The Oracle European Sustainable IT Survey

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INTRODUCTION

Sustainable IT, or green IT, is a term used to describe the manufacture, management, use, and disposal of IT in a way that minimizes damage to the environment. As a result, the term has many different meanings, depending on whether you are a manufacturer, manager, or user of technology. Sustainable IT management and use has to do with the way a company manages its IT assets. It includes purchasing energy-efficient desktops, notebooks, servers, and other IT equipment, as well as managing the power consumption of that equipment. It also refers to the environmentally safe disposal of that equipment, through recycling or donation at the end of its lifecycle. The goal behind most green business initiatives, including green IT, is to promote environmental sustainability.[1]

The Oracle European Sustainable IT Survey was conducted by Vanson Bourne, technology market research specialists, during January 2008, among 480 respondents in 12 European countries. Organizations in the financial services, public sector, and telecommunications industries were polled. The aim was to identify the green issues driving businesses and their awareness and uptake of virtualization technologies as a tool for sustainable IT.

The Oracle European Sustainable IT Survey was conducted by Vanson Bourne, technology market research specialists, during January 2008, among 480 respondents in 12 countries. The countries participating in the survey were Belgium, Denmark, Finland, France, Germany, Italy, the Netherlands, Norway, Portugal, Spain, Sweden, and the U.K. Organizations in the financial services, public sector, and telecommunications industries were polled. The aim was to identify the green issues driving businesses and their awareness and uptake of virtualization technologies as a tool for sustainable IT. This white paper summarizes the results of the survey.

GENERAL FINDINGS

The results of the survey have been simply divided into broader business issues and more technology-focused findings. Any notable differences among European countries have been highlighted.

Business Issues

The survey revealed that employees have the most influence when it comes to making organizations more environmentally aware: 23 percent of European organizations believe staff employees wield the most power when it comes to molding a company's green agenda and environmental responsibilities. The survey

[1] Katherine Walsh. "ABC: An Introduction to Environmentally Sustainable IT." *CIO* Magazine. October 29, 2007. http://www.cio.com/article/149651/ABC_An_Introduction_to_Environmentally_Sustainable_IT

finds that organizations can no longer ignore the impact their employees have on the way the business approaches the environmental agenda. It also reveals how apparent it is that employees have a sense of duty and responsibility when it comes to determining their employer's environmental direction. Other influential bodies include government organizations (cited by 21 percent of respondents), citizens (16 percent), and customers (15 percent).

Employees of Nordic organizations have a particularly strong voice when it comes to making the organization more environmentally aware: in this region, 37 percent cite employees as the influence, compared with the 23 percent European average. In the U.K. and Belgium, government organizations have the majority influence: 39 percent and 30 percent, respectively, compared with the 21 percent European average. In Germany, customers have a disproportionately strong influence in making the organization more environmentally aware: 21 percent, compared with the 15 percent European average.

This survey also brings into sharp focus the need for organizations to examine closely how environmentally responsible they are and, in particular, what impact any equipment they use has on the environment.

This survey also brings into sharp focus the need for organizations to examine closely how environmentally responsible they are and, in particular, what impact any equipment they use has on the environment. One-third (34 percent) of organizations are currently measuring their carbon footprint, and a further 22 percent intend to do so in the near future. However, 29 percent of organizations that took part in the survey are not conducting any such measurement and have no plans to do so. The survey highlights broad discrepancies across Europe in the desire to measure the organization's carbon footprint. The strongest interest comes from Belgium (73 percent are measuring it or intend to do so), the U.K. (70 percent), and France and Italy (both 65 percent). The least interest comes from the Netherlands (38 percent) and Germany (32 percent).

The survey indicates that issues associated with carbon footprint reduction are being driven from the CEO downward, with a marked strategy to reduce waste, introduce more efficient energy policies, and tackle carbon emissions. In fact, 22 percent of organizations that took part identify the CEO/head of the organization as now driving the company's carbon footprint initiative, and a further 20 percent have already appointed a dedicated "green czar" to meet the challenges of corporate, social, and environmental responsibilities. Other job functions overseeing the initiative include the head of technology (cited by 9 percent), a third-party consultant (7 percent), and the head of operations (7 percent).

The overwhelming priority for organizations in Europe is to have a policy on recycling and waste. According to the survey, 61 percent perceive waste management—from recycling paper and PCs to the ethical decommissioning of old equipment—as their primary goal. Their secondary goal is the efficient management of utility energy, including heating and lighting, which is cited by 49 percent of European organizations. Reducing IT power consumption is the tertiary priority (46 percent). Other priorities are to reduce travel (26 percent) and to introduce greener services and suppliers (24 percent).

Technology Issues

The survey highlights a rising trend among European organizations to adopt sustainable, green IT strategies. Almost two-thirds of organizations either have or are developing plans to reduce their energy and emissions caused by their use of technology, the priorities being to reduce IT power consumption and cut utility costs. For those organizations with plans in place, there are a number of pressures driving the implementation of their green IT initiatives: 55 percent cite rising energy costs, followed by corporate social responsibility (45 percent), regulatory compliance (41 percent), and storage capacity (15 percent).

Reducing technology waste and recycling are the key environmental priorities for these European organizations. The second goal is the efficient management of utility energy, such as data center heating and lighting, according to 49 percent of European organizations. Reducing IT power consumption is the third priority, cited by 46 percent of respondents. Three countries are leading the way when it comes to recycling and waste management: the U.K. (72 percent of organizations view it as their top priority), Italy (68 percent), and Spain/Portugal (67 percent). The U.K. is also 11 percentage points above the European average in prioritizing efficient utility management.

Although it is heartening to see a rising trend among European organizations to adopt plans to reduce energy and emissions caused by the use of IT, it is apparent that many are not aware of the full range of practical technology solutions available today that will help deliver the environmental efficiency they seek.

Although it is heartening to see a rising trend among European organizations to adopt plans to reduce energy and emissions caused by the use of IT, it is apparent that many are not aware of the full range of practical technology solutions available today that will help deliver the environmental efficiency they seek. Besides the evident issue of cost, the overwhelming constraint is a lack of understanding about what is available (cited by 23 percent), a lack of suitable products (16 percent), and a lack of support from the board or senior management (16 percent). At a country level, 70 percent of French organizations cite cost as the inhibitor, compared with only 35 percent in the Netherlands.

For those organizations actively associated with green IT initiatives, migration from legacy mainframes and the adoption of hardware, server, or Java virtualization techniques will help form the four Rs of responsible IT provision: reduce, reuse, recycle, and re-engineer. Mainframe migration, rehosting, and consolidation provides an opportunity to retire old, energy-intensive systems in favor of commodity blade server farms. It reduces power consumption of both systems and the data center by changing how cooling needs to be done. Instead of cooling the large systems, the ambient temperature of the entire data center is controlled. Virtualization also has a key role to play in enabling the green data center; by reducing the volume of servers, it reduces energy usage, enables the fuller use of underused computing resources, and translates into a longer life for the data center—with less strain on the environment.

However, when asked how aware respondents were about virtualization, 39 percent are "not very aware," with only 7 percent "very aware." The remaining 54 percent that expressed an opinion are in the middle, with varying degrees of knowledge and awareness. Awareness of virtualization in Europe is polarized: the proportion of

U.K. organizations aware of the technique is between two and three times higher than it is in Germany and the Netherlands. This implies a possible connection to Germany and the Netherland's lack of self-examination of IT-based internal energy consumption policies cited above and lack of awareness of the full spectrum of potential green IT solutions available to them.

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For those familiar with the technology, the overwhelming benefit of virtualization is reduced costs, cited as "very important" by 41 percent. The second most important perceived benefit is that it enables servers to work more efficiently (34 percent). The third benefit is increased agility and the ability for an infrastructure to react to peaks in demand (22 percent).

SURVEY RESULTS

To identify awareness of organizational green activities and virtualization as a tool to achieve more sustainable IT, Oracle commissioned a survey of senior IT managers/directors and CIOs across 12 European countries. The survey asked respondents in these countries the following questions:

1. Is your organization measuring its carbon footprint?
2. Which job function is driving any carbon footprint initiative?
3. Which areas of your business are the current top priorities for green initiatives?
4. Does your organization have a plan to reduce energy and emissions caused by your use of IT?
5. What are the top two business pressures driving implementation of green IT initiatives in your organization?
6. Who would you say is the single biggest influencer on your organization to be more environmentally aware?
7. Does your organization plan to invest in technologies that reduce energy and emissions?
8. What, within your organization, do you feel is preventing your organization from greater uptake of environmentally aware technology solutions?
9. At what stage is your organization in implementing the following IT initiatives?
10. How aware are you about virtualization?
11. Benefits of virtualization: Please rate how important each benefit is for your organization.
12. How far is your organization planning to use various forms of virtualization?
13. What do you believe would be the major obstacles to implementing a server virtualization model within your organization?

14. Java virtualization removes the need for an operating system. What is your immediate reaction to this statement?

Within this report, the survey results are reported by individual questions. Any trends by vertical industry—financial services, public sector, and telecommunications—are then identified.

Question 1: Is Your Organization Measuring Its Carbon Footprint?

