

Power Management

Power Management can be summarized as the reduction of power consumption thereby reducing costs and eliminating wastes. This document aims particularly at the desktop-level of computing devices. There are many benefits to implementing power management functions but there are recognized drawbacks as well. Many drawbacks have been acknowledged and addressed within this document. In conjunction with possible alternatives, a list of best practices has been included to improve utilization of existing IT equipment. There are also steps listed to take an environmentally friendlier approach to technology deployment.

Let's suppose....:

- UGA could save \$700,000 a year simply by activating power management features for the hundreds of computers across campus. Verizon saved over \$7 million by activating such features on their 185,000 PCs. Assuming that UGA has a similar setup but only a tenth of the size, we just may be able to save \$700,000.

www.energystar.gov/ia/products/power_mgt/VerizonCaseStudy.pdf

- UGA could cut annual energy use by 40%. Dell cut energy use by 40% utilizing NightWatchman and SMSWakeUp software that allows desktops and laptops to be shutdown or powered on as necessary for conserving energy or updating operating systems.

www.climatesaverscomputing.org/docs/Dell_Case_Study.pdf

- UGA could save over \$70 per computer. Fusion Trade saved \$70 per PC utilizing EZ GPO and the embedded Windows Task Scheduler to accommodate nighttime updates. They also specifically addressed the problem of administrators needing to remotely connect to sleeping computers.

http://www.energystar.gov/ia/products/power_mgt/Fusion_Case_Studyv4.pdf

- UGA could save over \$70 per computer. Fusion Trade saved \$70 per PC utilizing EZ GPO and the embedded Windows Task Scheduler to accommodate nighttime updates. They also specifically addressed the problem of administrators needing to remotely connect to sleeping computers.

http://www.energystar.gov/ia/products/power_mgt/Fusion_Case_Studyv4.pdf

- UGA could save over \$690,000 a year by enabling the sleep settings within Windows. Spring Branch Independent School District activated Windows sleep settings on 7,000 computers and realized a savings of \$230,000. Assuming UGA has a similar environment, but roughly three times as many computers, it is conceivable that we could save as much as \$690,000 simply by activating a free, built-in tool that every Windows computer should already have installed.

http://www.energystar.gov/ia/products/power_mgt/SBISDcasestudyvfinal.doc

Baby steps...:

While the scenarios above are quite possible, it may take some time for UGA to setup an infrastructure to allow for these enterprise-wide solutions to fit our environment. So until then, what can you do? Here is a short list of how you can help save power and cut back on energy costs.

- Power down computers and monitors when not in use
- Enable power management features included with many modern operating systems
- On laptops, be sure to activate these settings in the AC power profile — not just the DC (battery power) profile.
- Purchase EPEAT Registered Computers and Monitors
- After January 20, 2008, all EPEAT-registered computer desktops and laptops/notebooks will be ENERGY STAR 4.0 qualified. After January 20, 2008, simply requiring EPEAT-registered products will ensure that you meet all federal requirements for the purchase of EPEAT-registered and ENERGY STAR qualified products.
- Over its lifetime, equipment in a single home office (e.g., computer, monitor, printer, and fax) that meet the new ENERGY STAR specifications will save more than \$115 over the life of the products, and even more if you don't already have ENERGY STAR qualified equipment.

Future Goals:

- It is the recommendation of this committee that EITS should adopt and publish “Green IT” standards for the entire campus community. As the central computing organization of campus, EITS should be the leader and example of efficient, cost effective technology for the entire campus community. EITS should establish procedures and guidelines for best practices as it relates to power management.
- The schools and colleges of UGA should look to EITS for standards and practices for replacing aging and inefficient computing equipment. These same entities should also look to EITS for power management practices such as powering down computing equipment at night, computer hibernation, and enabling peripheral shutdown or sleep modes.
- This committee researched the possibility of an incentives or rewards program to encourage users and departments to embrace power management. Unfortunately, this committee was unable to expand its scope to include the in-depth discussions that must take place for such programs to be realized. If ITMF wishes to pursue such a program, it must begin with upper administration.
- Due to the nature of power management and the usual lengthy terms (months, in some cases, years) before costs can be realized, we will have data which we can share long after we have been dissolved. We wish to continue to share these findings and will gladly do so at future ITMF, EITS and any other related meetings.

Current Data:

- Just to inform the uninformed, please note the power usage of buildings in the charts below. While these charts represent total power consumption, focusing on computing power management will make a difference:

1023		BOYD GRAD RSCH CTR		
Electric				
Service Period		Usage	Average	Cost
5/27/1999	6/14/1999	348,800 kWh	18 Days	19,378 \$15,696.00
6/14/1999	7/30/1999	910,400 kWh	46 Days	19,791 \$40,968.00
7/30/1999	8/31/1999	770,400 kWh	32 Days	24,075 \$34,668.00
8/31/1999	9/29/1999	697,600 kWh	29 Days	24,055 \$31,392.00
9/29/1999	10/28/1999	625,600 kWh	29 Days	21,572 \$28,152.00
10/28/1999	11/29/1999	521,200 kWh	32 Days	16,288 \$23,454.00
11/29/1999	12/17/1999	260,800 kWh	18 Days	14,489 \$11,736.00
12/17/1999	1/27/2000	546,800 kWh	41 Days	13,337 \$24,606.00
1/27/2000	2/28/2000	454,400 kWh	32 Days	14,200 \$20,448.00
3/30/2000	4/27/2000	537,200 kWh	28 Days	19,186 \$24,174.00
4/27/2000	5/30/2000	658,800 kWh	33 Days	19,964 \$29,646.00
Total for	2000	6,332,000 kWh		\$284,940
5/31/2000	6/14/2000	316,800 kWh	14 Days	22,629 \$14,256.00
6/15/2000	7/28/2000	1,012,400 kWh	43 Days	23,544 \$45,558.00
7/28/2000	8/29/2000	773,200 kWh	32 Days	24,162 \$34,794.00
8/29/2000	9/28/2000	746,000 kWh	30 Days	24,867 \$33,570.00
9/29/2000	10/27/2000	566,800 kWh	28 Days	20,243 \$25,506.00
10/27/2000	11/29/2000	619,600 kWh	33 Days	18,776 \$27,882.00
11/29/2000	12/20/2000	354,400 kWh	21 Days	16,876 \$15,948.00
12/20/2000	1/30/2001	486,400 kWh	41 Days	11,863 \$21,888.00

1/30/2001	2/28/2001	450,000 kWh	29 Days	15,517	\$20,250.00
2/28/2001	3/30/2001	387,600 kWh	30 Days	12,920	\$17,442.00
3/30/2001	4/30/2001	513,200 kWh	31 Days	16,555	\$23,094.00
4/30/2001	5/30/2001	622,400 kWh	30 Days	20,747	\$28,008.00
Total for	2001	6,848,800 kWh		\$308,196	
5/30/2001	6/18/2001	483,200 kWh	19 Days	25,432	\$21,744.00
6/15/2001	7/30/2001	1,012,400 kWh	45 Days	22,498	\$45,558.00
7/30/2001	8/30/2001	742,000 kWh	31 Days	23,935	\$33,390.00
8/30/2001	9/27/2001	684,400 kWh	28 Days	24,443	\$30,798.00
9/27/2001	10/30/2001	787,200 kWh	33 Days	23,855	\$35,424.00
10/30/2001	11/29/2001	730,000 kWh	30 Days	24,333	\$32,850.00
11/29/2001	12/19/2001	436,800 kWh	20 Days	21,840	\$19,656.00
12/19/2001	1/30/2002	774,400 kWh	42 Days	18,438	\$34,848.00
1/30/2002	2/27/2002	574,000 kWh	28 Days	20,500	\$25,830.00
2/27/2002	3/28/2002	554,400 kWh	29 Days	19,117	\$24,948.00
3/28/2002	4/29/2002	757,600 kWh	32 Days	23,675	\$34,092.00
4/29/2002	5/29/2002	719,200 kWh	30 Days	23,973	\$32,364.00
Total for	2002	8,255,600 kWh		\$371,502	
5/29/2002	6/13/2002	339,200 kWh	15 Days	22,613	\$15,264.00
6/13/2002	7/30/2002	1,048,400 kWh	47 Days	22,306	\$47,178.00
7/30/2002	8/28/2002	652,400 kWh	29 Days	22,497	\$29,358.00
8/28/2002	9/30/2002	812,800 kWh	33 Days	24,630	\$36,576.00
9/30/2002	10/29/2002	738,800 kWh	29 Days	25,476	\$33,246.00
10/29/2002	12/2/2002	724,000 kWh	34 Days	21,294	\$32,580.00
12/2/2002	1/6/2003	436,000 kWh	35 Days	12,457	\$19,620.00
1/6/2003	1/30/2003	424,400 kWh	24 Days	17,683	\$19,098.00

1/30/2003	2/27/2003	415,600 kWh	28 Days	14,843	\$18,702.00
2/27/2003	3/28/2003	466,800 kWh	29 Days	16,097	\$21,006.00
3/28/2003	4/28/2003	392,700 kWh	31 Days	12,668	\$17,671.50
4/28/2003	5/21/2003	601,800 kWh	23 Days	26,165	\$27,081.00

Total for 2003 7,052,900 kWh \$317,381

5/21/2003	6/12/2003	567,900 kWh	22 Days	25,814	\$25,555.50
6/12/2003	7/30/2003	1,282,800 kWh	48 Days	26,725	\$53,877.60
7/30/2003	8/28/2003	801,900 kWh	29 Days	27,652	\$33,679.80
8/28/2003	9/29/2003	887,100 kWh	32 Days	27,722	\$37,258.20
9/29/2003	10/31/2003	741,600 kWh	32 Days	23,175	\$31,147.20
10/31/2003	12/1/2003	660,114 kWh	31 Days	21,294	\$27,724.79
12/1/2003	12/22/2003	634,086 kWh	21 Days	30,195	\$26,631.61
12/22/2003	1/29/2004	809,100 kWh	38 Days	21,292	\$33,982.20
1/29/2004	2/29/2004	391,933 kWh	31 Days	12,643	\$23,023.27
2/29/2004	3/29/2004	884,027 kWh	29 Days	30,484	\$37,129.13
3/29/2004	4/29/2004	714,900 kWh	31 Days	23,061	\$30,025.80
4/29/2004	5/27/2004	735,600 kWh	28 Days	26,271	\$30,895.20

