

# E2IT

## The Energy Efficient IT Report

*What Works and What Doesn't in IT Energy Reduction*



August 4, 2008

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# Introduction

Energy consumption and costs remain a top focus for Information Technology (IT) executives across all industry sectors. We surveyed 778 IT professionals in U.S. organizations (mid-size and large businesses; Federal, state and local government agencies; and K-12 and higher education institutions) to identify:

- » The **importance** organizations are placing on IT energy use/costs
- » The **measures** organizations are taking to reduce energy use
- » Why some organizations are seeing **better results** than others
- » What IT professionals need in order to **improve energy efficiency** in IT operations



# Executive Summary

- » **IT execs say their organizations care about energy efficiency, but it is not a top priority in IT equipment purchasing decisions**
  - While more than **90%** of IT executives with IT procurement responsibility say their organizations are taking steps to manage IT energy consumption and energy costs, **just one-third** say energy efficiency is a very important consideration when purchasing new equipment
  
- » **When organizations do purchase energy-efficient IT equipment, many are not taking full advantage of the efficiency features**
  - Of respondents who purchase ENERGY STAR 4.0-qualified PCs, only **38%** say they make full use of the power management tools in their systems
  
- » **IT executives with information about their energy consumption are more motivated to implement energy-reduction measures**
  - **57%** of IT executives say someone in their IT department receives reports, authorizes payments, or otherwise has responsibility for the amount and cost of energy used in the organization's IT operations
  - Of this group, **88%** have or are developing strategies to manage power demand and energy consumption versus only **38%** of others



## The Importance:

Do organizations value energy efficiency?



IT execs say their organizations care about energy efficiency, but it is not a top priority in IT equipment purchasing decisions.

**94%**

of IT executives who buy desktop equipment (desktop or laptop computers, monitors, printers, and other peripheral devices) or data center equipment say that their organization is taking some routine measure to **manage the energy consumption and energy cost** of IT equipment

Still, just **34%** of IT executives with procurement responsibility say energy efficiency is a very important consideration when purchasing new equipment

**Take Away** – Not Walking the Talk

TCO, reliability, ease of use, and other measures are more important than energy efficiency in the procurement decision for some organizations.

What other factors do you consider **more important than energy use and costs** when your organization buys new IT equipment?