The majority of European organizations are measuring their carbon footprint—the impact their activities have on the environment in terms of the amount of greenhouse gases produced and their contribution to global warming. Overall, according to the survey, 56 percent of respondents are proactively involved in measuring their carbon footprint: 34 percent are doing something now and 22 percent aren't doing it yet, but plan to do so in the near future. Almost one-third of organizations (29 percent) have no plans to measure their carbon footprint.

If your organization isn't measuring its carbon footprint, it needs to think about doing so. It's good business practice to do so, and it's going to be a big part of tomorrow's regulatory environment.

If your organization isn't measuring the footprint, it needs to think about doing so. It's good business practice to do so, and it's going to be a big part of tomorrow's regulatory environment. The European Union is pursuing regulation on the ecologically friendly design of energy-using products through Directive 2005/32/EC. This directive will require manufacturers to calculate the energy used to produce, transport, sell, use, and dispose of almost all products. It will also require manufacturers to go back to the energy used when extracting the raw materials needed to make its product, including all subassemblies and components.

Across Europe, some countries are more advanced than others when it comes to measuring the footprint. The strongest interest comes from Belgium (73 percent of organizations are measuring it or intend to do so), the U.K. (70 percent), and France and Italy (both 65 percent). The least interest comes from Germany (32 percent) and the Netherlands (38 percent).

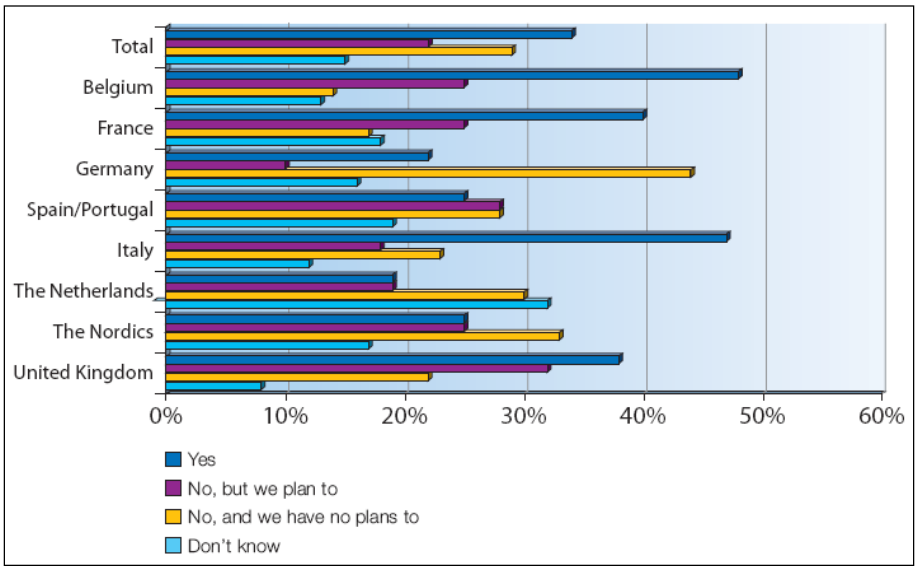

Figure 1. Is your organization measuring its carbon footprint?

Question 2: Which Job Function Is Driving Any Carbon Footprint Initiative?

Carbon footprint initiatives are being driven from the top down, According to the survey, the first primary job function driving carbon footprint initiatives is the CEO/head of the organization, cited by 22 percent of respondents.

Carbon footprint initiatives are being driven from the top down. According to the survey, the first primary job function driving carbon footprint initiatives is the CEO/head of the organization, cited by 22 percent of respondents. In the U.K., the CEO/head of the organization is spearheading this, with CEOs driving the carbon footprint issue in 39 percent of organizations. The CEO/head of the organization is also an above-average choice to spearhead carbon footprint initiatives in France (28 percent) and Belgium (27 percent).

The second most popular choice is a so-called green czar, appointed specifically to manage such initiatives (cited by 20 percent of respondents). They are particularly prevalent in Germany (37 percent), but barely visible in the U.K. (only 3 percent).

Altogether, the CEO/head of the organization and green czar account for 42 percent of European organizations. Other job functions cited include the head of technology (9 percent): IT departments can take the lead within organizations and create a new role for themselves in the process, by allowing organizations to be proactive in reducing energy consumption, and hence reduce their carbon footprint. In the Nordics (Denmark, Finland, Norway, and Sweden), the head of technology is driving the issue in 16 percent of organizations, 5 percentage points higher than the pan-European average.

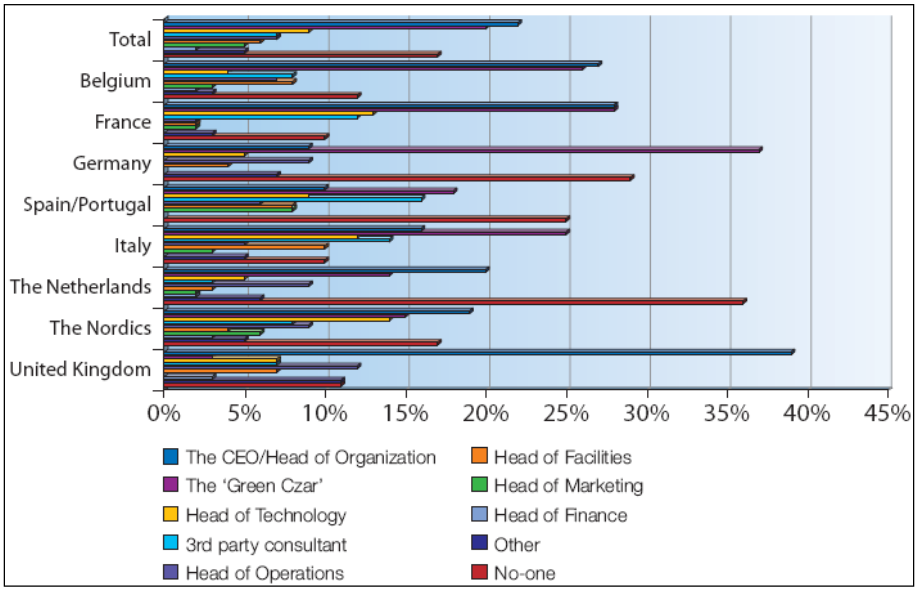

Figure 2. Which job function is driving any carbon footprint initiative?

Question 3: Which Areas of Your Business Are the Current Top Priorities for Green Initiatives?

Recycling and waste management—from recycling paper and PCs to the ethical decommissioning of old equipment—is the top green initiative adopted by European organizations, cited by 61 percent of organizations. Electrical waste in particular has become a key issue for businesses. The European Union Waste Electrical and Electronic Equipment (WEEE) Directive,[2] for example, is designed to address the fast-increasing waste stream of electrical and electronic equipment. It complements European Union measures on landfill deposits and waste incineration. Increased recycling of electrical and electronic equipment will also limit the total quantity of waste going to final disposal. The directive sets targets that 65 percent of IT equipment must be recycled, and materials such as CRTs (monitors), LCD displays, printed circuit boards, batteries, and flame-retardant plastics must be pretreated before disposal.

Looking at the findings, three countries are leading the way when it comes to recycling and waste management: the U.K. (72 percent of organizations view it as their top priority), Italy (68 percent), and Spain/Portugal (67 percent). The U.K. is also 11 percentage points above the European average in prioritizing efficient utility management.

[2] For more information about the WEEE Directive, please refer to http://ec.europa.eu/environment/waste/weee/index_en.htm.

Electrical waste in particular has become a key issue for businesses. The European Union Waste Electrical and Electronic Equipment (WEEE) Directive, for example, is designed to tackle the fast-increasing waste stream of electrical and electronic equipment. It complements European Union measures on landfill deposits and waste incineration.

The second goal is the efficient management of utility energy, including heating and lighting, cited by 49 percent of European organizations. IT power consumption is their third priority, according to 46 percent of respondents. The data center—and the computer in general—wastes a significant amount of energy every day. The data center represents an even bigger prize for organizations that address the issue of underutilization of servers. A Butler Group report[3] found that by consolidating 250 dual-core servers onto 25 more powerful dual-core servers, an organization could save US$280,000 per year in energy costs alone.

IT power consumption is the third major driver for Italian organizations (cited by 63 percent), although it is a comparatively low priority in the Netherlands (37 percent). The extent to which organizations are cutting back on travel in an attempt to be green differs too across the region. In Belgium and the U.K., it is a major driver for 43 percent of organizations, but surprisingly only important to just 8 percent of German organizations. Italy is also putting a strong concentration on using greener services and suppliers (40 percent), whereas no other country rises above 20 percent on this issue.

