IBM and Climate Change

- IBM recognizes climate change is a serious concern that warrants meaningful action to avert or slow the anthropogenic concentration of greenhouse gases (GHGs).
- IBM believes all sectors of society, the economy and governments worldwide must participate in solutions to climate change.
- IBM supports joint efforts by the public and private sectors to reduce global GHG emissions. These initiatives are most effective when they are implemented through studied, transparent mechanisms and are environmentally, economically effective and sustainable.
- IBM believes a diverse energy portfolio is necessary to achieve an orderly adaptation to a world in which GHG emissions are constrained while maintaining successful economies and secure supplies of energy, and also meeting the needs of humanity.
- IBM considers energy conservation to be a cornerstone of both IBM's and clients' efforts to address climate change. IBM is dedicated to reducing its GHG emissions and is taking actions to conserve energy, reduce waste and increase the use of renewable energy.
- IBM is committed to leadership in energy efficiency and climate protection. Its focus includes:
  - Reducing GHG emissions associated with the company's operations by:
    - Conserving energy
    - Using renewable energy
    - Supporting alternative commute options
    - Reducing perfluorocompound (PFC) emissions
    - Increasing the efficiency of its logistics
    - Developing energy-efficient products and providing diverse solutions for energy-efficient data centers
    - Collaborating with its clients and others on innovations that help protect the world's climate, conserve with IBM's valuable expertise and experience in this area, and also set an example for other companies and the world, and assist in a transition toward a more environmentally conscious society.

IBM's Early Action for Climate Protection: Building on a legacy of leadership

“we want to be in the forefront of those companies which are working to make our world a better place.”
— Thomas J. Watson Jr. (excerpt from IBM principles, 1969)

IBM Early Action for Climate Protection: Building on a legacy of leadership

Long-standing Commitment
Climate change is one of the most critical global environmental challenges facing the planet. There exists scientific consensus that global warming is occurring and that it is affected by emissions of greenhouse gases (GHGs) related to human activities. Although the understanding of the effects of climate change continues to evolve, it is now clear that climate change could impact the economy and the quality of life for the next several generations.

IBM has been committed to protecting the environment for more than three decades. The company's first formal environmental and energy conservation corporate policies date back to 1971 and 1974, respectively, and programs supporting them have been embedded within IBM's global environmental management systems since that time. The policies have been a cornerstone of IBM's energy management and climate protection programs.

Comprehensive and Multifaceted Programs
IBM is committed to leadership in energy efficiency and climate protection. Its focus includes:

1. Reducing GHG emissions associated with the company's operations by:
   - Conserving energy
   - Using renewable energy
   - Supporting alternative commute options
   - Reducing perfluorocompound (PFC) emissions
   - Increasing the efficiency of its logistics
   - Developing energy-efficient products and providing diverse solutions for energy-efficient data centers
   - Collaborating with its clients and others on innovations that help protect the world's climate, conserve with IBM's valuable expertise and experience in this area, and also set an example for other companies and the world, and assist in a transition toward a more environmentally conscious society.

Results of IBM’s Operational Leadership

Conserving Energy: Energy conservation and reduced GHG emissions reductions are major components of IBM’s climate protection programs.

- From 1990 through 2010, IBM reduced 3.5 million metric tons of electricity consumption equivalent annual energy, 21.8 million metric tons of CO2 emissions, and 45% of the company’s total 2010 greenhouse gas emissions.
- In 2001 to 2007, which accounted for 455 million kWh of electricity consumption, IBM saved $310 million through its annual energy conservation actions.

These results include only those energy conservation projects which actually reduced or avoided energy use. Reductions due to downsizing or the sale of operations are not included.

To further extend its CO2 emissions reduction achievements, IBM set a new goal in 2010 to reduce CO2 emissions associated with its energy use 12 percent between 2007 and 2012 through:
   - Energy conservation
   - Use of renewable energy and
c. Funding an equivalent CO2 emissions reduction through the Renewable Energy Certificates (RECs) or comparable instruments

Using Renewable Energy: Another important way IBM is reducing its CO2 emissions is through its increasing use of renewable energy. Between 2006 and 2010, IBM purchased 7.75 million gallons of fuel, conserved approximately 7.75 million gallons of fuel,

Procurement of Renewable Energy

Reductions from downsizing or the sale of operations are not included.

Procurement of Renewable Energy

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Supporting Alternate Employee Commute Options: IBM's pinnion programs to reduce employee commuting and has saved them for nearly two decades.

