



REDUCING FEDERAL ENERGY USE THROUGH SMARTER COMPUTER POWER MANAGEMENT

August, 3 2010

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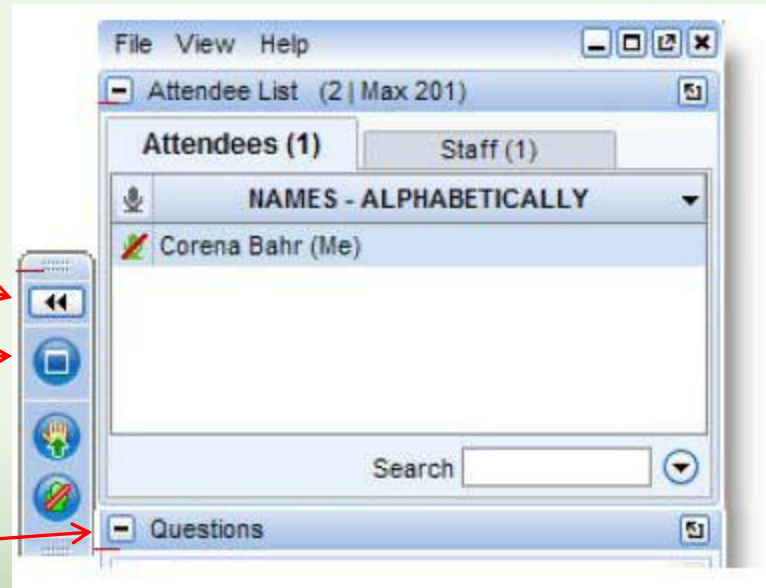
U.S. Environmental Protection Agency &
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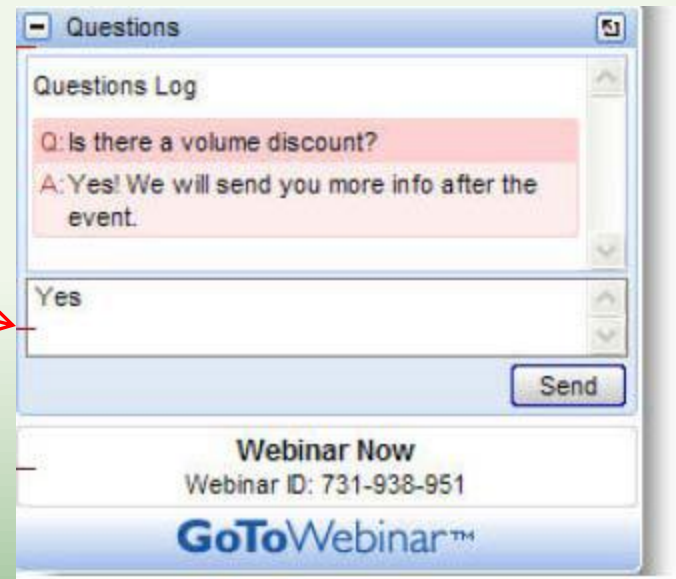


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Using the Conference Phone Line

- As an attendee, your line will be muted to minimize background noise.
- To ask a question, please use the Questions Pane.
- If you need assistance, please contact me using the Questions Pane.

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E.O. 13514

- Last October President Obama signed an Executive Order 13514: Federal Leadership in Environmental, Energy, and Economic Performance
- Goals of the 13514 included:
 - Measure, report, and reduce agency GHG emissions
 - Reduce building energy intensity
 - Increased procurement of EPEAT, Energy Star, & FEMP-designated electronic equipment
 - Establish policies to “enable power management, duplex printing, and other energy-efficient” features on agency electronic products

GreenGov

- October, GreenGov Challenge resulted in 5,000 ideas and 165,000 votes from 14,000 federal employees on greening government
- February, GreenGov Collaborative launched to “put ideas into action” now more than 1200 members, www.fedcenter.gov/joingreengov/
- July, GreenGov Awards receive 300+ nominations
- October 5-7, 2010 GreenGov Symposium in Washington, DC at George Washington University

REGISTRATION IS NOW OPEN

Register at www.gwu.edu/greengov today!



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REGISTRATION FEES

Federal Government Employee	\$225
Nonprofit, State, or Local Government Employee	\$250
Private Sector Employee	\$300

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THE GEORGE WASHINGTON UNIVERSITY

October 5-7, 2010 | Washington, DC

Today's Panel

Effective computer PM 101

- Cate Berard, EPA

PM Tools you can use

- Mike Walker, Beacon Consultants

Case Study 1: How to successfully deploy PM in your office

- Michael Blake, EPA

Case Study 2: Alternative funding strategies for PM

- Greg Leifer, NIH or Gail Williams, NIH

Effective Computer Power Management 101

Cate Berard
Environmental Protection Agency

What is Power Management?

