



Data Centers Lack Tools to Measure Efficiency and Support Green Initiatives

Survey shows that organizations lack the tools to measure energy efficiency, lack processes to charge the business for energy use, and many do not decommission 'ghost' servers that are no longer needed

This is the second of two research notes in which we report on the state of the 'green data center'. The first report was all about attitudes: we found that there was widespread interest in cutting the environmental impact of the data center, but cynicism about vendors' motives as they push 'green' technology. This second report is about actions: the steps that data center managers take – or fail to take – to cut the data center's environmental impact.

We found organizations unable or unwilling to meet the expectations set by the introduction of green initiatives. 74% refused to activate power saving features on devices if it would require a drop in performance. When it comes to procurement, energy efficiency and ease of disposal are the lowest priorities. 37% of data centers have no plans to measure energy efficiency, and 76% do not charge the business for the power used by the IT commissions. One reason is a lack of infrastructure for measuring power consumption.

We conclude that data centers lack the tools and processes they need if the organization is to effectively balance its environmental impact and its business priorities.

This is the second research note in a series of two. In the first one, published in March 2008 and entitled 'Data Centers are Adopting Green Initiatives but are Wary of Vendors' Marketing Messages', we explored attitudes and trends in the green data center. This second paper reports on the actions that data centers are taking to reduce their impact on the environment.

The results are based on a detailed survey of more than 100 data center professionals across a range of sectors including the healthcare, banking and insurance, retail, telecommunications, government and pharmaceutical industries.

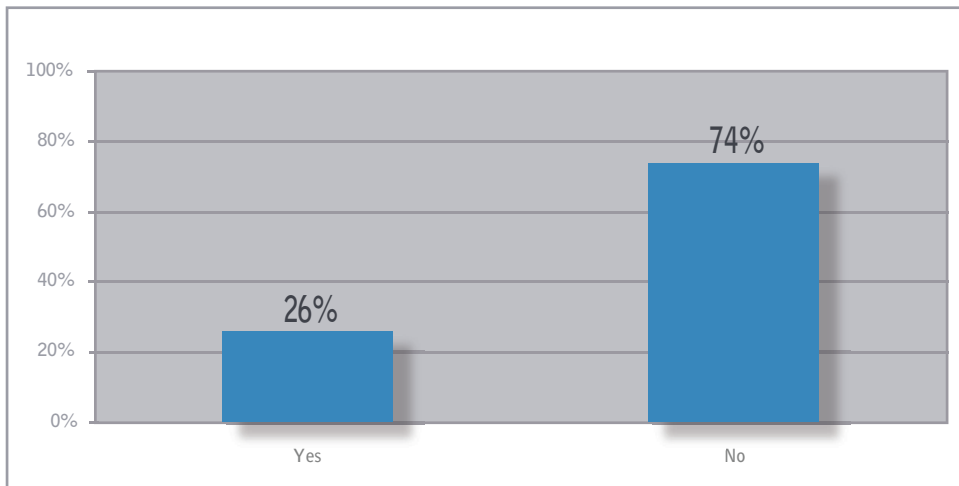
**Business first, or environment first?**

In our previous research note¹, we found that 35% of companies have already adopted green initiatives, and that a further 35% have plans to do so. This widespread adoption of environmentally friendly policies shows that companies are making a commitment to cut their impact on the environment, but actions speak louder than words. In this research note, we will look at what organizations do to reduce their environmental impact, and what opportunities they neglect.

Naturally, there are limits on the sacrifice organizations are willing to make. Nearly all human activity has a carbon footprint, and it's neither practical nor desirable for organizations to cease trading or serving their constituents to eliminate all environmental costs. Each organization must strike a balance between the optimal approach for those it serves, and the optimal approach for the planet.

So where do companies draw the line? One way to reduce environmental impact is to save energy. We asked data center managers whether they would be prepared to compromise device performance for a saving in power. 74% of those we questioned refused to do so.

If a device offered power saving features which sacrificed performance, would you turn those features on?