Total for 2004 9,111,060 kWh \$390,930

5/27/2004	6/30/2004	735,600 kWh	34 Days	21,635	\$30,895.20
6/30/2004	7/29/2004	1,145,400 kWh	29 Days	39,497	\$48,106.80
7/29/2004	8/30/2004	840,000 kWh	32 Days	26,250	\$35,280.00
8/30/2004	9/30/2004	894,900 kWh	31 Days	28,868	\$37,585.80
9/30/2004	10/28/2004	755,400 kWh	28 Days	26,979	\$31,726.80
10/28/2004	11/29/2004	628,800 kWh	32 Days	19,650	\$26,409.60
11/29/2004	1/4/2005	630,000 kWh	36 Days	17,500	\$26,460.00
1/4/2005	1/28/2005	692,100 kWh	24 Days	28,838	\$29,068.20

1/28/2005	2/25/2005	466,500 kWh	28 Days	16,661	\$19,593.00
2/28/2005	3/30/2005	874,500 kWh	30 Days	29,150	\$36,729.00
3/30/2005	4/29/2005	698,400 kWh	30 Days	23,280	\$29,332.80
4/29/2005	5/31/2005	960,900 kWh	32 Days	30,028	\$40,357.80

Total for 2005 9,322,500 kWh \$391,545

5/31/2005	6/30/2005	960,900 kWh	30 Days	32,030	\$40,357.80
6/30/2005	7/27/2005	702,600 kWh	27 Days	26,022	\$35,130.00
7/27/2005	8/30/2005	1,078,500 kWh	34 Days	31,721	\$53,925.00
8/30/2005	9/28/2005	830,400 kWh	29 Days	28,634	\$41,520.00
9/28/2005	10/28/2005	879,000 kWh	30 Days	29,300	\$43,950.00
10/28/2005	11/29/2005	869,400 kWh	32 Days	27,169	\$43,470.00
11/29/2005	1/3/2006	844,800 kWh	35 Days	24,137	\$42,240.00
1/3/2006	1/30/2006	805,800 kWh	27 Days	29,844	\$40,290.00
1/30/2006	2/28/2006	870,600 kWh	29 Days	30,021	\$43,530.00
2/28/2006	3/30/2006	1,012,500 kWh	30 Days	33,750	\$50,625.00
3/30/2006	4/27/2006	906,000 kWh	28 Days	32,357	\$45,300.00
4/27/2006	5/30/2006	1,008,300 kWh	33 Days	30,555	\$50,415.00

Total for 2006 10,768,800 kWh \$530,753

5/30/2006	6/13/2006	370,200 kWh	14 Days	26,443	\$18,510.00
6/13/2006	8/1/2006	1,477,200 kWh	49 Days	30,147	\$88,632.00
8/1/2006	9/1/2006	983,700 kWh	31 Days	31,732	\$59,022.00
9/1/2006	10/1/2006	853,200 kWh	30 Days	28,440	\$51,192.00
10/1/2006	11/1/2006	924,000 kWh	31 Days	29,806	\$55,440.00
11/1/2006	12/1/2006	885,000 kWh	30 Days	29,500	\$53,100.00
12/1/2006	1/1/2007	990,900 kWh	31 Days	31,965	\$59,454.00
1/1/2007	2/1/2007	823,200 kWh	31 Days	26,555	\$49,392.00

