

# PC ENERGY REPORT 2009

UNITED STATES, UNITED KINGDOM, GERMANY



ALLIANCE TO  
SAVE ENERGY  
*Creating an Energy-Efficient World*



## THE POWER TO SAVE MONEY

More than nine years ago, 1E became the first company to address the issue of energy waste caused by leaving PCs on overnight and essentially created the global market for IT power management. Today, we're still finding that each and every day many UK workers are unknowingly wasting their organisations' money through one simple act: leaving their PCs on when they're not being used, especially overnight and during the weekends. Collectively, in 2009 UK organisations will spend nearly £300 million powering on PCs when not required, resulting in 1.3 million tons of carbon dioxide emissions – roughly the equivalent impact of 245,000 cars. As an example, for an organisation with 1,000 PCs, this amounts to approximately £16,800 per year.

1E partnered with the Alliance to Save Energy to commission research on user behavior, and at the same time raise



Collectively, in 2009 UK organisations will spend nearly £300 million powering on PCs when not required, resulting in 1.3 million tons of carbon dioxide emissions

awareness of how powering down PCs can have a huge impact on the environment and on a company's bottom line. This is our second year of conducting surveys about PC power shut down. We have surveyed professional adults in several countries and, overall, are generally finding that some progress may have been made. However, it is evident that a significant number of UK workers may not always shut down their PCs at the end of the day for many reasons. Ultimately, these users may not realize that PC power costs are the largest single contributory factor of overall IT energy costs and can account for a quarter of the costs in a modern office building.<sup>1</sup>

At 1E we have had significant commercial success in implementing PC power management across our customer base. Historically, we have found that our 30 largest customers each with more than 100 000 PCs are the ones that are focused heavily on energy cost reduction. However, we are now also starting to see small and medium sized enterprises (SME) start to take energy consumption seriously and engage with us to understand how they can cut costs. What's more, very soon we're going to be helping both large and SME organisations take focus on energy waste in their server rooms and data centres.

We're also increasingly seeing governments take interest in power cost reduction. It is estimated that by using Night-Watchman across the estimated two million government PCs, government departments would save 140,000 tonnes of CO<sub>2</sub> annually<sup>2</sup>. Governments are now adopting energy-efficient measures from switching to energy-efficient products to reducing wastage in their data centres. Additionally, national and local government organisations are ensuring that mandates are being passed that drive both private and public sector to follow greener energy procedures.

Employers today have a golden opportunity to demonstrate environmental and financially astute thought leadership by taking a few simple energy-saving measures, such as setting up processes to power down PCs. Every day that passes is a lost opportunity to save money and reduce your carbon footprint. We hope you'll act now to take this opportunity to make a difference.

Sumir Karayi  
Chief Executive Officer, 1E

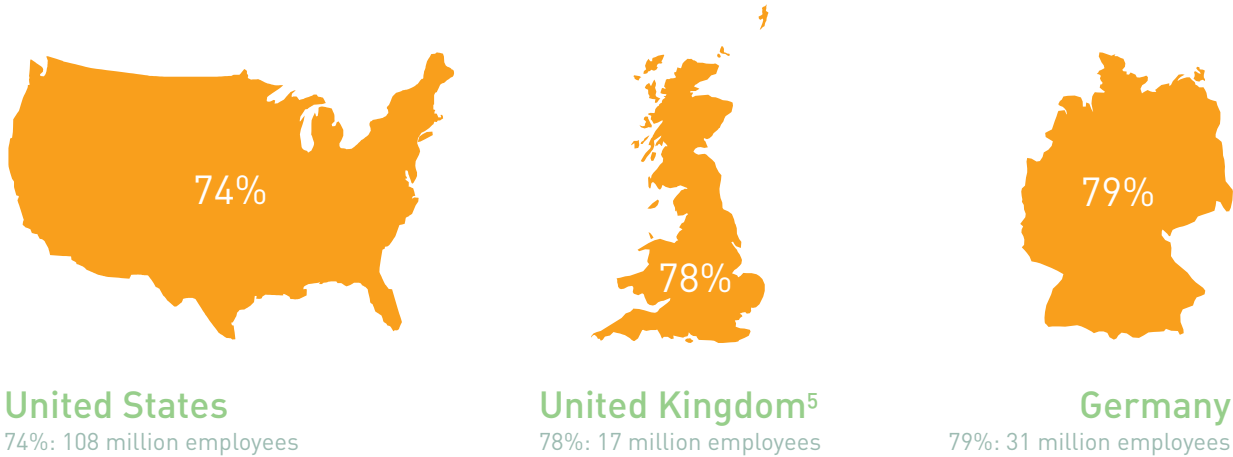
# SUMMARY OF KEY FINDINGS



## PC POWER

Every day 156 million employees in the US, UK and Germany make a decision at the end of their work days to power down their PCs... or not.<sup>3</sup>

A majority of workers in the US, UK and Germany regularly use a PC to do their jobs.<sup>4</sup>



### More Power, More Money

According to a separate survey conducted in October 2008, 50% of employed adults in the US who use a PC at work don't typically shut down their PCs at the end of the work day.

Based on these findings, we can assume that companies across the US are wasting \$2.8 billion and emitting 20 million tons of carbon dioxide to power PCs that aren't shut down. This figure is based on a conservative estimate of 14.5 hours for the overnight period and 48 hours on the weekend.<sup>5</sup> Under this scenario, a single US company with 10,000 PCs wastes more than \$260,000 annually and generates 1,871 tons of CO<sub>2</sub> emissions.<sup>6</sup>



By leaving computers on all night for a year, a company with 10,000 PCs wastes:<sup>8</sup>

#### Germany:

- 1.5 million kWh
- €285,000
- 887 tons CO<sub>2</sub> emissions

#### UK:

- 1.4 million kWh
- £168,000
- 828 tons CO<sub>2</sub> emissions

### Empowered to Power Down

European users have been found to be marginally better. 56% of employees in the UK and Germany always shut down their machines, however, many do not, creating significant expense for their employers. In the UK and Germany, 285,000 Euros and 168,000 Pounds are wasted each year, respectively, by a company with 10,000 PC's.<sup>18</sup>

### Powering Down at Home

The September survey reveals that a vast majority of employed adults who use a PC at work also do so at home (97% US, 96% UK, 97% Germany).

