



# Focus on Energy

## IT and Data Center Energy-Efficiency Programs

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# Agenda

- Focus on Energy
- Energy-Efficient Computing
- Best Practices Approach to Energy-Efficient Computing
- Next Steps

# Who is Focus on Energy?

- Wisconsin's statewide program for energy efficiency and renewable energy
- Legislature created the program in 1999 – expanded in 2005
- Helps implement projects that would not occur otherwise
- Customer eligibility based on their electric and/or natural gas utilities

# Focus Accomplishments

- Nearly 60,000 businesses and over 1 million residents have participated in Focus
- Over 3,000 Wisconsin businesses partner with Focus to sell energy related goods and services
- Since 2001, Focus has helped businesses around the state save more than **\$172 million** in annual energy costs

# Focus on Energy Services

- Energy efficiency and renewable energy programs for businesses and residences
  - Single and multifamily homes
  - Commercial, industrial, agricultural and school/government buildings
- Education, technical expertise, and financial assistance

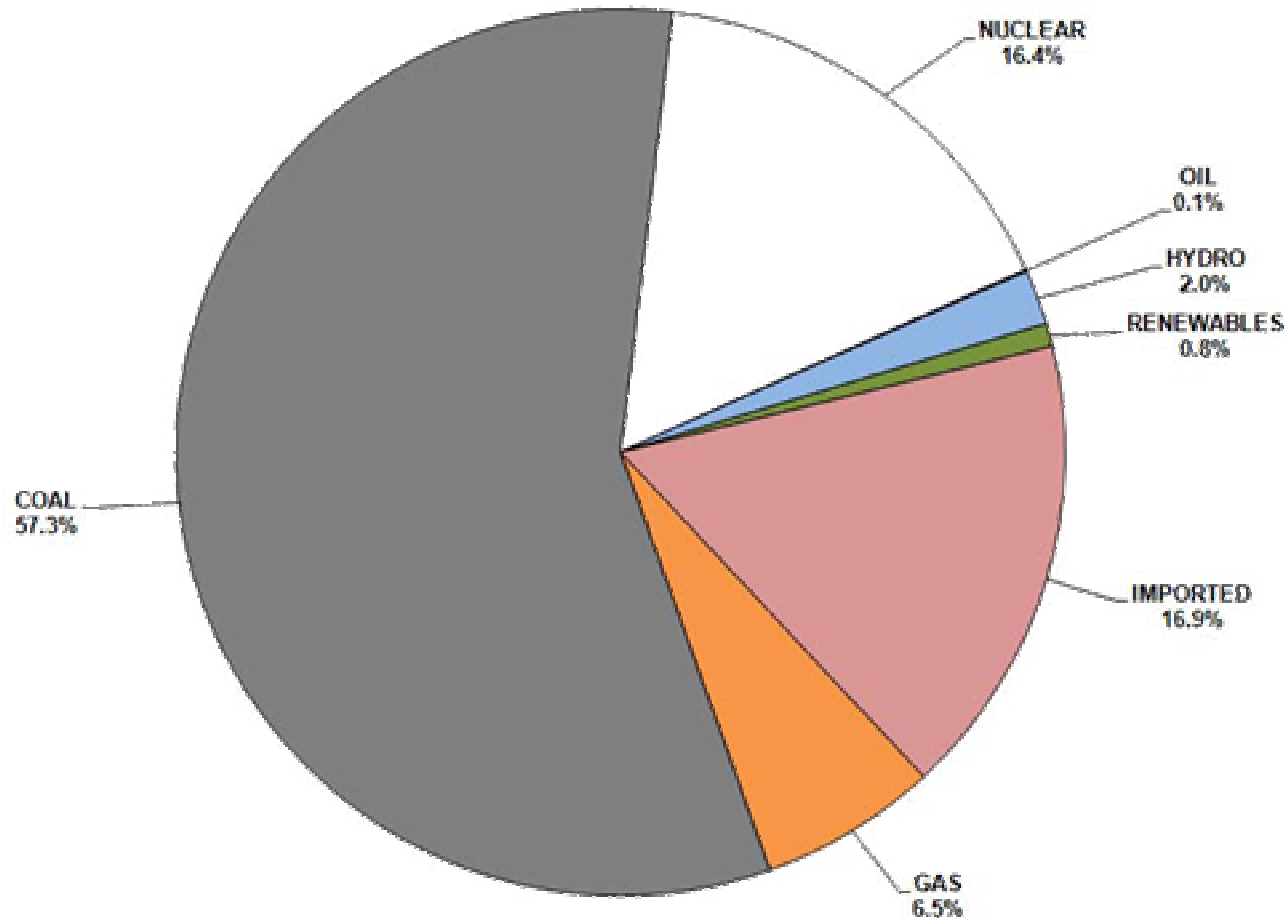
a1

## Slide 5

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- a1** Might want to call out financial assistance seperately in own bullet to call more attention to it  