“Overall cost of ownership” – **Business**

“Efficiency, reliability, quality, memory” – **Federal Government**

“Reliability, up-time, performance” – **State and Local Government**

“Ease of use, durability” – **Higher Education**

“Reliability. Service and support from manufacturer” – **K-12**



**Take Away** – Examine the Priorities

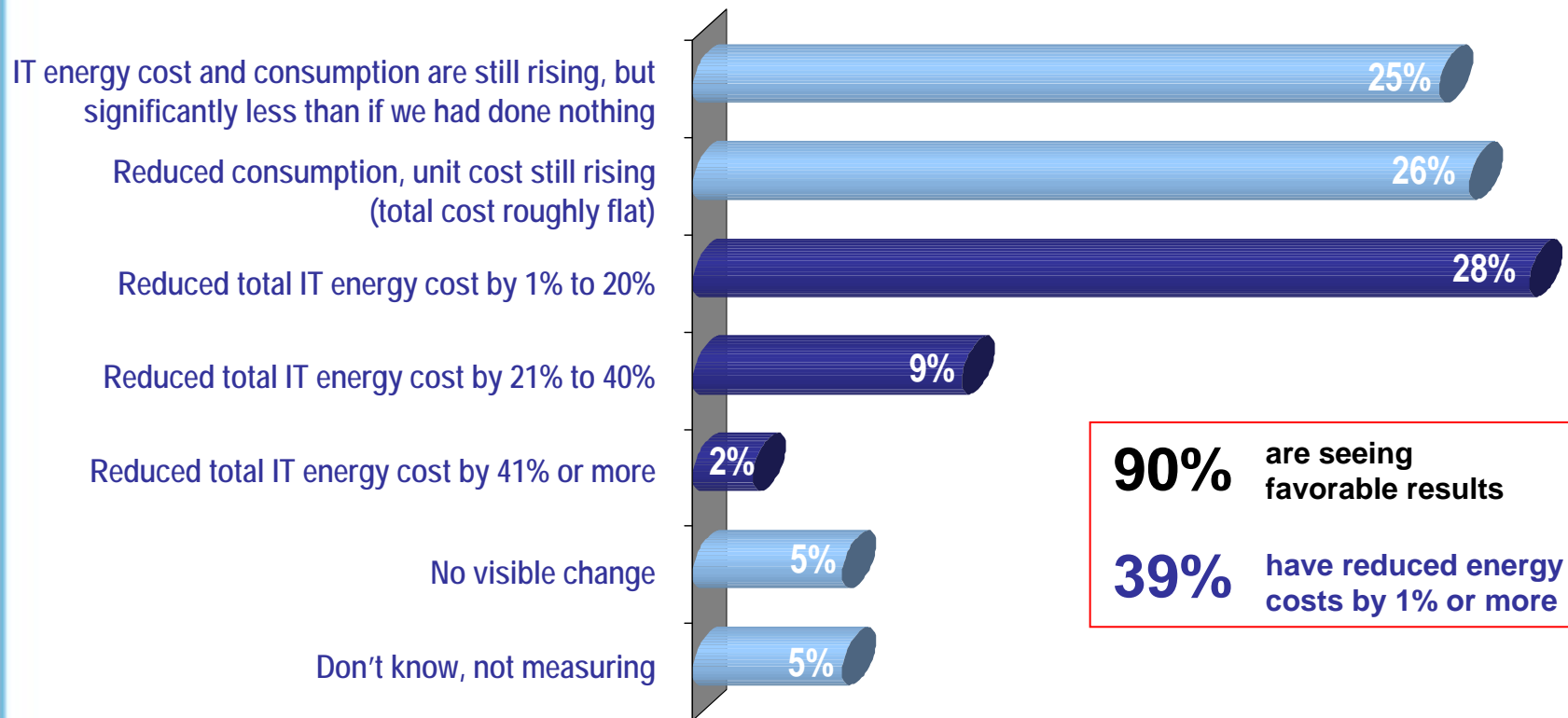
The Leaders:  
What's working?



## The majority of organizations with programs in place to manage energy consumption are having success.

Based upon your IT department's efforts to manage energy consumption and energy costs, how do you believe you have influenced total annual IT energy costs?\*

\*Question asked to respondents whose organizations have defined and enforced programs or strategies to manage power demand and energy consumption in IT operations



**Take Away – Significant Reductions are Possible**



Organizations that have programs to manage energy consumption *and have reduced* IT energy costs are taking a multi-faceted approach – procuring wisely and actively managing their technology investments for maximum savings.