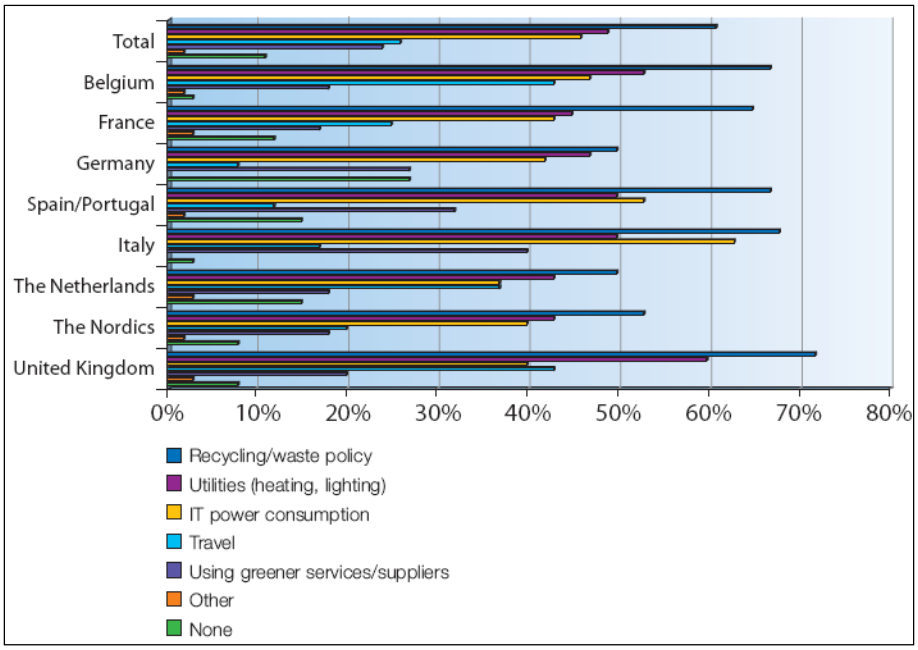

Figure 3. Which areas of your business are the current top priorities for green initiatives?

[3] http://www.binfo.co.uk/2008/01/16/butler-virtualisation-report/

Italy is the most advanced of all countries in terms of plans to reduce IT waste: 67 percent have a plan in place, are about to launch one, or are working on one, compared with the 59 percent European average.

Question 4: Does Your Organization Have a Plan to Reduce Energy and Emissions Caused by Your Use of IT?

Turning to issues specifically related to technology, the survey finds that one-third of European organizations (33 percent) currently have no plans at all to reduce energy and emissions caused by their use of IT, in spite of the advantages of so doing. The majority, however, (59 percent) have a plan in place, a plan ready to go, or are working on a plan.

Some countries are more advanced in their plans to reduce IT-related energy consumption and emissions: 47 percent of organizations in the Netherlands, for example, have a plan already in place or are on the cusp of launching one, compared with the 37 percent European average. Germany is the least advanced in this respect (33 percent) and Italy the most advanced (67 percent).

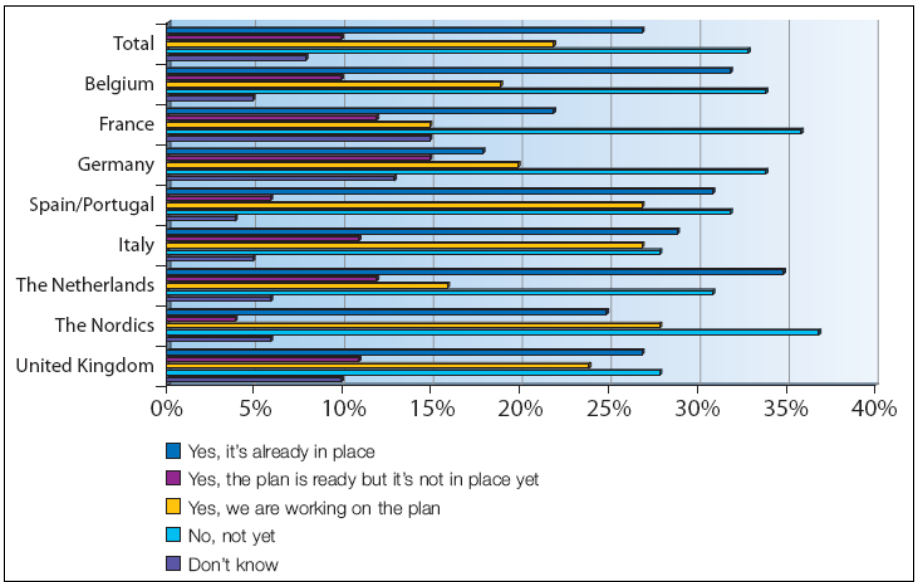

Figure 4. Does your organization have a plan to reduce energy and emissions caused by IT use?

Question 5: What Are the Top Two Business Pressures Driving Implementation of Green IT Initiatives in Your Organization?

IT has been on an unsustainable path for years. Centralized data centers cannot get sufficient power from the electricity network, and millions of computers burn up processor power by sitting idle or performing background processes while their users are away. If these factors alone are not reason enough to sign up to green IT, there are countless more. Many European Union regulations and campaigns demand greener businesses: the ethical disposal of equipment under the WEEE Directive, transparency on companies' carbon footprint, and ultimately a cap-and-trade system for carbon credits set to be introduced in 2010.

CEOs/heads of organizations will eventually see green IT—or environmental sustainability—as a better way to do business, not only because it's the right thing to do, but also because major stakeholders—including shareholders, nonprofit environmental organizations, and citizens and customers—will demand it.

CEOs/head of organizations will eventually see green IT—or environmental sustainability—as a better way to do business, not only because it's the right thing to do, but also because major stakeholders—including shareholders, nonprofit environmental organizations, and citizens and customers—will demand it. Because IT is a large contributor to the greenhouse gas emission problem, it also has an opportunity to be a big part of the solution.

Respondents see it slightly differently. According to 55 percent of those surveyed, the predominant driver to implement green IT initiatives is to combat rising energy costs. Germany, like the rest of Europe, gives predominance to addressing rising energy costs. What is interesting though is the magnitude of this issue: 70 percent of German organizations view it as the key pressure, compared with the 55 percent European average.

Corporate, social, and environmental responsibility is also now a core competency, which management is increasingly incorporating into their strategy and operations. It's the second most important issue, according to 45 percent of organizations. In the Netherlands, there is a strong emphasis on corporate social responsibility (62 percent, compared with the 45 percent European average). And in the Nordics, storage capacity is a comparatively strong pressure driving the implementation of green IT initiatives: 25 percent, compared with the 15 percent European average.

The third pressure driving green IT initiatives is regulatory compliance. Italy (60 percent) and Spain/Portugal (57 percent) are two regions particularly driven to meet the demands of regulatory compliance. (See Question 9 for more details on this topic.)

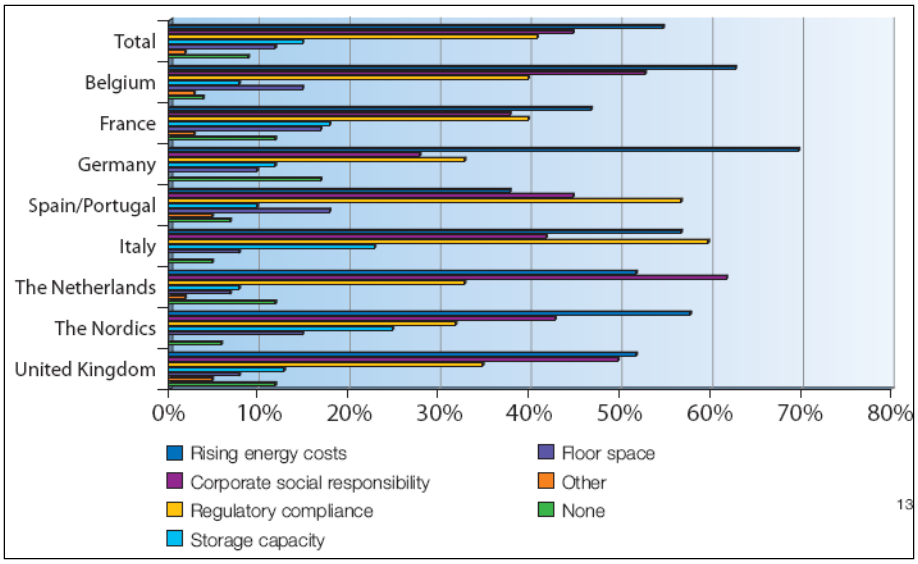

Figure 5. What are the top two business pressures driving implementation of green IT initiatives in your organization?

When asked who the single biggest influence within an organization is for the company to be more environmentally aware, 23 percent cited employees. After all, people like to work for companies they can be proud of; so being seen as a socially responsible organization is certainly a factor in attracting and retaining top talent.

Question 6: Who Would You Say Is the Single Biggest Influencer on Your Organization to Be More Environmentally Aware?

Staff is increasingly green aware and want to see their organization contributing to the solution, rather than exacerbating the problem, the survey reveals. When asked who the single biggest influence within an organization is for the company to be more environmentally aware, 23 percent cited employees. After all, people like to work for companies they can be proud of; so being seen as a socially responsible organization is certainly a factor in attracting and retaining top talent. Moreover, employees feel a sense of pride working in organizations that do their part for the environment. When employees know their computers are using less than half the power they used to, with no impact on productivity, they'll know they personally are helping to reduce the company's carbon footprint.

Looking at the variations across Europe, employees of Nordic organizations have a strong voice when it comes to making the organization more environmentally aware: 37 percent cite employees, compared with the 23 percent European average. In Italy, employees also have a strong voice (28 percent).

