

Enterprise Power Management

City of Riverside

City of Riverside Overview

- Demographics
 - Population = 305,478
 - Geography = 86 square miles
- Local Government
 - Departments = 16
 - Employees = 2,638
 - Budget = \$990M



Riverside Public Utilities

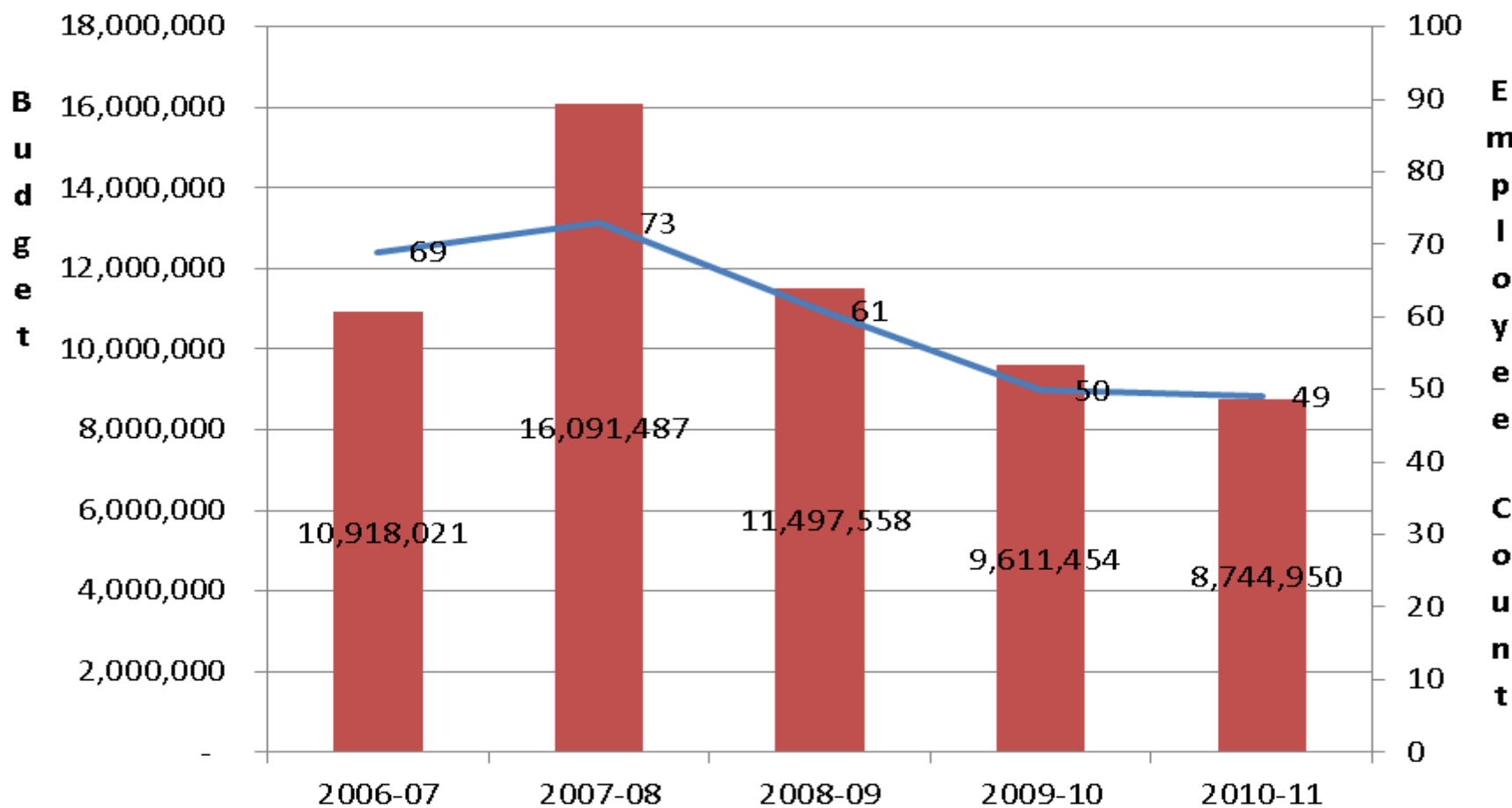
- Riverside owns and operates its own power through its Public Utilities Department
 - 2 “Peaker” power generation stations – RERC & Springs
 - 1 “Base-loaded” generation station – Clearwater
 - Partial ownership of San Onofre and multiple contracts with other power providers
 - Green initiatives include photovoltaic (solar)

Information Technology Overview

- IT Staff = 49
- IT Budget = ~ 9 Million Dollars
- Desktops/Laptops = 1750
- Servers (Physical/Virtual) = 425
- Smartphones (iPhone/Android) = 958

Economic Decline of IT

Information Technology Budget 2006-2011



So What's The Problem?