2/1/2007	3/1/2007	785,700 kWh	28 Days	28,061	\$47,142.00
3/1/2007	4/1/2007	858,300 kWh	31 Days	27,687	\$51,498.00
4/1/2007	5/1/2007	970,800 kWh	30 Days	32,360	\$58,248.00
5/1/2007	6/1/2007	721,800 kWh	31 Days	23,284	\$43,308.00
Total for	2007	10,644,000 kWh			\$634,938
6/1/2007	6/15/2007	732,900 kWh	14 Days	52,350	\$43,974.00
6/15/2007	8/1/2007	1,636,800 kWh	47 Days	34,826	\$98,208.00
8/1/2007	9/1/2007	1,387,500 kWh	31 Days	44,758	\$83,250.00
9/1/2007	10/1/2007	1,150,500 kWh	30 Days	38,350	\$69,030.00
10/1/2007	11/1/2007	417,300 kWh	31 Days	13,461	\$25,038.00
11/1/2007	12/1/2007	905,100 kWh	30 Days	30,170	\$54,306.00
12/1/2007	1/1/2008	1,194,000 kWh	31 Days	38,516	\$71,640.00
1/1/2008	2/1/2008	639,900 kWh	31 Days	20,642	\$38,394.00
2/1/2008	3/1/2008	639,900 kWh	29 Days	22,066	\$38,394.00
3/1/2008	4/1/2008	833,333 kWh	31 Days	26,882	\$49,999.98
4/1/2008	5/1/2008	1,533,300 kWh	30 Days	51,110	\$91,998.00
5/1/2008	5/23/2008	743,700 kWh	22 Days	33,805	\$44,622.00
Total for	2008	11,814,233 kWh			\$708,854
5/23/2008	6/30/2008	1,274,100 kWh	38 Days	33,529	\$82,817.00
6/30/2008	7/29/2008	996,600 kWh	29 Days	34,366	\$64,779.00
7/29/2008	8/25/2008	913,200 kWh	27 Days	33,822	\$59,358.00
8/25/2008	9/29/2008	1,233,300 kWh	35 Days	35,237	\$80,164.00
9/29/2008	10/28/2008	994,800 kWh	29 Days	34,303	\$64,662.00
10/28/2008	12/2/2008	1,137,300 kWh	35 Days	32,494	\$73,924.00
12/2/2008	1/5/2009	1,187,400 kWh	34 Days	34,924	\$77,181.00
Total for	2009	7,736,700 kWh			\$502,885

Electric

Service Period		Usage	Average	Cost	
5/27/1999	6/14/1999	525,600 kWh	18 Days	29,200	\$23,652.00
6/14/1999	7/30/1999	1,360,400 kWh	46 Days	29,574	\$61,218.00
7/30/1999	8/31/1999	989,900 kWh	32 Days	30,934	\$44,545.50
8/31/1999	9/29/1999	931,200 kWh	29 Days	32,110	\$41,904.00
9/29/1999	10/28/1999	942,000 kWh	29 Days	32,483	\$42,390.00
10/28/1999	11/29/1999	866,100 kWh	32 Days	27,066	\$38,974.50
11/29/1999	12/17/1999	509,100 kWh	18 Days	28,283	\$22,909.50
12/17/1999	1/27/2000	911,900 kWh	41 Days	22,241	\$41,035.50
1/27/2000	2/28/2000	726,500 kWh	32 Days	22,703	\$32,692.50
3/30/2000	4/27/2000	784,000 kWh	28 Days	28,000	\$35,280.00
4/27/2000	5/30/2000	951,600 kWh	33 Days	28,836	\$42,822.00
Total for	2000	9,498,300 kWh		\$427,424	
5/31/2000	6/14/2000	486,800 kWh	14 Days	34,771	\$21,906.00
6/15/2000	7/28/2000	1,332,800 kWh	43 Days	30,995	\$59,976.00
7/28/2000	8/29/2000	931,400 kWh	32 Days	29,106	\$41,913.00
8/29/2000	9/28/2000	771,200 kWh	30 Days	25,707	\$93,267.00
9/29/2000	10/27/2000	707,400 kWh	28 Days	25,264	\$31,833.00
10/27/2000	11/29/2000	711,100 kWh	33 Days	21,548	\$31,999.50
11/29/2000	12/20/2000	433,000 kWh	21 Days	20,619	\$19,485.00
12/20/2000	1/30/2001	788,000 kWh	41 Days	19,220	\$35,460.00
1/30/2001	2/28/2001	654,200 kWh	29 Days	22,559	\$29,439.00
2/28/2001	3/30/2001	662,300 kWh	30 Days	22,077	\$29,803.50
3/30/2001	4/30/2001	655,300 kWh	31 Days	21,139	\$29,488.50
4/30/2001	5/30/2001	923,200 kWh	30 Days	30,773	\$41,544.00

Total for	2001	9,056,700 kWh		\$466,115
5/30/2001	6/18/2001	479,800 kWh	19 Days	25,253 \$21,591.00
6/15/2001	7/30/2001	1,346,200 kWh	45 Days	29,916 \$60,579.00
7/30/2001	8/30/2001	942,700 kWh	31 Days	30,410 \$42,421.50
8/30/2001	9/27/2001	857,700 kWh	28 Days	30,632 \$38,596.50
9/27/2001	10/30/2001	905,400 kWh	33 Days	27,436 \$40,743.00
10/30/2001	11/29/2001	760,600 kWh	30 Days	25,353 \$34,227.00
11/29/2001	12/19/2001	529,300 kWh	20 Days	26,465 \$23,818.50
12/19/2001	1/30/2002	1,006,100 kWh	42 Days	23,955 \$45,274.50
1/30/2002	2/27/2002	731,300 kWh	28 Days	26,118 \$32,908.50
2/27/2002	3/28/2002	766,800 kWh	29 Days	26,441 \$34,506.00
3/28/2002	4/29/2002	898,100 kWh	32 Days	28,066 \$40,414.50
4/29/2002	5/29/2002	832,300 kWh	30 Days	27,743 \$37,453.50
Total for	2002	10,056,300 kWh		\$452,534
5/29/2002	6/13/2002	437,300 kWh	15 Days	29,153 \$19,678.50
6/13/2002	7/30/2002	1,387,800 kWh	47 Days	29,528 \$62,451.00
7/30/2002	8/28/2002	861,100 kWh	29 Days	29,693 \$38,749.50
8/28/2002	9/30/2002	1,001,300 kWh	33 Days	30,342 \$45,058.50
9/30/2002	10/29/2002	886,100 kWh	29 Days	30,555 \$39,874.50
10/29/2002	12/2/2002	812,400 kWh	34 Days	23,894 \$36,558.00
12/2/2002	1/6/2003	673,800 kWh	35 Days	19,251 \$30,321.00
1/6/2003	1/30/2003	594,300 kWh	24 Days	24,762 \$26,743.50
1/30/2003	2/27/2003	709,300 kWh	28 Days	25,332 \$31,918.50
2/27/2003	3/28/2003	755,000 kWh	29 Days	26,034 \$33,975.00
3/28/2003	4/28/2003	786,700 kWh	31 Days	25,377 \$35,401.50
4/28/2003	5/21/2003	650,000 kWh	23 Days	28,261 \$29,250.00