The second most important influential body is government organizations, cited by 21 percent. Here, organizations are being pressed to address environmental issues by a range of regulations, from the WEEE Directive to initiatives such as the Green Grid's data center infrastructure efficiency. In the U.K. and Belgium, government organizations have a comparatively strong influence—39 and 30 percent, respectively, compared with the 21 percent European average—whereas the Nordic region places comparatively less credence on government regulation (8 percent).

Citizens are the third most influential (cited by 16 percent). Although investors are demanding to know more about long-term plans to transform their investment into a beacon for green excellence, it is worth noting that shareholders are placed comparatively low (cited by only 8 percent).

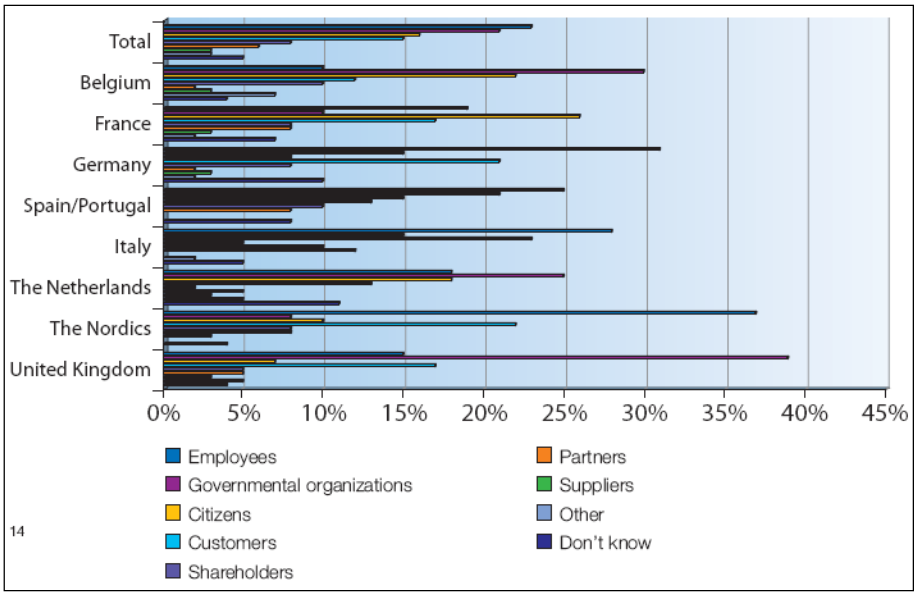

Figure 6. Who would you say is the single biggest influencer on your organization to be more environmentally aware?

Question 7: Does Your Organization Plan to Invest in Technologies That Reduce Energy and Emissions?

Sustainability is top of mind for C-level executives and IT managers. It is now a major focus for organizations, and executives are considering how it pays, where it doesn't, and where it counts to make changes. As earlier responses have highlighted, many organizations have discovered that sustainable practices can strengthen their reputation, improve employee morale, deliver cost savings, and benefit the environment.

This is borne out by the findings. More than one third of organizations in Europe (34 percent) have already made an investment in technologies that reduce energy and emissions, and are now planning to increase this investment.

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On the other side, almost one-quarter of organizations have no plans to invest in these sorts of technologies. The reasons for this lack of investment can be seen in the responses to Question 8: cost and a lack of support from the board and senior management for the initiative. Germany is the least advanced, with 31 percent of German organizations having no plans to invest in the necessary technologies, as compared with the 23 percent European average.

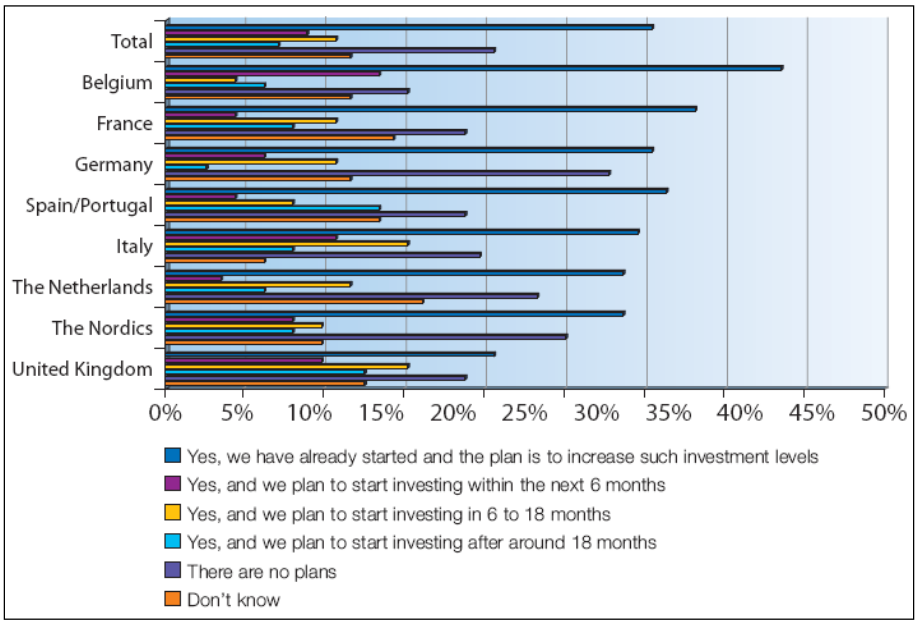

Figure 7. Does your organization plan to invest in technoloies that reduce energy and emissions?

Question 8: What, Within Your Organization, Do You Feel Is Preventing Your Organization from Greater Uptake of Environmentally Aware Technology Solutions?

Despite widespread enthusiasm for organizations to embrace environmentally aware technology solutions, the survey reveals a considerable number of barriers that need to be addressed. The overwhelming barrier is the cost of environmentally aware technology.

Despite widespread enthusiasm for organizations to embrace environmentally aware technology solutions, the survey reveals a considerable number of barriers that need to be addressed. The overwhelming barrier is the cost of environmentally aware technology, hence, the reason why organizations are deploying technologies like Electronic Product Environmental Assessment Tool–approved hardware combined with a thin client solution for reduced IT maintenance and extended hardware life. According to the survey, 53 percent of European organizations were balking at the financial investment needed in environmentally aware technology.

The issue of cost ranks most highly in France and Italy. Here, 70 percent and 65 percent of respondents, respectively, cite cost as the inhibitor to uptake of environmentally aware technology solutions, compared with the 53 percent European average.

For those organizations actively associated with green IT initiatives, the adoption of environmentally aware technology solutions such as virtualization can help form the four Rs of responsible IT provision: reduce, reuse, recycle, and re-engineer.

Although it is encouraging elsewhere in the survey to see a rising trend among European organizations to adopt sustainable IT strategies, many are unaware of the full range of practical technology solutions available today that will help deliver the environmental efficiency they seek. In the survey, 23 percent cite a "lack of understanding of what is available" as a barrier to the uptake of environmentally aware technology solutions. For those organizations actively associated with green IT initiatives, the adoption of environmentally aware technology solutions such as virtualization can help form the four Rs of responsible IT provision: reduce, reuse, recycle, and re-engineer.

The other main barriers are the availability of suitable products (especially in Spain/Portugal) and lack of support from the board and senior management for the initiative (both cited by 16 percent of European respondents).

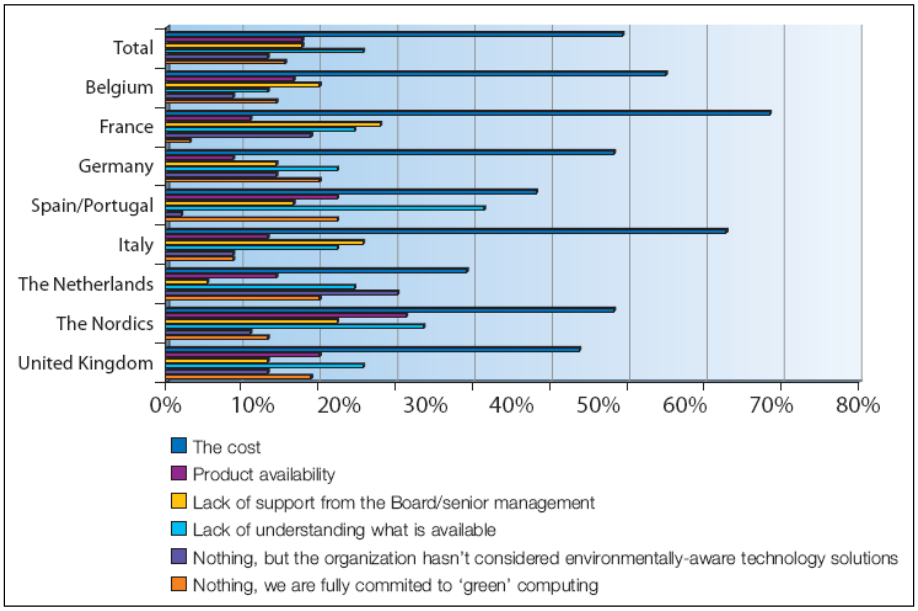

Figure 8. What, within your organization, do you feel is preventing your organization from greater uptake of environmentally aware technology solutions?

Question 9: At What Stage Is Your Organization in Implementing the Following IT Initiatives?