asvensson, 4/16/2010

# Wisconsin Energy Production



Source: PSC of WI, SEA, April 2009

# Planned IT Project Examples

Data Center Cooling      Cloud Computing  
ERP Upgrade      UPS Upgrade      Mobile Computing  
Call Center      Server Consolidation  
PC Refresh      VoIP Upgrade      Printing Solutions  
Network Consolidation      Antivirus Software      ISP Contract  
Licensing Agreement      Software Dev      Backup Solutions  
End User Support      Disaster Recovery      Data Warehouse  
Server Virtualization      Document Management  
Email Upgrade      Network Admin      Database Admin  
Patch Management      Document Destruction      SaaS

# Energy-Efficient Computing Approach

- Evaluate energy impact of planned projects
- Identify additional energy efficient projects
- Prioritize projects based on energy impact
  
- Are there best practices around approach?
  - Demand side efficiencies
  - Supply side efficiencies

# Energy-Efficient Computing Opportunities

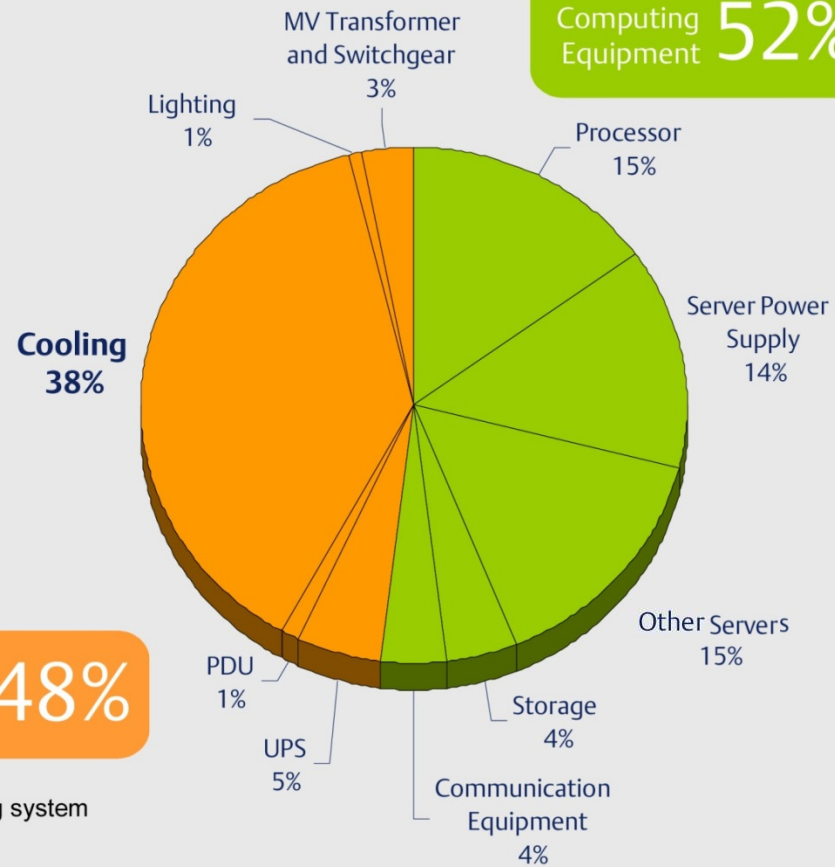
- Prescriptive Incentive Programs
  - PC Network Power Management
  - Server Virtualization
  - Thin Client Conversion
- Custom Grants
  - Energy Efficient Cooling in Data Centers
  - Airflow Management Upgrades
  - Energy Efficient UPS
  - Consolidated Networks