Total for	2003	9,555,100 kWh	\$429,980
5/21/2003	6/12/2003	606,500 kWh	22 Days 27,568 \$27,292.50
6/12/2003	7/30/2003	1,412,000 kWh	48 Days 29,417 \$59,304.00
7/30/2003	8/28/2003	885,500 kWh	29 Days 30,534 \$37,191.00
8/28/2003	9/29/2003	932,200 kWh	32 Days 29,131 \$39,152.40
9/29/2003	10/31/2003	808,600 kWh	32 Days 25,269 \$33,961.20
10/31/2003	12/1/2003	740,745 kWh	31 Days 23,895 \$31,111.30
12/1/2003	12/22/2003	436,855 kWh	21 Days 20,803 \$18,347.90
12/22/2003	1/29/2004	670,200 kWh	38 Days 17,637 \$28,148.40
1/29/2004	2/29/2004	690,653 kWh	31 Days 22,279 \$29,007.43
2/29/2004	3/29/2004	587,847 kWh	29 Days 20,271 \$24,689.57
3/29/2004	4/29/2004	742,100 kWh	31 Days 23,939 \$31,168.20
4/29/2004	5/27/2004	710,500 kWh	28 Days 25,375 \$29,841.00

Total for	2004	9,223,700 kWh	\$389,215
5/27/2004	6/30/2004	710,500 kWh	34 Days 20,897 \$29,841.00
6/30/2004	7/29/2004	947,400 kWh	29 Days 32,669 \$39,790.80
7/29/2004	8/30/2004	843,000 kWh	32 Days 26,344 \$35,406.00
8/30/2004	9/30/2004	796,500 kWh	31 Days 25,694 \$33,453.00
9/30/2004	10/28/2004	760,000 kWh	28 Days 27,143 \$31,920.00
10/28/2004	11/29/2004	725,300 kWh	32 Days 22,666 \$30,462.60
11/29/2004	1/4/2005	640,900 kWh	36 Days 17,803 \$26,917.80
1/4/2005	1/28/2005	470,300 kWh	24 Days 19,596 \$19,752.60
1/28/2005	2/25/2005	523,300 kWh	28 Days 18,689 \$20,542.20
2/28/2005	3/30/2005	812,100 kWh	30 Days 27,070 \$34,108.20
3/30/2005	4/29/2005	731,700 kWh	30 Days 24,390 \$30,731.40
4/29/2005	5/31/2005	797,300 kWh	32 Days 24,916 \$30,546.60

Total for	2005	8,758,300 kWh	\$363,472
5/31/2005	6/30/2005	727,300 kWh	30 Days 24,243 \$30,546.60
6/30/2005	7/27/2005	903,800 kWh	27 Days 33,474 \$45,190.00
7/27/2005	8/30/2005	948,800 kWh	34 Days 27,906 \$47,440.00
8/30/2005	9/28/2005	866,500 kWh	29 Days 29,879 \$43,325.00
9/28/2005	10/28/2005	781,400 kWh	30 Days 26,047 \$39,070.00
10/28/2005	11/29/2005	777,100 kWh	32 Days 24,284 \$38,855.00
11/29/2005	1/3/2006	610,100 kWh	35 Days 17,431 \$30,505.00
1/3/2006	1/30/2006	632,600 kWh	27 Days 23,430 \$31,630.00
1/30/2006	2/28/2006	604,400 kWh	29 Days 20,841 \$30,220.00
2/28/2006	3/30/2006	742,600 kWh	30 Days 24,753 \$37,130.00
3/30/2006	4/27/2006	737,100 kWh	28 Days 26,325 \$36,855.00
4/27/2006	5/30/2006	823,300 kWh	33 Days 24,948 \$41,165.00
Total for	2006	9,155,000 kWh	\$451,932
5/30/2006	6/13/2006	329,500 kWh	14 Days 23,536 \$16,475.00
6/13/2006	8/1/2006	1,249,100 kWh	49 Days 25,492 \$74,946.00
8/1/2006	9/1/2006	985,100 kWh	31 Days 31,777 \$59,106.00
9/1/2006	10/1/2006	759,300 kWh	30 Days 25,310 \$45,558.00
10/1/2006	11/1/2006	786,700 kWh	31 Days 25,377 \$47,202.00
11/1/2006	12/1/2006	617,600 kWh	30 Days 20,587 \$37,056.00
12/1/2006	1/1/2007	625,800 kWh	31 Days 20,187 \$37,548.00
1/1/2007	2/1/2007	538,400 kWh	31 Days 17,368 \$32,304.00
2/1/2007	3/1/2007	560,800 kWh	28 Days 20,029 \$33,648.00
3/1/2007	4/1/2007	573,000 kWh	31 Days 18,484 \$34,380.00
4/1/2007	5/1/2007	608,200 kWh	30 Days 20,273 \$36,492.00
5/1/2007	6/1/2007	669,200 kWh	31 Days 21,587 \$40,152.00

