Network and Company Operations

AT&T is creating and enacting mitigating measures within network software,

hardware, and infrastructure as well as company facilities.

For example, AT&T Telepresence Solution allows people to hold “in-person” meetings while in different locations via AT&T’s VPN Network. AT&T has also implemented a power-down software for 14,000 cell sites which turn-off radios during maintenance times to eliminate wasted energy when not on-air.

In addition, upgrades (such as the replacement of tower light controllers and incandescent bulbs with LED lights) are being implemented. And economizers are being installed at numerous cell sites to take advantage of natural ventilation and reduce reliance on mechanical heating ventilation and air conditioning (HVAC) systems. AT&T is also updating its central office switches to reduce electricity and HVAC demands.

AT&T is also updating its data centers to increase energy efficiency.

Their strategy includes equipment consolidation, technology optimization, application rationalization, supplier/partner integration, and industry and government collaboration.

#### Outreach and Partnerships

AT&T has become a partner and/or member in various collaborations aimed at helping make the telecommunications industry more sustainable. In 2009, AT&T announced their AT&T Business Sustainability Advisory Council. This group is dedicated to informing the company about links between information and communication technology as well as educating the customers on minimizing the environmental impacts of their business operations. The council will produce case studies to help business customers minimize GHG emissions associated with their ICT systems.

The company is a member and its representative is the Chairman of the Board of Directors of the Alliance for Telecommunication Industry Solutions (ATIS), a North American telecommunications standards development organization. It has helped create a methodology for measuring and reporting the energy efficiency of telecommunications equipment. The Telecommunications Energy Efficiency committee of ATIS, created a set of standards in 2009 for servers and transport, router and Ethernet switch products. According to the AT&T website, the American National Standards Institute (ANSI) has approved the standards and the company has incorporated such energy efficiency requirements into its network equipment power, grounding, and site design.

AT&T has also joined the U.S. Department of Energy’s (DOE) Save Energy Now LEADER<sup>®</sup> Initiative. A national public-private initiative, Save Energy Now LEADER<sup>®</sup> is focused on motivating immense reductions of energy intensity and carbon emissions across the U.S. industrial sector. Partners in this program pledge to reduce their energy intensity by 25% or more by 2019.

Engaging employees is also a part of AT&T’s sustainability commitment. Such programs as AT&T Cares, which allows employees and retirees to volunteer for environmental causes, and the AT&T Ecosystem Site, which is a web-based educational resource for employees, are facilitating the sustainability

goals of the company.

Finally, AT&T's inventory of current emissions and its creation of new metrics for measuring GHG emissions may be among its most notable achievements.

## **Sprint Nextel Corporation**

### General Goals and Initiatives

Sprint's Corporate Responsibility, according to its corporate website, includes a variety of initiatives and programs which include GHG emissions reduction, alternative energy utilization, equipment recycling plus operational measures such as e-billing and waste reduction. They've developed a number of environmental objectives to ensure that their vision and mission is achieved.

Sprint has focused its initiatives on climate change, natural resource utilization, e-waste management, environmentally-sound supply chain, green building, regulatory compliance and employee engagement.

Similar to AT&T, Sprint has taken on the responsibility of educating its employees, encouraging them to carry out daily sustainable measures that benefit the company *and* increase green awareness in the employees' personal lives.

Sprint has published a number of long-term goals that they hope to meet by 2017. They include:

- Reducing GHG emissions by 15%
- Obtaining 10% of their power from renewable resources
- Recycling 50% of operational waste from commercial facilities
- Reusing or recycling 95% of the network and IT e-waste
- 90% of Sprint suppliers complying with the Sprint's environmental standards
- 90% device collection rate (total number of devices collected divided by total number of devices sold)

### Alternative Energy Utilization

The majority of Sprint GHG emissions are attributed to the energy used for facilities and the network. Active mitigation measures and initiatives include large purchases of renewable energy, investment in alternative energy research, and the development of energy conservation programs.