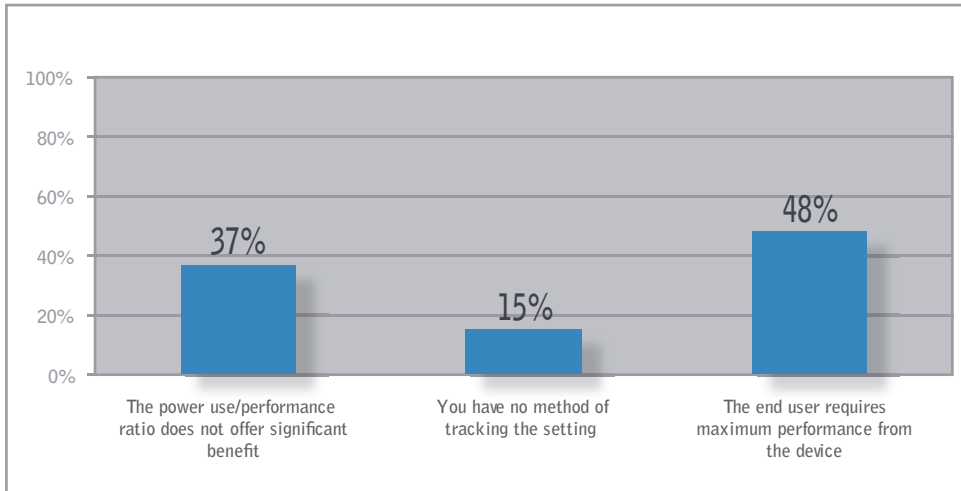
Why is there such reluctance to trade performance for a saving in power, which would not only benefit the environment but would also cut the organization's energy bill? 48% said that the end user requires maximum performance from the device, and effectively shifted the responsibility to the rest of the business. If such a compromise were acceptable within the wider interests of the business, this might be something that a green initiative could help to coordinate.

37% of those we surveyed said that there wasn't a good enough trade-off between the drop in performance and the saving in power consumption. A further 15% was worried about managing the devices and said their top concern was that they had no way to track whether power saving switches were turned on or off.

¹ See 'Data Centers are Adopting Green Initiatives but are Wary of Vendors' Marketing Messages', ARI, 2008



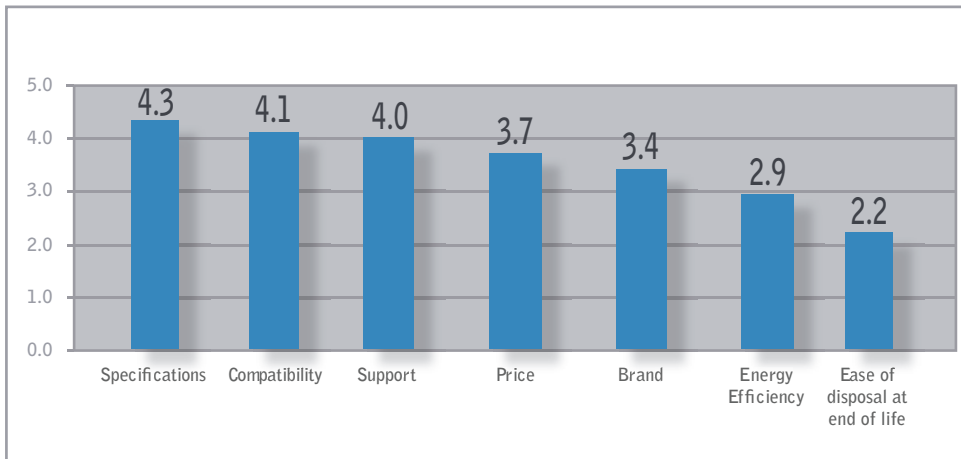
What would prevent you from turning on power saving features in devices?



Managers' priorities are also reflected in their buying behavior. We asked managers to rank how important different factors were when procuring servers. Environmental concerns – energy efficiency and ease of disposal at the end of the machine's life – were ranked lowest of seven factors. After the two factors that decide whether the server is capable of meeting the technical need (specifications and compatibility), came support, price, and brand.