Total for	2007	8,302,700 kWh	\$494,867
6/1/2007	6/15/2007	417,500 kWh	14 Days 29,821 \$25,050.00
6/15/2007	8/1/2007	1,283,400 kWh	47 Days 27,306 \$77,004.00
8/1/2007	9/1/2007	1,577,200 kWh	31 Days 50,877 \$94,632.00
9/1/2007	10/1/2007	295,584 kWh	30 Days 9,853 \$10,170.00
10/1/2007	11/1/2007	768,000 kWh	31 Days 24,774 \$46,080.00
11/1/2007	12/1/2007	701,500 kWh	30 Days 23,383 \$42,090.00
12/1/2007	1/1/2008	902,200 kWh	31 Days 29,103 \$54,132.00
1/1/2008	2/1/2008	668,000 kWh	31 Days 21,548 \$40,050.00
2/1/2008	3/1/2008	693,600 kWh	29 Days 23,917 \$41,604.00
3/1/2008	4/1/2008	685,400 kWh	31 Days 22,110 \$41,124.00
4/1/2008	5/1/2008	590,000 kWh	30 Days 19,667 \$35,400.00
5/1/2008	5/22/2008	429,100 kWh	21 Days 20,433 \$25,746.00
Total for	2008	9,011,484 kWh	\$533,082
5/22/2008	6/16/2008	555,500 kWh	25 Days 22,220 \$36,108.00
6/16/2008	7/14/2008	656,600 kWh	28 Days 23,450 \$42,679.00
7/14/2008	8/11/2008	735,100 kWh	28 Days 26,254 \$47,782.00
8/11/2008	9/15/2008	983,800 kWh	35 Days 28,109 \$63,947.00
9/15/2008	10/13/2008	680,100 kWh	28 Days 24,289 \$44,207.00
10/13/2008	11/17/2008	769,800 kWh	35 Days 21,994 \$50,037.00
11/17/2008	12/15/2008	464,800 kWh	28 Days 16,600 \$30,212.00
12/15/2008	1/20/2009	574,300 kWh	36 Days 15,953 \$37,329.00
Total for	2009	5,420,000 kWh	\$352,301

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Electric

Service Period	Usage	Average	Cost
7/30/2002	8/28/2002 33,600 kWh	29 Days	1,159 \$2,016.00
8/28/2002	9/30/2002 68,400 kWh	33 Days	2,073 \$4,104.00
9/30/2002	10/29/2002 36,000 kWh	29 Days	1,241 \$2,160.00
10/29/2002	12/2/2002 43,800 kWh	34 Days	1,288 \$2,628.00
12/2/2002	1/6/2003 61,800 kWh	35 Days	1,766 \$3,708.00
1/6/2003	1/30/2003 155,400 kWh	24 Days	6,475 \$9,324.00
1/30/2003	2/27/2003 188,400 kWh	28 Days	6,729 \$11,304.00
2/27/2003	3/28/2003 233,400 kWh	29 Days	8,048 \$14,004.00
3/28/2003	4/28/2003 254,400 kWh	31 Days	8,206 \$15,264.00
4/28/2003	5/21/2003 221,400 kWh	23 Days	9,626 \$13,284.00
Total for 2003	1,296,600 kWh		\$77,796
5/21/2003	6/12/2003 233,400 kWh	22 Days	10,609 \$14,004.00
6/12/2003	7/30/2003 635,400 kWh	48 Days	13,238 \$26,686.80
7/30/2003	8/28/2003 373,800 kWh	29 Days	12,890 \$15,699.60
8/28/2003	9/29/2003 434,400 kWh	32 Days	13,575 \$18,244.80
9/29/2003	10/31/2003 379,800 kWh	32 Days	11,869 \$15,951.60
10/31/2003	12/1/2003 362,400 kWh	31 Days	11,690 \$15,220.80
12/1/2003	12/22/2003 220,800 kWh	21 Days	10,514 \$9,273.60
12/22/2003	1/29/2004 327,000 kWh	38 Days	8,605 \$13,734.00
1/29/2004	2/29/2004 200,725 kWh	31 Days	6,475 \$8,430.45
2/29/2004	3/29/2004 461,075 kWh	29 Days	15,899 \$19,365.15
3/29/2004	4/29/2004 447,000 kWh	31 Days	14,419 \$18,774.00
4/29/2004	5/27/2004 340,200 kWh	28 Days	12,150 \$14,288.40
Total for 2004	4,416,000 kWh		\$189,673
5/27/2004	6/30/2004 340,200 kWh	34 Days	10,006 \$14,288.40