More people power down their PCs at home than at work - People in the UK (78%) and Germany (78%) are more likely than in the US (63%) to always power down their home PC.

## TO SHUT DOWN OR TO POWER DOWN?

Shutting down and powering down aren't the same. Here's how they differ:

SHUT DOWN	SLEEP/HIBERNATE	POWER SCHEME SETTINGS
<p>Turns off all power to your computer</p> <p>Cuts off an employee's remote access</p>	<p>Other terms include "power down" or "suspend"</p> <p>Greatly reduces energy consumption without cutting off an employee's remote access</p> <p>Is not a screen saver—in fact, complex screen savers actually can increase energy consumption</p>	<p>Used while a machine is running during the day (e.g. screen shut -down after five minutes of inactivity)</p>

### Confused About Powering Down?

If you don't know about your PC's power settings, you're not alone. Data collected between September and October 2008 revealed that more than one-third of employees in the UK (38%), 32% of US employees and 17% of German employees who use a PC at work said they either have no idea what power scheme settings are, or how to change the power settings on their PCs.



## NOT POWERING DOWN IS A BIG DEAL

If all of the world's 1 billion PCs were powered down for just one night, it would save enough energy to light up New York City's Empire State Building—inside and out—for more than 30 years.<sup>9</sup>

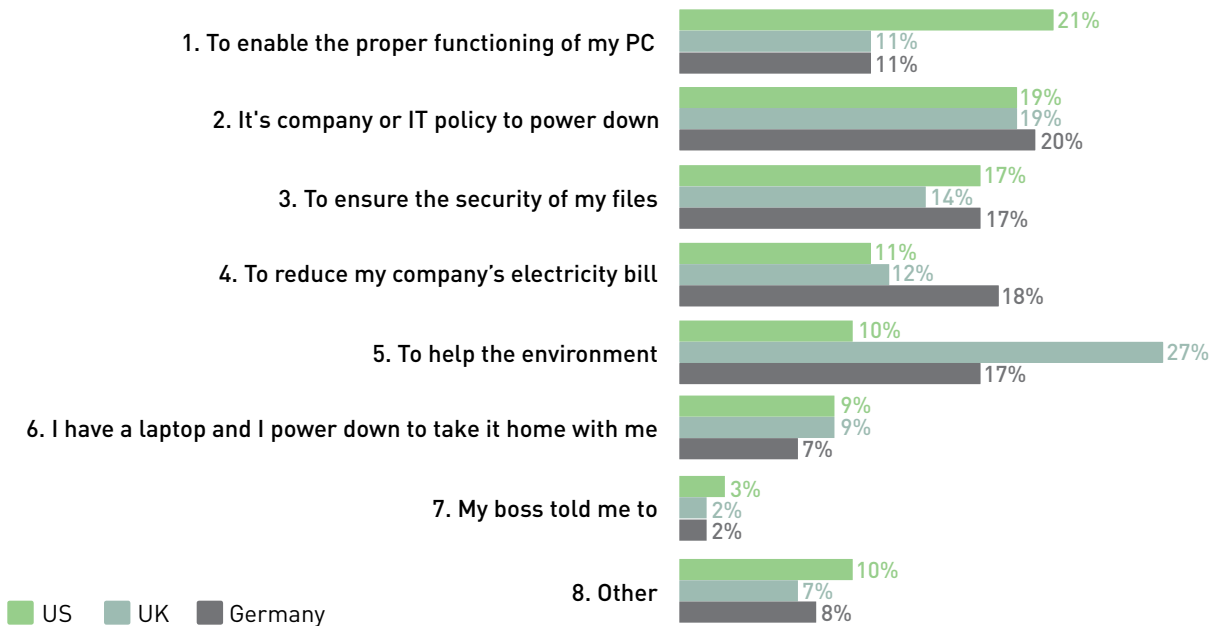


## A Look at Employee Behavior

Always-on PCs are costing organizations money and causing carbon to be emitted into the atmosphere. The September survey examined why users do and don't power down.

### Why Employees Power Down

Which of the following, if any, is the primary reason why you power down your PC when you have finished working for the day?



Employees in the UK are the most idealistic—27% say they power down PCs to help the environment. German employees are most conscious of saving their employer's money, with 18% saying they power down to reduce their company's electricity bill. US employees say they power down to make sure their PCs work properly and to comply with company policy. The table above suggests that the workers in the US and UK are not interested in saving their employers money, so organizations need to take the initiative to generate savings.

### AT&T Inc.: Ringing in the Savings

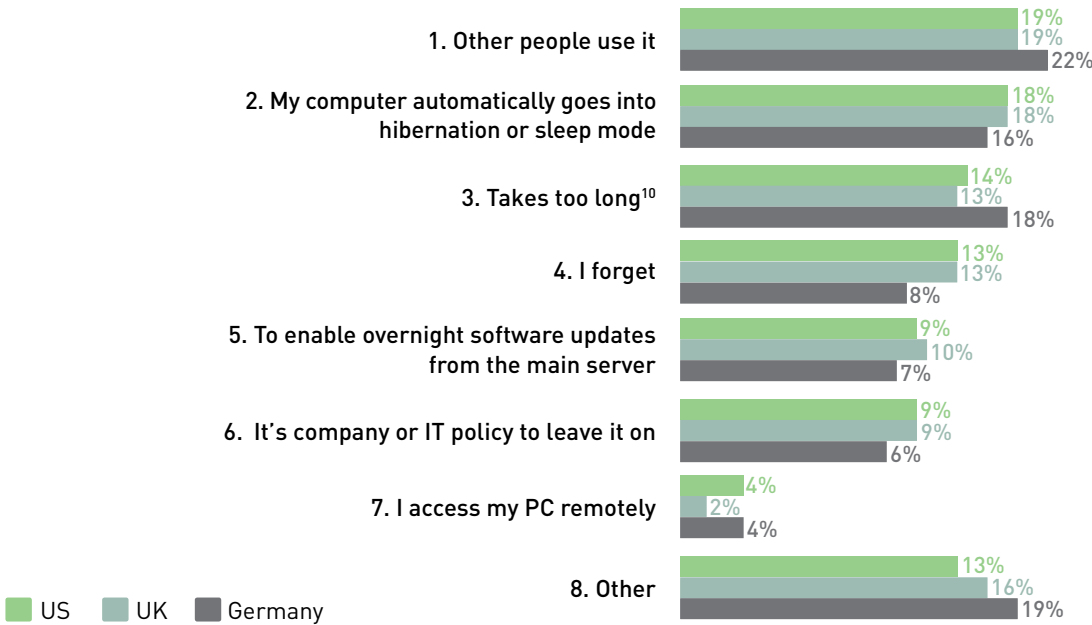
“Installing a power management solution builds on our ongoing efforts to drive energy efficiency inside our facilities.” - Rick Felts, AT&T Senior Vice President of Information Technology Operations.