It seems data centers would rather opt for a reputable supplier than go with a device that is more energy efficient. The implication is clear: for energy efficiency and ease of disposal to become influential on the buying decision, device manufacturers with trusted brands must first begin to promote them. Even then, it won't be easy to make green procurement a priority. Manufacturers must win the trust of data center managers, jaded by so much green marketing which they consider to be hype or impossible to validate².

When purchasing servers, how important are the following considerations?



² See 'Data Centers are Adopting Green Initiatives but are Wary of Vendors' Marketing Messages', ARI, 2008



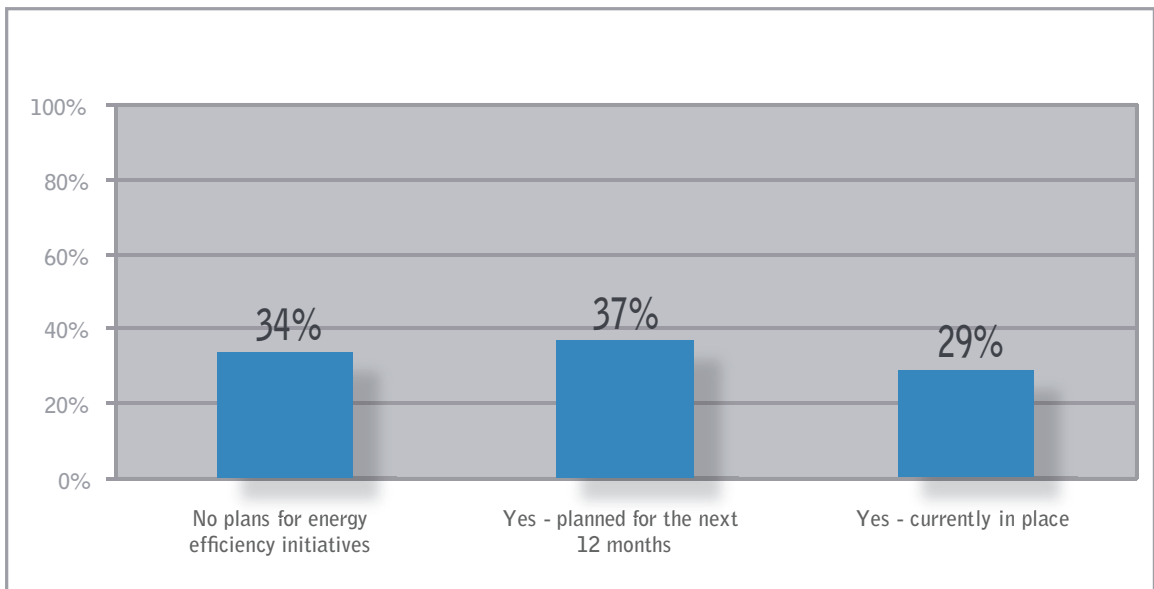
Energy efficiency in the data center

The 'green data center' means different things to different people. From the adverts in industry magazines, it seems some vendors would like customers to believe the green data center is about ordering new equipment, specially designed to minimize its environmental burden. For data center managers, it's often a higher priority to run existing equipment more efficiently, if only because they've already bought it and can't afford to rip and replace everything.

Improving energy efficiency can help to cut an organization's carbon footprint. Power is both a significant cost and constraint in the data center, so improving energy efficiency will deliver an immediate return to the business in lower power costs and greater capacity.

Our research discovered that energy efficiency initiatives are being widely adopted in the data center, although only 29% of the managers we surveyed said they already had them in place. 34% of respondents have no plans to introduce energy efficiency programs, while 37% will do so in the next year.

Does your organization have energy efficiency initiatives for the data center(s)?