- Utilization of ENERGY STAR features on ENERGY STAR qualified electronics, in order to save electricity
- Standard in Windows and Macintosh operating systems
- Places monitors and computers into a low-power “sleep mode” after a period of inactivity
- Keyboard or mouse activity “wakes” computers and monitors
- Must be “enabled” on computer and monitors to ensure power savings

What is Enabled?

Monitors

- Monitor is set to enter “sleep” mode or turn off after a specified period of inactivity
- Specified period of inactivity must be set to a specific time frame, not “Never”
- Recommended for 5 to 20 minutes of inactivity



What is Enabled?

Desktop Computers

- Desktop computer is set to enter “system standby” or “hibernate” after a specified period of inactivity
- Specified period of inactivity must be set to a specific time frame, not “Never”
- Recommended at 30 to 60 minutes of inactivity
- “Turn off hard disks” setting does not save much power and is optional

What is Enabled?

Laptop Computers

- Monitor is set to enter “sleep” mode or turn off after a specified period of inactivity
- Computer is set to enter “system standby” or “hibernate” after a specified period of inactivity
- Must be enabled in both the “plugged in” and “running on battery” modes
- Specified periods of inactivity must be set to a specific time frame
 - Recommended for 5 to 20 minutes for monitor and 30 to 60 minutes for the computer

System Standby and Hibernate

- System Standby (S3)
 - Drops power to 1-3 Watts
 - Saves \$25-75 per computer annually
 - ***Wakes up in seconds***
- Hibernate (S4)
 - Drops power to 1-3 Watts
 - Saves \$25-75 per computer annually
 - ***Wakes up in 20+ seconds***
 - ***Saves work if power is lost***

How to Power Manage

1. Determine your baseline for computers and monitors
2. Identify challenges
3. Find and implement a power management solution
4. Check power management status regularly
5. Calculate benefits



Determine Your Baseline

- Refer to your FEC Baseline Survey or Annual Reporting Form
 - Understand where these numbers come from
- Manually check a representative sample your computer pool
- Electronically check using software or networking tools
- Request technical assistance

Identify Challenges

- Talk to your IT staff
- Frequent challenges:
 - Activating power management settings on many computers at once
 - Ensuring power management settings do not interfere with administrative software updates
 - e.g., Security patches, antivirus definitions and scanning
 - Keeping power management features enabled

Find and Implement a Solution

- Numerous solutions exist, including free software, and software tools that you may already own
- ENERGY STAR provides free technical assistance to find a solution that works for your facility (generally via teleconference)
 - Email to powermanagement@cadmusgroup.com



Check Power Management

- Depending on the solution your facility implements, you may need to check and reset power management features
 - Lock down through administrative rights
 - Reset via login scripts, network policies or software solutions
 - Educate your users
- Annually record results either manually or electronically (from software solutions)

Calculate Benefits

- Use the ENERGY STAR calculator
 - http://www.energystar.gov/ia/products/power_mgt/LowCarbonITSavingsCalc_v26_with_5_0v2.xls
- Use the Electronics Environmental Benefits Calculator
 - <http://www.federalelectronicschallenge.net/resources/benncalc.htm>

Power Management Tools You Can Use

Mike Walker, President
Beacon Consultants Network Inc.
(An ENERGY STAR Technical Support Contractor)

Two challenges

1. Activating sleep settings on many computers at once
2. Ensuring that sleep settings do not interfere with the distribution of administrative software updates
 - E.g., Windows security patches, antivirus definitions



Numerous solutions exist, including free software, and software tools that you may already own

Challenge #1: “free” solutions

- Template Image Replication
 - Manually activate CPM and MPM settings in the master template hard drive image before replication & roll out
- Microsoft’s Windows 7 and Vista
 - Group Policy provides a way to centrally manage MPM and CPM features
- MSFT Group Policy *Preferences*
 - Provides means to centrally manage Vista and XP machines
- Login Scripts
 - Powercfg.exe can be used in a login script to configure MPM and CPM settings in Windows XP and Vista
- EZ GPO
 - Provides Group Policy Objects for centrally configuring power management settings in Windows 2000 & XP
- Windows Task Scheduler
 - Can force logged-out PCs to go into standby or hibernate



