CDW launched the annual Energy Efficient IT Report in 2008 to study marketplace attitudes, identify successful cost-saving measures and understand barriers to the widespread adoption of energy efficient IT.

Now in its third year, the 2010 Energy Efficient IT Report surveyed 756 IT professionals in U.S. organizations* to track progress and determine:

- Where energy efficiency ranks among IT priorities

- How organizations are improving efficiency

- What challenges hinder efficiency goals

*Medium and large businesses; Federal, state and local government agencies; and K-12 and higher education institutions

IT managers place increased importance on energy efficient technology

- The percentage of IT managers who believe that energy efficiency is a very important* consideration when purchasing new IT equipment has rebounded significantly during the past year – from 34% in 2008, down to 26% in 2009 and now back up to 39% in 2010
- Two-thirds of IT managers say understanding best practices in energy efficient IT is critical to their profession

Organizations are consolidating data centers and innovating to reduce energy use

- 79% of organizations currently have or are developing a data center consolidation strategy. Many cite energy reduction as a top driver
- 76% report they are deploying some kind of innovative approach to reducing energy use, including deploying more power efficient switches and using the network as a platform to manage energy use

Their efforts are paying off

- 74% of organizations have or are developing programs to manage and reduce IT energy use
- Of this group, 56% (up from 39% in 2008) have reduced their IT energy costs by 1% or more

## Still, many struggle to allocate funds for energy efficient IT programs

- Managers explain that they have too little budget left for new, more efficient IT systems after meeting internal client demands. They also find that senior management gives higher priority to investments in other areas of the organization
- Cost concerns may be more perception than reality. When asked specifically about upfront costs, just 17% of IT managers said that they believe the cost of energy efficient IT equipment is prohibitive

*Desktop computing and server procurement professionals selected 8-10 on a 1-10 scale, where 1 was "not at all important" and 10 was "extremely important"

A growing number of U.S. organizations have or are developing programs to manage and reduce IT energy use.

Percentage of organizations that have or are developing programs to manage and reduce IT energy use:

67% — 2008
69% — 2009
74% — 2010
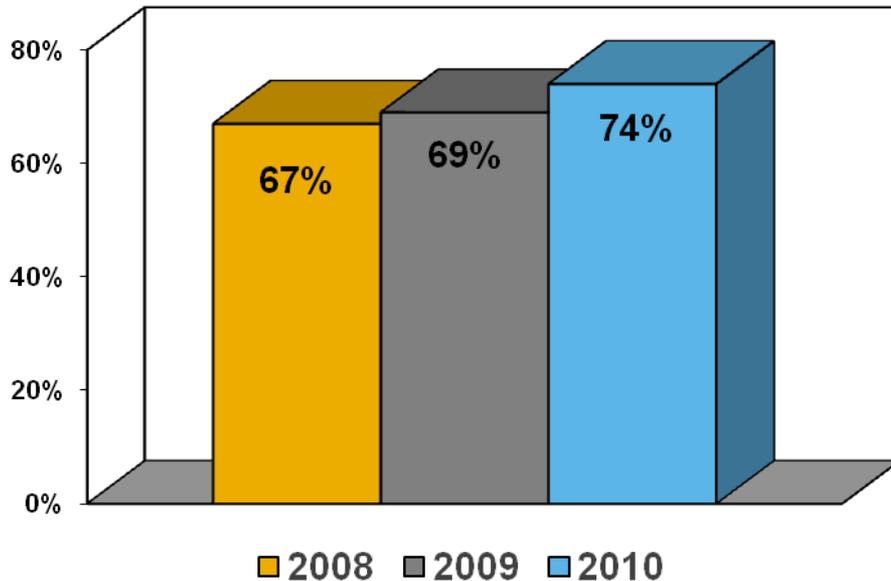
Additionally, the percent of IT managers who know what portion of their IT budget is spent on energy increased from 50% in 2009 to 57% in 2010*

*Not measured in 2008

56% of IT departments that employ power management strategies have reduced costs by 1% or more.

Results from energy efficiency efforts*:

	2008	2009	2010
Organizations have reduced IT energy <u>costs</u> by 1% or more	39%	52%	56%
Organizations have flattened or reduced IT energy <u>use</u>, but increasing prices of electricity continue to drive up IT energy costs	26%	20%	20%

How do you feel about the following statement?