The most popular IT initiative deployed among European organizations is the European Union Waste Electrical and Electronic Equipment (WEEE) Directive. The WEEE Directive, which establishes collection, recycling, and recovery targets for all types of electrical goods and imposes the responsibility for their disposal on manufacturers, is fully implemented, in the process of being implemented, or plans to be implemented by 59 percent of organizations.

The second most popular initiative is ENERGY STAR ratings—an initiative to rate products, including technology solutions, based on the energy they require to function. This is being, or will be, implemented by 57 percent of European organizations. The third most popular initiative is the Electronic Product Environmental Assessment Tool (EPEAT)—a system to help purchasers in the public and private sectors compare and select computing technology based on its environmental attributes. According to the survey, 56 percent of European organizations have or are implementing EPEAT. Initiatives for power usage effectiveness and data center infrastructure efficiency are also drawing resources.

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Turning to the country findings, Italy and Germany are spearheading the drive to implement these five IT initiatives. In each category, respondents in both countries are above the European average for having implemented, or planning to implement, the initiatives. The difference is most marked with ENERGY STAR–rated technology: 67 percent of German respondents and 69 percent of Italian respondents have, or are implementing, ENERGY STAR–rated technology.

	Total	Belgium	France	Germany	Spain/ Portugal
ENERGY STAR ratings					
Fully implemented	17%	19%	11%	18%	20%
In process of implementing	21%	14%	17%	33%	19%
Planning to implement	19%	19%	19%	16%	21%
Don't plan to implement	16%	16%	16%	15%	25%
Don't know	27%	32%	37%	18%	15%
Electronic Product Environmental Assessment Tool (EPEAT)					
Fully implemented	15%	21%	10%	17%	19%
In process of implementing	17%	14%	17%	21%	17%
Planning to implement	24%	17%	19%	25%	30%
Don't plan to implement	20%	23%	19%	21%	21%
Don't know	24%	25%	35%	16%	13%
EC Directive on Waste Electrical and Electronic Equipment (WEEE)					
Fully implemented	23%	28%	12%	30%	24%
In process of implementing	17%	17%	15%	12%	23%
Planning to implement	19%	16%	20%	26%	21%
Don't plan to implement	15%	10%	15%	14%	15%
Don't know	26%	29%	38%	18%	17%
Green Grid Power Usage Effectiveness (PUE)					
Fully implemented	11%	14%	9%	10%	12%
In process of implementing	14%	19%	15%	16%	9%
Planning to implement	20%	15%	20%	22%	23%
Don't plan to implement	24%	20%	15%	29%	31%
Don't know	31%	32%	38%	23%	25%
Data Center Infrastructure Efficiency (DCiE)					
Fully implemented	11%	14%	9%	7%	16%
In process of implementing	16%	17%	15%	17%	18%
Planning to implement	19%	12%	17%	17%	20%
Don't plan to implement	23%	20%	20%	27%	25%
Don't know	31%	37%	39%	32%	21%

Table 1. At what stage is your organization in implementing the following IT initiatives? Results shown are from Belgium, France, Germany, and Spain/Portugal.

	Total	Italy	The Netherlands	The Nordics	United Kingdom
ENERGY STAR ratings					
Fully implemented	17%	16%	15%	14%	21%
In process of implementing	21%	27%	16%	22%	18%
Planning to implement	19%	26%	16%	15%	18%
Don't plan to implement	16%	9%	18%	14%	18%
Don't know	27%	22%	35%	35%	25%
Electronic Product Environmental Assessment Tool (EPEAT)					
Fully implemented	15%	12%	17%	12%	11%
In process of implementing	17%	23%	16%	15%	15%
Planning to implement	24%	27%	20%	24%	29%
Don't plan to implement	20%	18%	16%	19%	21%
Don't know	24%	20%	31%	30%	24%
EC Directive on Waste Electrical and Electronic Equipment (WEEE)					
Fully implemented	23%	24%	16%	21%	25%
In process of implementing	17%	18%	14%	19%	21%
Planning to implement	19%	23%	16%	12%	15%
Don't plan to implement	15%	14%	17%	18%	19%
Don't know	26%	21%	37%	30%	20%
Green Grid Power Usage Effectiveness (PUE)					
Fully implemented	11%	10%	13%	8%	10%
In process of implementing	14%	20%	12%	13%	11%
Planning to implement	20%	26%	15%	17%	26%
Don't plan to implement	24%	20%	21%	22%	25%
Don't know	31%	24%	39%	40%	28%
Data Center Infrastructure Efficiency (DCiE)					
Fully implemented	11%	14%	14%	10%	7%
In process of implementing	16%	17%	15%	12%	19%
Planning to implement	19%	26%	15%	22%	22%
Don't plan to implement	23%	23%	22%	20%	27%
Don't know	31%	20%	34%	36%	25%

Table 2. At what stage is your organization in implementing the following IT initiatives? Results shown are from Italy, the Netherlands, the Nordics, and the U.K.

Question 10: How Aware Are You About Virtualization?

The next series of questions examined the concept of *virtualization*: a technique for hiding the physical characteristics of computing resources from the way in which other systems, applications, and end users interact with those resources. This includes making a single physical resource appear to function as multiple logical resources, or it can include making multiple physical resources appear as a single logical resource. This technique significantly reduces the underutilization of systems that were previously dedicated to particular functions and processes.

Virtualization has a key role to play in enabling the green data center. And it's easy to see why. By reducing the numbers and types of servers that support their business applications, organizations are realizing significant energy savings. Reduced power consumption, both from the servers themselves and the facilities' cooling systems, and fuller use of existing, underused computing resources translate into a longer life for the data center—and less strain on the environment.

Virtualization has a key role to play in enabling the green data center. And it's easy to see why. By reducing the numbers and types of servers that support their business applications, organizations are looking at significant energy savings.

However, the survey reveals a significant lack of awareness about virtualization technology. Asked on a scale of 1 to 5 how aware they were about virtualization, 39 percent cited "not very aware," with only 7 percent "very aware." The reason for this lack of awareness is probably due to the emerging nature of the technology. The technology is maturing rapidly, but most organizations are just starting to climb the adoption curve. The greatest levels of awareness lie in Spain, Portugal, and the U.K.

Regional awareness of virtualization is polarized too: respondents tend to be either very familiar with what it is and what it does—or not at all. In Spain and Portugal, for example, the number that is "very aware" is more than double the European average (17 percent versus 7 percent), whereas the number of respondents "not very aware" at all in Spain and Portugal is 38 percent, likewise in the U.K. Awareness in the Netherlands is also comparatively low, with 77 percent scoring either 1 or 2 in lack of awareness, compared with the 57 percent European average.

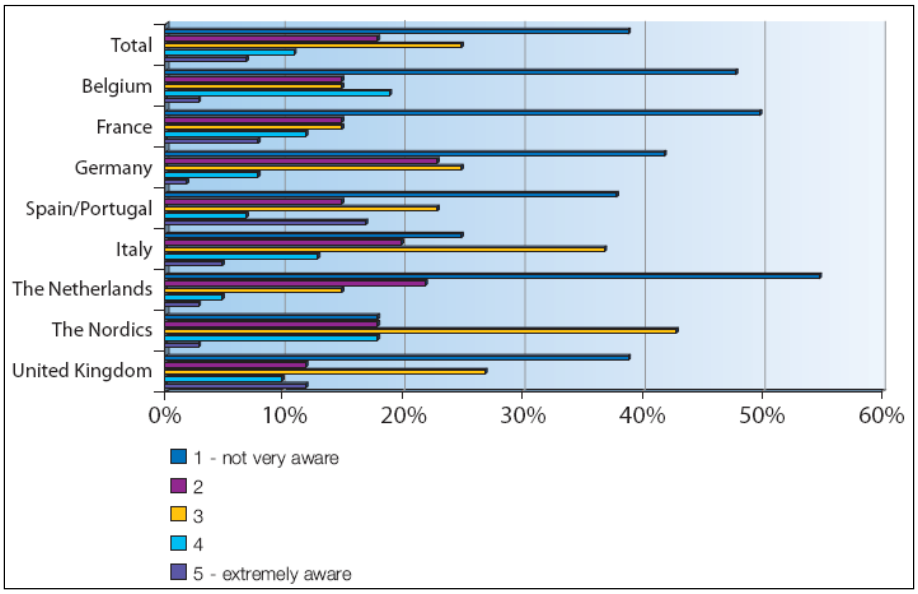

Figure 10. How aware are you about virtualization?

Question 11: Benefits of Virtualization: Please Rate How Important Each Benefit Is for Your Organization.

Virtualization offers the potential for a fundamental change in the way IT managers think about computing resources. When managing individual servers becomes less of a challenge, the focus of IT can shift from the technology to the services the technology can provide.

Beyond the potentially dramatic cost savings, virtualization can greatly enhance an organization's business agility. Companies that employ clustering, partitioning, workload management, and other virtualization techniques to configure groups of servers into reusable pools of resources are better positioned to respond to the changing demands their business places on those resources. Also, this technology offers the potential for a fundamental change in the way IT managers think about computing resources. When managing individual servers becomes less of a challenge, the focus of IT can shift from the technology to the services the technology can provide.