Challenge #1: commercial solutions

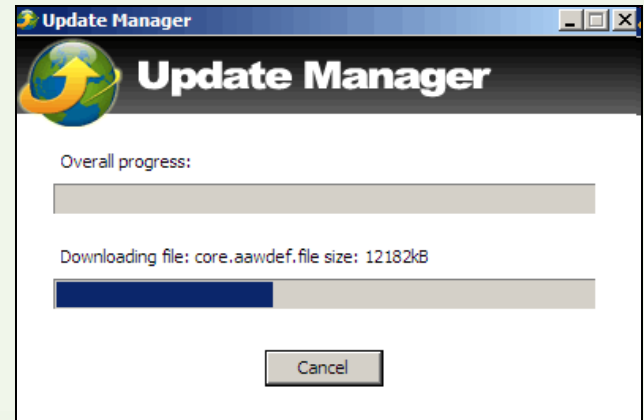
- Altiris Manageability Toolkit (from Symantec)
- BigFix
- eiPower Saver Solution
- Green IT Power Management (from Triumfant)
- LANDesk Management Suite (from Avocent)
- NightWatchman and SMSWakeUp (from 1E)
- Power Save (from Faronics)
- Remote Desktop (from Apple)
- SMS/SCCM Companion (from Adaptiva)
- Surveyor (from Verdiem)
- SysTrack Power Management (from Lakeside Software)

Info & case studies:

www.energystar.gov/powermanagement

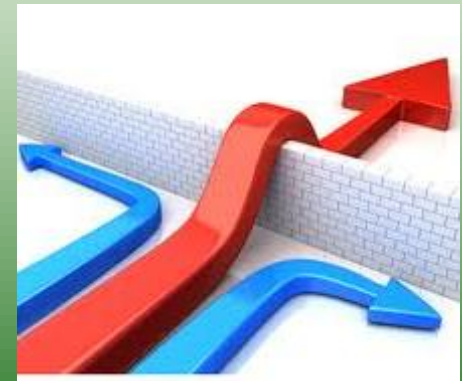
Challenge #2: ensuring that sleep doesn't interfere w/ software updates

1. Configure computers to apply software updates as soon as computers become “available” on the network
2. Use Windows Task Scheduler to wake up sleeping computers for updates
3. Use Wake-on-LAN to wake up sleeping computers to perform on-demand updates
 - Use vPro to wake up sleeping computers: Integrates with software update mechanism to switch only required computers on



5 ways to get IT on board

1. Estimate your potential \$ savings
2. Share the savings opportunity with your management and any “friends” in IT
3. Counter technical objections with “you might be right: let’s ask an expert”
4. Make one modest request: join a 30-60 min. call with CPM tech expert
5. Share the glory

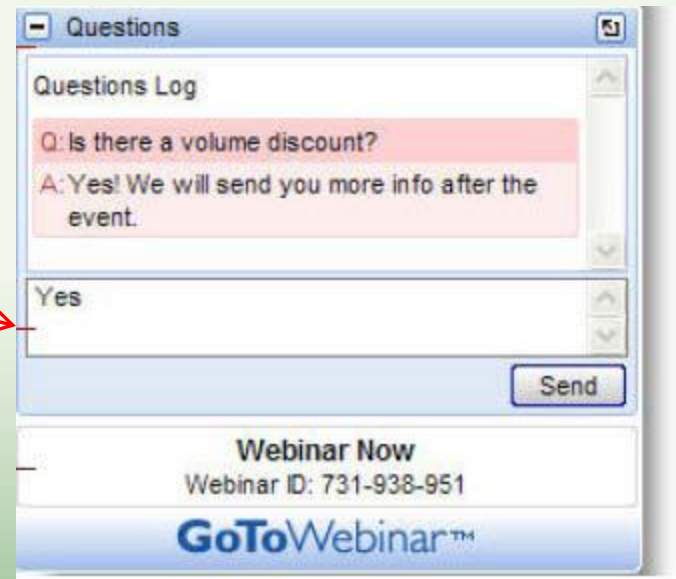


Suggested next steps

1. Review current enterprise power settings and policies
 - Are sleep features enabled on monitors? Computers?
 - What sleep settings are utilized? (e.g., MPM only? After 1 hr?)
 - Do users leave PCs on at night?
 - Roughly how many computers and monitors are there in total?
2. Estimate the savings potential at www.energystar.gov/lowcarbonit
3. Ask IT to join a free call with ENERGY STAR technical support contractors
 - Contact us at powermanagement@cadmusgroup.com

Questions?

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Case Study 1: How to successfully deploy PM in your office