**Organizations that have reduced annual IT energy costs by 1% or more:**

**62%** Buy computers that employ newer, low-power/low-wattage processors



**52%** Buy ENERGY STAR 4.0-qualifying devices



**50%** Train employees to shut down their equipment



**48%** Implement server consolidation and optimization



**41%** Make full use of power management tools

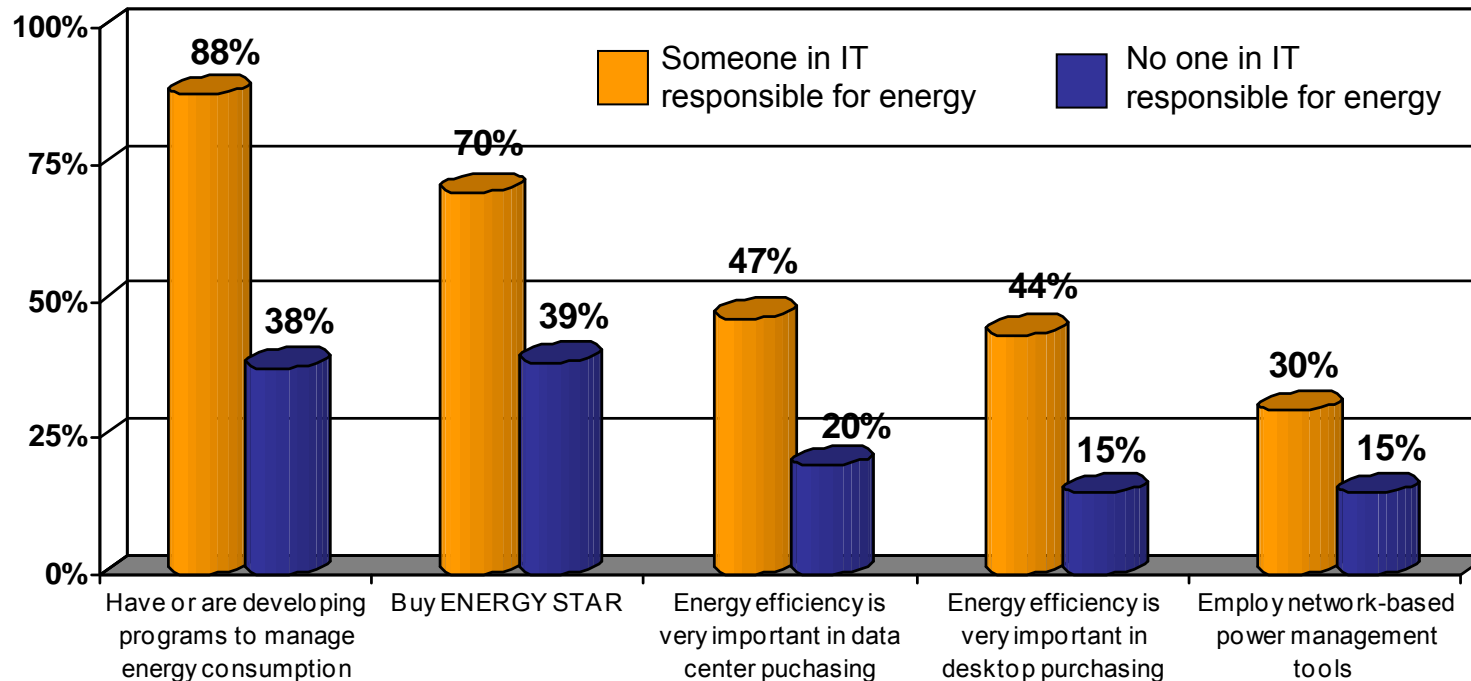


**Take Away – No Single “Silver Bullet”**



Available energy information makes an impact – those with more information do more and place higher priority on energy efficiency in purchasing decisions.

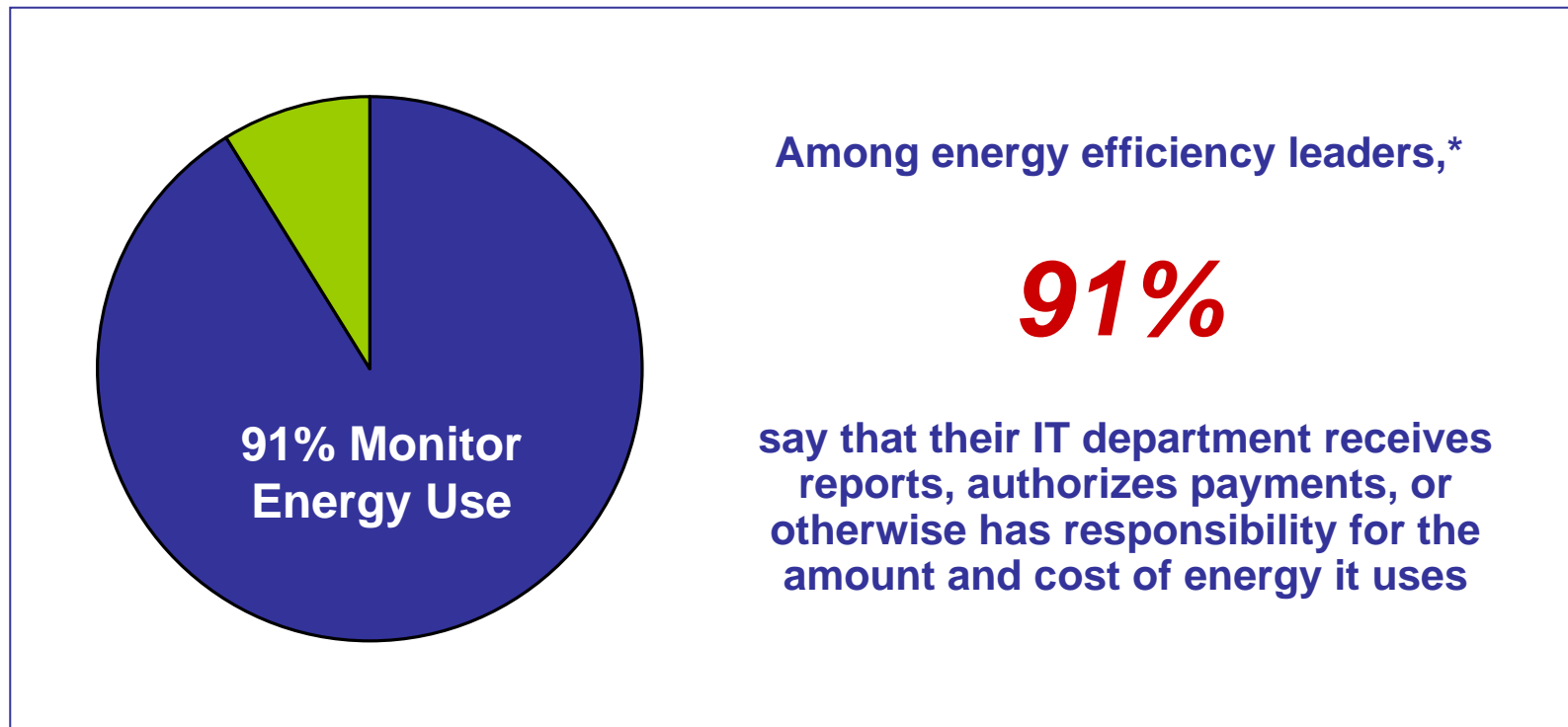
**57%** of all IT executives say that someone in their IT department receives reports, authorizes payments, or otherwise has responsibility for the amount and cost of energy used in the organization's IT operations