Beyond the potentially dramatic cost savings, virtualization can greatly enhance an organization's business agility. Companies that employ clustering, partitioning, workload management, and other virtualization techniques to configure groups of servers into reusable pools of resources are better positioned to respond to the changing demands their business places on those resources.

These and other advantages are highlighted among respondents. According to the survey, the overwhelming benefit of virtualization is reduced costs, cited as "very important" by 41 percent. Virtualization offers a direct and readily quantifiable means of achieving that mandate by collecting disparate computing resources into shareable pools. Moreover, reducing the number of servers in the data center means less daily power consumption and lessens the scope of future hardware expenditures. An above European average emphasis is placed on cost savings in Belgium, Germany, Spain, and Portugal, whereas in the U.K. it is 4 percentage points below the European average.

The second most important perceived benefit is that servers work more efficiently, cited as "very important" by 34 percent. For example, most analysts estimate that the average organization uses somewhere between 5 and 25 percent of its server capacity: in those companies, most of the power consumed by their hardware is just heating the room in idle cycles. This advantage is particularly important to respondents in Belgium, Spain/Portugal, and the Netherlands.

The third benefit cited by respondents is increased agility and the ability for an infrastructure to react to peaks of demand, cited as "very important" by 22 percent. This is popular in Spain, Portugal and the Netherlands—but of very minor importance in Italy (cited by only 8 percent).

	Total	Belgium	France	Germany	Spain/ Portugal
Increases hardware utilization					
1 – not at all important	5%	7%	5%	2%	11%
2	8%	3%	10%	10%	12%
3	34%	33%	32%	40%	42%
4	33%	32%	33%	33%	25%
5 – very important	20%	25%	20%	15%	10%
AVG	4	4	4	4	3
Reduces cost					
1 – not at all important	5%	7%	5%	2%	3%
2	5%	3%	8%	5%	8%
3	20%	17%	22%	18%	20%
4	29%	18%	25%	27%	25%
5 – very important	41%	55%	40%	48%	44%
AVG	4	4	4	4	4
Servers work more efficiently					
1 – not at all important	5%	8%	3%	2%	5%
2	4%	8%	10%	5%	5%
3	25%	18%	27%	28%	25%
4	32%	20%	35%	33%	22%
5 – very important	34%	46%	25%	32%	43%
AVG	4	4	4	4	4
Increases agility and ability for infrastructure to react to peaks of demand					
1 – not at all important	6%	7%	3%	3%	7%
2	6%	5%	12%	13%	3%
3	28%	30%	25%	32%	33%
4	38%	35%	38%	30%	30%
5 – very important	22%	23%	22%	22%	27%
AVG	4	4	4	4	4
Improved control over resources by allocating processing power to where it is needed					
1 – not at all important	5%	5%	1%	5%	3%
2	6%	3%	10%	5%	8%
3	30%	33%	30%	33%	28%
4	38%	36%	37%	39%	39%
5 – very important	21%	23%	22%	18%	22%
AVG	4	4	4	4	4
Reduces power/cooling requirements					
1 – not at all important	6%	8%	5%	3%	3%
2	8%	7%	12%	8%	10%
3	29%	25%	28%	28%	28%
4	35%	35%	35%	34%	32%
5 – very important	22%	25%	20%	27%	27%
AVG	4	4	4	4	4

Table 3. Respondents in Belgium, France, Germany, and Spain/Portugal rank the importance of virtualization benefits.

	Total	Italy	The Nether-lands	The Nordics	United Kingdom
Increases hardware utilization					
1 – not at all important	5%	5%	8%	0%	8%
2	8%	10%	3%	7%	7%
3	34%	35%	23%	28%	39%
4	33%	40%	34%	42%	23%
5 – very important	20%	10%	32%	23%	23%
AVG	4	3	4	4	3
Reduces cost					
1 – not at all important	5%	7%	10%	0%	7%
2	5%	3%	5%	3%	3%
3	20%	20%	18%	22%	23%
4	29%	43%	25%	35%	30%
5 – very important	41%	27%	42%	40%	37%
AVG	4	4	4	4	4
Servers work more efficiently					
1 – not at all important	5%	7%	8%	3%	6%
2	4%	3%	2%	0%	2%
3	25%	28%	18%	22%	30%
4	32%	39%	32%	38%	40%
5 – very important	34%	23%	40%	37%	22%
AVG	4	4	4	4	4
Increases agility and ability for infrastructure to react to peaks of demand					
1 – not at all important	6%	8%	8%	1%	7%
2	6%	7%	2%	5%	5%
3	28%	32%	25%	25%	25%
4	38%	45%	38%	42%	40%
5 – very important	22%	8%	27%	27%	23%
AVG	4	3	4	4	4
Improved control over resources by allocating processing power to where it is needed					
1 – not at all important	5%	6%	6%	2%	6%
2	6%	7%	7%	5%	2%
3	30%	30%	22%	30%	37%
4	38%	45%	35%	40%	38%
5 – very important	21%	12%	30%	23%	17%
AVG	4	3	4	4	4
Reduces power/cooling requirements					
1 – not at all important	6%	6%	8%	2%	10%
2	8%	10%	5%	5%	5%
3	29%	37%	22%	33%	33%
4	35%	42%	35%	37%	35%
5 – very important	22%	5%	30%	23%	17%
AVG	4	3	4	4	3

Table 4. Respondents in Italy, the Netherlands, the Nordics, and the U.K. rank the importance of virtualization benefits.

Question 12: How Far Is Your Organization Planning to Use Various Forms of Virtualization?

According to the survey, the majority (56 percent) of European organizations have, or are piloting or considering, server virtualization to address data center inefficiency.

According to the survey, the majority (56 percent) of European organizations have, or are piloting or considering, server virtualization to address data center inefficiency. Server virtualization hides the physical nature of server resources, including the number and identity of individual servers, processors, and operating systems, from the software running on them.

The survey found that 54 percent have, or are piloting or considering, hardware virtualization: creating a pool of hardware "potential" from all the available physical computing resources. It treats all the CPUs as one large processing farm that can be divided as required for any given task and presents all the disks simply as a "place to store data." This way, many separate machines can appear as one larger machine, or a single powerful server can be presented as exactly the right number of smaller computers.

Java virtualization can improve utilization by reducing the resources consumed by redundant and unused functionality in the stack and can enhance performance by removing layers between the application and the "bare metal" of the server.

The survey also found that 42 percent of European organizations have, or are piloting or considering, Java virtualization. This focuses on optimizing Java software in virtualized environments and is designed to deliver substantial improvements in utilization, performance, and flexibility for Java environments. It can improve utilization by reducing the resources consumed by redundant and unused functionality in the stack and can enhance performance by removing layers between the application and the "bare metal" of the server.

Java virtualization tends to encourage further greening of IT environments. Because virtualization is typically part of data center consolidation and modernization projects, there are also efforts to build out new functionality on virtualized blade server hardware—a platform that reduces data center cooling requirements and optimizes compute resource utilization. In addition, data center consolidation leverages service-oriented architecture (SOA) environments to deliver Web services. These SOA environments on the data center side enable the smooth transition to thin client desktop and mobile environments, and can result in the removal of power-consuming and inefficient desktop PCs.

A study by Forrester estimates total power consumption savings for the average corporation with thin client PC replacement programs of up to 25 percent.[4] Another European study estimates carbon footprint savings for the estimated 3.4 million thin client PCs already deployed in Western Europe to be 166,000 tons in 2007[5]—equivalent to the emissions of more than 540 return flights from London to New York. These studies acknowledge that for thin client environments to work, companies need Web services–based delivery of applications and services—from

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[4] Euan Davis et al. "Green Benefits Put Thin-Client Computing Back on the Desktop Hardware Agenda," Forrester Research (March 10, 2008).

[5] Hartmut Pflaum, "Thin Clients Trump PCs on Energy Consumption," Environmental Leader (March 26, 2008), Hhttp://www.environmentalleader.com/2008/03/26/thin-clients-trump-pcs-on-energy-consumption/H (accessed October 2008).

back-office applications to desktop productivity programs. Even knowledge worker files must be moved to servers and networked storage. Java 2, Enterprise Edition (J2EE)–based and virtualized J2EE platforms facilitate this effort to Web services–based application delivery.

Across Europe there are varying degrees of support for these types of virtualization. Spain, Portugal, and Italy are leading the way in virtualization: each country is several percentage points higher in terms of the number of organizations that have or are planning to deploy hardware, server, and Java virtualization. In the Nordics, there is above-average interest in hardware virtualization (57 percent have, or are planning to use, hardware virtualization, compared with the 54 percent European average). In the U.K., interest in both server and Java virtualization is below the European average—in the case of server virtualization, by 15 percent.

	Total	Belgium	France	Germany	Spain/ Portugal
Hardware virtualization					
Considering	18%	17%	12%	20%	27%
Piloting	13%	11%	8%	12%	15%
Implemented	23%	19%	29%	23%	23%
Don't plan to implement	17%	13%	14%	19%	21%
Don't know	29%	40%	37%	26%	14%
Server virtualization					
Considering	16%	15%	12%	23%	21%
Piloting	15%	20%	13%	15%	13%
Implemented	25%	17%	32%	15%	30%
Don't plan to implement	15%	13%	12%	18%	21%
Don't know	29%	35%	31%	29%	15%
Java virtualization					
Considering	15%	12%	9%	16%	20%
Piloting	11%	13%	8%	10%	15%
Implemented	16%	10%	19%	8%	21%
Don't plan to implement	21%	15%	20%	27%	20%
Don't know	37%	50%	44%	39%	24%

Table 5. How far is your organization planning to use various forms of virtualization? Responses shown are from Belgium, France, Germany, and Spain/Portugal.