Sprint estimates that 80% of its energy consumption is related to powering the network. In order to improve its network energy efficiency, Sprint is looking at ways to become more efficient and to utilize renewable resources for power. Its renewable endeavors include solar, wind, hydrogen, and geothermal power. Sprint has been researching wind power since 2004 and purchasing Green-e wind energy certificates for one of its Overland Park, Kansas headquarter buildings. In 2006, they expanded their wind power use by entering into a five-year agreement with Kansas City Power and Light (KCP&L), facilitating the construction of the Spearville Wind Farm. As part of the agreement, Sprint is purchasing 87 million kWh per year for its 200-acre Overland Park headquarters from KCP&L via the Spearville Wind Farm. This

has provided for 80% of the Overland Park campus energy needs. With the help of these measures, Sprint currently ranks as one of the top 25 purchasers of green power in the EPA Green Power Partnership Fortune 500 Register.

Having back-up emergency power sources is one of the most important elements in a successful, dependable network. Providing back-up power in a sustainable way is preferable. Sprint boasts more than 250 cell sites utilizing hydrogen fuel cell systems to power back-up generators. Furthermore, Sprint is looking to use renewable energy to power cell sites for daily use. In California and New York, Sprint has installed solar panels on a number of sites that use solar power during the day and commercial power at night.

Sprint has partnered with the DOE and two national labs to research energy storage and photovoltaic (PV) panels. One of the most notable achievements in Sprint's commitment to a cleaner environment is the \$7.3 million grant awarded to them by the DOE for the expansion of their hydrogen fuel cell deployment.

This will facilitate storage capabilities and provide 72 hours of back-up power to cell sites. The back-up power is intended to be completely unassisted by commercial utilities, using power generated solely by hydrogen fuel cells.

#### Network and Company Operations

Taking a holistic approach to greening the ICT industry, Sprint includes Information Technology (IT) in its greening efforts. Green IT includes hardware, software, power management, virtualization, and recycling practices. IT simplicity is also one of Sprint's strategies. Reducing complexity within the network includes identifying, consolidating, and removing redundant or unused applications as well as simplifying the support infrastructure, hardware, and software. This will increase the energy efficiency of the network and eliminate excess equipment. Recently, Sprint decommissioned 3,850 old servers which increased efficiency and decreased GHG emissions. According to the Sprint website, this saved 20,355 metric tons of GHG emissions (comparable to taking 3,200 cars off the road).

To improve sustainability Sprint has developed an energy management program that audits all the company's enterprise real estate facilities for energy efficiency and puts measures into place to reduce energy use. Implementations include installing building automation systems, web-based meter-information systems, and demand-response capabilities.

Sprint is also implementing other measures in its corporate buildings. The United States Green Building Council (USGBC) has awarded LEED Certification to two buildings on their Overland Park headquarter campus. LEED Certification requires a whole-building approach to sustainability including design, construction, and operating performance. The LEED evaluation starts at ground-breaking and continues through building maintenance and operations.

In 2009 Sprint was awarded LEED Certification in one of its San Francisco retail stores, which made them the first wireless carrier to achieve that goal. This store has been used as a model, and various LEED standards have been

implemented in 500 newly-updated Sprint stores.

Sprint has also adopted energy strategies provided by ENERGY STAR. ENERGY STAR, a joint program of the EPA and the DOE, focuses on saving money and protecting the environment through energy efficient products and practices. In 2009, Sprint was awarded the ENERGY STAR Rating at one of its Overland Park, Kansas, retail stores.

To further fulfill the holistic approach, Sprint is evaluating the sustainability of its vendors. The company has provided vendors with guidelines for improving the life cycle of new devices and requirements for manufacturers to help meet Sprint's 2017 goals. Should a vendor not be able to meet the Sprint requirements, it must provide an exemption waiver.

Realizing that consumer products also have an environmental impact, Sprint has implemented improved strategies for phone and accessory production, performance, packaging, recycling, and service solutions. These methods include using the most environmentally sustainable manufacturing processes for products, making them easily upgradeable and extending the average device life to lessen waste.