AT&T Inc. is launching the NightWatchman® PC power management solution from 1E on 310,000 desktop computers across its domestic operations to help improve energy efficiency. Powering down corporate PCs during non-work hours is expected to save AT&T more than 135 million kilowatt hours of electricity a year and eliminate 123,941 tons of carbon dioxide emissions equivalent to the electricity required to power 14,892 homes.

“For the IT function at AT&T, our emphasis is doing more work with less energy and using products that are minimally impacting the environment,” said Rick Felts, AT&T senior vice president of Information Technology Operations. “Installing a power management solution builds on our ongoing efforts to drive energy efficiency inside our facilities. It also allows us to systematically and safely power down PCs while at the same time not compromising our ability to perform software updates as needed.”

## Why Employees Leave PCs on All Night

Which of the following, if any, is the primary reason why you don't always power down your PC when you have finished working for the day?



Almost half of employees in each country surveyed (49% in the US, 48% in the UK, and 43% in Germany) said answer nos. 3 to 7 were the reasons why they left PCs on. Changing employee behavior is one way to avoid the problems of leaving machines powered on all night, however, power management software is another method that organizations can employ to eliminate these excuses.

### UK Office for Government Commerce: Taking On PCs To Battle Carbon Emissions

The UK Government's central procurement department, the Office for Government Commerce (OGC), has selected NightWatchman as part of its campaign to encourage the public sector to work smarter for the environment when using PCs. The campaign also ties into the Cabinet Office agenda for "greening" government IT. This pan-government framework will assist the switching off of PCs when not in use and could save up to £10.2 million and carbon emission reductions of up to 55,723 tons per year.

The Department for Culture, Media and Sport (DCMS), in collaboration with the OGC's ICT, Energy and Sustainability category teams, have awarded a new pan-government IT power management framework to 1E. This deal is available for all software products within the 1E portfolio, including NightWatchman. The framework will provide easy access and contractual agreement for projects, and is open to all public sector bodies from 1 May 2008 for a period of four years.





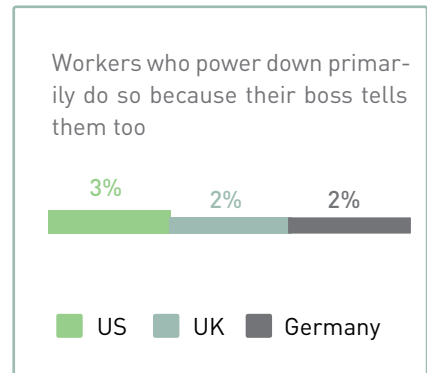
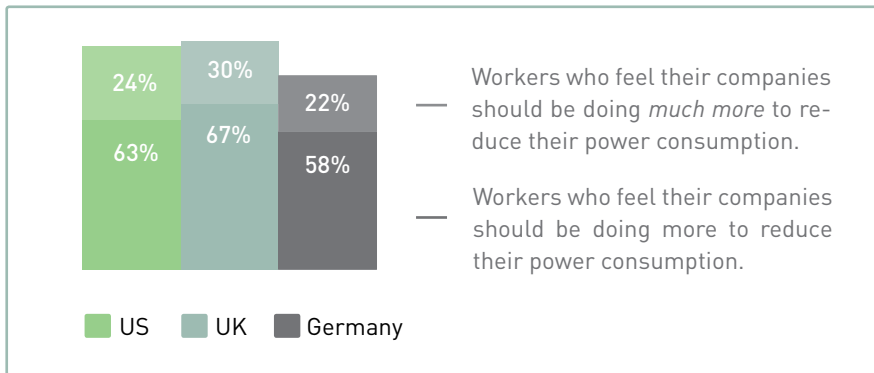
## THE COMPANY'S ROLE IN POWER CONSUMPTION

Across all three countries in the September poll, most employed adults who use a PC at work believe that their employers should be doing more to reduce power consumption—suggesting that power management initiatives would be welcomed by employees.

A majority of workers feel their companies should be doing more to reduce their power consumption (63% in the US, 67% in the UK, and 58% in Germany).

Those in the UK (30%) are more likely than those in the US (24%) and Germany (22%) to believe their companies should be doing much more.

Very few people power down their PC because their bosses told them to—among employed adults who at least sometimes power down their PCs, a mere 3% in the US and 2% in the UK and Germany indicated that they do so primarily because their boss told them to—showing clear opportunity for leaders to set policy.



“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.”

– Andy Lawrence, Research Director, Eco-Efficient IT, The 451 Group, November 2008



# PUTTING PC ENERGY WASTE INTO CONTEXT



## PC PROLIFERATION

“Mature markets such as the United States, Western Europe and Japan currently account for 58 percent of the world’s installed PCs, but these markets only account for 15 percent of the world’s population. We expect per capita PC penetration in emerging markets to double by 2013.”  
Gartner, June 2008<sup>11</sup>

Every year, the information and telecommunications technology industry generates 2% of the world’s carbon emissions—that’s the same as a year’s worth of air traffic. PCs and monitors account for 39% of these emissions<sup>12</sup>, which is equal to a full year of CO<sub>2</sub> emissions from approximately 43.9 million cars.<sup>13</sup>

Unless we make PCs substantially more energy efficient, this number surely will rise because more people are using PCs. According to Gartner Research, there are more than 1 billion PCs in use worldwide, but by 2014, this number is expected to exceed 2 billion.



