



# Microsoft: Enabling Environmental Sustainability and Energy Efficiency

## Committed to Improving the Environment

Microsoft is committed to innovating software and technology that help people and organizations around the world improve the environment. Our goal is to reduce the impact of our own operations and products, and to be a leader in environmental responsibility.

Microsoft wants to revolutionize our world by using technology to solve the challenges of sustainability and encourage global action. We will accelerate the innovation of accessible solutions through broad technology leadership, our extensive partner network, and most importantly through the effectiveness of our customers.

## Leveraging Technology for Environmental Impact

Microsoft believes software is essential to solving today's environmental challenges and enabling long-term sustainability. Microsoft is improving the output from technology, without increasing the energy consumed, by developing solutions that provide built-in efficiency and resource optimization. We provide out-of-the-box settings that minimize the power consumption in products such as Windows Vista® and Windows Server®.

Tests for Windows Server 2008 reveal savings of up to 10% over Windows 2003 for comparable throughput. And a recent study by Climate Savers Computing suggests use of sleep and power management capabilities in Microsoft products can save more than 1,000 tons of greenhouse gas emissions per year for every 10,000 PCs.

We are helping organizations rethink the way they work with tools and technology that allow them to increase productivity, reduce their environmental footprint, analyze operations, monitor their goals, visualize the impact of change, and inspire further improvement.

## Visualizing Impacts. Enabling Alternatives

Using Microsoft's Business Intelligence (BI) solution, organizations can build custom scorecards to plan, analyze, and monitor environmental sustainability initiatives. The flexibility of Microsoft BI products allows users to configure data collection and reporting requirements to fit their needs. Organizations can now measure and manage their carbon footprint from greenhouse gas emissions by using Microsoft Dynamics® AX and its integrated Environmental Sustainability Dashboard.

At Microsoft we believe the visualization of data is one of the most important capabilities for effective data analysis.

Microsoft Virtual Earth™ platform allows customers, like the U.S. Environmental Protection Agency, insight into global trends and patterns through online maps and data. Microsoft Unified Communications (UC) solutions streamline communications and collaboration, reducing the need for business travel and commuting. With these tools, customers can collaborate across an integrated platform of e-mail, voicemail, calendaring, instant messaging, and teleconferencing. Studies done in conjunction with Forrester Research shows UC can reduce travel by 10%, and as much as 30% when widely deployed across an organization.

With one of the largest research budgets in the world, Microsoft is committed to driving efficiency in computing and to accelerating fundamental advances in science. Our scientists are doing cutting-edge work in the areas of power management, energy grids, and home metering; traffic flow management; climate change impacts; and the development of computational tools and methods to predict and mitigate the rapid changes occurring in the Earth's life-support systems. We welcome the opportunity to share this research with our government clients and to collaborate on important energy and environmental research in the future.

## Partnering for a Global Impact

Microsoft works with global organizations to extend the positive impact technology can have on worldwide sustainability. For instance, Microsoft, the Clinton Foundation, Local Governments for Sustainability (ICLEI), and the Center for Neighborhood Technology offer a free Software-plus-Services application cities can use to measure, track, and improve their greenhouse gas (GHG) emissions. The tool enables cities to collaborate and share best practices on the most effective ways to reduce GHGs.

Microsoft is a board member of The Green Grid, which is developing standard metrics to measure and improve datacenter energy efficiency and we are working with the Environmental Protection Agency (EPA) and Department of Energy's ENERGY STAR® program to develop specific requirements for datacenters, personal computers, and servers. We also partner with our industry colleagues through the Climate Savers Computing Initiative, which aims to reduce the environmental impact of IT with education, awareness, and tools. Together, we have committed to reduce global carbon emissions from computing by over 50 million tons per year by 2010.

## Drive Corporate Sustainability and Environmental Stewardship

A large part of our environmental sustainability focus involves greening our own operations and becoming a role model for corporate environmental stewardship.

We empower our employees to build sustainable practices into our operations and we strive to act with complete transparency as we build a sustainable corporate infrastructure.

Microsoft is proud to have been the first corporate campus to achieve Certified Green Restaurant™ status for its food-service facilities. Through the adoption of compostable materials we have successfully reduced our waste by 50%. We operate one of the country's largest private transportation systems, which has eliminated approximately 32,200 miles of travel/day. And through the use of flexible work schedules and telework, we give people the option of working in more efficient ways that reduce travel costs and reduce CO2 emissions.

Microsoft is serious about its environmental footprint. We measure our carbon annually and are actively developing strategies to reduce our impact. Microsoft believes that providing transparency on our company's carbon emissions is important and we report annually to the Carbon Disclosure Project (CDP).

Microsoft continually looks for ways to minimize the impact of its datacenters. Microsoft's new datacenters are expected to consume 50% less energy for the same level of output compared to facilities built just three years ago.

We've done this with efficient datacenter design that allows for flexible configuration, optimization of power and cooling requirements, effective reporting and monitoring of server utilization, and proactive management of issues.

We welcome the opportunity to work with our government customers whose goal is to reduce their own carbon footprint by driving more functions to cloud-based services hosted in some of the world's most efficient datacenters.

## Microsoft Research Projects

- Data Center Genome project motivates the use of wireless sensor network to understand and control cooling in datacenters.
- Power Aware Computing Awards give grants to four recipients totaling \$500,000 on proposals that ranged from datacenters through compilers and micro-architecture, to instrumentation and the measurement of energy use.
- MSR is working to reduce energy consumption for hosting Internet services. Dynamic server provisioning techniques are effective in turning off unnecessary servers to save energy.
- SenseWeb project aims to build an open and diverse community of sensor data publishers/consumers and to develop shared infrastructure and tools for data publishing, data management, and data querying and visualization.
- Clearflow enables drivers to find routes based on least traffic, thereby significantly reducing time on roads and pollution.
- Computational tools and methods to predict and mitigate the rapid changes occurring in the Earth's life-support systems. Working with the scientific community to identify critical problems and develop novel computational methods and tools for addressing these problems.
- Geospatial analysis through collaboration with hydrology scientists at the University of California, Berkeley Water Center and the Lawrence Berkeley National Laboratory to build a "Digital Watershed."
- Enabling climate change insight through a collaboration with scientists at the University of Oxford, England and the Freie Universität, Berlin, to develop new technology to study individual and populations of animals and their sensitivity and response to changes in their environment in real time.

For more information on environmental solutions, visit: [www.microsoft.com/environment](http://www.microsoft.com/environment)