Moreover, the products should be made with the least hazardous materials and should use minimal energy or be completely self-charging. Customers who want to purchase the greenest products the company has to offer can search the Sprint website for the meaning of various sustainability symbols found on Sprint products.

Sprint eco-friendly phones include the Samsung Reclaim, LG Remark, and the Samsung Restore. Sprint customers can get the SOLIO Mono Charger which charges phones via tiny solar panels or by traditional electricity. Sprint accessories also include carrying cases such as the Nite Ize Carry Case, which is made from 100% recycled plastic water bottles.

### Outreach and Partnerships

Recycling is where Sprint strongly encourages the end-user to take action. The company has created the Re:Cycle program, which helps decrease the amount of equipment going into landfills. Sprint boasts that 90% of its products get recycled or reused, which not only reduces landfill waste and mitigates GHG emissions, air and water pollution. Sprint tries to make this initiative as easy and appealing as possible by offering a buyback program for old devices and allowing any device -- regardless of the carrier or condition -- to be recycled at any Sprint retail store.

Sprint has become a member of the EPA's Climate Leaders Program, an industry-government partnership focused on developing long-term comprehensive corporate climate change strategies. Sprint is also a participant in the Carbon Disclosure Program (CDP), which encourages companies to report GHG emissions and disclose climate change risks and opportunities to investors.

Sprint is also a partner in various corporate responsibility organizations such as the Boston College Center for Corporate Citizenship and the EPA's Plug-In to eCycling and Waste Wise programs.

Sprint was ranked 15th in a 2009 Newsweek poll of the greenest U.S. companies. They were evaluated on their environmental impacts, green policies, industry reputation among peers, and environmental experts.

Sprint knows that its 2017 goals will not be accomplished without the support of the vendors and the consumers, so education and outreach are a vital part of Sprint's commitment to environmental responsibility. Education, it believes, is key for employees and consumers. The company's on-going commitment to sustainability includes employee training programs and their Green Microsite, a website dedicated to Sprint's green achievements, facts, figures, and tips for the public to become more environmentally friendly.

## **Verizon Wireless**

### General Goals and Initiatives

Verizon Wireless' initiatives towards a greener and cleaner tomorrow include a phone recycling program, paperless billing, solar powered cell sites, energy efficiency in stores and corporate buildings, energy saving technologies, and products and services that increase sustainability.

### Alternative Energy Utilization

In 2008, the federal government gave Verizon the ENERGY STAR Award in part for operating the largest fuel cell facility of its kind in the nation. The facility uses seven cells to help reduce dependence on commercial electricity and provides back-up power in the event of a natural disaster or power outage. Each fuel cell can produce 200 kW of electrical power per hour, enough to supply the energy needs of nearly 400 single-family households. Verizon also has smaller scale fuel cell sites to provide back-up power to telephone switching offices in Missouri, Texas, Washington, and New York. In addition, Verizon currently has 20 solar cell sites active in the western United States and uses alternative energy to power vehicles in its fleet. The company plans to add 1,600 alternative-fuel vehicles in 2010, and forecasts a total of 15,000 in the next ten years.

### Network and Company Operations

Like AT&T and Sprint, Verizon is implementing better IT practices.

They've developed software solutions such as BigFix, which minimizes power usage from company-owned workstations by putting PCs in sleep mode when they're not being used. This and other software technology has resulted in a 24% reduction in personal computer power consumption and CO2 emissions.

Verizon has also created a virtual technology termed "Thin Client", which allows users to access centrally-stored programs and software. This has reduced the impact on 17 of the company's 33 call centers by minimizing network operations and equipment requirements, reducing cooling costs and power consumption and extending the lifespan of the equipment, and ultimately reducing carbon footprints and waste.

Verizon requires that all new network equipment be 20% more efficient than

its predecessor.

Finally, Verizon is performing audits on its cell sites and is working toward improving energy efficiency.