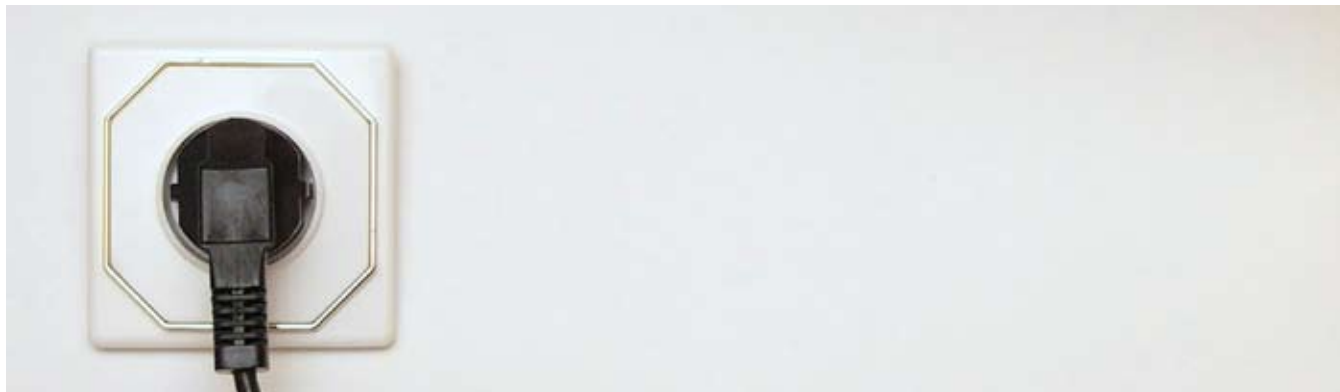
PCs and monitors  
account for **39%**  
of the information  
and  
telecommunications  
industry’s emissions,  
which is  
equal  
to a  
full year  
of CO<sub>2</sub>  
emissions<sup>2</sup>  
from approximately  
**43.9**  
million cars.

# THE FINANCIAL CONTEXT OF ENERGY SAVINGS

## High Energy, High Cost

As energy costs escalate, organizations and consumers are on the lookout for ways to reduce consumption. At the same time, government programs around the world are encourag-

ing—and sometimes requiring—businesses to become more energy efficient.



## Today's Average Electricity Costs By Survey Country<sup>14</sup>

COUNTRY	AVERAGE COST OF ELECTRICITY
United States	10.2¢
United Kingdom	12.0p
Germany	19.46 Euro Cents

*Note: Figures are per kWh as of October 2008. While these are national average prices, regional costs, particularly in the US, can vary greatly because of many factors, including taxes and access to low-cost fuels for generating power.<sup>15</sup>*

### “One of Our Best Investment Decisions” Peterborough City Council

“I am delighted with the results of this project. We set out to achieve a return on investment in 6 months and achieved our target in less than 3 months. When added to the carbon emission savings and the better delivery to our in-house customers, this has been one of our best investment decisions.” - Nigel Green, Head of ICT, Peterborough City Council

Peterborough City Council in the UK has 4,500 staff and it was estimated that 30% of PCs were being left on, costing the authority between £40 - £60 per year per machine. Educating the user community had been tried and a shut down policy was in place, but the perception remained that machines that went into standby mode were powered off. This resulted in significant power still being used by machines left on standby, particularly over weekends.

Peterborough City Council in conjunction with 1E looked at a simple, cost-effective and immediate solution. Night

Watchman® has been deployed globally across 2.5 million PCs in both private and public sector organizations.

Benefits from this program include:

- A cashable saving of £50k per annum on electricity
- Over 250 hours of ICT staff time saved by introducing SMS
- A reduction of 250 tons of CO<sub>2</sub> emissions per year

## INCENTIVES TO SAVE

Governments, non-governmental organizations and utility companies around the world are working to combat growing energy consumption by helping people save energy when they use their PCs. Here are a few examples:

### United States

All federal agencies are required to purchase energy-efficient products and activate power management settings on their computers.

Washington and Texas have enacted state legislation that requires a power management plan to power down state agency PCs.

Several states, including Colorado, Oregon, Minnesota and Kansas, are part of the Climate Savers Computing Initiative, an organization dedicated to improving the power efficiency of computers.

Many utility companies and organizations in the US and Canada offer rebates for customers that use a computer energy savings program, including:

- Avista (Washington and Idaho)
- Austin Energy (Texas)
- BCHydro (Canada)
- Bonneville Power Administration (Pacific Northwest)
- Hawaii Electric Company (Hawaii)
- Idaho Power (Idaho, Oregon)
- Manitoba Hydro/Saskatchewan Power (Canada)
- Nevada Power/Sierra Pacific Power (Nevada and Northeastern California)
- New York Power Authority (New York)
- New York State Energy Research & Development Authority (NYSERDA – New York)
- Northeast Utilities (Connecticut, western Massachusetts, New Hampshire)
- NSTAR (Massachusetts)
- Oregon Energy Trust (Oregon)
- PacifiCorp (Utah)
- PG&E (California)
- Puget Sound Energy (Washington)
- Sacramento Municipal Utility District (California)
- San Diego Gas & Electric (California)
- San Francisco Energy Watch (California)
- Seattle City Light (Washington)
- Silicon Valley Power (California)
- Snohomish PUD (Washington)
- Southern California Edison (California)
- The United Illuminating Company (Connecticut)
- Wisconsin Focus on Energy (Wisconsin)
- Xcel Energy (Minnesota and Colorado)

### EU

The EU has set a target of 20-40% improvement in energy efficiency by 2020.<sup>16</sup> Other European initiatives include:

In Germany, there are rebates or tax breaks for companies that are conserving energy and/or PC power.