**Take Away – Knowledge is Power**



To prove the point: Almost all energy efficiency leaders – the organizations that have energy management programs *and have reduced* annual IT energy costs – have given IT responsibility for its energy use.



\*Respondents whose organizations have reduced annual IT energy costs by 1% or more

**Take Away – IT Needs to “Own” the Energy Bill**



# The Barriers: What's holding everyone else back?

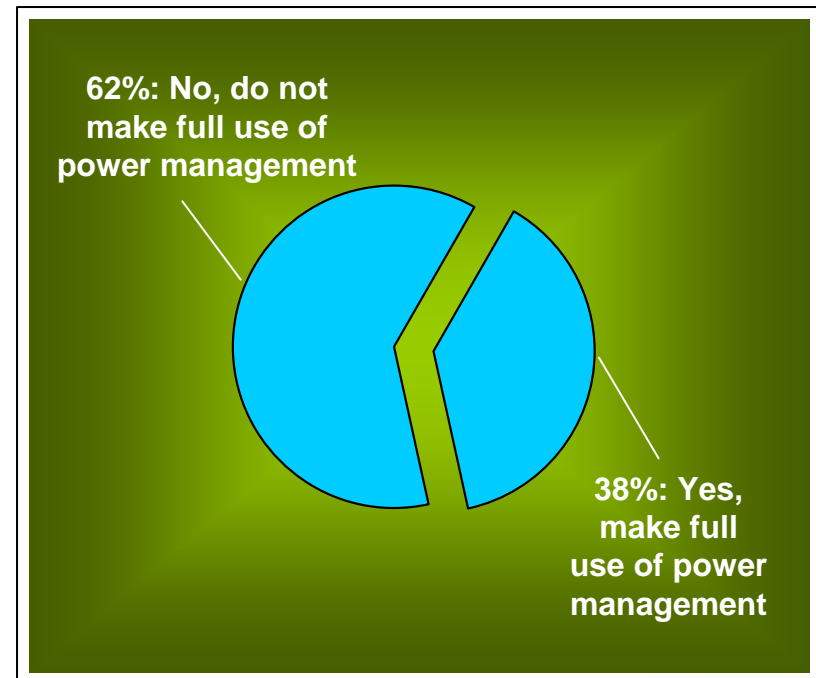


When organizations purchase energy-efficient IT equipment, many are not taking full advantage of the efficiency features.