	Total	Italy	The Nether-lands	The Nordics	United Kingdom
Hardware virtualization					
Considering	18%	9%	19%	14%	26%
Piloting	13%	27%	6%	23%	7%
Implemented	23%	26%	27%	20%	15%
Don't plan to implement	17%	18%	14%	17%	17%
Don't know	29%	20%	34%	26%	35%
Server virtualization					
Considering	16%	9%	19%	13%	19%
Piloting	15%	20%	10%	20%	9%
Implemented	25%	41%	27%	23%	13%
Don't plan to implement	15%	13%	10%	15%	15%
Don't know	29%	17%	34%	29%	44%
Java virtualization					
Considering	15%	9%	21%	15%	18%
Piloting	11%	18%	8%	13%	6%
Implemented	16%	29%	18%	13%	13%
Don't plan to implement	21%	18%	13%	24%	27%
Don't know	37%	26%	40%	35%	36%

Table 6. How far is your organization planning to use various forms of virtualization? Responses shown are from Italy, the Netherlands, the Nordics, and the U.K.

Question 13: What Do You Believe Would Be the Major Obstacles to Implementing a Server Virtualization Model Within Your Organization?

Server virtualization is the most common application of the technology today, and it is widely considered the primary driver of the market. According to the survey though, major obstacles need to be overcome to implement this virtualization model.

Server virtualization is the most common application of the technology today, and it is widely considered the primary driver of the market. According to the survey though, major obstacles need to be overcome to implement this virtualization model. The most common obstacle—highlighted by 43 percent of organizations—is the familiar problem of "a lack of budgets/funding." Cost is an obstacle across every country, although it is particularly high in the U.K. (55 percent), Germany (52 percent), and the Nordics (50 percent).

The second major hurdle is a lack of understanding and education about the concept—cited by 36 percent of organizations. This is predominantly the case in Spain/Portugal (47 percent), Italy (45 percent), and the U.K. (43 percent). As highlighted earlier, the technology is comparatively new, but it is maturing fast.

Other country anomalies include the issue of delivering proof of successful return on investment (ROI) in France (35 percent, which is 9 percent above the European average) and a skills shortage—highlighted by 28 percent of respondents in the Nordics and 25 percent in Italy. U.K. respondents are also challenged to change organizational behavior, according to 35 percent of respondents, again above the European average.

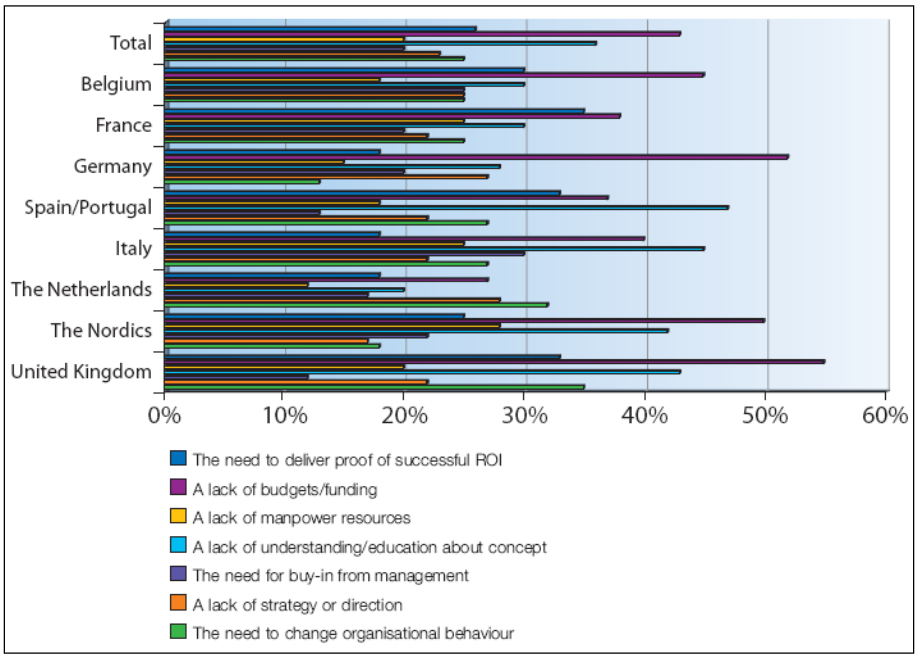

Figure 13. What do you believe would be the major obstacles to implementing a server virtualization model within your organization?

Question 14: Java Virtualization Removes the Need for an Operating System. What Is Your Immediate Reaction to This Statement?

Java virtualization enables considerably higher resource utilization at the Java virtual machine (JVM) layer. The JVM can run on a next-generation hypervisor without a standard operating system, allowing Java applications to run directly on the virtualization layer. The result is that Java virtualization provides a virtualized Java container without the need for an operating system. This reduces memory consumption and enables virtualized Java application appliances.

When asked about their reaction to the statement that Java virtualization removes the need for an operating system, respondents' views were mixed. The most common response across Europe was that they weren't sure, but it sounded quite interesting.

When asked about their reaction to the statement that Java virtualization removes the need for an operating system, respondents' views were mixed. The most common response across Europe was that they weren't sure, but it sounded quite interesting (cited by 24 percent), which undoubtedly reflects the general lack of awareness surrounding the capabilities of virtualization, and in particular Java virtualization. The survey further revealed 22 percent quite liked the idea and wanted to learn more, 18 percent were concerned and wanted to learn more, 10 percent were extremely concerned, and 9 percent liked the idea a lot.

Respondents in the Nordics and Belgium expressed the greatest degree of uncertainty (36 percent and 30 percent, respectively, were not sure, but thought it sounded interesting); and Germany was above average (31 percent versus the 22 percent European average) in liking the idea but wanting to know more. Italy was almost double the European average in being concerned. Italian respondents wanted to know more (35 percent versus 18 percent) and 25 percent expressed the

opinion of being extremely concerned about the statement, compared with only 10 percent of all other countries.

Belgium and the U.K. were 4 percentage points above the European average in being "not bothered about this at all."

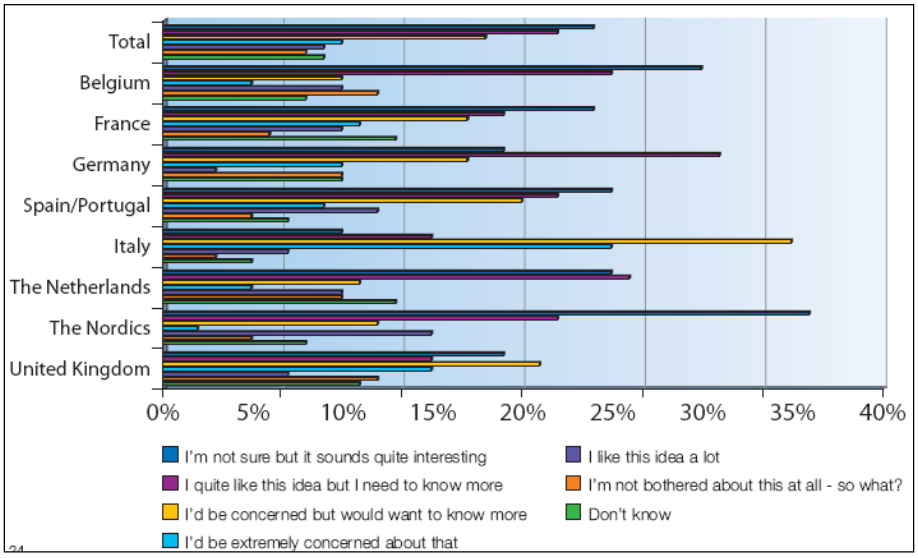

Figure 14. Java virtualization removes the need for an operating system. What is your immediate reaction to this statement?

INDUSTRY FINDINGS

The survey focused on three vertical markets—financial services, private sector, and telecommunications—and the European industry trends are discussed below.

Financial Services

The survey revealed that the financial services sector is slightly ahead in sustainable IT provision.

There has been considerable focus on green campaigns from banks, financial services organizations, and insurance providers, with some marketing ethical propositions exclusively and others offering them as an alternative to propositions focused solely on performance. What has been less apparent until now is the degree to which the industry is proactively executing sustainable IT provision. The survey revealed that the financial services sector is slightly ahead in sustainable IT provision: 59 percent already, or plan to, measure their carbon footprint, compared with the cross-industry average of 56 percent.

When compared with other sectors, notably telecommunications and the public sector, fewer than average financial services organizations have appointed a dedicated green czar to oversee the carbon footprint (14 percent, compared with 26 percent of public sector organizations, for example). The reasons for this are clouded, although one governing reason might be that the industry has historically been less focused on environmental issues and more on fiscal performance. However, environmental issues are being addressed from the top down, starting with the CEO/head of the organization and departmental heads.