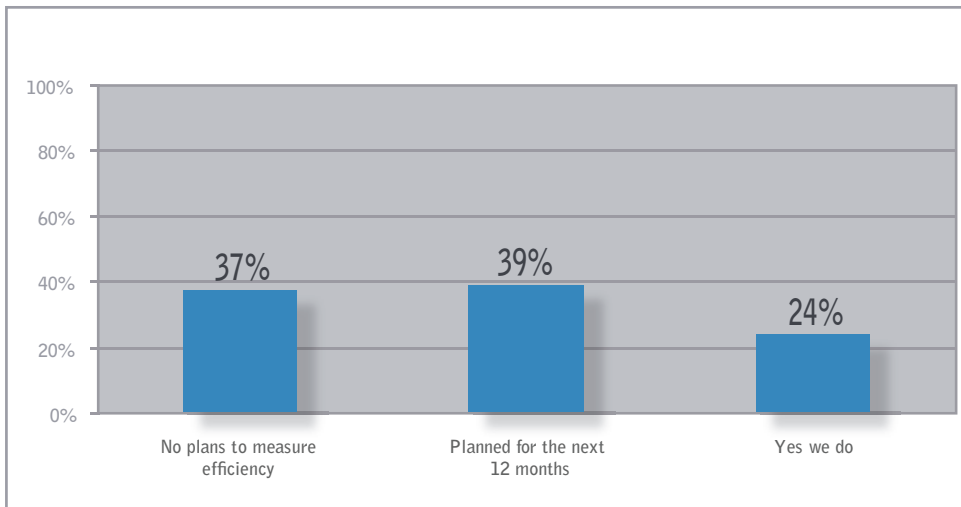
The US Environmental Protection Agency has said:

"A major barrier to improved energy efficiency is the difficulty of collecting data on the energy consumption of individual components of data centers, and the lack of data collection on many data centers overall."

Our research bears this out. You can't manage something you can't measure, so enforcing any targets to improve energy efficiency might prove difficult. Only 24% of data center managers currently measure the energy efficiency of the data center. 39% of those surveyed will introduce measurement in the next year. A full 37% of all those surveyed have no plans to measure efficiency, suggesting there will remain a small number of managers (at least 3%) who will attempt to manage energy efficiency without measuring it.



Do you measure the energy efficiency of your data center(s)?

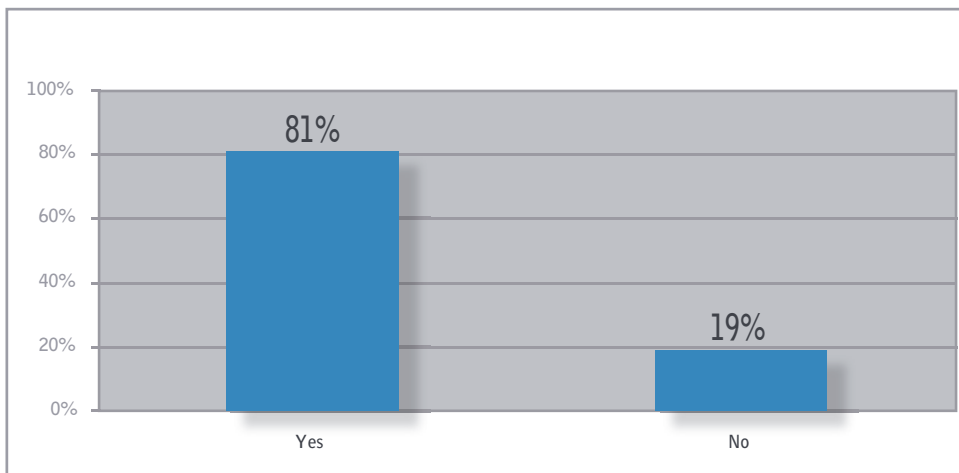


Ghostbusting in the data center

When we asked data center management where the greatest energy savings could be made, only one person suggested powering off unused CPUs³.

