



Green PCs for a Smarter Future.



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White Paper

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White Paper Top Line Highlights.



- **PC PROLIFERATION:** With worldwide PC shipments expecting to top 300 million units in 2010 and continue at a double-digit pace that will result in a projected four billion PCs in use by 2020, computer manufacturing and consumption are becoming a significant environmental concern as manufacturers increasingly look for ways to reduce greenhouse gas (GHG) emissions, the resources they consume and the waste they generate.
- Smart deployment of more efficient computing resources has become a key focus for many businesses and consumers looking to reduce their own energy consumption and carbon footprint.
- **THE NEED FOR GREEN INFORMATION AND TELECOMMUNICATIONS TECHNOLOGY (ICT):** PCs, mobile computing and the underlying Internet-enabled Information Technology (IT) infrastructure that support them are being viewed as key enablers for delivering significant changes in business processes and human behaviour that can deliver smarter, more efficient workplaces while enabling significant reductions in GHG emissions.
- **ENVIRONMENTAL IMPACT:** A groundbreaking study developed by [The Climate Group](#) in partnership with the [GeSI](#), 'SMART 2020: Enabling the Low Carbon Economy in the Information Age' estimated that ICT-enabled solutions could cut annual CO₂ emissions by up to 15% worldwide by 2020, delivering nearly an eight-fold benefit when comparing carbon use vs. carbon reduction.
- **SMART POWER MANAGEMENT FOR GREENER COMPUTING:** PC power management — the act of powering down PCs when not in use (e.g. nights, weekends), can help reduce the energy-related operating expenses of IT as well as reduce carbon emissions related to the global climate change. By powering down PCs during periods of inactivity, ENERGY STAR® estimates that firms can save \$25 to \$75 per PC, per year.
- A 'green' computer is one that is built from eco-friendly materials, features low power consumption and Computer Power Management (CPM) capabilities. It has fewer and smaller component parts and generates less heat than previous models, is packaged with recyclable materials and ultimately is responsible for the decrease in CO₂ emitted into the atmosphere.
- **GROWTH DRIVERS:** Research from industry analyst firm NextGen Research indicates that the global green PC market has been spurred by a number of factors, including legislative initiatives, increased consumer awareness and demand for eco-friendly products, power requirements/costs, government and utility incentives, among others.
- The objective of this white paper is to provide further data and support the growing role of green PCs that help businesses and consumers achieve more efficient energy consumption, reduce CO₂ emissions ensuring sustainable development/green growth and compliance with various regulatory regimes.
- Building on this topic, this paper provides Lenovo's perspective on advancing green PCs across five key areas (noted below). Each of these five areas is accompanied by descriptions of Lenovo® products and solutions available today that can help customers become more energy efficient, productive and sustainable.
 - Green Product Design
 - Product Packaging
 - Supply Chain Operation
 - Recycling and Asset Recovery
 - PCs for Smarter Workplaces and a Low Carbon Economy
- The paper concludes with Lenovo's commitment to further help support energy-efficient computing with a broad portfolio of products, providing customers greener options throughout the lifecycle of their PCs.
- Lenovo has taken a major leap forward in green computing across multiple areas including eco-friendly material selection, energy efficiency, product packaging, product end-of-life disposal and product recycling. Lenovo is also working hard to reduce its own environmental impact while providing environmentally-responsible, energy-efficient technology choices to the world's PC users.

Introduction.

Global warming and the problem of minimising environmental impact from fossil-fuel emissions has risen to the top of the global public policy agenda. As a result, businesses and consumers alike have started to embrace environmentally sustainable products that offer low-carbon solutions that can not only reduce their global greenhouse gas (GHG) emissions, but can do so by more efficient energy consumption and lower costs.

Smart deployment of more efficient computing resources, starting with green PCs, has become a key focus for many businesses and consumers looking to reduce their own energy consumption and carbon footprint. This is fuelled by an increase in public awareness of the effects of climate change, recognition by businesses and consumers that reducing energy usage can save costs and by government regulation covering everything from energy efficiency to power management and reduction of hazardous materials to e-waste disposal.

ICT and Climate Change.