Energy efficient IT offers my organization a competitive advantage
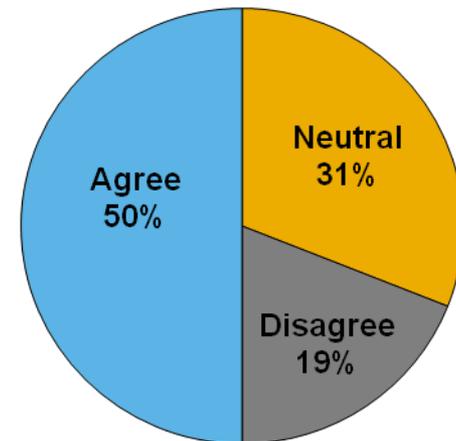
Agree 50%
Neutral 31%
Disagree 19%

*Those with defined programs to manage power demand and/or energy consumption in their IT operations

Organizations with successful IT energy reduction programs are actively upgrading their desktop and data center technologies.

Top energy-saving measures used by successful organizations*:

#1   Migrate monitors from CRTs to LCDs *(65%)*

#2   Buy servers and other data center equipment employing newer, low-power/low-wattage processors *(64%)*

#3   Buy computers that employ newer, low-power/low-wattage processors *(59%)*

#4   Make full use of the power management tools in desktop computer operating systems *(51%)*

#5   Redesign data centers to balance equipment and cooling needs *(43%)*

*Those with defined programs to manage power demand and/or energy consumption in their IT operations that have reduced IT energy costs by 1% or more

While energy efficiency is increasingly top of mind, other IT initiatives can trump efficiency in many organizations.

Overall, what are the most significant barriers to more efficient use of energy in your IT operations?*

We have too little budget left for new, more efficient systems after meeting internal client demands
32%

Senior management gives higher priority to other investments
32%

The people who pay our energy bills do not pay attention to IT's energy use
31%

We do not have a way to isolate and measure energy use
27%

We do not know all of the things we could do to improve efficiency
26%

If we cut IT energy costs, our IT budget is cut by a corresponding amount
16%
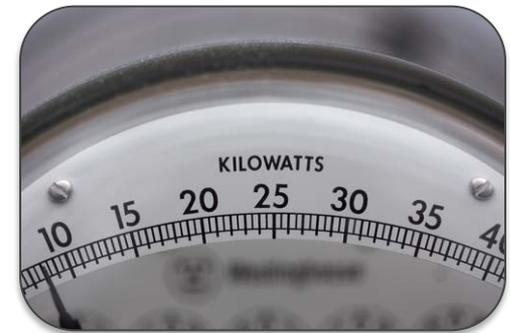
"Electricity is included in our lease. There is no incentive to save energy."

"Our main IT center is in a building with shared services, so we are unable to measure our direct power use."

*Respondents were asked to select their top three barriers

Few IT managers say their organization would pay a premium for energy efficient technology. They may not need to.

The percentage of IT managers who see energy efficiency as a very important* consideration in purchasing new IT equipment has rebounded:

40%

39%

34%

20%

26%

0%

□ 2008 □ 2009 □ 2010

and
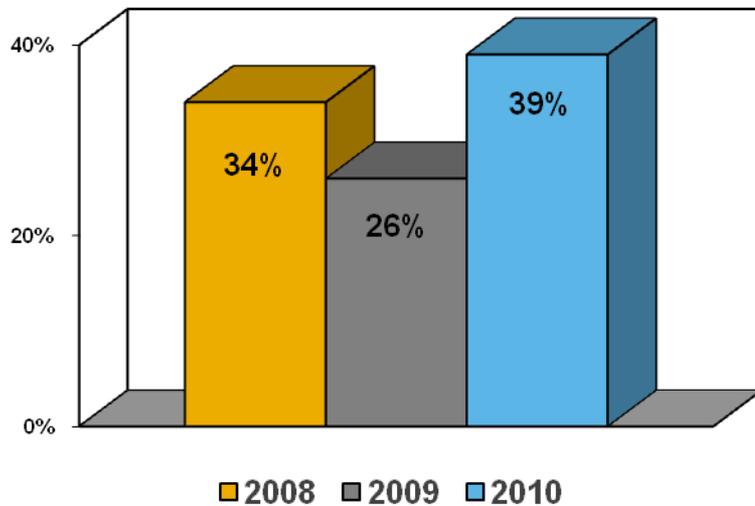
While most say they won't pay a premium:

31% of IT managers say their organization would pay a premium for energy efficient technology

Most also say they won't have to:

Just **17%** believe that the cost of more energy efficient IT equipment is prohibitive

*Desktop computing and server procurement professionals selected 8-10 on a 1-10 scale, where 1 was "not at all important" and 10 was "extremely important"

Though less than half of IT managers are incented to improve IT energy efficiency, they see value in understanding cost-reducing measures.