# Where Does It Go?

Equipment Category	Energy Consumption
Computing	588 kW
Lighting	10 kW
UPS & Distribution Losses	72 kW
Cooling Power Draw for Computing & UPS Losses	*429 kW
Building Switchgear / MV Transformer / Other Losses	28 kW
<b>Total Power Draw</b>	<b>1,127 kW</b>

Power and Cooling **48%**

Computing Equipment **52%**



\* Cooling load assumes chilled water based cooling system

© 2007 Emerson Network Power

Source: Emerson Network Power

# Energy-Efficient Computing Best Practices



IT Equipment Procurement Policies



IT Power Management



IT Power Consolidation

# Energy-Efficient Computing Best Practices



Power Distribution



Energy Efficient Cooling



Monitor and Optimize



# IT Equipment Procurement Policy

- Foundation for energy efficiency
- Initiates energy-efficiency discussions into every project
- Energy efficiency potential will fall short without this step



# PC Power Management Results

- Focus 2009 results driven by 107 projects
  - 11 million kWh estimated savings
  - 62,392 devices controlled for savings
  - 176 kWh average annual savings per device
    - At \$0.08 per kWh = \$14.08 annual savings per device
  - Focus paid \$530,149 in cash incentives
- 2010 results to date



# IT Power Consolidation

- Replace existing equipment with more energy efficient equipment
  - Lower requirements on PCs
  - Laptops
  - Thin clients – zero clients
  - Blade servers
- Right size instead of oversize



# Server Virtualization

- Virtualization program and results
- Average savings results
  - 9-to-1 consolidation ratio
  - 3,500 kWh annual energy savings per server
  - At \$0.08 per kWh cost = \$280 annual savings
- Funds committed to date in 2010
  - \$423,750 for 1,695 servers
  - \$474,600 anticipated in customer kWh savings