Every year, the Information and Telecommunications Technology (ICT) industry generates 2% of the world's carbon emissions. That's the same as one year's worth of air traffic. Today's typical PC consumes approximately 100 to 200 watts of electricity, less than most household appliances and many other electronic devices. And there are nearly one billion PCs in use world over, accounting for 39% of these carbon emissions, which is equal to a full year of CO₂ emissions, from approximately 43.9 million passenger vehicles.

With worldwide PC shipments expecting to top 300 million units in 2010 and continue at a double-digit pace that will result in a projected four billion PCs in use by 2020, computer manufacturing and consumption are becoming a significant environmental concern as manufacturers increasingly look for ways to reduce GHG emissions, the resources they consume and the waste they generate.

Green Computing is Smart Computing.



With increasing customer awareness and regulatory norms, the focus on green PCs has resulted in a growing need for integrating environmentally-sound choices into each step in the lifecycle of the PC, beginning with how products are designed, manufactured, used and managed till end-of-life.

Embracing green PCs is a smart approach that saves money on reduced energy costs, enables new business processes and behaviours that are more productive and energy efficient. It also supports larger sustainability goals of reducing GHG emissions and carbon footprint. In fact, a groundbreaking study developed by The Climate Group in partnership with the Global eSustainability Initiative (GeSI) estimated that ICT-enabled solutions could cut annual CO₂ emissions by up to 15% worldwide by 2020, delivering nearly an eight-fold benefit when comparing carbon use vs. carbon reduction.

A 'green' computer as defined by NextGen Research is one that is built from eco-friendly materials, features low power consumption and Computer Power Management (CPM) capabilities. It has fewer and smaller component parts and generates less heat than previous models, is packaged with recyclable materials and ultimately if adapted successfully, the use of these green computers will be responsible for lower amounts of CO₂ released into the atmosphere.

While the goal of producing a wholly green computer may never be fully realised, according to a report by NextGen Research, purchases of green desktops, notebooks and netbooks will grow from less than a sixth (\$37 billion) of the \$249-billion PC market in 2009 to nearly two-thirds (more than \$190 billion) of the projected \$323-billion PC market in 2013.

Lenovo's Green PC Lifecycle Approach.

With the increased focus on green computing, Lenovo, the world's fourth largest PC manufacturer, has put its green philosophy front and centre. One of the core tenets of this philosophy is to make technology greener in terms of material selection, energy efficiency, product packaging, product end-of-life disposal and product recycling. Based on this lifecycle approach, Lenovo established its corporate environmental policy that applies to all Lenovo manufacturing and development operations in 2006. This is the foundation of Lenovo's Environmental Management System (EMS), an integral part of its business processes, from start to finish.

Lenovo is committed to demonstrating leadership in environmental affairs in all of its business activities and has identified the following significant areas in developing, manufacturing and marketing PCs that are energy efficient and that minimise impact on the environment, including the use of environmentally-preferred materials and green product packaging:

- **Product Development/Design:** Develop sustainable products with improved efficiency and/or reduced energy consumption, in compliance with the design criteria established by the [Electronic Product Environmental Assessment Tool \(EPEAT™\)](#) and the U.S. Environmental Protection Agency (EPA) ENERGY STAR® requirements.
- **Packaging:** Minimise consumption of packaging material while driving the use of environmentally-sustainable materials.
- **Green Supply Chain Management:** Implement effective logistics and supply chain management to support environmental stewardship.
- **Product Recycling:** Maximise the reutilisation and recycling of all products, parts and materials, while minimising the amount of site-related waste sent to landfills.
- **A PC's Role in Delivering Smarter Workplaces and a Low Carbon Economy:** Smart deployment of more efficient computing resources, resulting in more efficient workplaces and significant reductions in GHG emissions.

Product Design: Supporting Green from the Onset.

The Green Electronics Council notes that 90% of a product's environmental attributes come from design, so starting off with environmentally-conscious design practices is a critical first step. Green design techniques are factored into building Lenovo's exceptionally-engineered PCs, right from stringent global standards regarding the use of safe materials to utilising recycled materials wherever feasible and minimising resource consumption.