**31%**

of IT executives who buy desktop/client IT equipment report purchasing ENERGY STAR 4.0-qualifying devices

But more than half – **62%** – of this group report they do not make full use of the power management tools within their operating systems



**Take Away – Hijacked Savings**

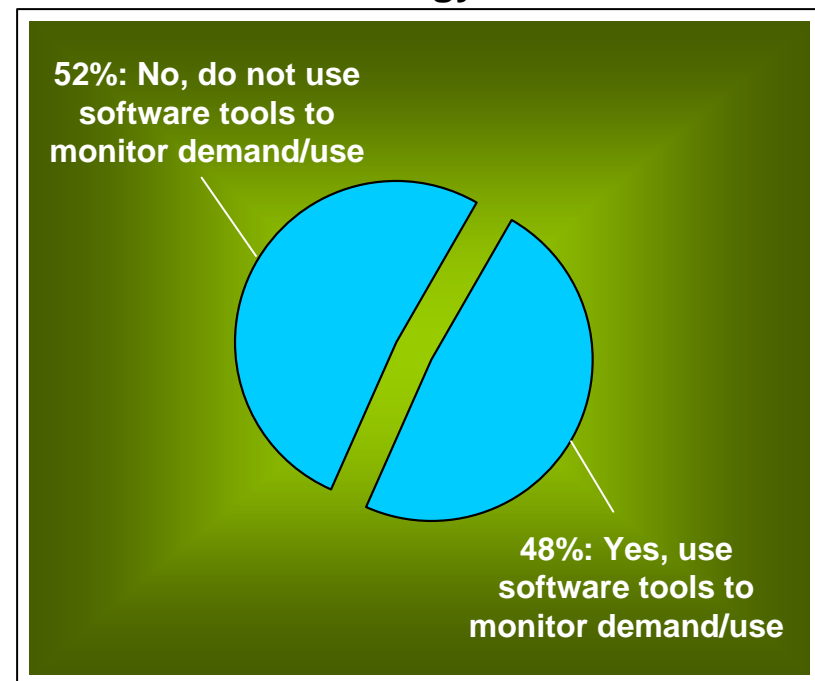


Organizations are not taking full advantage of efficiency tools in the data center.

**32%**

of IT executives who buy data center equipment report purchasing energy-efficient/load-shedding uninterruptible power supplies (UPS)

But of this group, more than half – **52%** – report they do not use software tools within their UPS system to monitor power demand and energy use



**Take Away** – Buying is not Doing



Lack of clear information about energy efficiency is a key barrier to achieving greater energy/cost reduction.

### Room for Improvement:

- » **49%** of IT executives say they do not know all the things they can do to improve energy efficiency
- » **54%** say that easier identification of energy-efficient equipment options is a high priority
- » **52%** would like an objective assessment and breakdown of power and energy use within IT, with cost/benefit analysis of potential savings
- » **55%** would like a clear set of industry standards for what constitutes energy-efficient IT equipment in the data center
- » **47%** would like assistance finding the best consolidation/virtualization options for our systems



**Take Away** – It's Hard to Change Things You Can't See



## Lack of organizational support also hampers energy-reduction efforts.

**Wanted:**  
More executive  
support and  
incentives to succeed



**57%** of IT executives say they are somewhat or significantly more concerned about the cost and amount of energy used in IT operations than their organization's top management

**43%** of IT executives say the people who pay their bills do not pay attention to IT's energy use

**67%** of IT executives do not believe or are unsure if they will be rewarded/recognized by their employer's top management if they deliver a measurable improvement in IT energy efficiency and/or reduce energy costs

**Take Away – Listen Down the Ladder**



# Recommendations



# Recommendations

- » **Make the commitment:** Implement organization-wide IT energy guidelines. Assign roles and responsibilities, and provide the tools to monitor and improve IT energy efficiency
- » **Walk the talk – procure with care:** Absent other standards, employ guidelines from such groups as [climatesaverscomputing.org](http://climatesaverscomputing.org), The Uptime Institute, or Green Grid. IT equipment manufacturers are constantly improving energy efficiency, so look actively for low-power/low-wattage devices that meet your performance requirements, because you may be surprised how quickly they pay for themselves
- » **Pick all of the low-hanging fruit:** For example, activate the power management options embedded in PC and server operating systems, train employees in best energy practices, and use the monitoring tools in 'smart UPS' systems
- » **Have a professional energy assessment:** Identify and quantify all of your opportunities to reduce IT energy use, and prioritize them by cost/benefit for action
- » **Plan data center improvements with efficiency in mind:** Smart designs based on optimized servers and storage, thermal assessment, and the latest rack-based cooling systems can reduce data center energy use by 10% to 45% or more