48%

of IT departments are incented to reduce IT energy costs (with awards, bonuses and/or rebates)

Still,

66%

believe IT managers must understand best practices in energy efficient IT

Why?

"We have to do more without exceeding our current power utilization."

"[We are seeing] continued growth in demand for new servers/services, but no increase in staffing. We need to leverage this technology to allow existing staff to perform more work."

"We are looking for improved efficiency, both from a system standpoint and operationally."

Many organizations are turning to data center consolidation for IT energy reductions.

79%

of IT managers report that their organization currently has or is developing a data center consolidation strategy

What are the top drivers for your organization's data center consolidation efforts?*

Driver	Percentage
Reducing expenditures on data center hardware, software and operations	61%
Reducing energy consumption	60%
Increasing use of new and more efficient computing platforms and technologies	44%
Increasing IT security	44%
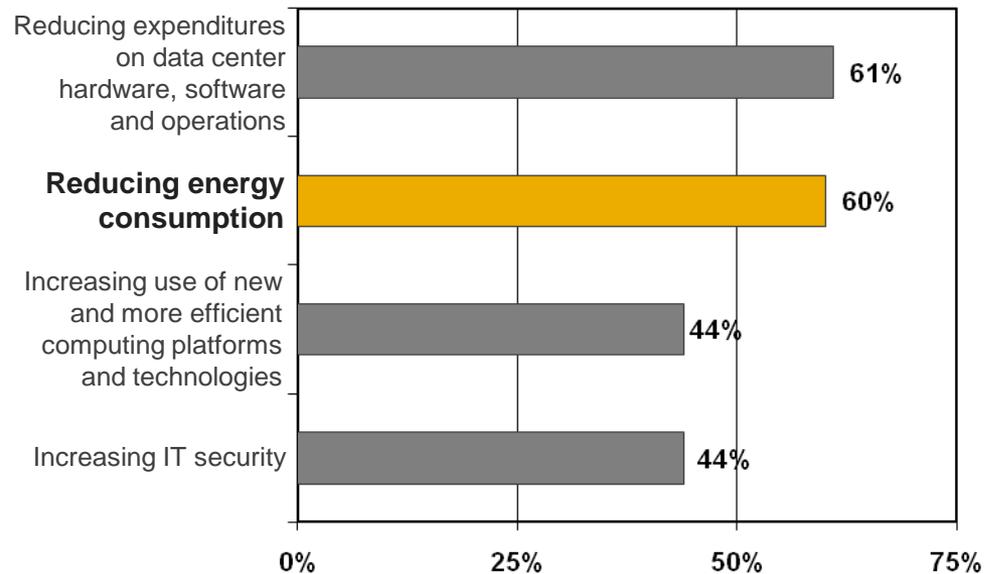
*Those who have or are developing a strategy were asked to select all that apply

Nearly all steps included in organizations' data center consolidation strategies can individually improve energy efficiency.

Current consolidation strategies include*:

63% — Virtualizing servers and/or storage

61% — Consolidating servers

37% Building private or using public clouds

36% Retiring unused or "ghost" servers

35% Replacing old processors with low-power versions

24% Consolidating UPS devices

22% Shutting down or pausing servers during off-peak operations

14% Employing high-density cooling

"We believe that virtualization is the most efficient solution for data center consolidation and reduction of energy consumption. We currently have several servers, each with a single function that takes up less than 20% of the server's CPU time. This is not only a waste of computer power, but also electricity."

"We are replacing old energy-burning components with newer energy-efficient ones that will save us money in the long run."

*"We are shutting down non-essentials in the off-work hours."*

*Those who have or are developing a strategy were asked to select all that apply

Organizations can use free U.S. Environmental Protection Agency (EPA) and Department of Energy programs to assess data center improvements and validate investments, but some are not aware of these tools.

How familiar are you with the EPA's ENERGY STAR Rating for Data Centers program?