To ensure the development and marketing of environmentally-friendly products, Lenovo has committed to the design criteria established by EPEAT™ and offers products at the EPEAT™ Gold and Silver levels that deliver higher levels of energy efficiency and power management. Lenovo also gives customers the option of recycling their PC at the end of its life. EPEAT™ is an environmental standard and rating system that makes it easier for computer purchasers to buy high performance notebooks, desktops and monitors that meet stringent environmental criteria developed through a stakeholder consensus process supported by the U.S. EPA ENERGY STAR® programme. The EPA estimates that at the end of 2006, its ENERGY STAR® campaign had saved 170 billion kWh of electricity from changes made to monitors alone (a measure equivalent to lighting 95 million homes and reducing CO₂ emissions by 33 million tonnes per year).



Purchasers of monitors can use the EPEAT™ labelling system to ensure that the product purchased meets a particular class of overall environmental impact, reducing the need to make detailed and difficult decisions between different products. The EPEAT™ tool incorporates 28 required environmental performance criteria (and more) to determine whether computers and monitors are created, delivered, used and disposed in the most environment-friendly manner (see: <http://www.epeat.net/FastBenefits.aspx>). Electronics that are EPEAT™ certified are typically made with recyclable components, use low amounts of energy and have less product packaging.

Lenovo was the first company to receive an EPEAT™ Gold certification (2006) for a computer monitor and became the first PC maker (2008) to offer a full lineup of EPEAT™ Gold rated ThinkVision® monitors. Today, all Lenovo ThinkVision monitors meet the latest ENERGY STAR® Programme requirements for displays (Version 5.0) criteria and more than 25 of Lenovo's Think-branded business and Idea-branded consumer PCs meet the new ENERGY STAR® programme requirements (effective since July, 2009) for computers (Version 5.0). These qualified models include: ThinkPad® X301, ThinkPad T400s, ThinkPad W700ds, the IdeaPad® U330, IdeaPad Y430, ThinkCentre® M58, ThinkCentre M58p and ThinkCentre M58e desktops.

Lenovo advanced its green monitor design even further with its latest line of ThinkVision monitors, introduced in October, 2009, which are over 50% more energy efficient than previous models and include mercury-free panels, low halogen components and recycled packaging. Lenovo also built the monitors' chassis using 65% Post-Consumer Recycled (PCR) content and no virgin plastics. All these monitors surpass the U.S. EPA's ENERGY STAR® criteria requirement levels and have earned an EPEAT™ Gold certification.



Smart Power Management for Greener Computing.

A typical PC consumes between 400 kWh (kilowatt hours) and 600 kWh of electricity each year, depending on the brand, how it is equipped (e.g. LCD or CRT monitor) and how hard the CPU is working. Most PC users don't take advantage of the minimal power management settings. Even when the monitor is turned off on a desktop PC or when it is set to standby, a PC will consume almost as much energy as a fully-powered but idle PC. And a PC with a screensaver will actually consume significantly more power than an idle PC. The issue of power consumption and energy loss is a common concern, albeit multiplied by the number of servers and networking devices that are required to be kept in operation.

According to a report from the research firm Gartner Group, enterprises waste nearly \$4 billion each year powering PCs that are not in use and estimates that organisations can save up to 50% of their power costs and related CO₂ emissions on PCs alone. To elaborate, Gartner estimates that a company with 2,500 PCs and a power management system uses 91,203 kWh per year. But without a power management system to control their company's PC energy use, that figure jumps to 988,026 kWh. This costs an extra \$92,372 per year, at the U.S. average power price of 10.3¢ per kWh.

By enabling power management settings, computers and monitors go into a low-power sleep mode after a period of inactivity. Power management has the potential to save up to \$50 per computer annually. Despite the significant savings, according to Lawrence Berkeley National Labs, only 5% to 10% of organisations have deployed these settings on computers. And according to U.S. EPA estimates, if all office computers and monitors in the U.S. were set to sleep mode when not being used, the country could save more than 44 billion kWh or \$4 billion worth of electricity and avoid the GHG emissions equivalent of about five million passenger vehicles each year.

According to Andy Lawrence, Research Director, The 451 Group, "Desktop power management is one of the most effective technologies that businesses can use to improve the environmental footprint of their IT. It isn't expensive or disruptive and it provides a rapid and strong return on investment. In most cases, its introduction results in an immediate and sustained reduction in energy use by corporate IT*."

