



Solution Brief  
Intel® vPro™ Technology  
Energy Savings

## PC Practices to Save Energy and Increase Productivity

Amid growing concerns about climate change, IT organizations worldwide are coming under increasing pressure to reduce energy consumption and greenhouse gas emissions. At the same time, extremely challenging economic conditions and volatile energy costs make it imperative to lower operating costs by reducing energy consumption.

Today, IT organizations are proactively pursuing opportunities to utilize information and communication technologies in an effort to reduce total organizational energy consumption. Intel® vPro™ technology offers advanced capabilities that organizations can utilize to achieve energy-saving goals.

This document focuses on four ways IT organizations can reduce PC-related energy consumption and CO<sub>2</sub> emissions:

- Replace older PCs with new, more energy-efficient systems.
- Take advantage of PC power management.
- Use hardware-enhanced PC management to reduce IT dispatches and vehicle emissions.
- Enable telework by deploying mobile platforms with hardware-enhanced management.

### Intel and the environment

From responsible product design to sustainable operations to global citizenship, a commitment to the environment is woven into everything Intel does. Year after year, Intel has relentlessly advanced Moore's Law, delivering ever more energy-efficient processors, as well as innovative power management and virtualization solutions. As a co-founder of both the Climate Savers Computing Initiative and the Green Grid, Intel is an industry leader in defining standards and practices for reducing IT-related energy use.

## Replace older PCs with new, more energy-efficient systems

Today's PCs can consume as little as half as much energy as a PC that's three or four years old. For example, an unmanaged PC using an Intel® Pentium® D processor, an Intel® 945G chipset, and a CRT (cathode-ray tube) display consumes approximately 1,000 KWh of electricity in a year. By comparison, a current model PC using an Intel® Core™2 Duo processor, an Intel® Q45 Express chipset, and an LCD (liquid crystal display) can consume less than 500 KWh of electricity per year.

Figure 1 compares energy saved by replacing the CRT with an LCD, and eventually replacing the entire PC itself. As you can see, the largest potential savings comes from replacing the PC.

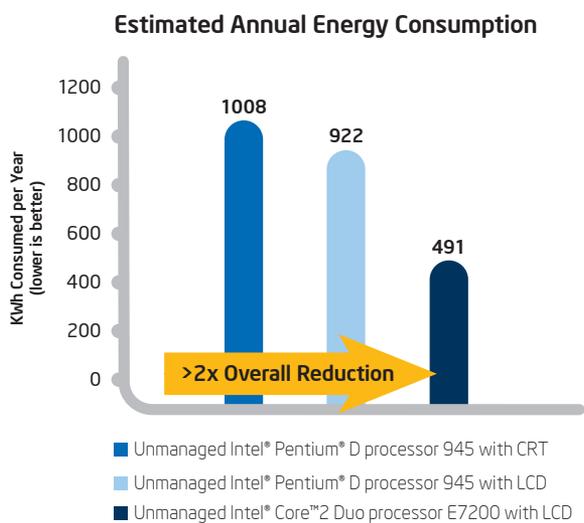


Figure 1. Energy saved by replacing older PCs and/or displays.<sup>2</sup>

Mobile PCs that are optimized for performance and battery life take energy efficiency a step further. For similar tasks, a mobile PC typically consumes far less energy than a comparable desktop PC. As a result, along with all the other benefits of mobility, an employee with a laptop will use less energy for computing than a comparable employee with a desktop PC. For more information on energy consumption for desktop vs. mobile PCs, see "Take advantage of PC power management."

## Take advantage of PC power management

According to the Environmental Protection Agency, *if all office computers and monitors in the U.S. were set to "sleep" when not in use, the country would save more than 44 billion kwh or \$4 billion worth of electricity, as well as greenhouse gas emissions equivalent to about 5 million cars each year.*<sup>1</sup>

## Save energy and get a rebate

Many electric utility companies offer incentives for software or PCs that can be shown to help reduce energy use. These incentives, which vary depending on the utility company, can help offset a portion of the investment in approved PCs or software. Check with your local utility company for potential programs.

Power management involves turning a PC off or placing it in a "sleep" state when not in use. One reason why PCs are left running is to permit off-hours maintenance when existing methods of waking PCs for software updates or other remote maintenance are considered unreliable or less secure than desired.

New hardware-enabled management capabilities, such as those available with Intel vPro technology, enable remote PCs that are asleep or powered off to be securely and reliably woken up for off-hours maintenance. As a result, organizations can now put PCs to sleep or power them completely off, knowing they can be woken at any time for patching or updates.