Also in Germany, a new database connects companies to German-made, energy-efficient services and products as part of a government initiative to help companies buy energy-efficient products.

In the UK, the Market Transformation Programme (MTP) is the government's main initiative on reducing energy consumption in appliances. It supports the development and implementation of policy on sustainable products and collects information on how energy (such as that consumed by PCs) is used.<sup>17</sup>

### Setting an Example: UK Department for Children, Schools and Families

The Department for Children, Schools and Families found that many of its PCs were being left on unnecessarily overnight and at weekends. As part of the target for all government offices to be carbon neutral by 2012, the Department is committed to reducing its carbon footprint and setting an example to others to advocate emission savings.

By installing NightWatchman in Nov. 2006, the Department for Children, Schools and Families has already made a significant step towards its target of becoming carbon neutral by 2012. By enforcing the automatic powering down of PCs overnight and at weekends, the Department has made the following savings:

- A reduction of 35,290 kg of CO<sub>2</sub> emissions
- A saving of 53,960 kWh of electricity

“By installing NightWatchman® in Nov. 2006, the Department for Children, Schools and Families has already made a significant step towards its target of becoming carbon neutral by 2012.”

## THE POWER OF POWERING DOWN

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 up to 988,026 kWh. This costs an extra \$92,372 per year, at the US average power price of 10.3 cents an hour.<sup>19</sup>

### Dell Saves 40 Percent with More Efficient PCs for its Workforce

"We want to take an industry-leading approach to energy conservation. The technology is now available to make significant improvements in conservation, and we set out to deploy that technology to both conserve energy and cut costs." — Jay Taylor, Regulatory Engineer Strategist at Dell

Dell is firmly committed to meeting energy conservation benchmarks in manufacturing its products, and to conserve energy within the corporation by improving the power management of an estimated 50,000 in-house computers. "We want to take an industry-leading approach to energy conservation," says Jay Taylor, Regulatory Engineer Strategist at Dell. "The technology is now available to make significant improvements in conservation, and we set out to deploy that technology to both conserve energy and cut costs."

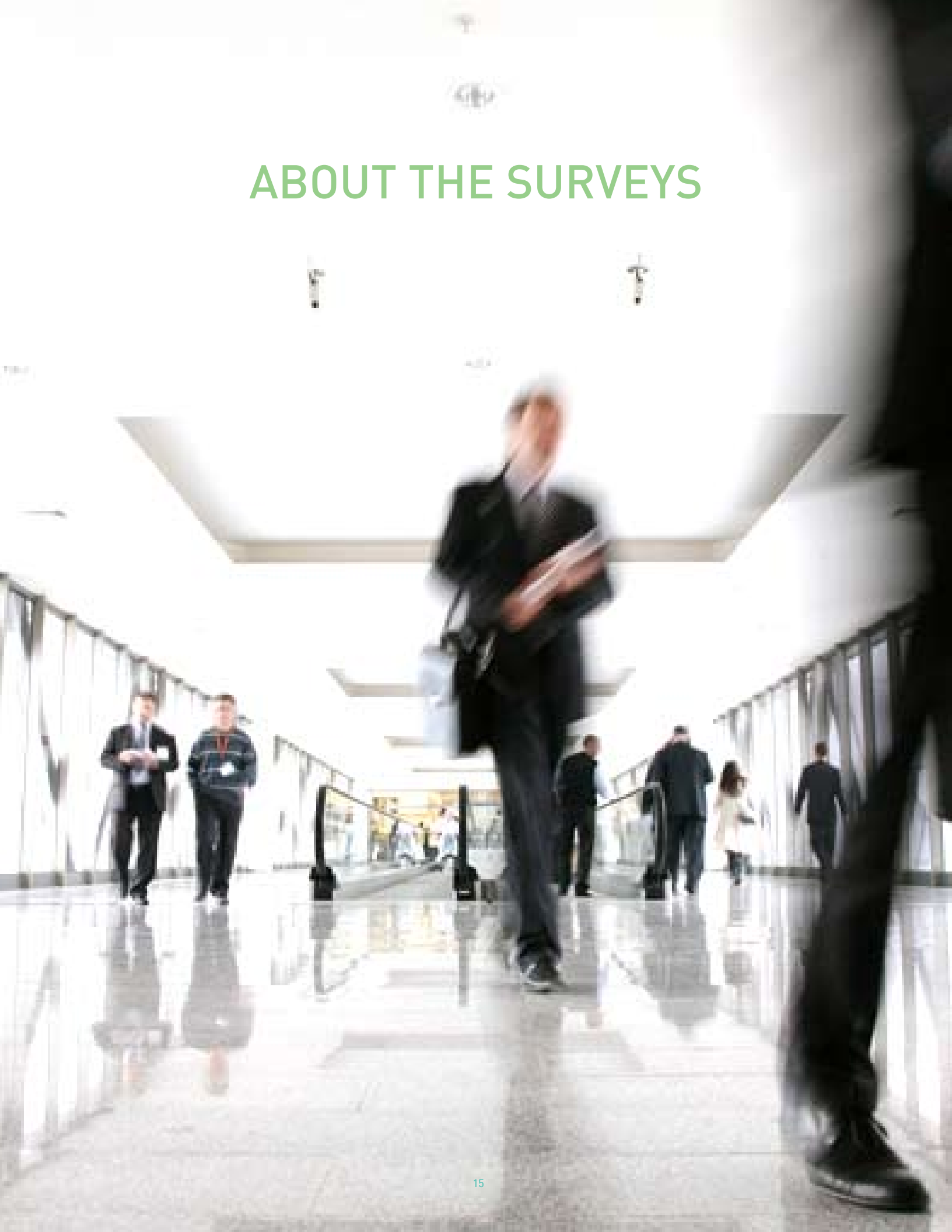
In many offices, computers are left on overnight. "During the off-hours, those computers are creating heat and burning energy," Taylor continues. "And by creating heat, computers force buildings to use more air conditioning, which uses even more energy."