## Recommendations (Continued)

- » **Virtualize as much as possible:** Assess your infrastructure from desktop to data center and look to a number of virtualization technologies available today to reduce system footprint, reducing both power and cooling requirements:
  - » Servers – Probably the most common of all virtualization platforms, server virtualization can reduce the number of physical servers, racks, switches, and cabling, lowering power consumption accordingly. The blade and rack servers operating a virtual environment can offer additional energy efficiencies
  - » Desktops – Hosting desktop computers and applications centrally in a data center and removing computers from employee desks can greatly reduce power consumption. Many technologies exist to virtualize not only desktops but applications as well
- » **Consolidate the rest of the data center:** Most organizations cannot virtualize everything in the data center. However, consolidating multiple database servers and network switches can result in a smaller physical footprint, ultimately boosting energy efficiency
- » **Take the old offline:** Develop a storage strategy, archiving old and rarely accessed data and eliminating duplicate data. As a result, organizations can reduce the number of storage devices, cutting energy consumption



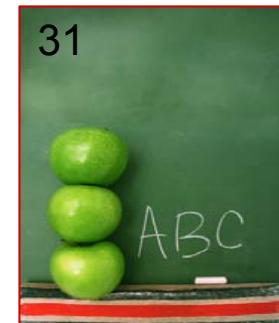
# Methodology and Demographics

- » CDW-G hired O’Keeffe & Company to survey IT professionals in mid-size and large organizations (100+ employees) in June 2008 on the state of IT energy consumption and costs
  - Data collection: A national online survey through e-Rewards
  - Total sample size: 778
    - › Business: 150
    - › Federal government: 150
    - › State/Local government: 157
    - › Higher education: 169
    - › K-12: 152
  - Margin of error for total sample:  $\pm 3.49\%$  at a 95% confidence level
  - Margin of error for industry samples:  $\pm 8.00\%$  at a 95% confidence level
- » Demographics
  - Organization Size:
    - › 27%: 100-499 employees; 52%: 500-10,000 employees; 21%: More than 10,000 employees
  - Title:
    - › 6%: CIO/CTO; 3%: Deputy CIO/CTO; 21%: IT Director/Supervisor; 21%: IT Manager; 16%: Network Administrator; 3%: Data Center Manager; 3%: Procurement Specialist; 27%: Other IT Manager



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# Business Snapshot

## Importance

**37%**

of IT executives with procurement responsibility say that energy efficiency is a very important consideration when purchasing new desktop/client IT equipment (38% for data center equipment)



## Leaders

**66%**

say that someone in their IT department receives reports, authorizes payments, or otherwise has responsibility for the amount and cost of energy used in the organization's IT operations (**significantly greater** than the average organization surveyed: 57%)

**Of  
this  
group:**

**95%**  
manage energy  
consumption\*

## Barriers

**71%**

say the lack of a way to isolate and measure the energy used in IT operations is or may be a significant barrier to energy efficiency

**49%**

say they do not know all the things they can do to improve energy efficiency



\*Have or are developing programs or strategies to manage power demand and energy consumption in IT

# What is unique about business?

Pulse Check	Recommendations
<ul style="list-style-type: none"><li>• Businesses are most likely to <b>assign someone the responsibility</b> for energy costs within the organization's IT operations (66% vs. 55% of others*)</li><li>• Businesses are also most likely to <b>recognize employees</b> for improving IT efficiency (47% vs. 29% of others*)</li><li>• Businesses are most likely to see <b>actual reductions</b> in energy costs – 46% have reduced energy costs by 1% or more vs. only 37% of others*</li></ul>	<ul style="list-style-type: none"><li>• Do what the energy efficiency leaders do: <b>Assign responsibility, measure consumption and reward success</b> in IT energy efficiency</li><li>• Go to the next level: Have an IT energy efficiency assessment to <b>isolate and measure</b> opportunities to reduce energy use and peak power demand</li><li>• Procure with care: Make IT energy efficiency a higher <b>procurement priority</b>; favor innovative power/cooling options and push forward with server consolidation</li></ul>

\*Others refers to the combined group of Federal government, state and local government, higher education, and K-12 respondents (N=628)