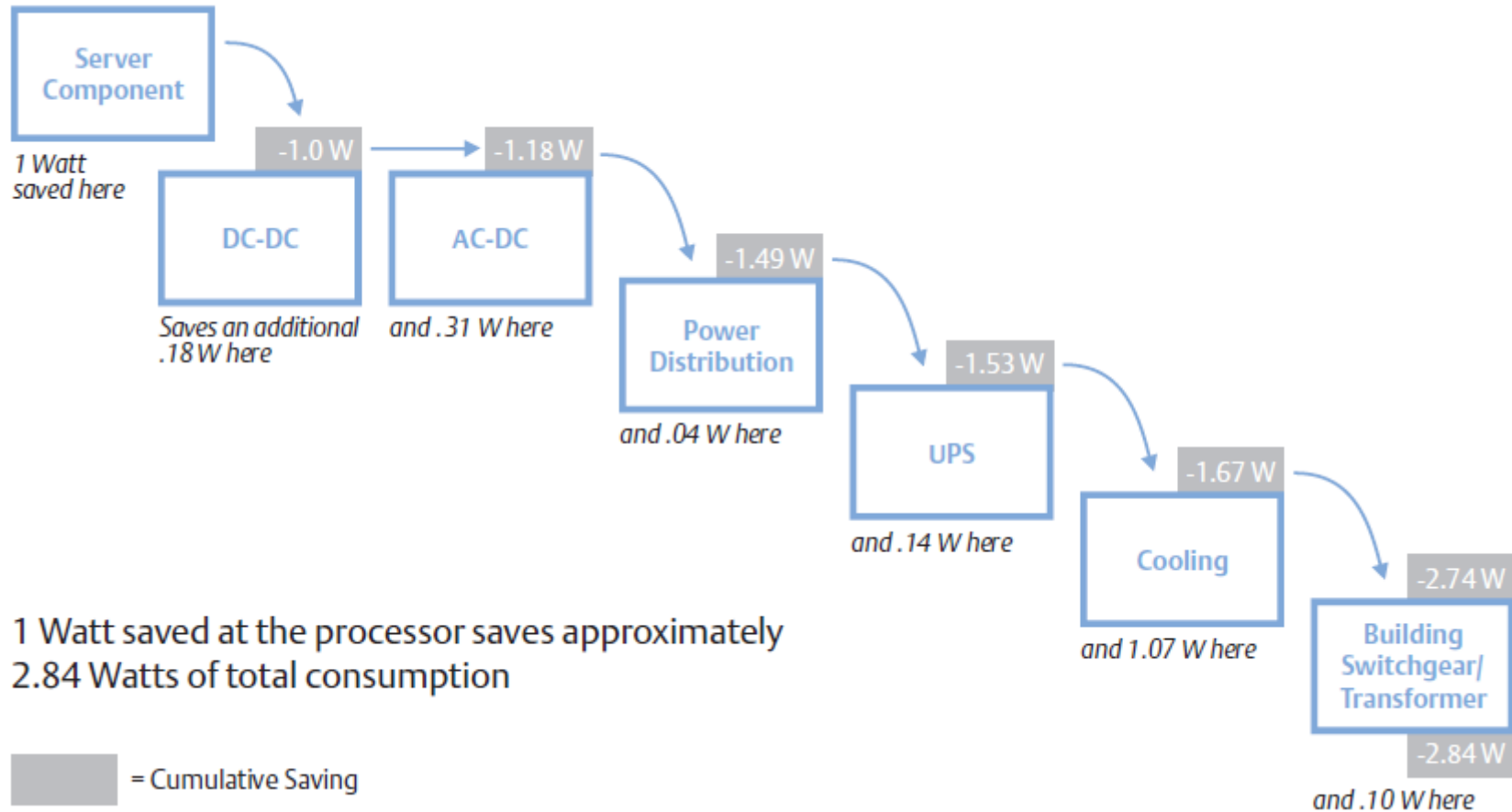


# Desktop Virtualization

- Thin client conversion program
- Savings results analysis and assumptions
  - Typical PC consumes 535 kWh annually
    - Typical thin clients 35 kWh annually
  - 400 kWh annual energy savings per PC
  - At \$0.08 per kWh cost = \$32 annual savings
- Funds committed to date in 2010
  - \$392,220 for 6,537 thin clients
  - \$209,184 in anticipated customer kWh savings



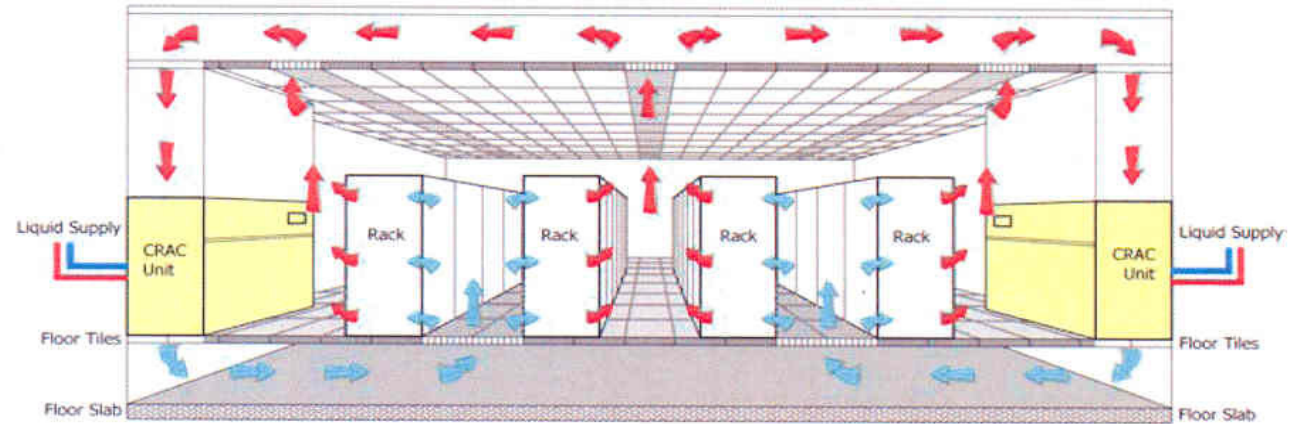
# Supply Side of Energy





# ASHRAE-Recommended Supply/Return Air Design

Use the drop ceiling as an active plenum, keeping hot air from flowing across the cold aisles.