Ghost servers are those servers which the business is no longer using, but which have not been switched off. Before a server can be decommissioned, data center managers must have absolute confidence that it is not being used by the business. Our survey found that nearly a fifth (19%) of data centers have no decommissioning process for servers that are no longer needed. Any resulting ghost servers will be consuming limited data center resources (including space, power, and cooling) and will be increasing the data center's environmental impact without returning any benefits to the business.

Do you have a process for decommissioning servers in the data center when the business no longer needs them?

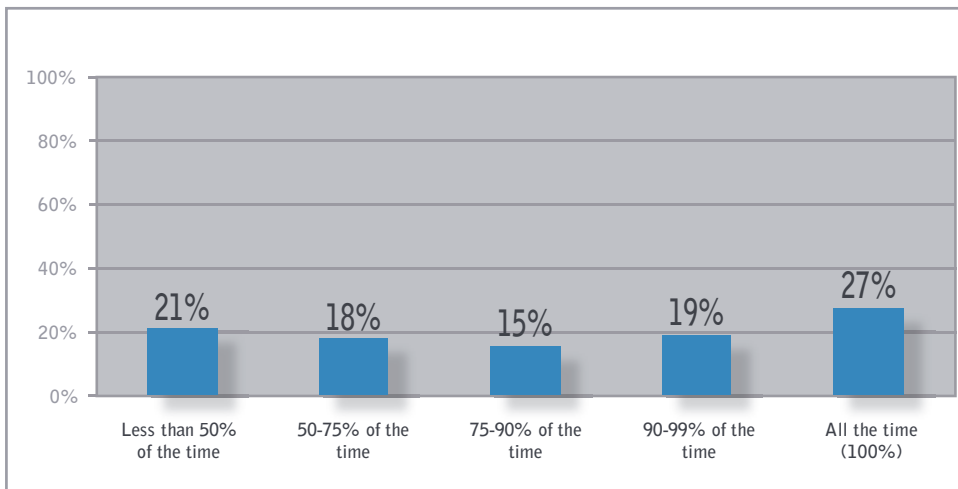


Even those organizations that do have a process for decommissioning servers do not routinely decommission servers they no longer need. Only 27% of those we surveyed would commit to always removing redundant servers, and a fifth (21%) said servers are removed less than half the time.

³ See 'Data Centers are Adopting Green Initiatives but are Wary of Vendors' Marketing Messages', ARI, 2008



How often do you completely remove a server from the data center when it is no longer needed by the business?



This leads to the inevitable conclusion that decommissioning processes are not strictly followed, even where they are in place, and ghost servers are accepted as a fact of life. One way that a business could cut its environmental impact without having to make any sacrifice in terms of performance or availability, would be to eliminate ghost servers. Doing so implies access to reliable information on where servers are and how they are being used, and it's possible a lack of such information is hampering any efforts to manage data centers more tightly.

There can also be a question of whose job it is to hunt down and remove ghost servers, particularly where there are dual reporting lines for managing the IT equipment and managing the facilities (including power). Even where relationships are strong between the IT and facilities departments, there will often be split incentives. Success in the IT department might be measured by the speed with which resources can be provisioned, a target which could be most easily met by having redundant servers powered on and ready to go. The facilities department might have the conflicting goal of cutting energy bills. The US Environmental Protection Agency has said:

“...split incentives are especially problematic where IT equipment and facilities are managed by separate organizations within the same company. In either case, while the IT side is responsible for purchasing and managing the IT equipment, the facility side is responsible for providing the power and cooling infrastructure and paying the energy bills.”

Who pays for the power?

The demand for power in the data center is derived from the demand for IT services. Indeed, data center managers told us that the number one reason why power usage is increasing in the data center is that demand from the business is rising⁴.