In the U.S. alone, IBM's work-at-home programs have reduced more than 7,700,000 gallons of fuel and avoided more than 44,000 metric tons of CO2 emissions in 2007. More than 2 million metric tons of CO2 emissions were avoided in the same year by employees working off site who were not otherwise engaged in projects, as well as a result of IBM's telecommuting program.

Reducing PFC Emissions: In 1998, IBM became the first semiconductor manufacturer to publicly announce a specific PFC emissions reduction target. IBM's initial PFC goal was to reduce PFC emissions from semiconductor manufacturing by 2010 from a 1995 baseline of 25 percent to 2010 by $310 million through its annual energy conservation actions.

Increasing the Efficiency of its Logistics: IBM is reducing PFC emissions associated with both domestic and international shipping of parts and products through the efficient design of its packaging, working with suppliers on their packaging designs and optimizing logistics.

As a member of the U.S. Environmental Protection Agency's (EPA) SmartWay Transport Partnership, IBM focuses on reducing its transport footprint (in U.S. dollars) of 185 percent from 2007 transport spend (as of 2008) and 25 percent from the U.S. and (in the U.S. and Canada) Mexico) with SmartWay carriers shipping 150 million pounds of its annual, 150 percent in its annual, and 1997.8 percent in its annual, 1999.
Innovations—Energy Efficient Microprocessors

IBM has a rich history of innovation that has enabled significant increases in the energy efficiency of microprocessors. Beginning with the IBM 360/370 System and continuing with its new chip family, IBM announced 10 semiconductor innovations in 15 years that have made possible the production of computer chips and many other kinds of electronic devices that are smaller, less expensive, more powerful and more energy efficient. Some of the latest innovations include:

• **Power4 Microprocessor**—The Power4® chip combines a variety of technologies that allow IBM to increase the performance of the chip by 15 percent without increasing the energy consumed.

• **Power5 Microprocessor**—This chip provides a 40 percent energy savings compared to the most advanced chips using current technology. IBM plans to use this technology in future-generation microprocessors. Using the Power5™ architecture, researchers have proven that these chips can perform 15 percent less energy compared to the most advanced chips using conventional methods.

• **Power6 Microprocessor**—The Power6™ chip contains many technology breakthroughs that increase the processor’s performance while virtually no increase in energy consumption.

Innovations—Energy Efficient Products

An early leader in addressing the environmental design of its products, IBM continuously participated in the ENERGY STAR program since 1992. This pioneering route has enabled IBM to become a charter member of U.S. EPA’s ENERGY STAR Systems Director Active Energy Manager Program. Founded in 1995, the program encourages businesses to use energy efficient products that have the potential to reduce energy and water consumption. One of the first 3 manufacturers to report under U.S. EPA’s Climate Protection Program, IBM has engaged with customers to deliver hardware, software and services that help them reduce energy costs and carbon emissions. Here are some examples of IBM’s energy saving capabilities:

• **EnerLogic Modular Data Center** —"drink-water" and standardized to create data centers ranging in size from 5,000 to 20,000 square feet, it can save up to 40 percent by uniting chilled water to dissipate heat generated by computer systems while requiring no additional fans or electricity.

• **Software for a Greener World**—Wide software capabilities to help businesses optimize their facilities, workplaces and people for energy efficiency.

In May 2007, IBM announced that it was submitting 1 billion per year across its business to dramatically improve the energy efficiency of its data centers. The company expects to double the computing capacity of its data centers while using only 10 percent less energy. IBM has engaged with customers to deliver hardware, software and services that have helped them reduce data center energy usage, or electrify their facilities and cut energy costs by 15 percent. Here are some examples of IBM’s energy saving capabilities:

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Innovations—Energy Efficient Data Centers

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Innovations—Intelligent Systems and Solutions

Innovative Utility Network (INU)—A combination of information architecture and information-continuously receives a safety’s assets and operations as well as the electrical systems’ customers. “data” information—demand information was used to improve the reliability and efficiency of one. In an RIM pilot project, IBM used smart appliances, measurement devices and a virtual market place to achieve a 50 percent reduction in short-term peak electricity consumption loads and a 15 percent reduction in overall peak loads.

Intelligent Transportation Systems—With Intelligent Transportation Systems, city governments can have real-time insights into the factors affecting traffic. Encouraging early morning and evening travel during off-peak hours can reduce traffic congestion and cut energy consumption.

Energy, Environment and Sustainability Consulting and Solutions—IBM has developed a range of consulting capabilities and solutions to help clients understand and manage their energy use, impact on the environment and the overall sustainability of their operations.

For more information, visit www.ibm.com/green.