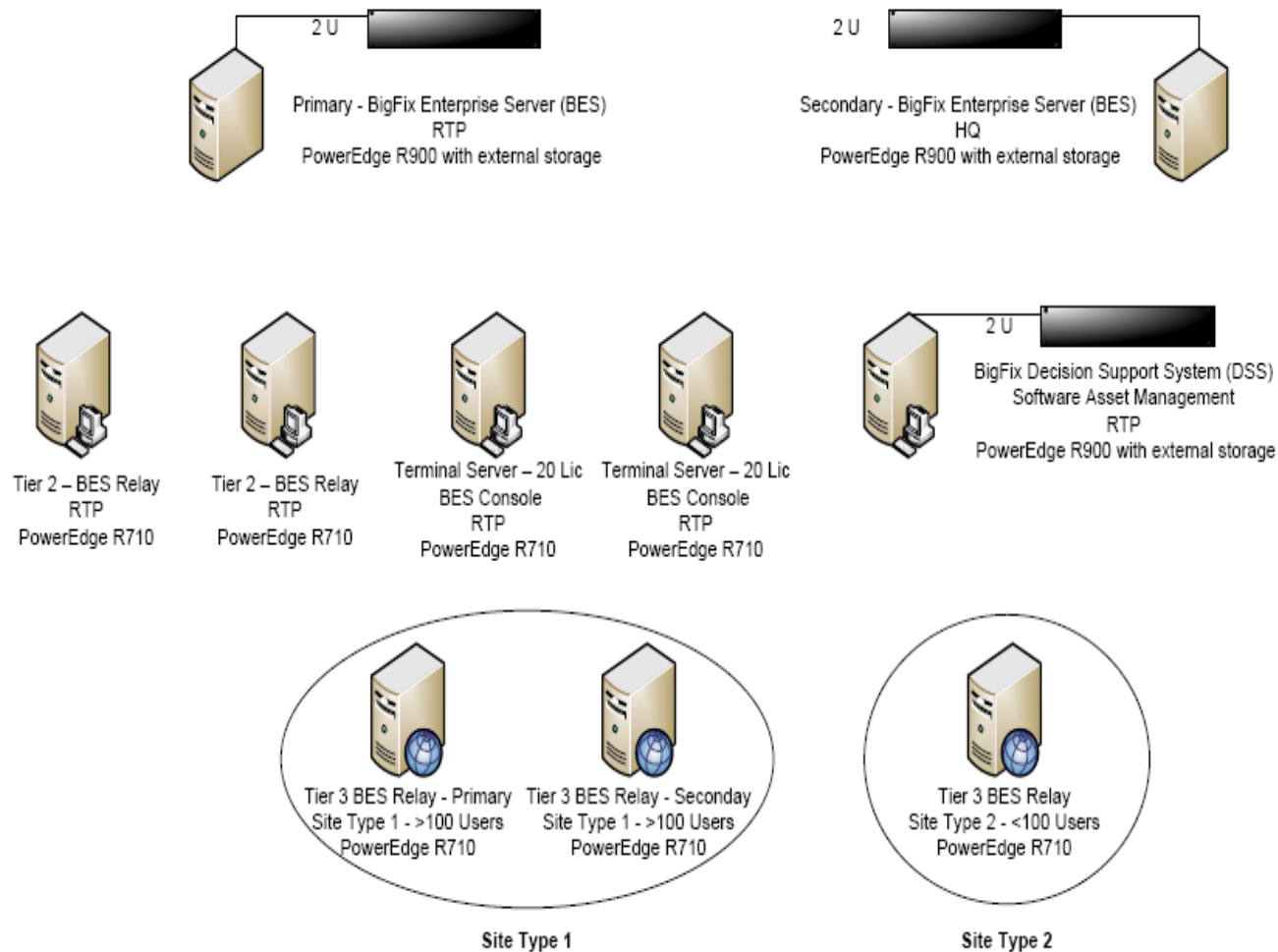
Mike Blake, EPA

**Federal Electronics Stewardship Working
Group (FESWG)**

Discussion Topics

- EPA BigFix Implementation
- Power Management
- Power Management Architecture
- Reporting