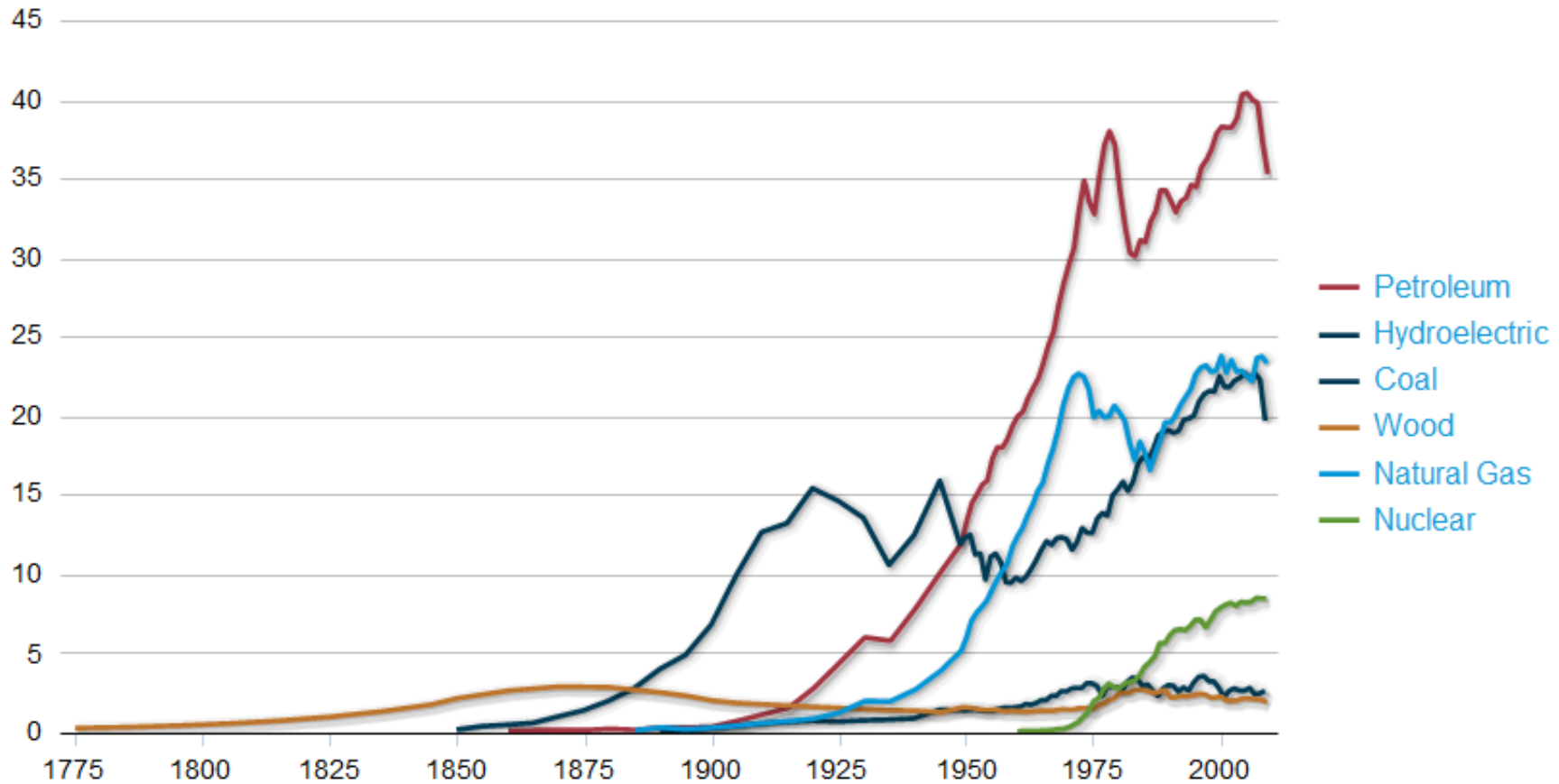
PCs, peripherals and printers are responsible for 60 percent of the energy consumption of overall information technology (25 percent from network infrastructure and 15 percent from data centers) and the IT industry is responsible for between 2 and 3 percent of the world's greenhouse gas emissions according to researchers at the Climate Group and Gartner.