6/30/2004	7/29/2004	532,200 kWh	29 Days	18,352	\$22,352.40
7/29/2004	8/30/2004	439,800 kWh	32 Days	13,744	\$18,471.60
8/30/2004	9/30/2004	429,600 kWh	31 Days	13,858	\$18,043.20
9/30/2004	10/28/2004	408,600 kWh	28 Days	14,593	\$17,161.20
10/28/2004	11/29/2004	412,800 kWh	32 Days	12,900	\$17,337.60
11/29/2004	1/4/2005	327,000 kWh	36 Days	9,083	\$13,734.00
1/4/2005	1/28/2005	237,000 kWh	24 Days	9,875	\$9,954.00
1/28/2005	2/25/2005	304,200 kWh	28 Days	10,864	\$12,776.40
2/28/2005	3/30/2005	357,000 kWh	30 Days	11,900	\$14,994.00
3/30/2005	4/29/2005	351,000 kWh	30 Days	11,700	\$14,742.00
4/29/2005	5/31/2005	375,600 kWh	32 Days	11,738	\$15,775.20

Total for 2005 4,515,000 kWh \$189,630

5/31/2005	6/30/2005	375,600 kWh	30 Days	12,520	\$15,775.20
6/30/2005	7/27/2005	354,600 kWh	27 Days	13,133	\$17,730.00
7/27/2005	8/30/2005	505,200 kWh	34 Days	14,859	\$25,260.00
8/30/2005	9/28/2005	461,400 kWh	29 Days	15,910	\$23,070.00
9/28/2005	10/28/2005	440,400 kWh	30 Days	14,680	\$22,020.00
10/28/2005	11/29/2005	401,400 kWh	32 Days	12,544	\$20,070.00
11/29/2005	1/3/2006	315,000 kWh	35 Days	9,000	\$15,750.00
1/3/2006	1/30/2006	318,600 kWh	27 Days	11,800	\$15,930.00
1/30/2006	2/28/2006	320,400 kWh	29 Days	11,048	\$16,020.00
2/28/2006	3/30/2006	366,000 kWh	30 Days	12,200	\$18,300.00
3/30/2006	4/27/2006	400,800 kWh	28 Days	14,314	\$20,040.00
4/27/2006	5/30/2006	480,000 kWh	33 Days	14,545	\$24,000.00

Total for 2006 4,739,400 kWh \$233,965

5/30/2006	6/13/2006	177,000 kWh	14 Days	12,643	\$8,850.00
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6/13/2006	8/1/2006	730,200 kWh	49 Days	14,902	\$43,812.00
8/1/2006	9/1/2006	594,000 kWh	31 Days	19,161	\$35,640.00
9/1/2006	10/1/2006	459,600 kWh	30 Days	15,320	\$27,576.00
10/1/2006	11/1/2006	458,400 kWh	31 Days	14,787	\$27,504.00
11/1/2006	12/1/2006	384,000 kWh	30 Days	12,800	\$23,040.00
12/1/2006	1/1/2007	327,000 kWh	31 Days	10,548	\$19,620.00
1/1/2007	2/1/2007	259,800 kWh	31 Days	8,381	\$15,588.00
2/1/2007	3/1/2007	301,200 kWh	28 Days	10,757	\$18,072.00
3/1/2007	4/1/2007	363,600 kWh	31 Days	11,729	\$21,816.00
4/1/2007	5/1/2007	421,800 kWh	30 Days	14,060	\$25,308.00
5/1/2007	6/1/2007	493,800 kWh	31 Days	15,929	\$29,628.00

Total for 2007 4,970,400 kWh \$296,454

6/1/2007	6/15/2007	196,800 kWh	14 Days	14,057	\$11,808.00
6/15/2007	8/1/2007	664,200 kWh	47 Days	14,132	\$39,852.00
8/1/2007	9/1/2007	665,400 kWh	31 Days	21,465	\$39,924.00
9/1/2007	10/1/2007	295,200 kWh	30 Days	9,840	\$17,712.00
10/1/2007	11/1/2007	391,800 kWh	31 Days	12,639	\$23,508.00
11/1/2007	12/1/2007	430,200 kWh	30 Days	14,340	\$25,812.00
12/1/2007	1/1/2008	417,600 kWh	31 Days	13,471	\$25,056.00
1/1/2008	2/1/2008	282,600 kWh	31 Days	9,116	\$16,956.00
2/1/2008	3/1/2008	295,200 kWh	29 Days	10,179	\$17,712.00
3/1/2008	4/1/2008	372,000 kWh	31 Days	12,000	\$22,320.00
4/1/2008	5/1/2008	441,600 kWh	30 Days	14,720	\$26,496.00
5/1/2008	6/2/2008	339,600 kWh	32 Days	10,612	\$20,376.00