EPA BigFix Implementation: Server Architecture



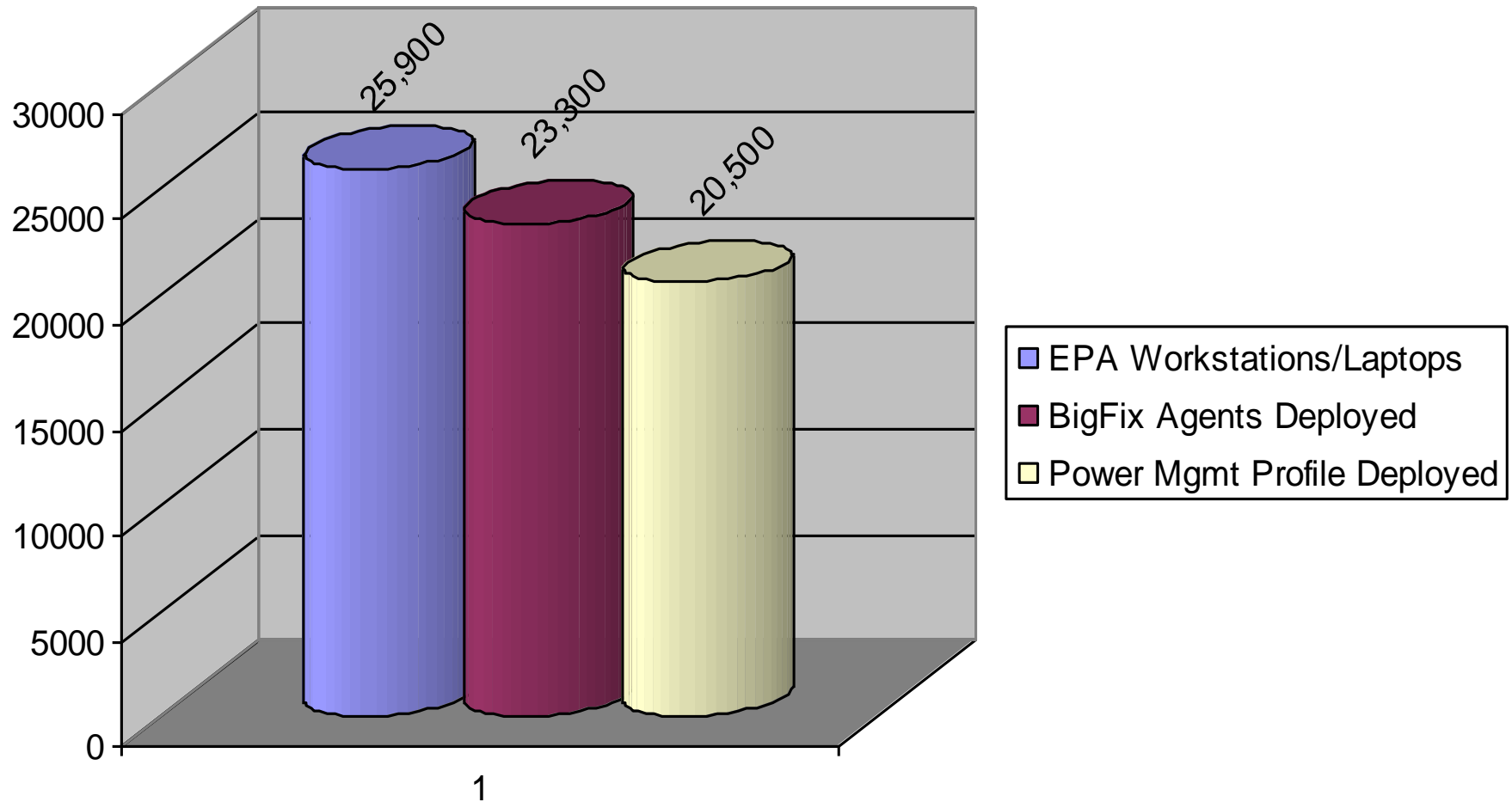
BigFix Implementation:

Software Modules

- System Lifecycle Management
 - Asset Discovery
 - Patch Management
 - **Power Management**
 - Remote Assistance
 - Software Distribution
 - Software Asset Management
 - OS Deployment
- Security Configuration & Vulnerability Management
 - Security Configuration Management
 - Vulnerability Management
 - Patch Management
 - Asset Discovery
 - Device Control

BigFix Implementation:

Agent & Power Profile Deployment



Power Management

- EPA Power Management Settings

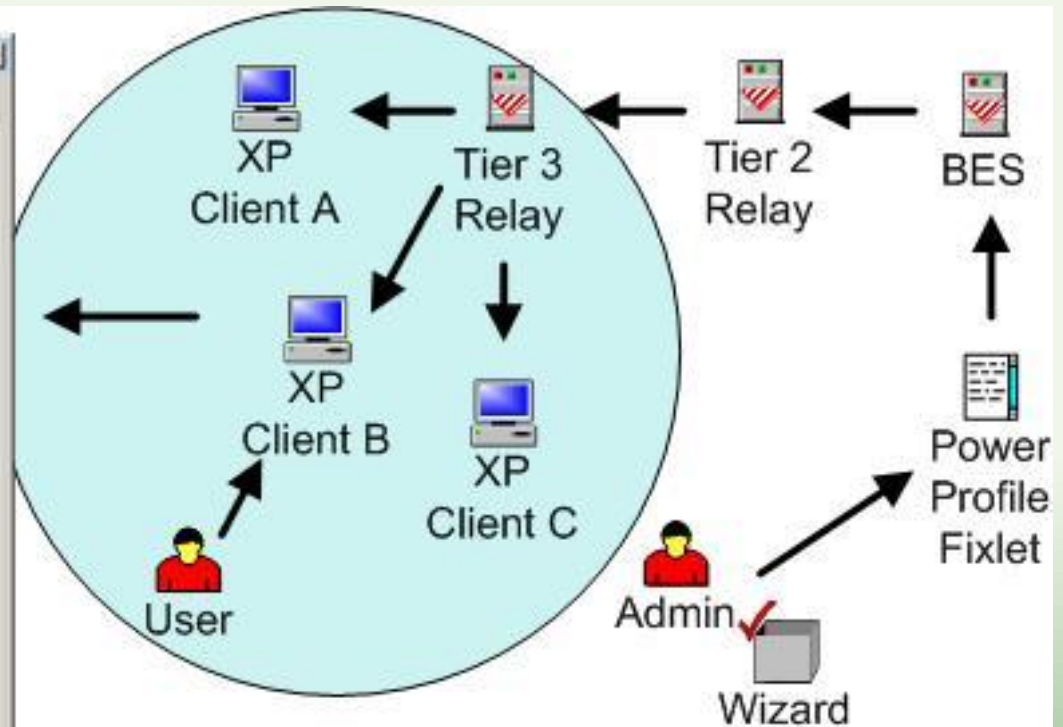
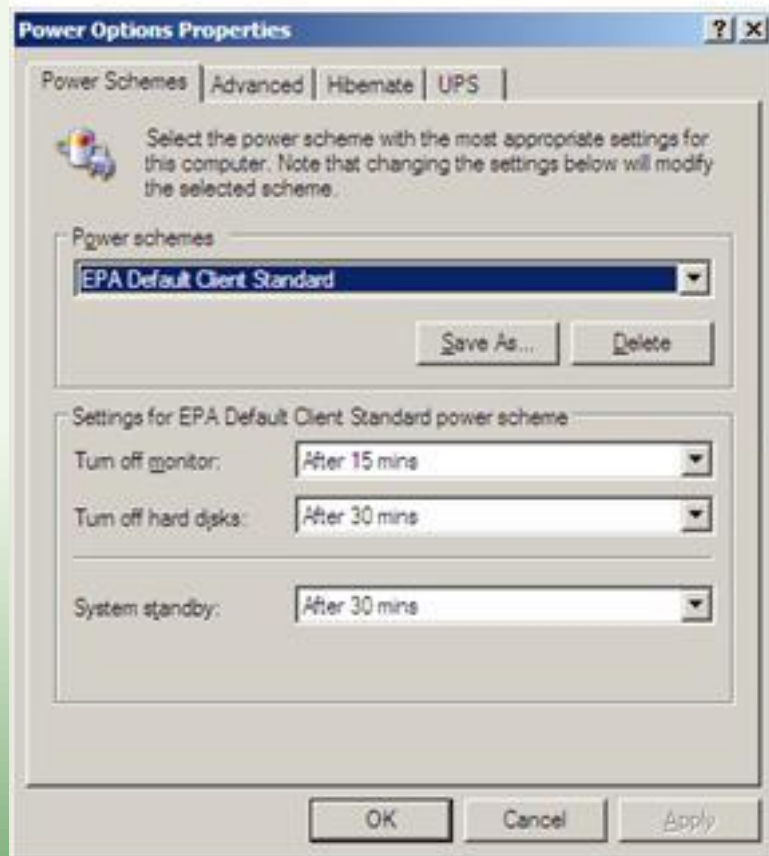
AC Power Profile:

- Monitor = 15 minutes of inactivity
- Hard Disk = 30 minutes of inactivity
- Standby = 30 minutes of inactivity

DC Power Profile:

- Monitor = 5 minutes of inactivity
- Hard Disk = 10 minutes of inactivity
- Standby = 15 minutes of inactivity

Power Management: Architecture



Reporting on Power Management

Daily Power Statistics by Computer - Web Reports - Windows Internet Explorer

http://bigfix.epa.gov/webreports?page=Report&ReportID=BES%2520Power%2520Management%2f109

File Edit View Favorites Tools Help

Daily Power Statistics by Computer - Web Reports

jmontgom | Preferences | Logout
version 7.2.5.22

BES WEB REPORTS

Overview | Reports | Create | Schedule | Email | Users | Database

Daily Power Statistics by Computer

Select Operator: **bfadm** Print Report

Type	Total Computers	Average On-time	Total Cost	Total CO2	Cost Per Computer	CO2 Per Computer
Server	0	00:00:00 - 0%	\$0	0.000 lb	0¢	0 lb
Workstation	14	18:45:00 - 78%	\$1.52	26.535 lb	10.8¢	1.895 lb
Laptop	0	00:00:00 - 0%	\$0	0.000 lb	0¢	0 lb