# Federal Snapshot



## Importance

**32%**

of Federal IT executives with procurement responsibility say that energy efficiency is a very important consideration when purchasing new desktop/client IT equipment (32% for data center equipment)

## Leaders

**56%**

say that someone in their IT department receives reports, authorizes payments, or otherwise has responsibility for the amount and cost of energy used in the organization's IT operations

**Of  
this  
group:**

**88%**  
manage energy  
consumption\*

## Barriers

**69%**

say the lack of a way to isolate and measure the energy used in IT operations is or may be a significant barrier to energy efficiency

**39%**

say they do not know all the things they can do to improve energy efficiency (**significantly less** than the average organization surveyed: **49%**)

\*Have or are developing programs or strategies to manage power demand and energy consumption in IT

# What is unique about the Federal government?

Pulse Check	Recommendations
<ul style="list-style-type: none"><li>• Federal government respondents are most confident in their <b>knowledge of energy efficiency</b> (only 39% say they do not know all the things they could do to improve energy efficiency vs. 51% of others*)</li><li>• Federal government organizations are most likely to have a <b>formal, organization-wide policy</b> to guide buying decisions that affect energy consumption (65% vs. 51% of others*)</li><li>• However, Federal government organizations are <b>least likely to train</b> employees to shut down their equipment when they leave the office (34% vs. 45% of others*)</li></ul>	<ul style="list-style-type: none"><li>• Take the next step: Buying to mandated standards is only the first step. <b>Train employees</b> on energy-saving behaviors such as turning off equipment. <b>Turn on energy saving features</b> at the desktop and in the data center to maximize savings</li><li>• Monitor and Measure: Provide greater visibility into IT energy use with <b>power metering systems</b> and <b>smart UPS systems</b> that enable monitoring of data center power loads; have a comprehensive <b>IT energy efficiency assessment</b></li></ul>

\*Others refers to the combined group of business, state and local government, higher education, and K-12 respondents (N=628)



# State and Local Snapshot

## Importance

**30%**

of state and local IT executives with procurement responsibility say that energy efficiency is a very important consideration when purchasing new desktop/client IT equipment (33% for data center equipment)



## Leaders

**61%**

say that someone in their IT department receives reports, authorizes payments, or otherwise has responsibility for the amount and cost of energy used in the organization's IT operations

**Of  
this  
group:**

**82%**  
manage energy  
consumption\*

## Barriers

**76%**

say the lack of a way to isolate and measure the energy used in IT operations is or may be a significant barrier to energy efficiency

**48%**

say they do not know all the things they can do to improve energy efficiency

\*Have or are developing programs or strategies to manage power demand and energy consumption in IT



# What is unique about state and local government?

Pulse Check	Recommendations
<ul style="list-style-type: none"><li>• State and local government organizations are most likely to report that <b>increasing prices of electricity</b> continue to drive up annual energy costs (33% vs. 25% of others*)</li><li>• State and local government organizations are most likely to report they are approaching the <b>limits of their power supply</b> in some locations (45% vs. 36% of others*)</li><li>• State and local government respondents are most likely to believe it's important to control power demand and energy consumption because they are <b>consolidating data centers</b> (50% vs. 42% of others*)</li></ul>	<ul style="list-style-type: none"><li>• Do an <b>IT energy efficiency assessment</b>: Many state governments have agencies that offer comprehensive energy audits and provide access to energy services and alternative power sources</li><li>• Make the most of data center consolidation: <b>Pursue energy-smart facility redesign</b> and seek low-power/wattage equipment that meets performance needs</li><li>• Educate: Improve IT staff <b>knowledge</b> of energy efficiency strategies; provide the tools and information to <b>monitor</b> and manage IT energy use</li></ul>

\*Others refers to the combined group of business, Federal government, higher education, and K-12 respondents (N=621)



# Higher Education Snapshot

## Importance

**31%**

of higher education IT executives with procurement responsibility say that energy efficiency is a very important consideration when purchasing new desktop/client IT equipment (36% for data center equipment)



## Leaders

**49%**

say that someone in their IT department receives reports, authorizes payments, or otherwise has responsibility for the amount and cost of energy used in the organization's IT operations (**significantly less** than the average organization surveyed: 57%)

**Of  
this  
group:**

**88%**  
manage energy  
consumption\*

## Barriers

**79%**

say the lack of a way to isolate and measure the energy used in IT operations is or may be a significant barrier to energy efficiency