Figure 2 extends the example in Figure 1 by adding annual energy consumption for both a managed desktop and a managed mobile PC. The managed desktop with an LCD consumes 80 percent less energy than the three-year-old unmanaged desktop with a CRT; while the managed mobile PC consumes 96 percent less energy than the same three-year-old unmanaged desktop.

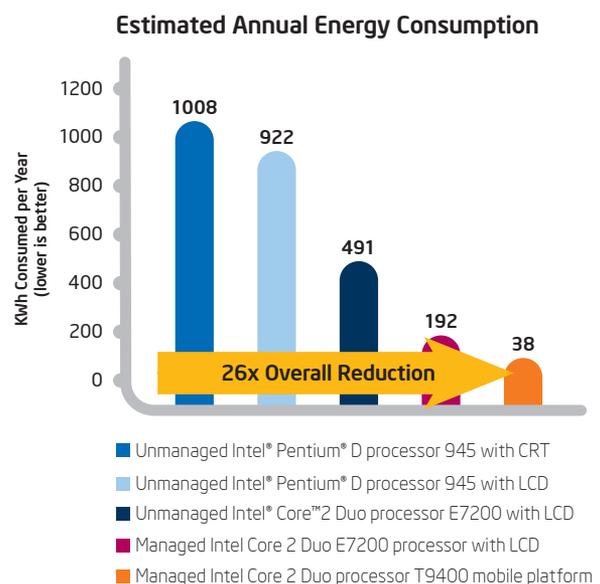


Figure 2. Incremental energy saved with power management.<sup>2</sup>

## Energy savings using Intel® vPro™ technology with PC power management

These three organizations use Intel vPro technology to enable enterprise-wide PC power management.

- **State of Indiana** – 20,000 PCs; projected energy savings of \$1.4M over four years.<sup>3</sup>
- **Calgary Health Region** – 16,000 PCs; projected energy savings of \$276K over four years.<sup>4</sup>
- **University of Plymouth** – 50 percent annual reduction in PC energy use.<sup>5</sup>

For these and other studies demonstrating energy savings with Intel vPro technology, visit <http://communities.intel.com/docs/DOC-1494>.

## Use hardware-enhanced PC management to reduce IT dispatches and related vehicle emissions

PC problems that can't be remotely resolved often require dispatching a technician. IT costs grow rapidly when that dispatch involves a vehicle. Often overlooked is the increased environmental impact caused by vehicle emissions. According to the U.S. Department of Energy, each gallon of gasoline burned produces 20 pounds of CO<sub>2</sub>. It's both economically and environmentally beneficial to resolve such incidents remotely.

Hardware-enhanced remote diagnosis and repair capabilities available with Intel vPro technology provide IT with a more robust set of tools for remotely resolving PC problems. A study with the State of Indiana found that Intel vPro technology would help the Indiana Office of Technology reduce travel for hardware and software support calls by 80 percent and vehicle-related CO<sub>2</sub> emissions by nearly 860,000 pounds over four years.

## Reducing remote visits using Intel® vPro™ technology

These three IT organizations have found that Intel vPro technology can help them resolve more problems remotely.

- **Cleveland Clinic** – 19,000 PCs; estimated savings of 4,900 IT hours in travel time over four years with remote reimaging<sup>6</sup>
- **Telkomsen** – Nearly 100 locations; deskside visits for patching reduced by 92 percent<sup>7</sup>
- **ValueSpace** – 420 franchisees with over 21,000 PCs; deskside visits for software issues virtually eliminated, hardware visits cut by 50 percent.<sup>8</sup>

For these and other studies demonstrating energy savings with Intel vPro technology, visit <http://communities.intel.com/docs/DOC-1494>.

## Enable telework by deploying mobile platforms with hardware-enhanced management

Telework is the ability to work from a remote location, such as home or a satellite location. Studies demonstrate that organizations that adopt telework programs can realize a range of benefits, including reduced office space requirements, improved employee recruitment and retention, and increased productivity. As governments begin offering incentives to encourage telework, organizations are evaluating telework, both for environmental and economic benefits.

For IT organizations, one of the impediments to embracing telework is the challenge of managing PCs beyond the firewall. But with remote management capabilities of Intel vPro technology such as those listed below, organizations can support remote PCs without compromise.

- **Remote scheduled maintenance:** Enables a PC outside the firewall to automatically contact the management console for scheduled software updates.
- **Remote alerts:** Provides the ability for a PC to automatically isolate itself from the network and alert the console when suspicious traffic patterns are detected or software agents are disabled. While isolated, the PC remains available to the console for remote repair.
- **Remote call for help:** Enables a user to alert the console via a keyboard command when problems occur.