Computer	Type	Daily Statistics			Power Management Settings		
		Average On-time	Cost	CO2	Monitor	Standby	Hard Drive
D18H1NFLICKJ	Workstation	23:58:00 - 100%	12¢	2.102 lb	X	X	X
D1818TJVIANCO01	Workstation	23:59:00 - 100%	12¢	2.102 lb	X	X	X
D18H1NNPELLEGR1	Workstation	19:10:00 - 80%	10.7¢	1.873 lb	X	X	X
D1818TIBLACKLE1	Workstation	17:16:00 - 72%	10.2¢	1.783 lb	X	X	X
D1818CNATSE01	Workstation	20:28:00 - 85%	14.4¢	2.518 lb	X		
D1818TDSEGREST1	Workstation	20:37:00 - 86%	11.1¢	1.942 lb	X	X	X
D1818TGCHAMBER1	Workstation	16:12:00 - 68%	9.9¢	1.732 lb	X	X	X
D18H1NMRAINS1	Workstation	17:27:00 - 73%	10.2¢	1.792 lb	X	X	X
D1818TPROBIN051	Workstation	17:01:00 - 71%	10.1¢	1.771 lb	X	X	X

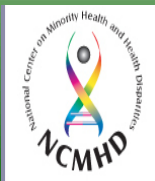
Done Local intranet 100%

Case Study 2: Alternative funding strategies for PM

Greg Leifer
Gail Williams
National Institutes of Health



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What are UESC's and ESPC's?

- **UESC** = Utility Energy Service Contract, while **ESPC** = Energy Savings Performance Contract.
- Both are contract vehicles created by the Federal Government for use by Federal Agencies, in order to achieve energy, water, and cost savings.
- UESC's and SuperESPC's are also used to refer to companies
 - UESC's are typically un-regulated divisions of regulated electric or gas utilities.
 - SuperESPC's are companies that perform this same work, they have no connection to regulated utilities or GSA.

Why were UESC's and ESPCs Developed?

- GSA and DOE wished to develop simpler, faster, and more economical procurement strategies of energy and water savings projects, while providing the flexibility and the high performance quality/value to the user agency.
- Using a structured processes, existing contracts, and with proven established source firms that are both experienced and competitively pre-determined technically and financially sound, agencies are positioned to be able to meet their objectives and be proper stewards of the environment.
- Enable agencies to meet their goals and comply with Federal Laws and associated mandates, passed by both legislation and executive decree, without up front capital cost, congressional appropriations, or budget impacts

How do UESC's and ESPCs work?

Structured Process:

- Request made by government for a study.
- Vendor conducts free audit or studies of the facilities and existing equipment
- Based on initial findings, agency can further tailor the project, enter into design phase, or begin the construction phase
- Upon technical and financial concurrence, the agency would then enter a task order against the applicable contract
- Upon the project's completion, agency must then decide on a financing mechanism
 - At the agencies discretion, or in the absence of capital funds, the job can be financed and paid back over time, e.g. ESCO agreement

Benefits of UESC's and ESPC's

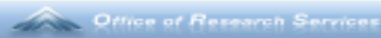
- Acquisition Streamlining
- No synopsis
- No advertisement
- No large obligations tying up capital funds
- Procure without congressional appropriations or notification
- No protests
- Pre-competed on energy service companies technical merit and financial stability
- Procurement time that can typically take up to a year, or end up with marginally qualified entities that vie for the work.

Benefits of UESC's and ESPC's

- Overhead and profit is preset
- Open book process
- No payment of any kind on initial study
- No payment of any kind on further or subsequent engineering or construction efforts until the entire process is complete and accepted, regardless of construction term
- Loan – One of the main options for these contracts is that they allow the use of loans to pay for the construction that typically is paid for with capital improvement dollars.
- Contracts by design offer one-stop shop for feasibility/initial studies, design, and construction for consistency and accountability.

2007 Pilot Actual Results

- Measured energy consumption *before* and *after* implementing Verdiem Surveyor on ~1,000 ORS and ORF clients
- 39% reduction in PC energy consumption and emissions
- Low impact, low risk to NIH mission