Lenovo's Power Manager™ function can enable IT administrators to monitor and remotely control the amount of electricity used by all Power Manager™-enabled desktops in a PC fleet. For example, PCs can be programmed to shut down in the evenings and on weekends or more often, depending on the employee's usage profile. Lenovo's latest version of Power Manager™ includes popular features such as BatteryStretch and InstantResume. When battery power becomes low, BatteryStretch allows the battery's life to be extended by turning off notebook functions that aren't being used. InstantResume keeps your wireless connection active even when you close the lid of your notebook so that you can move from your desk to the conference room without losing your connection.

Lenovo products have what is known as 'scalable' power management. By enabling Lenovo's Power Manager™, an innovative ThinkVantage® Technology, users of Think-branded products can realise the full potential of annual power savings. Given that 50% of all PCs are left on both overnight and on weekends (70% of the total hours each week), implementing effective power management across an organisation can result in savings of up to 35% of PC-related electrical costs. For example, business customers deploying ThinkCentre M58 Tower PCs can save approximately \$71 per year, per user, by enabling Power Manager™.

Eco-friendly PC Manufacturing.

Reducing power consumption and increasing energy efficiency at the product level is only part of the story. Lean manufacturing combined with minimising the use of environmentally-sensitive substances is a growing business movement among consumer electronics companies and their suppliers, helping to reduce harmful waste and create efficiencies all around the world.

Lenovo is demonstrating leadership in a number of eco-friendly manufacturing practices, including reduced electromagnetic emissions and low use of sensitive materials. The company strives to eliminate environmentally-sensitive substances from products wherever cost effective, wherever safer alternatives are available. Lenovo is committed to a well-reasoned approach to the elimination of materials of concern, including Brominated Flame Retardants (BFRs) and PolyVinyl Chloride (PVC), new low halogen and halogen-free materials. Lenovo is working with its suppliers to eliminate materials of concern from its product portfolio. In support of its overall commitment to leadership in green PCs, Lenovo is actively working through industry groups including International Electronics Manufacturing Initiative (INEMI), EPEAT™, the CoSN Green Computing Certification Programme, Green Electronics Council (GEC), GREENGUARD® Environmental Institute and TCO Development.

Building the Ultra-green Monitor: the Lenovo ThinkVision L2440x wide.



Starting in 2008, Lenovo began offering a PC monitor, the ThinkVision L2440x wide that is virtually BFR and PVC free. In addition, it is mercury and arsenic free and uses up to 60% less power than conventional CCFL-based LCD monitors with the same screen size and resolution. This low-halogen monitor uses only 29 watts to drive its 24" widescreen display. The full product range, which is EPEAT™ Gold rated and GREENGUARD® certified, also includes the ThinkVision L1700p, ThinkVision L1940 wide, ThinkVision L1940p wide, ThinkVision L2240p wide and ThinkVision L2440p wide.

One immediate advantage of changing to LED backlights is the elimination of mercury, which is a hazardous material. The elimination of mercury is a benefit in itself, but also makes recycling of products at the end of the PC lifecycle much simpler. Great care has to be taken in disassembling LCDs with CCFLs to ensure that the mercury does not get into the environment.

In addition, 85% of the weight of the plastics used in the mechanical parts for the ThinkVision L2251x wide comes from recycled plastic material, with 65% of the plastic in the monitor comprising post-consumer content (material previously used in products such as home appliances, computers, vehicles and office equipment). By weight, over 25% of the total plastics used in the ThinkVision L2251x wide are post-consumer recycled content plastics (per EPEAT™ calculation guidance).

The ThinkVision L2440x is the first monitor to be awarded the TCO Certified Edge designation from the Swedish-based TCO labour organisation, based on its environmental impact and energy usage. In announcing its certification, TCO lauded Lenovo for 'exceptional leadership by pushing the boundaries of green design, while designing a product that also meets the high demands of today's user'.

Eco-friendly PC Manufacturing.



 Lenovo green product leadership strategy



The Lenovo Energy Calculator.