Verizon's has also greened its retail stores and corporate buildings. Sixty-one retail stores in the U.S. that have earned the ENERGY STAR Rating and two stores are LEED Gold Certified for Commercial Interiors (LEED-CI). Additionally, the company's headquarters in Basking Ridge, New Jersey achieved LEED Certification.

Elements that helped these achievements include energy efficient lighting and HVAC systems, energy management and monitoring systems, recycled content products and eco-friendly finishes, low-flow plumbing fixtures, ENERGY STAR Rated equipment, and waste reduction methods.

Verizon is building new data centers that include green building measures and updating their network infrastructure to be more efficient.

Verizon and Motorola have partnered to improve the FiOS TV set-top box, which will use significantly less energy. The device will be packaged in 75% recycled cardboard and will be 100% recyclable. Additionally, Verizon has started working with suppliers to perform lifecycle analyses of their products to encourage waste reduction and increase product durability.

### Outreach and Partnerships

Verizon's HopeLine® program recycles old phones and accessories by allowing customers to bring them to any retail store or by sending them to Verizon via paid postage label. The phones are either refurbished for reuse or recycled with a zero-landfill method. According to the Verizon website, for every 5,000 phones that are recycled, 11,000 kWh of energy are saved.

In 2009, Verizon appointed its first Chief Sustainability Officer who built a sustainability team that is focused on increasing energy efficiency within the company and developing a methodology to measure and report sustainability performance.

The company is also teaming up with public works departments and utility companies across the country to develop programs designed to increase public awareness and reduce energy consumption. Currently, the company is partnering with Consert, IBM and the Fayetteville Public Works Commission (FPWC) to deploy a "smart grid" pilot program. This "smart grid" program allows commercial and residential participants to use an internet-based program to place daily use profiles, monitor energy consumption, set target monthly billing amounts, and allow FPWC to cycle their appliances off during peak times. So far, the results show that customers can reduce their energy use by 15% through monitoring alone. Verizon's public outreach, such as the FPWC "smart grid" program, can increase sustainability through education, encouraging customers to become more environmentally-aware.

### **How Vendors Can Help**

We all live in a world of information and communication. So who better to

greening the ICT industry than wireless carriers themselves? All they need to do is embrace the power they already have to create awareness and encourage sustainable actions.

Instead of merely advertising prices and devices, carriers should advertise their green initiatives and the results. This will encourage consumers to take ownership and engage in strategies for a cleaner tomorrow.

In the spirit of Sprint's vendor sustainability requirements, businesses associated with the ICT industry should also take part in the effort. Everyone from manufacturers to site acquisition firms can play a role. Initiatives can include creating a greener workplace when it comes to design, construction, and the wellbeing of employees. Vendors can also implement waste reduction measures that promote the use of recycled office products such as document paper, ink, paper goods (if necessary), toilet paper, and furniture.

Companies can offer telecommuting options for their employees and offer eservices — such as e-billing, e-ordering, and digital exchange of information — to their clients. Carbon footprints can be greatly reduced by performing energy audits for company operations, installing ENERGY STAR Rated products and turning off unused machines, computers, and lights. Monitoring systems can power down unused devices and motion detectors can shut off lights.

Designing for the greatest efficiency is one of the most important initiatives for those in every fact of the wireless business. This will save the carrier money due to the amount of minimized material *and* reduce power consumption. Implementation of high efficiency equipment as well as heating and cooling systems can also reduce energy use.

For vendors who work with product design, site design, and/or contracts, paper reduction can have a large impact. Documents can be printed double-sided with minimal margins maximizing the use of each piece of paper, and businesses can increase paper recycling. Drafts of plans can be printed on smaller paper size and with minimal copies. It has even been suggested that vendors talk to jurisdictions that require large amounts of full size plans to see if the requirement can be reduced and if initial plan submittals can occur electronically.

For the ICT industry to succeed environmentally, it will take more than just a few actions. From the equipment to the software, employees to consumers, greening telecom is a comprehensive undertaking. With continued efforts and innovation from the carriers, environmentally sound manufacturing, vendor support, and consumer dedication, the telecommunications industry can truly become a sustainable one.