Source: <http://gigaom.com>

It's Only Getting Worse

History of energy consumption in the United States, 1775-2009

quadrillion Btu



interactive

Source: U.S. Energy Information Administration - Annual Energy Review 2009

Project Funding

- \$250,000 to RPU from American Recovery and Reinvestment Act (ARRA)
- Partnership between SmartRiverside & Riverside Public Utilities
- Rebate of \$15 per PC up to a maximum of \$25,000 per entity
- Must show proof of purchase and a report showing 3 months of energy savings
- <http://www.riversideca.gov/utilities/businesspcmanagementsoftware.asp>

Software Evaluation - 2009

- BigFix – Now IBM Tivoli Endpoint Manager
 - Complete package with many capabilities going beyond power management at an additional cost
 - Good overall solution for organizations that do not use Microsoft Systems Center Config Manager
- Verdiem – Surveyor
 - Best choice for power management only.
 - Simple installation and best WOL support
- 1E – NightWatchman
 - Good product that included support for MACs

BigFix Solution

- BigFix Enterprise Server (BES) provides central management and reporting of all power management settings
- BigFix client installed on all managed PC's
- BigFix Client deployed using Microsoft Systems Center Configuration Manager
- Clients check for new policies periodically through the day
- Wake-on-LAN available from BES server

Power Management Settings

- All monitors power off after 15 minutes of inactivity
- All hard drives power off after 15 minutes of inactivity
- Sleep mode enabled after 2 hours of inactivity on training room PC's, shared PC's and general purpose systems
- Other PC's managed on an individual basis depending on user requirements

Results

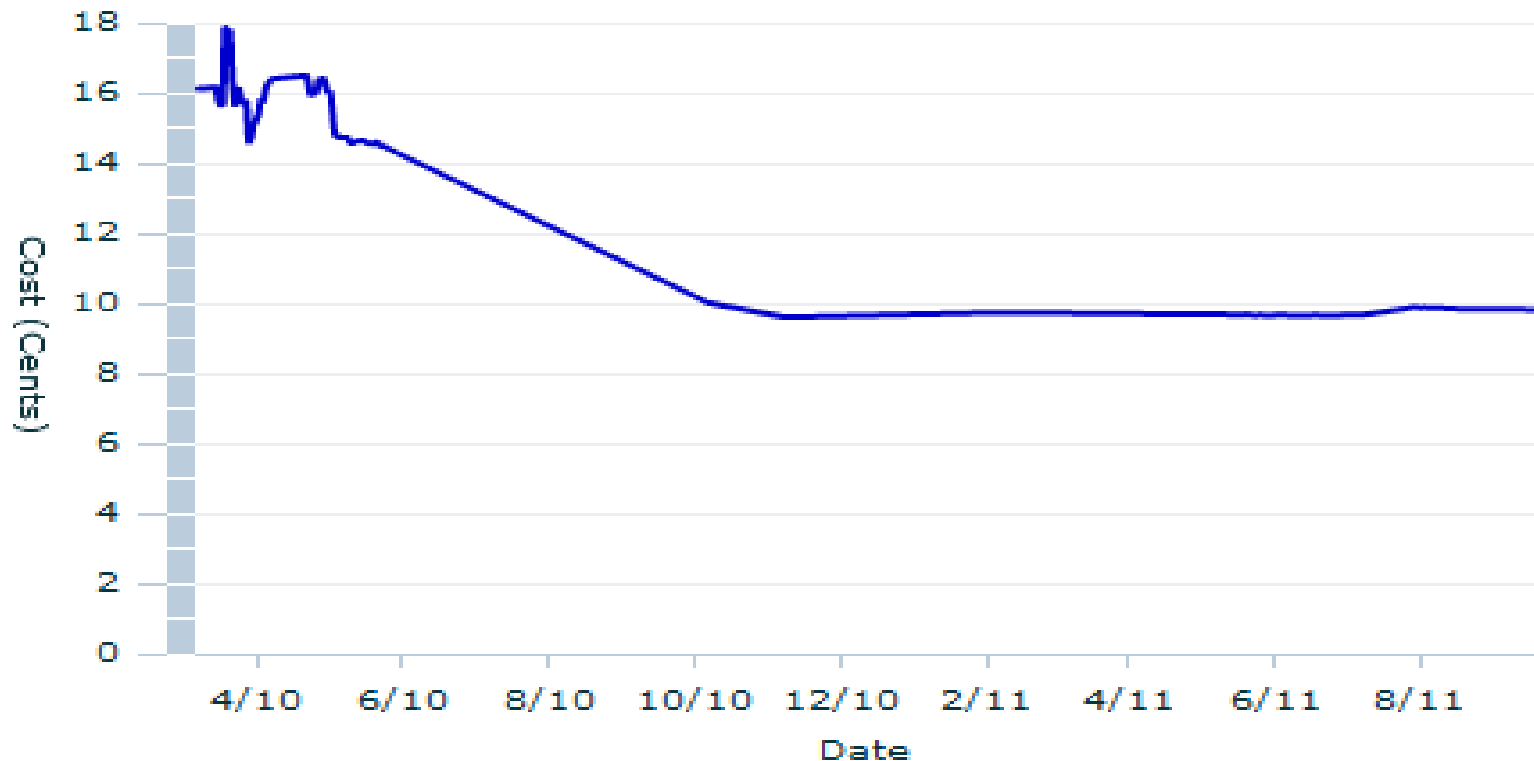
- Daily Savings:
 - Power – 800 Watts per computer
 - CO² Emissions – 1.1 lbs per computer
 - Savings – 6.5 cents per computer
- Total Annual Savings
 - Power – 445 MW
 - CO₂ Emissions – 612,287 lbs
 - Annual Savings per computer - \$24
 - Total Annual Savings - \$36,180