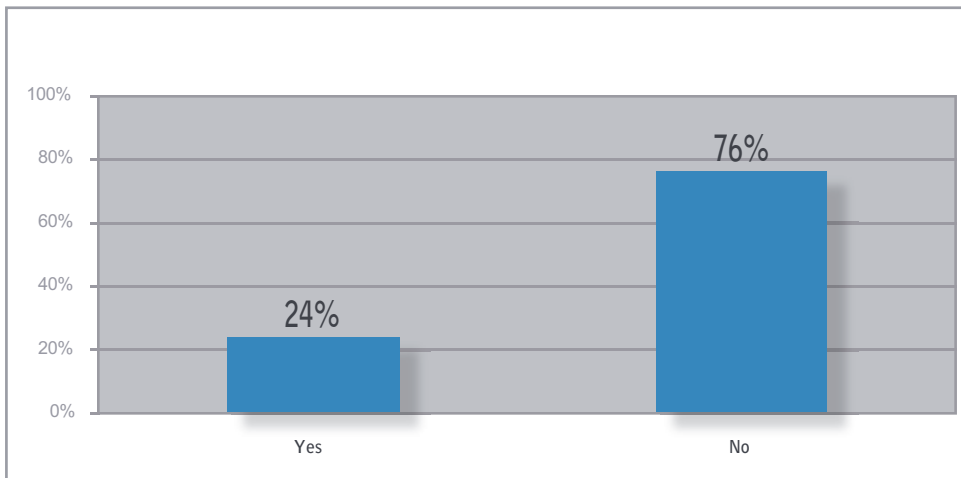
Since the number one cause of increasing power consumption is an increase in demand for IT services, making business managers accountable for the energy their applications consume could have a significant impact on the organization's environmental footprint. One of the best practice approaches that can achieve that is to charge business departments for the energy consumed by the IT they commission.

However, this is a strategy that has not yet been widely adopted. Only 24% of businesses we surveyed said that the IT department charged the rest of the business for energy use.

⁴ See 'Data Centers are Adopting Green Initiatives but are Wary of Vendors' Marketing Messages', ARI, 2008

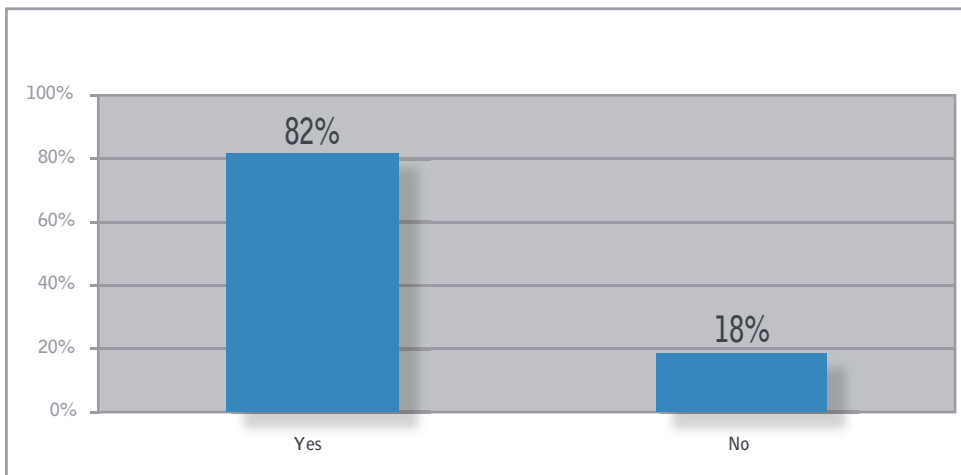


Does your IT department charge back the business for energy usage?



Of those that did charge the business for energy use, 18% admitted that they excluded the data center from that invoice.