Taylor's team brought together several departments at Dell to develop an energy conservation plan. After reviewing the marketplace, the Dell team unanimously selected two products from 1E: NightWatchman® and SMSWakeUp™ (now known as 1E WakeUp™). 1E WakeUp powers on all PCs that are hibernating or shutdown for successful deployment of updates or patches. NightWatchman can put systems into hibernation or standby, and automatically saves open documents, ensuring successful patch deployment and significantly reducing power consumption.

The 1E applications not only reduce energy consumption but also co-operate to serve as a powerful and flexible administration tool. By deploying NightWatchman and SMSWakeUp across approximately 50,000 client computers, Dell has achieved a 40 percent reduction in energy costs, which translates into \$1.8 million per year.



# ABOUT THE SURVEYS



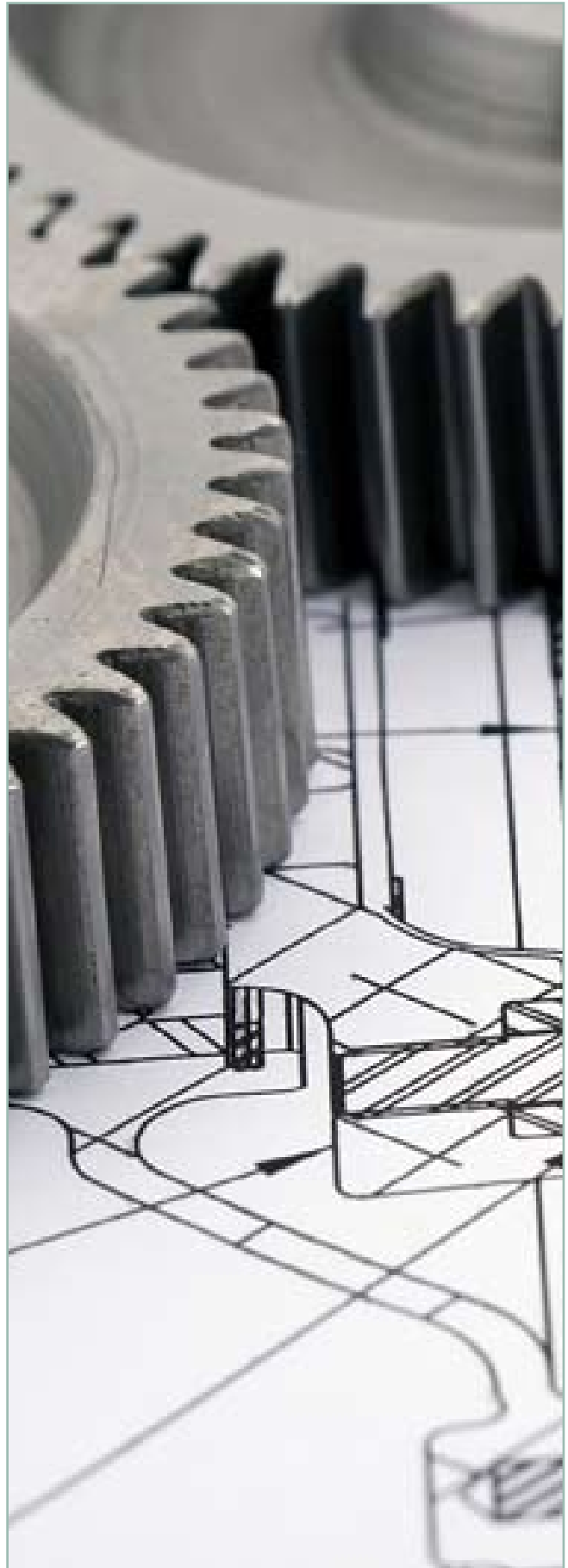
## The October US Survey

This PC Usage survey was conducted online within the United States by Harris Interactive® on behalf of 1E between October 15 and October 17, 2008 among 2,631 adults aged 18+, of whom 1,717 are employed and 1,418 use a PC for work purposes at their job.

## The September US, UK, Germany Survey

This PC Usage survey was conducted online within the United States, UK (excluding Northern Ireland,) and Germany by Harris Interactive® on behalf of 1E between September 4 and September 8, 2008 among 2,112 US adults aged 18+, of whom, 1,258 are employed and 942 use a PC for work purposes at their job; between September 3 and September 12, 2008 among 2,021 British adults aged 16+, of whom, 1,273 are employed and 1,036 use a PC for work purposes at their job; and, between September 3 and September 12, 2008 among 2,028 German adults aged 16+, of whom, 1,432 are employed and 1,137 use a PC for work purposes at their job.

These online surveys are not based on probability samples and therefore no estimates of theoretical sampling error can be calculated.





# ABOUT 1E





## About 1E

1E is a global Windows Management software and services company. Our expertise in providing leading-edge automation solutions, which reduce complexity, management costs and power consumption, has earned us the trust and confidence of over 12 million users across more than 1,000 businesses in 42 countries worldwide. Customers include Allstate Insurance, Blue Cross, British Airways, Dell Inc, HSBC, ING Investment Management, Marks & Spencer, Microsoft, Nestlé, Reed Elsevier, SABMiller, Syngenta, the US Air Force on behalf of the Pentagon, Verizon Wireless. Please visit [www.1e.com](http://www.1e.com)

## About the Power & Patch Management Pack™

The Power & Patch Management Pack™ from 1E comprises two leading applications: NightWatchman and 1E Wake-Up™. The solution enables unused computers to be powered down centrally, safely and remotely – to an automated schedule. Before powering down a PC, it saves any open documents so users don't lose any work. The pack gives you the power to manage software patches and updates across your enterprise network in a less intrusive, more effective manner. You can wake up PCs out of office hours, install the latest updates through Microsoft System Center Configuration Manager 2007 or SMS 2003, and then shut them down 'en masse' moments later. Your staff can remain productive and work without interruption on well protected PCs, without the risk and potential cost of a virus attack.