BigFix Report – Cost Per Computer

Daily Power Cost

Type:

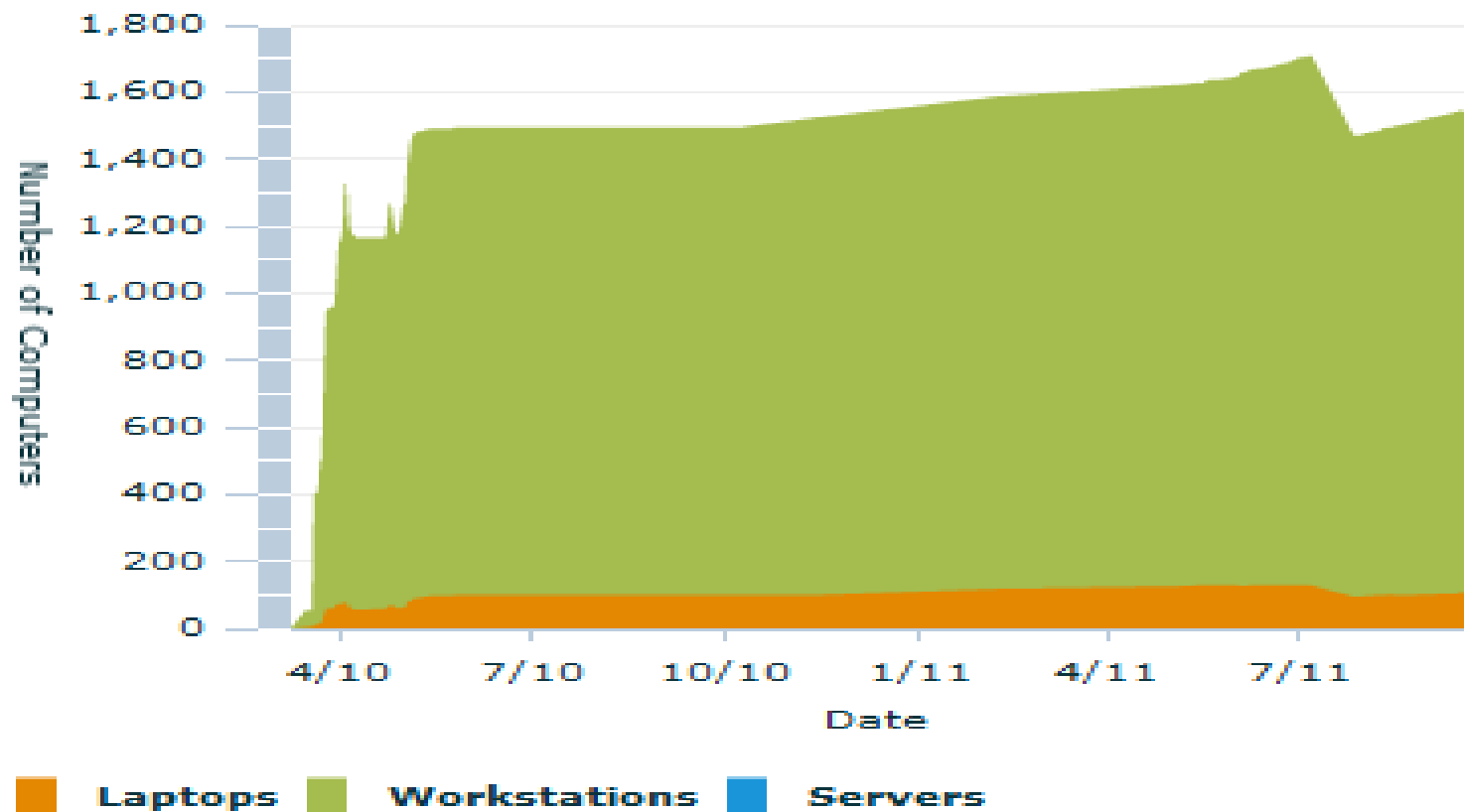
Per Computer



Average Daily Power Cost per Computer

BigFix Report – Managed Computers

Tracked Computer Types



BigFix Report – Daily Power Statistics

Select Operator: **bigfix** ▼

Print Report

Daily Power Statistics by Computer Type

Type	Total Computers	Average On-time	Total Cost	Total CO2	Cost Per Computer	CO2 Per Computer
Workstation	1,441	18:16:00 - 76%	\$152.42	2,667.306 lb	10.6¢	1.851 lb
Laptop	106	08:16:00 - 34%	\$1.22	21.408 lb	1.2¢	0.202 lb
Server	0	00:00:00 - 0%	\$0	0.000 lb	0¢	0 lb

Daily Power Statistics by Computer

Computer	Type	Daily Statistics			Power Management Settings		
		Average On-time	Cost	CO2	Monitor	Standby	Hard Drive
PDFM-NPCX8715	Workstation	23:54:00 - 100%	6.7¢	1.166 lb	X	X	
EOC-CONFROOM	Workstation	16:48:00 - 70%	6.3¢	1.107 lb	X	X	
PDFM-NPCX8714	Workstation	22:04:00 - 92%	6.6¢	1.151 lb	X	X	X