Never heard of it
5%

Have only heard of it
20%

Very familiar
25%

Somewhat familiar
50%
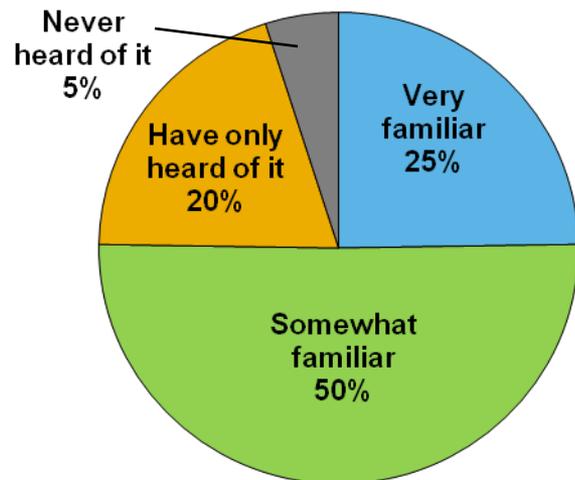
Has your organization used the Department of Energy's Data Center Energy Profiler (DC Pro)?


Yes
23%

No
52%

Unsure
25%
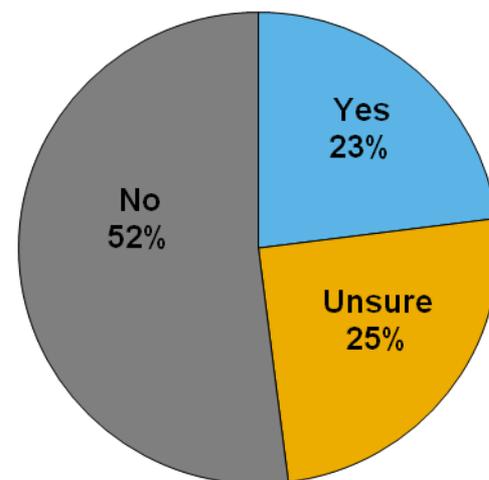
While industry, EPA and Department of Energy programs provide energy efficiency metrics, very few organizations actively track them.
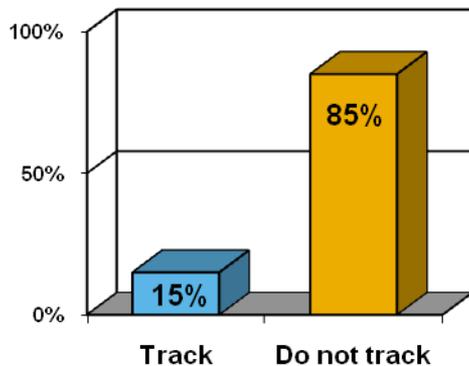
Power Usage Effectiveness (PUE)	Data Center infrastructure Efficiency (DCiE)	Uninterruptible Power Supply (UPS) efficiency

Power Usage Effectiveness (PUE)

100%

50%

15%

0%

85%

Track   Do not track

Data Center infrastructure Efficiency (DCiE)

100%

50%

0%

11%

89%

Track   Do not track

Uninterruptible Power Supply (UPS) efficiency

100%

50%

0%

42%

58%

Track   Do not track
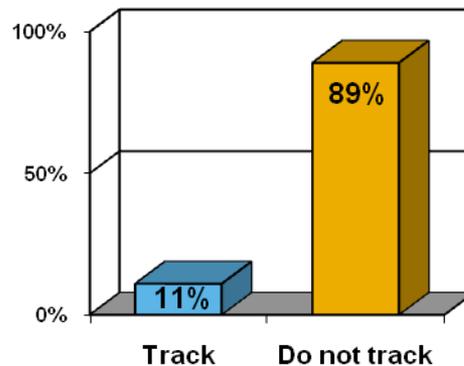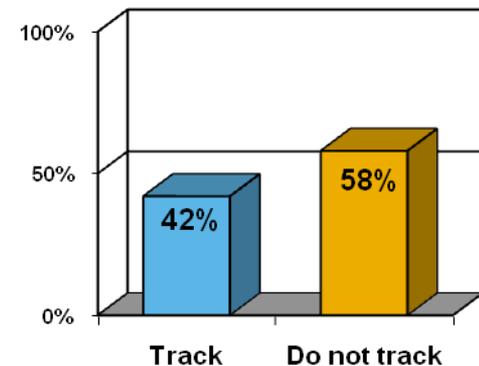
PUE is a ratio of total facility power consumed to the amount that directly powers IT equipment, with an ideal data center having a PUE of 1 – all power going directly to IT equipment. *PUE is the core measurement for the EPA Data Center program.*

DCiE represents how close to the PUE ideal a data center has come as a percentage. A data center where only half of all incoming power was used directly by IT equipment, for example, would have a PUE of 2 and a DCiE of 50%.