**Appendix A: Carrier Comparison Matrix**

Carrier	General Goals and Initiatives	Alternative Energy	Operations/Network	Education	Other
AT&T	<p><b>Citizenship and Sustainability</b></p> <ul style="list-style-type: none"> <li>• Carbon Reduction                             <ul style="list-style-type: none"> <li>▪ Network/Data Centers</li> <li>▪ Vehicle Fleets</li> <li>▪ Alternative Energy</li> </ul> </li> <li>• Green Innovation/ICT Solutions</li> <li>• Recycling Programs/Waste Management</li> <li>• GHG Inventory and Monitoring</li> <li>• Industry and Government Collaboration</li> <li>• Employee Engagement</li> <li>• Paperless Billing</li> <li>• Eco-friendly Charger</li> </ul>	<ul style="list-style-type: none"> <li>• Use of alternative energy for corporate facilities and back-up generators</li> <li>• 2 Solar Power Plants:                             <ul style="list-style-type: none"> <li>▪ San Ramon, CA</li> <li>▪ Secaucus, NJ</li> </ul> </li> <li>• 2008: Began buying wind power for 10% of electricity use in Austin, TX corporate facilities</li> <li>• Currently 100 sites using hydrogen fuel cell powered back-up generators, 180 more sites planned</li> </ul>	<ul style="list-style-type: none"> <li>• AT&amp;T Telepresence<sup>SM</sup></li> <li>• Created power-down software feature that takes radios out of service during maintenance windows</li> <li>• Testing HVAC economizers on 40 sites to reduce energy use</li> <li>• Installed light sensors and control systems in corporate facilities</li> <li>• Reduce energy consumption for Central Office Switches</li> <li>• Lights Out Program: business practice for reducing building electrical load by turning down/off unused network equipment</li> <li>• 2009: Replaced tower light controllers and incandescent bulbs with LEDs on 207 cell sites</li> <li>• Data Center Energy Efficiency and Sustainability                             <ul style="list-style-type: none"> <li>▪ Expected reduction of 69,231 metric tons of CO<sub>2</sub> emission</li> </ul> </li> </ul>	<ul style="list-style-type: none"> <li>• Employee website focused on environmentally sustainable efforts and tips</li> <li>• Encouragement of employee volunteerism and outreach for environmental causes                             <ul style="list-style-type: none"> <li>▪ AT&amp;T Cares</li> </ul> </li> </ul>	<ul style="list-style-type: none"> <li>• Member of the Department of Energy Save Leaders Now Initiative</li> <li>• Created National Solar Initiative</li> <li>• Recycling program: Reuse and Recycle</li> <li>• Current commercial vehicle fleet:                             <ul style="list-style-type: none"> <li>▪ 2,000 powered by alternative energy</li> <li>▪ 1,500 powered by compressed natural gas</li> <li>▪ 2019 Goal: 15,000 alternative energy/compressed natural gas vehicles in fleet</li> </ul> </li> <li>• Green Grid participant: global consortium dedicated to advancing energy efficiency in data centers and business computing ecosystems</li> <li>• Assisted in creation of ENERGY STAR Data Center Infrastructure Rating</li> <li>• Member and Chairmen of the Board of Directors for the Alliance for telecommunications Industry Solutions (ATIS)</li> <li>• Enacted AT&amp;T Corporate Business Sustainability Advisory Council</li> </ul>
Sprint	<p><b>Corporate Responsibility</b></p> <ul style="list-style-type: none"> <li>• GHG Emission Reduction</li> <li>• Use of Alternative Energy</li> <li>• Equipment Recycling Program</li> <li>• Operational Mitigations</li> <li>• Green IT</li> <li>• Supply Chain Greening</li> <li>• Green Building</li> <li>• Stakeholder and Employee Engagement</li> <li>• 2017 Reduction Goals</li> </ul>	<ul style="list-style-type: none"> <li>• Use renewable energy for powering facilities and cell sites</li> <li>• 2004: Began purchasing Green-e wind energy certificates for headquarter building</li> <li>• 2006: Partnered with KCP+L, enabling construction of Spearville Wind Farm</li> <li>• 2007: Installation of small wind turbine at Overland Park campus to test wind as primary power source for cell sites</li> <li>• Currently a couple CA and NY solar powered cell sites</li> <li>• Currently 250 cell sites with hydrogen fuel cell powered back-up generators.                             <ul style="list-style-type: none"> <li>▪ Studying potential for hydrogen fuel cell to completely power cell sites</li> </ul> </li> </ul>	<ul style="list-style-type: none"> <li>• Energy Management Program to reduce energy consumption throughout network and operations</li> <li>• LEED Certified and ENERGY STAR Rated corporate buildings and retail stores</li> <li>• Currently 500 retail stores built with sustainable measures</li> <li>• IT network efficiency via hardware and software</li> <li>• Vendor sustainability requirements</li> </ul>	<ul style="list-style-type: none"> <li>• Employee education teaching sustainability methods for both professional and personal life</li> <li>• Green Microsite (<a href="http://green.sprint.com">green.sprint.com</a>)</li> </ul>	<ul style="list-style-type: none"> <li>• 2 national labs for renewable energy research and development focusing on energy storage and solar panels</li> <li>• Awarded \$7.3 Million grant by U.S. Department of Energy for hydrogen fuel cell development</li> <li>• Provide environmentally conscious phones and accessories</li> <li>• Recycling program: Re:Cycle</li> <li>• Participant in the Carbon Disclosure Program</li> <li>• Member of the EPA Climate Leaders Program</li> <li>• Member of the EPA’s Plug-In to eCycling Program</li> <li>• Member of Global e-Sustainability Initiative e-Waste Working Group</li> </ul>
Verizon	<p><b>Green Initiatives</b></p> <ul style="list-style-type: none"> <li>• HopeLine Recycling Program</li> <li>• Paperless Billing</li> <li>• Solar Powered Cell Sites</li> <li>• Energy Efficient Retail Stores and Corporate Buildings</li> <li>• Energy Efficient Technology</li> <li>• Product Sustainability</li> </ul>	<ul style="list-style-type: none"> <li>• Currently 20 solar powered cell sites in the Western United States</li> <li>• Fuel Cell Facility</li> </ul>	<ul style="list-style-type: none"> <li>• Currently 61 ENERGY STAR Rated retail stores</li> <li>• Currently 2 LEED-CI Certified stores</li> <li>• LEED Certified NJ Corporate Headquarters</li> <li>• Deployment of software technology to reduce power consumption at workstations</li> <li>• Thin Client virtual technology</li> <li>• BigFix software</li> <li>• FiOS set-top device</li> <li>• Chief Sustainability Officer/Sustainability Team to increase sustainability within company and develop methodology for reporting progress</li> </ul>	<ul style="list-style-type: none"> <li>• Go Green Applications “Apps”                             <ul style="list-style-type: none"> <li>▪ Educates customers on green</li> <li>▪ Provides green IQ quizzes and steps to leading a greener lifestyle</li> </ul> </li> </ul>	<ul style="list-style-type: none"> <li>• Recycling program: HopeLine</li> <li>• VZ Navigator                             <ul style="list-style-type: none"> <li>▪ Provides customers with most direct route of travel for fuel cost savings</li> </ul> </li> <li>• Fuel Finder                             <ul style="list-style-type: none"> <li>▪ Provides locations of least expensive gas stations</li> </ul> </li> <li>• “Smart Grid” Partnership with FPWC, IBM, and Consort</li> <li>• Alternative fuel vehicle fleet:                             <ul style="list-style-type: none"> <li>▪ 1,600 by 2010</li> <li>▪ 15,000 project within next decade</li> </ul> </li> <li>• 2007: EPA WasteWise Hall of Fame for waste prevention efforts</li> </ul>

\*All Information has been obtained from carrier websites: ([www.att.com](http://www.att.com), [www.sprint.com](http://www.sprint.com), [www.verizonwireless.com](http://www.verizonwireless.com))