## Conclusion

IT organizations seeking to reduce energy use can move toward their goal by replacing older PCs with newer, more energy-efficient PCs, and by taking advantage of hardware-enhanced management capabilities found in PCs based on Intel vPro technology.

To learn more about how leading IT organizations are taking advantage of Intel vPro technology to reduce energy consumption, reduce CO<sub>2</sub> emissions, and improve organizational performance, visit <http://communities.intel.com/docs/DOC-1494>.

## IT service providers can help

Whether a client computing environment is internally or externally managed, organizations can benefit from the capabilities outlined here. For organizations whose PCs are externally managed, Intel has worked closely with industry-leading IT service providers to integrate these capabilities into their desktop service offerings. Talk to your systems integrator or service provider to understand how they can help you take advantage of Intel vPro technology.

<sup>1</sup> United States Environmental Protection Agency Press Release, 4/3/08: "Sleep Does a Body and the Environment Good: Energy Star Launches Low Carbon IT Campaign."

<sup>2</sup> System Configurations:

Intel® Pentium® D Processor 945 (3.4 GHz, 800 MHz FSB, 2x2MB L2 Cache), with Intel® 945G Chipset on Intel® D945GPM board, Intel® Chipset Software Installation File 8.1.1.1010, Dual Channel Micron® PC2-5300U 2x1 GB of DDR2 667 5-5-5-15, Seagate Barracuda® 320GB NCQ SATA2 7200RPM, Windows® Vista® Ultimate RTM Build 6000 NTFS.

Intel® Core™2 Duo processor E7200 (2.33 GHz, 1333 MHz FSB, 4MB L2 Cache), Intel® DQ45CB motherboard with Intel® Q45 Express chipset; 1333MHz FSB, Intel integrated graphics, 2x1GB Micron® DDR2-667 5-5-5-15, Seagate 320GB/16MB cache/7200rpm, Windows XP® Professional with SP3.

Intel® Core™2 Duo processor T9400 (2.40 GHz/4 MB) with 2 GB (1x1 GB) Dual Channel DS Hynix® DDR2 667 5-5-5-15 memory on Lenovo ThinkPad® T400, Intel GM45 Chipset (Intel Chipset 8.7.0); BIOS Default Setup, Intel® Graphics Media Accelerator X4300 (Intel Integrated driver 14.37.0.5009) Resolution 1440x900x32-bit color, Hitachi Travelstar® HTS722020K9SA00 200GB 5400RPM SATA, AD v. 6250, Windows XP® Professional with SP3 build 6000, System Power Management Policy: AC/High, LCD Size:15.5" widescreen; Battery Capacity rated at 56 Watt-Hours.

Desktop display power draw values gathered from spec sheets of 10 models of each type of display (CRT and LCD). Assumed values are: CRT (95W active, 5W asleep), LCD (55W active, 5W asleep).

Energy Cost: 8.65 cents/KWh, which is the U.S. average for industrial and commercial customers as of December, 2008. Source: U.S. Department of Energy, [http://www.eia.doe.gov/cneaf/electricity/epm/table5\\_6\\_a.html](http://www.eia.doe.gov/cneaf/electricity/epm/table5_6_a.html).

Intel EEP methodology is described here: <http://www.intelcapabilitiesforum.net/EEP>.

Performance tests/ratings are provided assuming specific computer systems and/or components and reflect the approximate performance of Intel products as measured by those tests. Any difference in system hardware or software design or configuration may affect actual performance. This data may vary from other material generated for specific marketing requests.

<sup>3</sup> Intel Corporation, 2008: "ROI Analysis - Reducing 856,000 Pounds of CO<sub>2</sub> Emissions through Remote Services and Off-Hours Power Management (State of Indiana)."

<sup>4</sup> Intel Corporation, 2008: "ROI Analysis - Transforming IT Support with Intel® vPro™ Technology (Calgary Health)."

<sup>5</sup> Intel Corporation, 2008: "ROI Analysis - Leaner and Greener Because of Intel® Core™2 Processors with vPro™ Technology (University of Plymouth)."

<sup>6</sup> Intel Corporation, 2008: "ROI Analysis - Improving Productivity and Reducing Energy Costs and Consumption with Intel® vPro™ Technology (Cleveland Clinic)."

<sup>7</sup> Intel Corporation, 2008: "ROI Analysis - Positive ROI of 180% with More Reliable, Secure, Scalable IT Using PCs with Intel® vPro™ Technology (Telkomsel)."

<sup>8</sup> Intel Corporation, 2008: "ROI Analysis - Substantial Savings and Revenue Gains via 65% to 98% Faster Remote Help-Desk Services (ValueSpace)."

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