To further assist users in determining estimated energy savings on Lenovo desktops, notebooks and monitors, Lenovo created the [Lenovo Energy Calculator](#) which allows users to make side-by-side comparisons of the estimated energy characteristics of its various PC solutions. The calculator determines actual energy consumption based on an estimated usage model for various configurations, considering costs per kilowatt hour. The Calculator employs CO₂ emission factors from the U.S. Department of Energy's most recent data and also allows users to customise calculations by entering their own actual local energy costs, CO₂ emission factors and usage profiles.

Green Product Packaging.

Green packaging is on the rise and experts say this upward trend will continue till at least 2013. A new study by industry research firm Freedonia Group forecasts demand for green packaging (defined as material comprised of recycled content, is biodegradable or is reusable) to increase 3.4% annually, to \$43.9 billion in 2013. Green packaging growth is anticipated to outpace overall packaging.

Lenovo is an industry leader in the use of green, environment-friendly product packaging and reduced its packaging materials consumption annually by up to 750 tonnes in 2008 alone, i.e. approximately 20% of its total packaging volume. As part of this effort, Lenovo is using up to 100% recycled cushioning materials in packaging select ThinkPad notebooks, ThinkCentre desktops and ThinkVision monitors. This allows components to be stacked together and requires less packaging material to help minimise shipping costs and reduce associated energy use.

Lenovo established bulk packaging options for all products. This has helped reduce packaging used in large-scale rollouts to business customers and universities. For instance, bulk packaging can save more than 1.8kg of packaging material per PC which means, for example, that a 5,000 unit desktop deployment could save nearly 9,980kg of material, a significant waste reduction. In another example, Lenovo eliminated the use of multi-page user manuals shipped with many of its products, replacing a 50-page user manual with a single page poster, saving approximately 350 million printed pages per year.

Recycling and Reuse: There's 'Green' in Old Machines.

According to the Natural Resources Defense Council, U.S. consumers throw out approximately 130,000 computers a day. That tallies up to 47.5 million a year. And the numbers can only grow. Undoubtedly, e-waste is one of the fastest growing parts of the waste stream. As a result, recycling and asset recovery from e-waste has become a critical environmental issue.

End-of-life electronics pose serious issues regarding proper disposal and potential environmental consequences throughout the world. The reduction of e-waste should be a serious priority to ensure the sustainable protection of the environment. The good news is that many electronic products contain parts that could be profitably refurbished and reused with little effort. When properly disposed off, older equipment has value that can help pay for newer, more efficient systems.

Lenovo leads the industry in offering PCs made with post-consumer recycled materials. Since early 2008, Lenovo has used more than 6.3 million kg (gross) of post-consumer recycled plastics in its PCs, with a net post-consumer content of almost two million kg. This contributes to more than 65 Lenovo products being EPEAT™ Gold certified. During FY 2009, Lenovo began to utilise cushioning materials with up to 100% recycled content in ThinkPad, ThinkCentre and ThinkVision products.

Lenovo is also committed to minimising the amount of site-related waste sent to landfills by maximising recycling and reuse activities. Lenovo's manufacturing sites each recycled over 97% of non-hazardous solid waste generated.

Lenovo's EPEAT™ Gold monitors contain more than 25% recycled material, with the total percentage of recycled material increasing with each new product design. All of Lenovo's product lines use recycled plastic and metals, including gold, silver and other precious metals recovered from end-of-life products. Specifically using post-consumer material has become a keen focus for Lenovo and is an effective differentiator in the market for the company. For instance, recycled polymer from water bottles, PCs and TVs comprise up to 27% of several Lenovo PCs; a single ThinkStation® D20 workstation uses nearly 30% post-consumer content, equivalent to 19 plastic water bottles.

Lenovo also encourages customers to reuse or recycle products by helping to ensure secure and environmentally safe disposal of obsolete electronic equipment at end-of-life by offering consumers and/or commercial clients a range of recycling options for disposing products, batteries and product packaging worldwide through voluntary programmes and/or country, province or state-mandated programmes.