Total for 2008 4,792,200 kWh \$287,532

6/2/2008	6/24/2008	337,200 kWh	22 Days	15,327	\$21,918.00
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6/24/2008	7/28/2008	494,400 kWh	34 Days	14,541	\$32,136.00
7/28/2008	8/25/2008	415,800 kWh	28 Days	14,850	\$27,027.00
8/25/2008	9/29/2008	542,400 kWh	35 Days	15,497	\$35,256.00
9/29/2008	10/27/2008	448,200 kWh	28 Days	16,007	\$29,133.00
10/27/2008	12/1/2008	441,600 kWh	35 Days	12,617	\$28,704.00
12/1/2008	1/5/2009	330,000 kWh	35 Days	9,429	\$21,450.00
Total for	2009	3,009,600 kWh			\$195,624

The committee also tested an energy efficient and standard configuration of a Dell Optiplex 960 to determine if the energy saving claims could be verified. The results are as follows:

General assumptions:

- 17,000 machines using UGA resources (33K + total desktop/laptop computers according to property control.)
- 6 cents per kWh using 2007 fiscal year energy data.
- Money saved is calculated from 1st to 3rd quartile (25% to 75%) compliance range or 12750 to 4250 machines out of compliance.
- Desktop Model tested: Dell Optiplex 960 standard power supply and Dell Optiplex 960 88% efficient power supply.
- Dell 19" Monitor.

Tested power consumption rates:

Monitor On: .03 kWh/h

Monitor Off: .0033 kWh/h

Standard Dell 960 at idle: .0533kWh/h

Energy Efficient Dell 960 at idle: .0389 kWh/h

Standard Dell 960 at standby: .0049 kWh/h

Energy Efficient Dell 960 at standby .0043kWh/h

Standard configuration (currently deployed model) assumptions:

230 workdays X 16 hours idle time. (260 work days –holidays –vacation/sick days) = 3680 hours

135 non-work days x 24 hours idle time = 3240

Assumes constant productivity (using idle consumption rate) during 8 hr work day

230 workdays x 8 hours work time = 1840

1840 work hours x .0533 kWh/h = 98.07 kWh/y

6920 total idle hours per year x .0533 kWh/h = 368.84 kWh/y

368.84 kWh/y x .06 dollars/kWh = \$22.13 per year

6920 total idle hours at standby per year x .0049kWh/h = 33.91 kWh/y

33.91 kWh/y x .06 dollars/kWh = \$2.03 per year

\$20.10 savings per year per computer

1st to 3rd quartile (25% to 75%) annual savings with standby enabled = \$85425 - \$256275

Energy Efficient configuration (88% efficient power supply) assumptions:

Energy efficient machines assume a 0% current inventory.

230 work days X 16 hours idle time = 3680

135 off days x 24 hours idle time = 3240

6920 idle hours/year x .0389kWh/h = 269.2 kWh/y

6920 idle hours per year at standby x .0043kWh/h = 29.76 kWh/y

Assumes constant productivity (using idle consumption rate) during 8 hr work day

230 workdays x 8 hours work time at energy saving. = 1840

1840 work hours x .0389 kWh/h = 71.576 kWh/y

Workday operating cost difference= 98.07kWh/y – 71.676 kWh/y = 26.39 kWh/y = \$1.51 per computer per year

Idle hours operating cost difference (100% standby compliance) = 33.91 kWh/y – 29.76 kWh/y = 4.15 kWh/y = \$.25 per computer per year

Idle hour operating cost per year difference 368.84 kWh/y – 269.2 kWh/y = 99.64 kWh/y = \$5.98 per year per computer

Total operating cost difference: \$7.76 per year per computer

1st to 3rd quartile (25% to 75%) savings from switching to energy efficient units = \$32895 - \$98940

Monitor assumptions:

Monitor On

230 work days X 16 hours idle time = 3680

135 off days x 24 hours idle time = 3240

6920 idle hours/year x .03 kWh/h = 207.6 kWh/y

1840 work hours/year x .03 kWh/h = 55.2 kWh/y

Total operating cost/year = 262.8kWh x .06 dollars/kWh = \$15.77/year/monitor

1st to 3rd quartile (25% to 75%) annual cost = \$67022.5 - \$201067.50

Monitor Off

1840 work hours/year x .03 kWh/h = 55.2 kWh/y

6920 idle hours/year x .0033 kWh/h = 22.84 kWh/y

Total operating cost/year = 78.04 kWh x .06 dollars/kWh = \$4.68/year/monitor

1st to 3rd quartile (25% to 75%) compliance (\$19890 – \$59670)

1st to 3rd quartile (25% to 75%) total annual savings = \$47132.50 - \$141397.50

Total Annual Savings: Energy Efficient computer + Standby + Monitor Off

1st to 3rd quartile (25% to 75%) = \$165452.50 - \$512550