## About the Alliance to Save Energy

The Alliance to Save Energy is a coalition of prominent business, government, environmental, and consumer leaders who promote the efficient and clean use of energy worldwide to benefit consumers, the environment, economy, and national security. More information is available at [www.ase.org](http://www.ase.org)

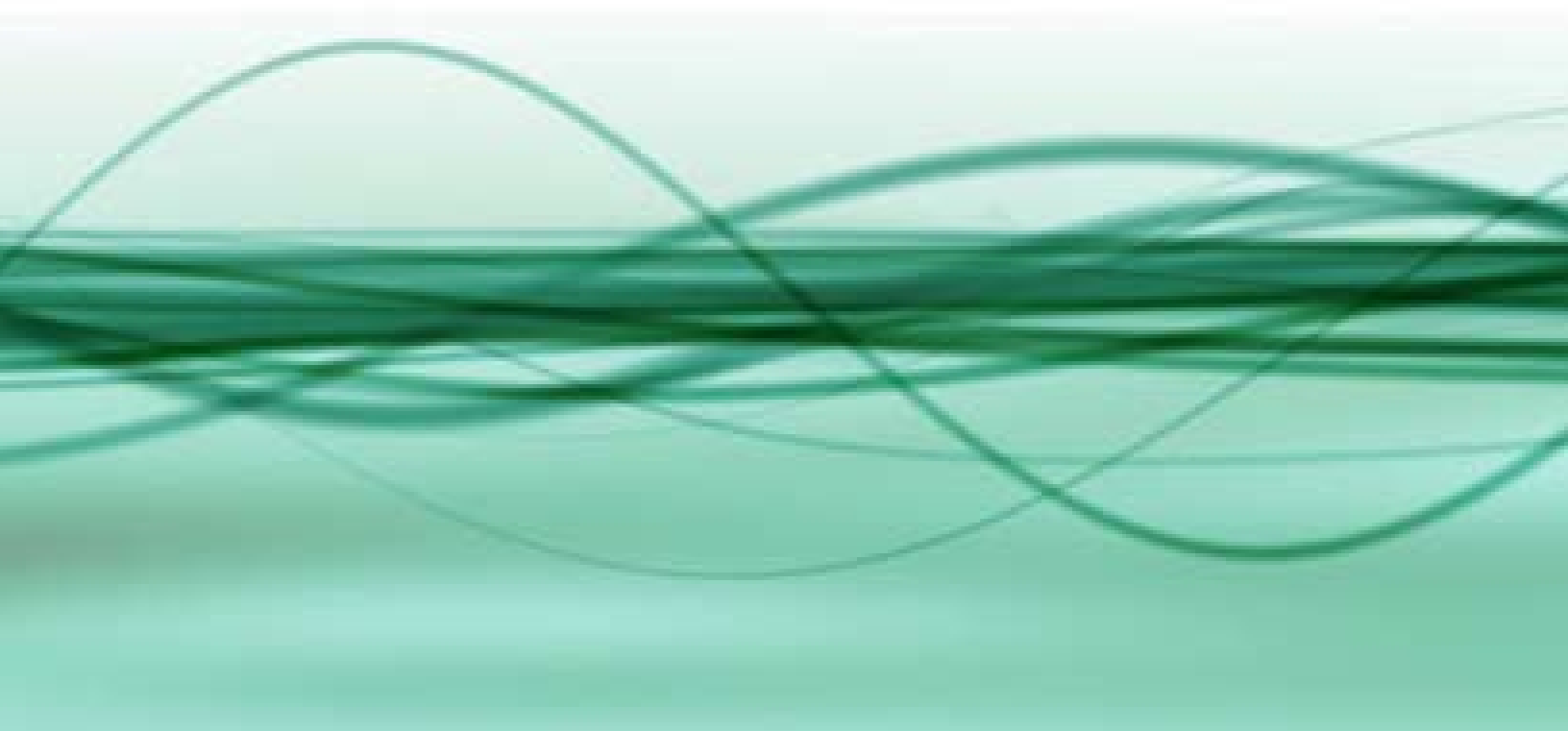
## About Harris Interactive®

Harris Interactive® is a global leader in custom market research. With a long and rich history in multimodal research, powered by our science and technology, we assist clients in achieving business results. Harris Interactive serves clients globally through our North American, European and Asian offices and a network of independent market research firms. For more information, visit [www.harrisinteractive.com](http://www.harrisinteractive.com)



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# APPENDIX



1) Source: Gartner, Inc., "IT Vendors, Service Providers and Users Can Lighten IT's Environmental Footprint" by Simon Mingay, December 5, 2007

2) Source: [http://www.cio.gov.uk/documents/greening\\_govt\\_ict/greening\\_gov\\_ict080724.pdf](http://www.cio.gov.uk/documents/greening_govt_ict/greening_gov_ict080724.pdf)

3) Arrived at number of employees by using the following calculations:

- US: 145.3 million full-time employees, per US Bureau of Labor Statistics: <http://www.bls.gov/news.release/empsit.nr0.htm>
- Germany: Germany: 39.7 million full-time employees, per Federal Office of Statistics, Germany. <http://www.bmwi.de/English/Navigation/Press/press-releases,did=275308.html>
- UK: 21.9 million full-time employees, per Office for National Statistics, UK. <http://www.statistics.gov.uk/pdfdir/lmsuk1008.pdf> [page 2]

Percentage of employees (FT, PT, Self) who use PCs to do their jobs, according to findings from a Sept. 08 Harris Interactive Survey for 1E:

US : 74%           108 million employees  
UK: 78%:           17 million employees  
Germany: 79%:     31 million employees

4) Please note: Map does not include Northern Ireland because the 1E PC Energy Survey in the UK did not interview respondents in Northern Ireland.