For instance, Lenovo has initiated free product take-back and recycling programmes, making it easy for customers to recycle their unwanted, end-of-life PCs. The Lenovo Eco Take Back Programme allows consumers to recycle any Lenovo product and selected IBM products for free. It also allows consumers to receive money back on any brand of PC that has residual value. For programmes in different geographies, please refer to www.lenovo.com/recycling

For business customers, Lenovo offers Asset Recovery Services to provide computer take-back, data destruction, refurbishment and recycling. Learn more about computer refurbishing and recycling with Lenovo's Asset Recovery Services at www.lenovo.com/asset_recoveryservice

From a regulatory standpoint, a growing number of locales are instituting programmes to reduce the rising tide of discarded TVs, computers and other electronics that have contributed to the fastest-growing e-waste streams. In the U.S. market for example, in many states (not all of U.S. yet and some started in 2008 and 2009) manufacturers must register with the state, pay annual fees and file reports detailing the devices they sold and how much e-waste they funnelled into recycling programmes.

Greening Supply Chain Management.

According to a recent World Economic Forum report, the global transport and logistics industry accounts for 2,800 megatonnes of GHG emissions. Designing a more efficient distribution network is the key to making a positive environmental impact and requires a delicate balance between cost, speed and environmental considerations.

Effective supply chain management is crucial to environmental stewardship and provides a great opportunity to include effective green strategies and technologies. The logistics side of global supply chains provides many areas in which companies can become more efficient and sustainable.

Lenovo continues to optimise its global logistics programme to drive additional product volumes to shipping methods that are more environmentally friendly, such as ocean and rail. Ocean-borne shipping is generally seen as the most carbon-efficient means of freight transportation. Lenovo is also closely working with its shipping partners to ship products responsibly. For example, in North America, Lenovo has joined the EPA SmartWay programme and has requested its North American carriers to comply.

The SmartWay Transport Partnership is an innovative collaboration between the freight industry and the U.S. EPA that promotes fuel efficiency improvements while significantly reducing GHG emissions. For instance, in FY 2009, Lenovo shifted an additional 7% of notebooks from air transport to ocean transport.

PCs for Smarter Workplaces and a Low Carbon Economy.

The ICT industry has been driving huge productivity gains for decades and today has the capacity to deliver solutions that can yield the greatest impact in reducing GHG emissions. A new IDC report, dubbed the G20 ICT Sustainability Index, has identified roughly 5.8 billion tonnes (Gigatonnes) of CO₂ that can be eliminated by 2020 with the 'focused use of ICT-based solutions'. The ICT sector must seize the chance to lead the way in energy-efficient technologies. Silicon chips, computers, software and high-speed networks are the tools needed to help us build a smarter, Low Carbon Economy.

Mirroring these goals, Lenovo joined industry leaders Intel® and Google in the launch of the Climate Savers Computing Initiative (CSCI) in 2007 together with the World Wildlife Fund (WWF) and other technology companies to help validate the proposition that reducing emissions is good business. CSCI and its member companies advocate and promote energy-efficient computer products globally. CSCI set a goal of lowering the total energy consumption of all the computers in the world to half of the current level by 2010, equivalent to the annual output of 11 million cars.

With transportation contributing to approximately 26% of CO₂ emissions worldwide, decreasing energy-intensive travel through telework, telecommuting, teleconferencing is the key to help control GHG emissions. It will allow for more efficient collaboration or dematerialisation of processes enabled by PCs and smart IT infrastructure.

According to the International Telecommunications Union (ITU), every one million telecommuters working from home in Europe can help save one million tonnes of GHG emissions annually. In the U.S., where commuting distances tend to be longer, the savings are higher. ITU has found that the U.S. already has 3.9 million telecommuters who save up to 14 million tonnes of GHG emissions annually.

According to the GeSI report, by supporting telework where people work from home rather than commute to an office, businesses could reduce their total air and road travel by an estimated 5% to 9%. Additionally, according to World Wildlife Fund (WWF) estimates, telecommuting and virtual meetings could eliminate one billion tonnes of workplace emissions annually by the year 2030. In addition, if enough employees telecommute, it would also be possible to reduce office space and associated heating, cooling, lighting and electrical costs.

According to the GeSI report, worldwide emissions from commuters and the office buildings that support them create 830 million tonnes of CO₂, meaning that an aggressive 31% implementation of teleworking could result in global annual savings of 260 million tonnes of CO₂. Each telecommuter using a desktop PC with a high-speed connection produces about 1.20kg of CO₂ a day, representing a reduction of CO₂ emissions of more than 10.43kg per day.