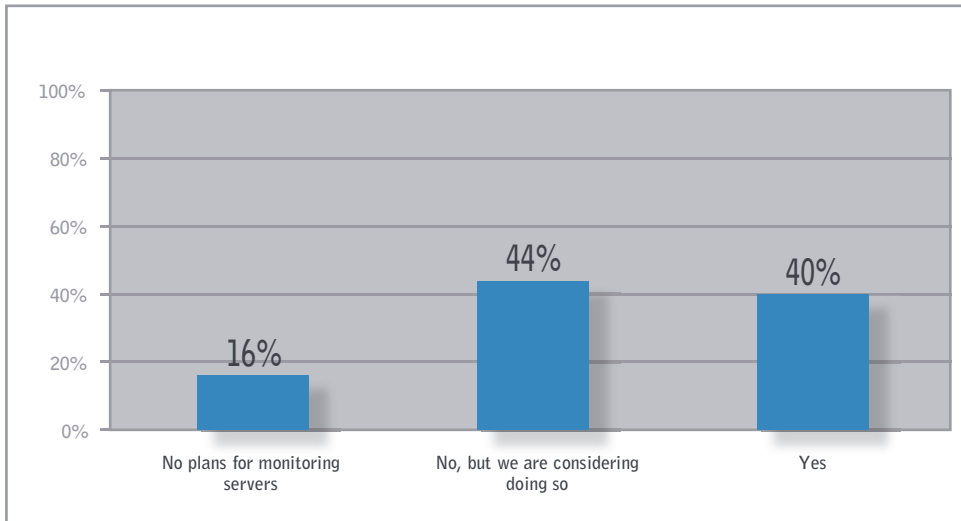
If your IT department DOES charge back the business: Is power in the data center included?



Many organizations will be thwarted by a lack of infrastructure in any attempt to introduce charging. Only 40% of those we surveyed said they monitored server power consumption. A further 44% said they were considering introducing it, but 16% confessed they had no plans to monitor servers. It's impossible to charge the business for using a resource you can't measure. Until power consumption is accurately measured, IT departments will be unable to charge business users accurately, and so will be unable to link provisioning decisions to their energy consequences.



Do you monitor server power consumption in your data center?



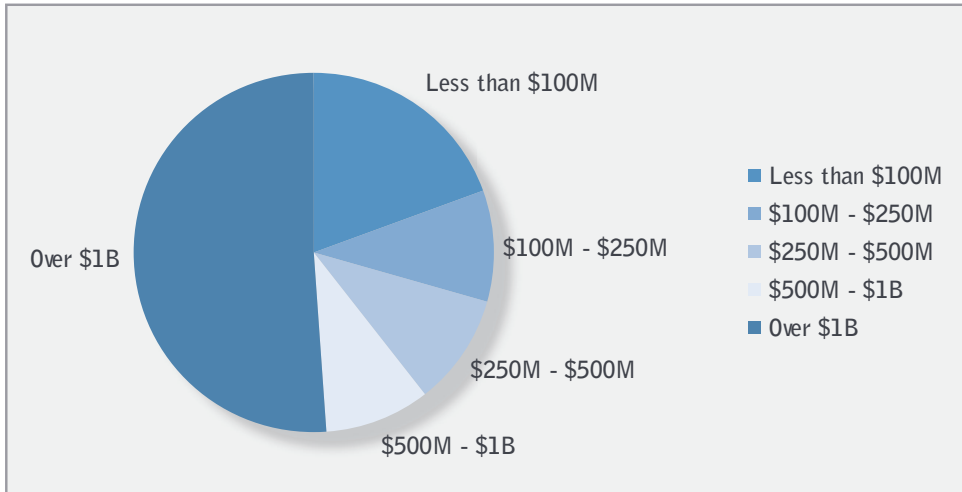
Business departments are used to commissioning a capability, rather than a piece of equipment, and so will not have the insight needed to decide when a device can be powered off. The use of virtualization means a device could, in any case, be hosting any number of applications. While the business can – and should – take responsibility for the power its applications use, it is important that the IT, facilities and business teams are able to communicate clearly about resources throughout a device's entire lifecycle.



Survey methodology

More than 100 data center professionals and executives from a variety of industries participated in this online survey. Survey participants were solicited from an industry database of Aperture customers and prospects. The charts below illustrate the demographics of companies that took part in the survey.

Annual Revenue of Participating Companies



The chart below shows the cross section of types of businesses that participated in the survey. It includes companies across various vertical industries and ranges from smaller businesses to Fortune 100 companies.

Primary Industry of Participating Organizations