ORS/ORF Time Period Comparison Report Surveyor Clients

Summary of Time Period Consumption Data

Summary of Time Period Energy Consumption Data

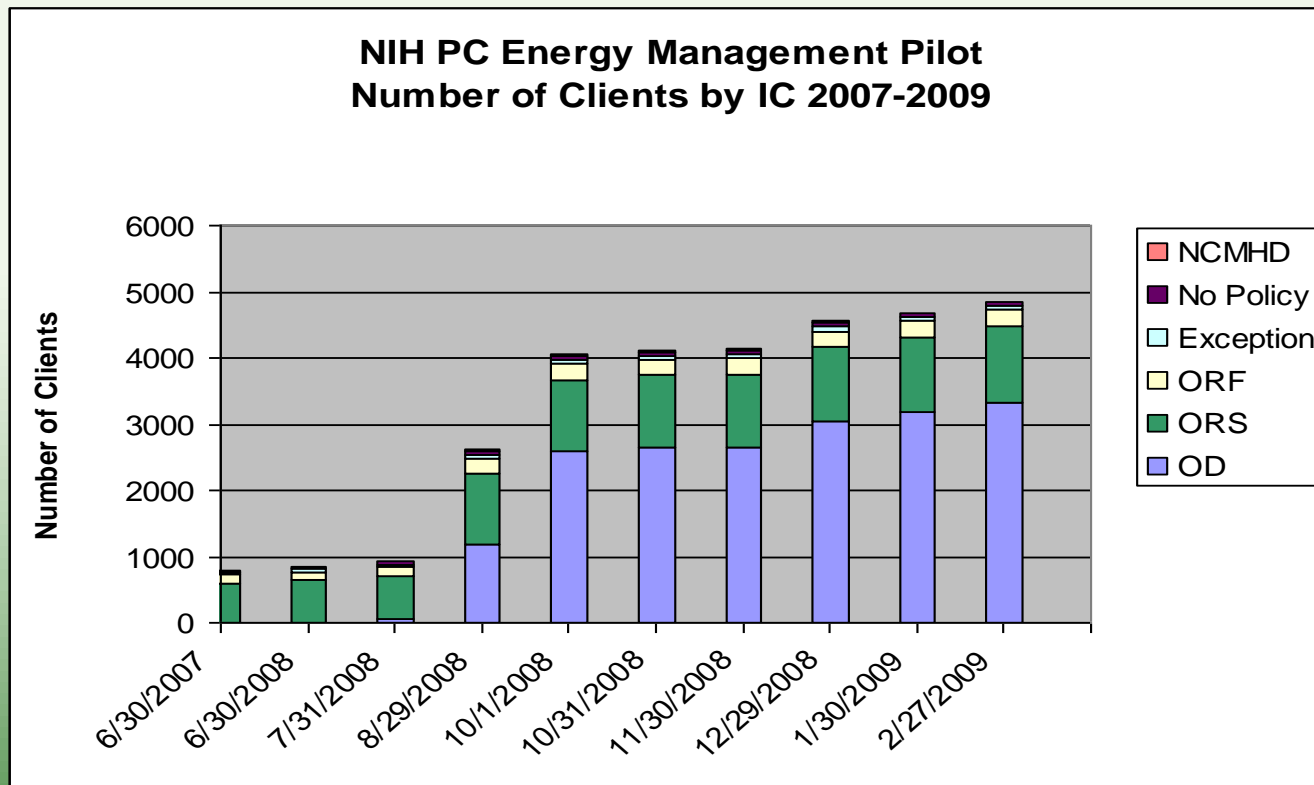
	Annual Per PC Average	All 1,400 PCs
Period 1 Energy Consumption	664 kWh	929,809 kWh
Period 2 Energy Consumption	401 kWh	560,740 kWh
Energy SAVINGS	263.62 kWh	369,069 kWh
Greenhouse Gas Emission REDUCTION	432.34 lbs	605,273 lbs
Energy REDUCTION %	39.7 %	

Summary of Time Period Energy Costs Data

	Annual Per PC Average	All 1,400 PCs
Period 1 Energy Costs	\$ 49.81	\$ 69,735.70
Period 2 Energy Costs	\$ 30.04	\$ 42,055.51
Cost SAVINGS	\$ 19.77	\$ 27,680.19
Cost SAVINGS %	39.7 %	

2008-09 Expanded Pilot

- Installed on **4,800** client PC's: OD, NCMHD, ORS, ORF
- 35%-38% reduction in PC energy consumption



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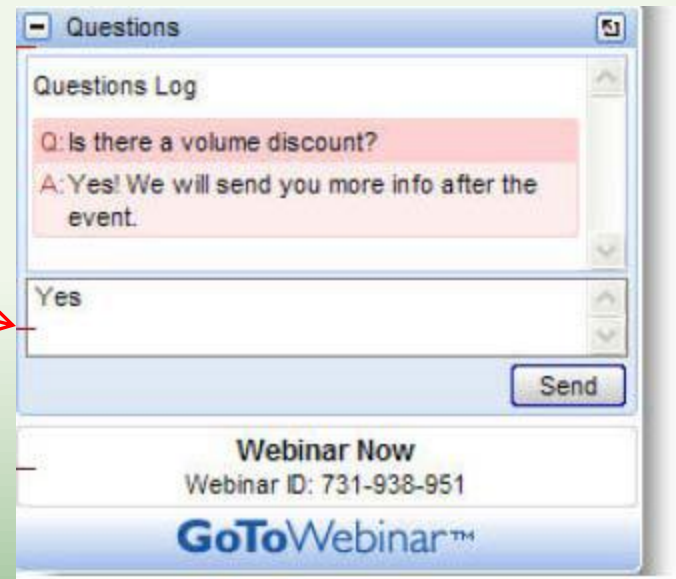
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Results

- **Training and technical briefings** at 19 Institutes/Centers
- **Project Energy savings** (kilowatt-hours through FY09): approximately 1,563,055 kWh
- **Project Cost savings** (dollars through FY09): approximately \$172,043.00

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