5) Note: Survey did not include respondents from Northern Ireland

6) One PC uses 84 watts idle, according to Lawrence Berkeley National Laboratory

Assumptions:

PCs left on for 14.5 hours over night on week nights  
PCs left on for 48 hours on weekends

Weekdays:

84 watts x 14.5 overnight hours = 1,218 watts = 1.2 kWh per PC per week night  
Total weeknights per year: 1.2 kWh x 260 week nights per year (52 weeks x 5) = 312 kWh

Weekends:

84 watts X 48 hours = 4,032 watts = 4 kWh per PC per weekend  
Total weekends per year: 4 kWh x 52 weekends per year = 208 kWh

Total kWh used per PC being left on during weeknights and weekends per year: 208 + 312 = 520 kWh

Average cost of energy in the U.S.=10.2 cents per kWh, or \$.1 (see note 14, below)

Of the 108 million computers US employees use, 54 million are left on overnight in US (Oct 2008 Harris Interactive Survey for 1E: 50% typically don't shut down)

520 kWh X 54 million = 28.8 billion kWh  
28.8 billion kWh @ \$.1 per kWh = \$2.8 billion

To calculate GHG emissions based on kWh used:

In the US, there are .71 metric tons/1000 kWh, according to <http://www.epa.gov/cleanenergy/energy-resources/calculator.html>

28.08 billion kWh X (.71 tons/1000 kWh) = 20 million tons UK

7) Total kWh used per PC per year (based on above calculation): 520 kWh  
Of a company's 10,000 PCs, 5,000 are left on overnight in US (Oct. 2008 Harris Interactive Survey for 1E: 50% don't typically shut down)  
520 kWh X 5,000 = 2.6 million kWh  
2.6 million kWh @ .1 cents per kWh = \$260,000

2.6 million kWh X (.71 tons/1000 kWh) = 1,846 tons CO2 emissions

8) Germany:

Total kWh used per PC per year (based on above calculation): 520 kWh  
Of a company's 10,000 PCs, 3,000 are left on (Sept. 2008 Harris Interactive Survey for 1E: 30% don't always shut down)  
520 kWh X 3,000 = 1.5 million kWh

Average cost of energy in Germany = .19 euro cents per kWh, or .19 euros (see note 14, below)

1.5 million kWh @ .19 euro cents per kWh = 285,000 euros

To calculate GHG emissions based on kWh used:

- Multiply kWh X 0.537 to find Co2 emissions (Carbon Trust, 2008. Greenhouse Gas conversion figures. [http://www.carbontrust.co.uk/resource/conversion\\_factors/default.htm](http://www.carbontrust.co.uk/resource/conversion_factors/default.htm))
- Convert kgs to tons: 907 kgs = 1 ton <http://www.convertunits.com/from/kg/to/tons>

1.5 million kWh x 0.537 = 805,000 kg  
805,000 kg = 887 tons CO2 emissions

UK: Of a company's 10,000 PCs, 2,800 are left on (Sept. 2008 Harris Interactive Survey for 1E: 28% don't shut down)  
520 kWh X 2,800 = 1.4 million kWh

Average cost of energy in the U.K. = £.12 per kWh, or £.12 (see note 14, below)

1.4 million kWh @ £.12 = £168,000  
1.4 million kWh X 0.537 = 751,800 kg  
751,800 kg = 828 tons CO2 emissions

9) According to Lawrence Berkeley National Laboratory, a computer uses 84 watt-hours of power when idle (on, but not downloading or saving materials).

- 84 watt hours X 14.5 hours computers left on in just one night = 1,218 watt hours = 1.22 kWh
- Gartner: 1 billion PCs in the world ([http://www.gartner.com/DisplayDocument?ref=g\\_search&id=644708&subref=simplesearch](http://www.gartner.com/DisplayDocument?ref=g_search&id=644708&subref=simplesearch))
- 1 billion PCs X 1.22 kWh = 1.22 billion kWh
- Empire State Building: Uses 40 million kWh annually [http://www.esbnyc.com/tourism/tourism\\_facts.cfm?CFID=30477166&CFTOKEN=62800391](http://www.esbnyc.com/tourism/tourism_facts.cfm?CFID=30477166&CFTOKEN=62800391)
- 1.22 billion / 40 million = 30.5 years

10) The percentages cited refer to a net, or sum, of the percentage of respondents who selected "it takes too long to power up when I turn it on the next time I use it" and "it takes too long to power down when I shut down."

11) <http://www.gartner.com/it/page.jsp?id=703807>

12) Gartner: Conceptualizing 'Green' IT and data center power and cooling issues, September 2007

13) Source: Gartner

Car equivalency calculation:

- Information and Communications Technology industry emissions were just short of 600 million metric tons.
- Gartner: PCs and monitors are 39% of total ICT emissions. (39% of 600 million = 240 million metric tons of CO2.)
- One car = Produces 5.46 metric tons of CO2 emissions in a year (US Environmental Protection Agency: <http://www.epa.gov/cleanenergy/energy-resources/refs.html#vehicles>)
- 240 million / 5.46 = 43.9 million

14) Energy price sources:

- US [http://tonto.eia.doe.gov/cfapps/STEO\\_Query/steotables.cfm?periodType=Annual&startYear=2005&startMonth=1&endYear=2009&endMonth=12&tableNumber=19](http://tonto.eia.doe.gov/cfapps/STEO_Query/steotables.cfm?periodType=Annual&startYear=2005&startMonth=1&endYear=2009&endMonth=12&tableNumber=19)
- UK: (including Climate Change Levy and VAT : <http://www.tnei.co.uk/>)
- Germany: [www.verivox.de](http://www.verivox.de)

15) US Department of Energy [http://www.eia.doe.gov/cneaf/electricity/page/fact\\_sheets/retailprice.html](http://www.eia.doe.gov/cneaf/electricity/page/fact_sheets/retailprice.html)

16) <http://www.stopclimatechange.net/index.php?id=19>

17) For more information see: <http://www.1e.com/EnergyCampaign/downloads/1ENEFReport.pdf>

18) In the UK and Germany, 27% and 30% of employees who use a PC at work respectively say they don't always shut down their PC with 56% stating they always shut down, 14% sometimes and 9% never

19) PC Power Management Activation Leads to Significant Power and Cost Savings" Gartner, August 2007 [ftp://download.intel.com/apac/roadmap/gartner%20pc\\_power\\_management\\_activati\\_150422.pdf](ftp://download.intel.com/apac/roadmap/gartner%20pc_power_management_activati_150422.pdf)