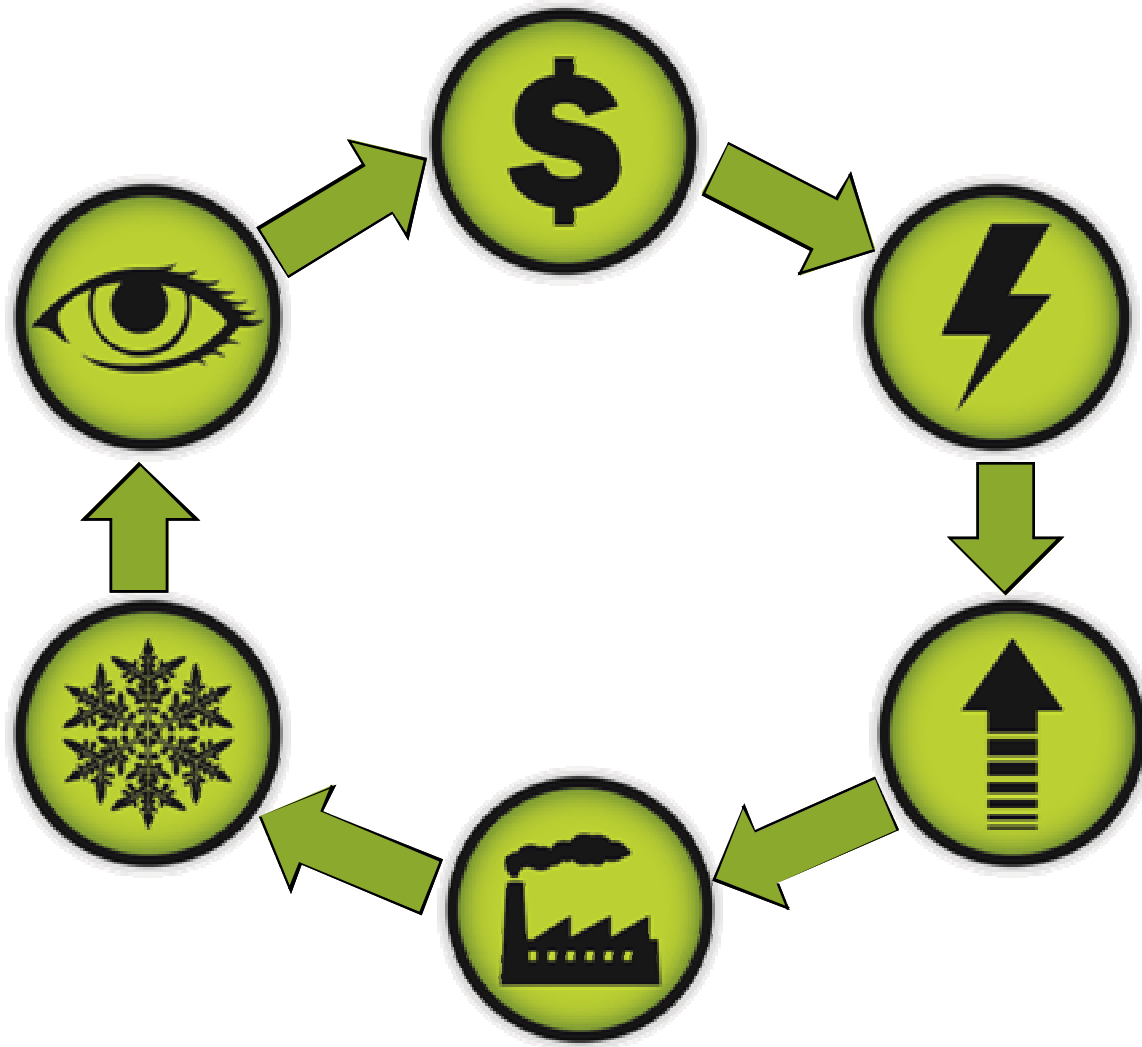


**Figure 4-6** Raised floor implementation using a dropped ceiling as a hot air return plenum.



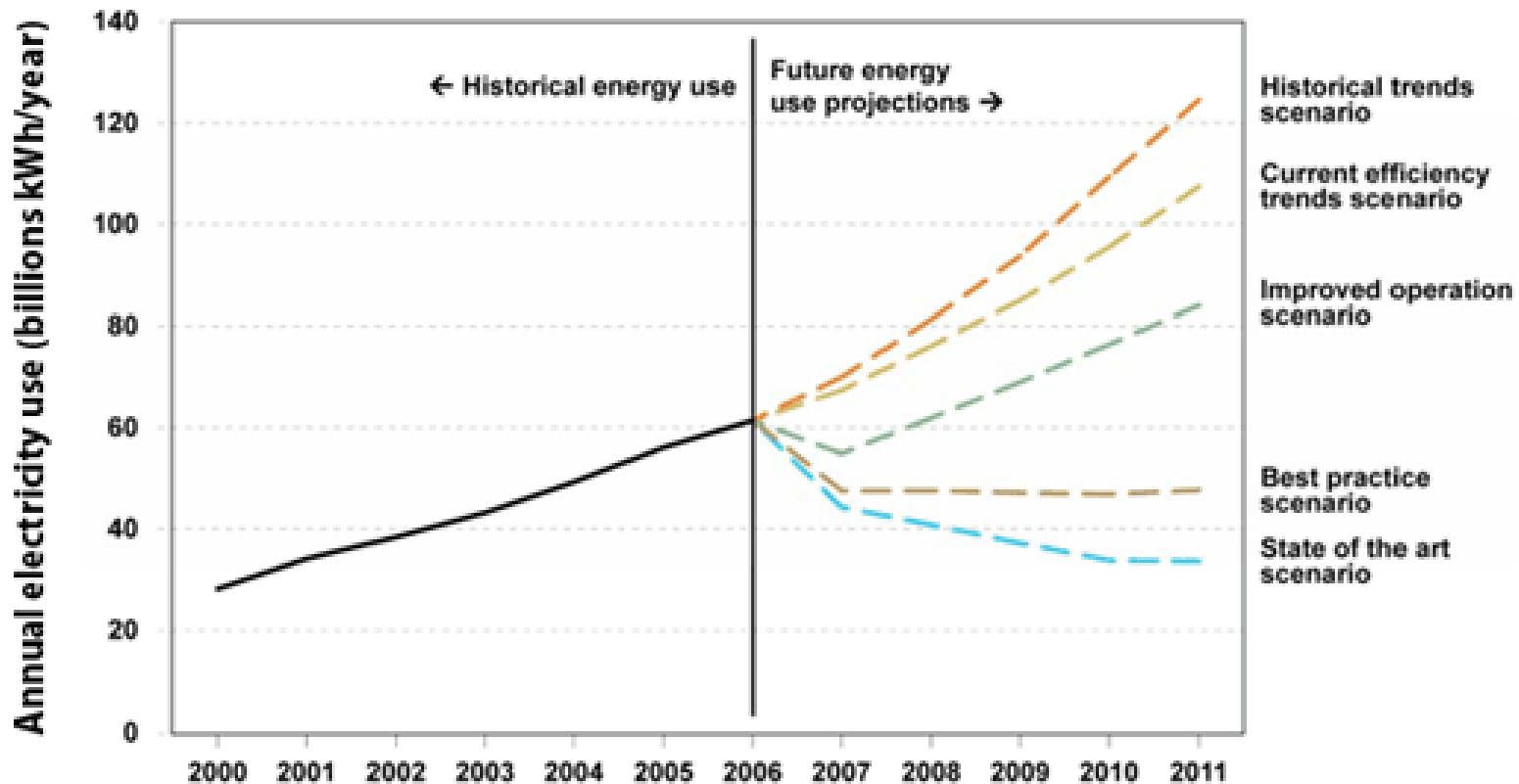
# Monitor and Optimize

- Energy measurements in your IT environment are key to...
  - Compare products
  - Identify future energy-efficient IT projects
  - Demonstrate bottom line impact
  - Confirm energy efficient progress in IT
  - Compare against the industry



# Energy-Efficiency Opportunities

## Comparison of Projected Electricity Use, All Scenarios, 2007 to 2011



Source: U.S. DoE, Office of Energy Efficiency & Renewable Energy

# Above and Beyond

- Cloud computing
- Software as a service
- Data center/server room consolidation
- Cooling empty space
- Rear-door heat exchangers
- Flywheel UPS
- Rack Level Cooling

# Next Steps

- Work with our IT Market Provider
- Energy impact of IT projects
- Consider programs and technologies to reduce your energy consumption
- Attend our Energy-Efficient Computing Summit – July 20<sup>th</sup>

# Contact Focus Today

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