*UPS efficiency measures how much of the input electricity is actually available to the load after the overhead incurred by system electronics, power conversion, etc.** An ideal UPS has an efficiency rating of 100%.*

76% of organizations are adding at least one of the following innovative approaches to their energy efficiency tool kits.

Innovative approaches to lowering IT energy footprint*:

39% Deploying more power-efficient core switches

30% Replacing edge and workgroup switches with more power-efficient switches

24% Using the network as a platform to manage and reduce energy use

23% Adopting 10GB Ethernet, Infiniband technologies

21% Reducing SAN infrastructure by implementing Fibre-channel Over Ethernet (FcOE)

19% Moving to top-of-rack models for access layer switching

*Respondents asked to select all that apply

Leverage Available Tracking Tools

Utilize *free* EPA and Department of Energy programs to assess data center improvements and validate investments. Install the tools to track efficiency metrics, such as PUE.

Think Bigger

While training employees to shut down computers will aid in reduction efforts, organizations that have successfully reduced IT energy costs are making more significant changes, such as investing in LCD monitors and low-power servers and computers. Other organizations are trying new approaches, such as upgrading to more power-efficient switches.

Incent IT

Demonstrate your organization's commitment to energy efficient IT by recognizing and rewarding reduction efforts. For example, reduced IT energy spending could be one component of a manager's performance evaluation, with successful reduction recognized with a monetary award.

CDW hired O'Keeffe & Company to survey IT professionals across five industries in August 2010. The total sample size equates to a margin of error of ±3.5% at a 95% confidence level; individual industry samples equate to margin of error of ±8.0% at a 95% confidence level.

- Data collection methodology: National online survey
- Total sample size: 756
  - Medium and large business: 150
  - Federal government: 150
  - State/local government: 154
  - Higher education: 152
  - K-12: 150
- Respondent demographics:

Organization Size	
3%	0-99 employees
27%	100-499 employees
47%	500-10,000 employees
23%	More than 10,000 employees

Respondent Titles	
12%	IT executive level/C-Level (e.g., CIO, CTO, VP of IT)
18%	IT director/systems director
15%	IT supervisor
27%	IT manager (e.g., IT, help desk or telecommunications manager)
11%	Network administrator
4%	Data center manager
13%	Other IT manager
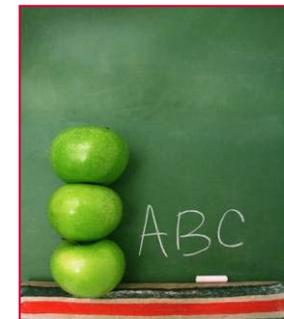
Commitment to Energy Efficiency

80% have or are developing programs to manage and reduce energy use in IT

Results to Date

41% have reduced IT energy costs by 1% or more*

28% have flattened or reduced IT energy use, but increasing prices of electricity continue to drive up IT energy costs*

Remaining Barriers

#1 Senior management gives higher priority to investments in other areas

#2 We have too little budget left for new, more efficient systems after meeting internal client demands

Spotlight on the Data Center

86% have or are developing a specific data center consolidation strategy

and

85% are familiar** with the EPA's ENERGY STAR Rating for Data Centers program

but

Just 20% currently track PUE

(the core measurement for the EPA program)

*Of those with defined programs to manage power demand and/or energy consumption in their IT operations **Very or somewhat familiar

Commitment to Energy Efficiency

78% have or are developing programs to manage and reduce energy use in IT

Results to Date

56% have reduced IT energy costs by 1% or more*

21% have flattened or reduced IT energy use, but increasing prices of electricity continue to drive up IT energy costs*
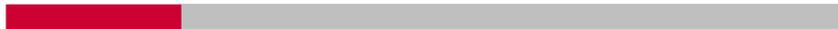
Remaining Barriers

#1 Senior management gives higher priority to investments in other areas

#2 The people who pay our organization's energy bills do not pay attention to IT's energy use

Spotlight on the Data Center

81% have or are developing a specific data center consolidation strategy

and

76% are familiar** with the EPA's ENERGY STAR Rating for Data Centers program

but

Just 17% currently track PUE

(the core measurement for the EPA program)

Status of Federal Energy Efficiency Mandates:

57% have submitted a comprehensive Strategic Sustainability Performance Plan (SSPP) to the Office of Management and Budget (OMB)

59% met the June 30, 2010 deadline to submit an initial data center consolidation plan to OMB

*Of those with defined programs to manage power demand and/or energy consumption in their IT operations **Very or somewhat familiar