When it comes to the priority green initiatives, IT power consumption is particularly important in the industry (51 percent, compared with the 46 percent cross-industry average). This is expected, given the overwhelming scale and reliance on large data centers needed to drive and deliver financial products and services. Moreover, the issue of regulatory compliance is also increasing the demand for storage and processing capacity—again putting the spotlight on the power consumption of IT infrastructure.

One of the key business pressures driving the implementation of green IT issues in the financial services sector is corporate social responsibility. Almost half the respondents report this issue as a key pressure to adopt green IT.

One of the key business pressures driving the implementation of green IT issues in the financial services sector is corporate social responsibility. Almost half the respondents report this issue as a key pressure to adopt green IT. Last year for example, HSBC unveiled a US$90 million global environmental efficiency program, geared to reducing the bank's impact on the environment through initiatives, which include renewable energy technology and water and waste reduction programs. First Direct has also disclosed plans to install automated computer shutdown software in an effort to reduce its carbon emissions by 147 tons and save almost US$50,000 per year on energy costs.

According to the survey, it's the customers and employees that are pushing the banks, financial services organizations, and insurance providers to become more environmentally aware. Promoting an ethically friendly business appeals to customers, while simultaneously, an increasing proportion of investors are looking to invest their funds ethically. People also like to work for socially responsible financial services organizations—and that helps with staff acquisition and retention. This green tag has also penetrated the credit card market, such as Rabobank's Rabocard, which contributes toward carbon offsetting programs.

The on-demand nature of banking is probably the reason for the growing interest in virtualization. According to the survey, funding a server virtualization model is less of an obstacle in this industry than it is in other sectors, although the main barrier continues to be a lack of understanding surrounding the technology. It's clear why virtualization appeals so much to this sector. The technology allows investment banks and other financial services organizations, for example, to effectively manage their spikes in demand for processing power dynamically—providing resources when and where they're needed on short notice and at reduced cost.

Public Sector

Government organizations are setting the agenda for environmental legislation and compliance that the commercial sector subsequently needs to adhere to; therefore, it can lead from a position of strength and set an example in green computing. "Do as I do" is the watchword. Moreover, the sector is traditionally also more conscientious than others about implementing change that is driven by noncommercial needs.

This emerging issue of *g*-government—where *g* refers to green—can be delivered in a variety of ways, most of which involve the better use of IT, a natural extension of

e-government's push to move government services to online channels as the primary or alternative mode of government service delivery. The survey shows that the majority of public sector organizations are now measuring their carbon footprint. However, the proportion currently measuring, or planning to measure, their carbon footprint is 7 percent lower than either the telecommunications sector or the financial services sector.

The initiative is being driven from comparatively high up in the organization though: the carbon footprint initiative is the responsibility of the head of the organization or a dedicated green czar in 52 percent of public sector organizations, the survey reveals. This is higher than in the telecommunications or financial services sectors, which devolve responsibility down to a higher proportion of departmental heads.

The overriding priority for the public sector is to tackle waste management and recycling—this being 12 percent higher than either the telecommunications sector or the financial services sector. The reason for this is that the public sector needs to implement what it mandates for others and adopt the green initiatives it urges its citizens to be involved in. Indeed, the European Union Directive on Energy End Use Efficiency & Energy Services tasks the public sector with taking an exemplary role in reaching energy savings targets of 9 percent by 2017.

The survey reveals that the sector has an above-average focus on managing utility costs (heating and lighting) and reducing IT power consumption, although this probably has as much to do with driving cost efficiency as it has to do with g-government. The other reason for conscientious energy management might also lie in the fact that the public sector often finds itself locked into long-term power supply contracts. The findings here correlate with the pressures driving the public sector to implement green IT initiatives: 45 percent cite regulatory compliance (the highest of any of the industries surveyed), which again points to the public sector taking the lead on an issue it evangelizes.

Unsurprisingly, cost remains the overriding barrier for the public sector (cited by 56 percent, 12 percentage points higher than the telecommunications sector), reflecting the drive for efficiencies in this sector.

The survey also calls for greater awareness of the environmentally aware technology solutions available to the public sector. Almost one-quarter of public sector respondents cite a lack of understanding surrounding these technologies as the key inhibitor to deployment—the highest of any of the sectors polled. There is an opportunity here to build a community of like-minded individuals, geared to overcoming this awareness barrier and sharing information concerning the appropriate technologies. Unsurprisingly, cost remains the overriding barrier (cited by 56 percent, 12 percentage points higher than the telecommunications sector), reflecting the drive for efficiencies in this sector.

Of all the sectors polled, the survey finds the least amount of awareness surrounding this environmentally aware technology, with almost half of respondents not being aware of it. The reason for this comparative lack of awareness is due to the telecommunications and financial services sectors being early adopters of virtualization technology, owing to their reliance on large data centers and dynamic demand for data.

One key technology that such a public sector community might consider promoting is virtualization. Of all the sectors polled, the survey finds the least amount of awareness surrounding this environmentally aware technology, with almost half of respondents not being aware of it. The reason for this comparative lack of awareness is due to the telecommunications and financial services sectors being early adopters of virtualization technology, owing to their relatively greater reliance on large data centers and dynamic demand for data. However, the growing use of a shared services model as a road map for consolidation and modernization projects associated with e-government initiatives within the public sector provides an opportunity for further efficiencies by implementing virtualization technologies.

Telecommunications

In many respects, the telecommunications industry is doing more than any other industry to address environmental concerns. After all, it is facilitating carbon-neutral collaborative communications, like online conferencing and video applications, along with unified communications packages that let people do their jobs productively without traveling to the office to perform basic corporate functions.

That aside, the industry is showing demonstrable uptake of sustainable IT initiatives. According to the survey, 59 percent are already measuring, or intend to measure, their carbon footprint. This is the same number as in financial services, but significantly ahead of the public sector respondents. Many Tier 1 telecommunications companies have already appointed a dedicated green czar to oversee green initiatives, and the survey bears this out, with one-fifth of organizations having such an individual in place. Equally significant is the role of the CEO/head of the organization in driving the carbon footprint initiative.

The telecommunications industry, with its vast demands on data center processing and storage, cites IT power consumption as a current priority for green initiatives (cited by 48 percent of respondents). Recycling and waste management are also a priority (57 percent), as is utility management (41 percent), such as heating and lighting. The survey also reveals that the industry is leading the way when it comes to reducing energy and emissions caused by their use of IT, with 62 percent either already having a plan in place or intending to do so.

This is being driven by rising energy costs (according to 53 percent of respondents) and corporate social responsibility (48 percent), the survey reveals. Such admission of corporate social responsibility is the highest of all the sectors polled and is likely to be a result of the corporate market, where agreements demand the inclusion of environmental ethics clauses. Regulatory compliance ranks comparatively low (35 percent), on the basis that the emerging telecommunications industry has traditionally experienced less rules and regulations than, for example, the financial services sector.

Turning to the barriers preventing the uptake of environmentally aware technology solutions, cost is the major hurdle for financial services and the public sector, but is

less of a barrier in the telecommunications industry (46 percent, compared with 56 percent in the two other sectors). Part of the reason for this could be the considerable reliance on technology in almost every aspect of the business with less significance placed on cost. An above-average proportion cites product availability as a barrier though. Here, the reason could be that although the products are there, they are not optimized for highly-demanding carrier-grade telecommunications.

The industry displays an above-average awareness of virtualization technology. This would be expected, given that so many telecommunications companies are consolidating their data centers from the traditional mainframe to virtualized racks of blade technology. Virtualization helps telecommunications companies simplify their infrastructure to reduce costs; improve responsiveness; and overcome the space, cooling, and power restrictions in the data center.

The industry has adopted Java virtualization aggressively because not only does it provide additional utilization and cost benefits, but it also passes flexibility and integration benefits up the organization to end users. The idea is to make the application platform appear as a general pool of resource that any application, user, or service can consume.

According to the survey, the telecommunications industry is also leading the way in Java virtualization, with 52 percent having already deployed, considering, or piloting the solution, compared with 37 percent in financial services and 39 percent in the public sector. The industry has adopted Java virtualization aggressively because not only does it provide additional utilization and cost benefits, but it also passes flexibility and integration benefits up the organization to end users. The idea is to make the application platform appear as a general pool of resource that any application, user, or service can consume.

In summary, it is apparent from the survey that the telecommunications industry has a strong desire to embrace sustainable IT, first and foremost for fiscal reasons as opposed to issues associated with regulatory compliance. Whichever tools, techniques, and technologies they do adopt, it needs to deliver proof of a successful ROI, and meet the watchful eye of the in-house green czar.

CONCLUSION

At the highest level, the Oracle European Sustainable IT survey reveals a growing awareness of, and demand for, environmentally friendly IT initiatives. Although generally supported in a top-down capacity, employees also feel empowered to effect change. Among the three industries surveyed, competency and maturity of initiatives might vary, but all industries are rapidly creating and deploying sustainability plans and investing in sustainable technologies. As environmental concerns continue to grow in the public eye, organizations will feel increased pressure to demonstrate an effective execution of ecofriendly strategies. Fortunately, there are economic benefits to be gained through embracing such initiatives and that will further encourage widespread adoption.

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