Tele and videoconferencing meetings online via PCs or on the phone instead of face-to-face could also reduce emissions. Previous conservative estimates have suggested that tele and videoconferencing could replace between 5% and 20% of global business travel.



Conclusion.

Energy efficiency is at the heart of the climate change problem. Unless we make PCs substantially more energy efficient, this number will surely rise because more people are using PCs than before. Hence, smart deployment of more efficient computing resources has become a key focus for many businesses and consumers looking to reduce their own energy consumption and carbon footprint.

New York Times columnist Thomas L. Friedman correctly observes that, “you can’t make a product greener — whether it’s a car, a refrigerator or a traffic system, without making it smarter in terms of smarter materials, smarter software or smarter design**”.

Today’s concerns over climate change and the environment has created a unique opportunity for businesses to be responsible corporate citizens and create smart technology solutions along with cost and energy efficiencies at the same time. Lenovo views coping with climate change as an important part of its global responsibility and attaches great importance to the energy efficiency of its products.

In this new era of the great green frontier, the key is to not just invest in green products, but to be more energy efficient. There is an increased focus on the role IT has to play as we move towards a resource intensive, Low Carbon Economy. Simply put, technology must now do more than deliver dollar savings and productivity gains. It must deliver on reducing organisational GHG emissions and increase energy efficiencies. Lenovo embraces this challenge and is fully committed to leading the way to a more energy-efficient, green PC future, delivering a broad portfolio of smart PCs and monitors that provide customers greener options.

Minimising environmental impact is a strategic focus in all aspects of Lenovo’s business, from product design and supplier selection to manufacturing, facilities management, transportation & logistics and product lifecycle management, including recycling and reuse. Lenovo has taken a major leap forward in green computing across multiple areas, including selection of eco-friendly materials, energy efficiency, product packaging, product end-of-life disposal and recycling. Lenovo is also working hard to reduce its own environmental impact while providing environmentally responsible, energy-efficient technology choices to the world’s PC users.

To learn more on how Lenovo is contributing to the environment, log on to www.lenovo.com/green

**The New York Times, ‘The Green Road Less Traveled,’ by Thomas L. Friedman, July 15, 2007, <http://www.google.com/url?sa=t&source=web&cd=6&ved=0CC0QFJAF&url=http%3A%2F%2Fselect.nytimes.com%2F2007%2F07%2F15%2Fopinion%2F15friedman.html&ei=VzOWTJ3eKoKclgefrODIDA&usq=AFQjCNEOR948VkJTmKy-2eaSoVRGJ3qqjw>

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18. Climate Savers Computing Initiative. Lenovo is a sponsor of Climate Savers Computing Initiative, a nonprofit group composed of consumers, businesses and conservation organisations that are dedicated to curbing emissions and increasing power efficiency. Visit Climate Savers to see what you can do to help.
19. The International Electronics Manufacturing Initiative (iNEMI). Lenovo is a member of iNEMI. iNEMI is an industry-led consortium whose mission is to assure leadership of the global electronics manufacturing supply chain. <http://www.inemi.org/cms/>
20. The Climate Group. Lenovo is a supporting member of The Climate Group. The Climate Group's primary goal is to help government and business set the world economy on the path to a low-carbon, prosperous future. To reach this goal, they have created a coalition of governments and the world's most influential businesses — all committed to tackling climate change; <http://www.theclimategroup.org/>
21. Green Electronics Council (GEC). Lenovo is a member of GEC. GEC is a programme of the International Sustainable Development Foundation that manages EPEAT™, the green electronics 'certification' and purchasing system that has created a \$60 billion market incentive for greener laptops, desktops and monitors; <http://www.greenelectronicscouncil.org/>
22. GREENGUARD® Environmental Institute. Lenovo is an active participant in the GREENGUARD® certification programme. GREENGUARD® is an industry-independent, non-profit organisation that oversees the GREENGUARD® Certification ProgramSM which establishes acceptable indoor air standards for indoor products, environments and buildings; <http://www.greenguard.org/>
23. TCO Development. TCO development works to ensure that users of IT and office equipment have excellent products with a high degree of usability, while keeping environmental impact to a minimum; <http://www.tcodevelopment.com/>