Commitment to Energy Efficiency

62% — have or are developing programs to manage and reduce energy use in IT

Results to Date

64% have reduced IT energy costs by 1% or more*

14% have flattened or reduced IT energy use, but increasing prices of electricity continue to drive up IT energy costs*

Remaining Barriers

#1 We have too little budget left for new, more efficient systems after meeting internal client demands

#2 The people who pay our organization's energy bills do not pay attention to IT's energy use

Spotlight on the Data Center

77% have or are developing a specific data center consolidation strategy

and

68% are familiar** with the EPA's ENERGY STAR Rating for Data Centers program

but

Just 11% currently track PUE

(the core measurement for the EPA program)

*Of those with defined programs to manage power demand and/or energy consumption in their IT operations **Very or somewhat familiar

State and Local Success: Chesapeake, Va.

- Heat produced by the City of Chesapeake, Va.'s, data center was reducing the lifespan of the equipment it housed. Rather than expand the data center and replace underutilized servers, the city chose to deploy 84 virtual servers – increasing the longevity of its hardware, maintaining data center operations in the same physical space and conserving budget dollars

- With virtualization, the city realized:
  - **Energy cost savings** of $3,000 a month (50%)
  - **Annual hardware cost savings** of $200,000
  - **Reduced physical server count** from 135 to 20

- The savings realized allow Chesapeake to work on projects that would be otherwise underfunded. Next on the city's list is a storage virtualization project, which will include off-site data backup and disaster recovery capabilities

"One piece of advice I can give Federal and state and local agencies is to capture your current costs and compare them to the end result. Proving a reduction in total cost of ownership is the only way to truly show the value of IT in today's economic climate." – Peter Wallace, CIO, Chesapeake, Va.

Commitment to Energy Efficiency

74% have or are developing programs to manage and reduce energy use in IT

Results to Date

61% have reduced IT energy costs by 1% or more*

10% have flattened or reduced IT energy use, but increasing prices of electricity continue to drive up IT energy costs*

Remaining Barriers

#1 Senior management gives higher priority to investments in other areas

(tie)

#1 We have too little budget left for new, more efficient systems after meeting internal client demands

Spotlight on the Data Center

78% have or are developing a specific data center consolidation strategy

and

74% are familiar** with the EPA's ENERGY STAR Rating for Data Centers program

but

Just 13% currently track PUE

(the core measurement for the EPA program)

*Of those with defined programs to manage power demand and/or energy consumption in their IT operations **Very or somewhat familiar

Higher Education Success: Saint Xavier University

- Saint Xavier University is an independent Catholic institution in Chicago enrolling more than 5,000 students

- In November 2008, university officials realized that the university data center was no longer reliable or resilient. A single system outage would create a domino effect, taking multiple systems offline. Compounding the problem was an outdated power and cooling system that could not keep up with computing demands

- After extensive research, the university decided to consolidate its data center to reduce its physical server count and power and cooling costs:

  - Server virtualization reduced physical servers from 50 to 20, eliminated excessive cables, reduced power costs and increased available physical space

  - An uninterruptible power supply (UPS) improved power efficiency by 30 percent

  - A new cooling solution reduced downtime and increased efficiency by eliminating the unnecessary over-cooling of a traditional system

- Saint Xavier estimates an **annual savings of $7,680** in energy and hardware costs

> "*Saint Xavier University's outdated data center created a host of problems. IT could not support increasing technology demands or new applications needed for the campus to function and grow. Virtualizing our data center means we sleep better at night knowing end users have more up time, and we can now deliver applications in hours rather than weeks.*" – Daniel Lichter, director of data and network infrastructure, Saint Xavier University

Commitment to Energy Efficiency

74% have or are developing programs to manage and reduce energy use in IT

Results to Date

63% have reduced IT energy costs by 1% or more*

22% have flattened or reduced IT energy use, but increasing prices of electricity continue to drive up IT energy costs*

Remaining Barriers

#1 We have too little budget left for new, more efficient systems after meeting internal client demands

#2 We do not have a way to isolate and measure the energy used in our IT operations

Spotlight on the Data Center

77% have or are developing a specific data center consolidation strategy

and

75% are familiar** with the EPA's ENERGY STAR Rating for Data Centers program

but

Just 12% currently track PUE

(the core measurement for the EPA program)

*Of those with defined programs to manage power demand and/or energy consumption in their IT operations **Very or somewhat familiar

Thank you.

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