**53%**

say they do not know all the things they can do to improve energy efficiency

\*Have or are developing programs or strategies to manage power demand and energy consumption in IT

# What is unique about Higher Education?

Pulse Check	Recommendations
<ul style="list-style-type: none"><li>• Higher education respondents are most likely to <b>support environmental initiatives</b> (65% vs. 54% of others*) and employ <b>top executives who are concerned</b> with environmental sustainability (56% vs. 46% of others*)</li><li>• Despite these values, they are least likely to have a <b>formal, organization-wide policy</b> to guide buying decisions that affect power demand (49% do not have a policy vs. 33% of others*). They are also <b>least likely</b> to have <b>enforced programs</b> to manage energy consumption (only 31% have programs in place vs. 43% of others*)</li><li>• Higher education organizations are least likely to <b>assign someone the responsibility</b> for energy costs within the organization's IT operations (49% vs. 59% of others*)</li></ul>	<ul style="list-style-type: none"><li>• Walk the Talk: Senior management should capitalize on internal support for energy-efficiency initiatives and <b>implement organization-wide policies and assign employees</b> to manage energy consumption</li><li>• Measure: <b>Isolate and measure</b> IT's energy use to better inform energy management initiatives</li><li>• Engage: Expand environmental initiatives to include power management, <b>involving students, faculty and staff</b> in the effort</li><li>• Showcase: Universities and colleges are expected to be at the leading edge of knowledge and culture; the increasing national focus on energy spotlights an opportunity to <b>demonstrate leadership</b></li></ul>

\*Others refers to the combined group of business, Federal government, state and local government, and K-12 respondents (N=609)

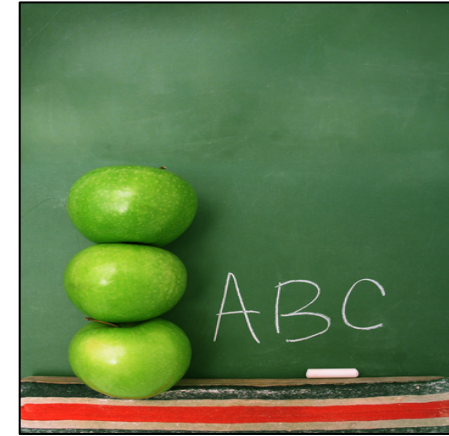


# K-12 Snapshot

## Importance

**30%**

of K-12 IT executives with procurement responsibility say that energy efficiency is a very important consideration when purchasing new desktop/client IT equipment (42% for data center equipment)



## Leaders

**53%**

say that someone in their IT department receives reports, authorizes payments, or otherwise has responsibility for the amount and cost of energy used in the organization's IT operations

**Of  
this  
group:**

**89%**  
manage energy  
consumption\*

## Barriers

**76%**

say the lack of a way to isolate and measure the energy used in IT operations is or may be a significant barrier to energy efficiency

**57%**

say they do not know all the things they can do to improve energy efficiency (**significantly greater** than the average organization surveyed: **49%**)

\*Have or are developing programs or strategies to manage power demand and energy consumption in IT

# What is unique about K-12?

## Pulse Check

- K-12 respondents are **most likely to be concerned** with lowering and managing energy costs (71% vs. 61% of others\*)
- They are also **most likely to train** their employees to shut down their equipment when they leave the office (50% vs. 41% of others\*)
- Still, K-12 respondents are least confident in their **knowledge of energy efficiency** (57% say they do not know all the things they could do to improve energy efficiency vs. 47% of others\*)
- They are also least likely to be **recognized by management** for improving IT's energy efficiency (only 20% vs. 36% of others\*)



## Recommendations

- Educate: Provide **additional education** on energy efficient equipment and energy management strategies for IT staff; give them the **information and tools** to monitor and reduce energy costs
- Do an **IT energy efficiency assessment**: Often, local utilities or state government agencies offer energy audits; identify and quantify efficiency opportunities and assign responsibility for capturing them
- Recognize success: Organizations that do so (i.e., with a **public acknowledgement**, an award, a promotion, or other compensation) are more likely to see energy costs decrease

\*Others refers to the combined group of business, Federal government, state and local government, and higher education respondents (N=626)



# Thank you.

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