DEV-RLEWIS	Workstation	06:52:00 - 29%	5.1¢	0.894 lb	X	X	X
PDLN-REPORTRMS	Workstation	23:56:00 - 100%	6.7¢	1.166 lb	X	X	
PUEN-KCONNOR	Workstation	09:33:00 - 40%	6¢	1.046 lb	X	X	X
PDMG-GANGX7238	Workstation	05:10:00 - 22%	3.8¢	0.672 lb	X	X	X
PDDV-INVX3265	Workstation	11:52:00 - 49%	6.1¢	1.065 lb	X	X	
PDAIR-24	Workstation	23:21:00 - 97%	6.6¢	1.161 lb	X	X	
FS06-CAD-DISP	Workstation	23:60:00 - 100%	6.7¢	1.167 lb	X	X	
PWAD-DTEAGARDEN	Laptop	01:49:00 - 8%	0.3¢	0.056 lb	X	X	X
DEV-JBELDING	Workstation	21:41:00 - 90%	6.6¢	1.147 lb	X	X	X
PWAD-BGUILLEN	Workstation	23:38:00 - 98%	6.7¢	1.164 lb	X	X	
PDDV-INVX3260	Workstation	23:38:00 - 98%	6.7¢	1.164 lb	X	X	X
PUPLZCALLCNTR08	Workstation	23:33:00 - 98%	6.6¢	1.163 lb	X	X	X
PDOR-CSBX5900	Workstation	18:16:00 - 76%	6.4¢	1.119 lb	X	X	
PDOR-RECX5521	Workstation	19:59:00 - 83%	6.5¢	1.133 lb	X	X	
PDLN-MOTOX6085B	Workstation	23:47:00 - 99%	6.7¢	1.165 lb	X	X	X
DEV-GRAPH	Workstation	14:54:00 - 62%	6.2¢	1.091 lb	X	X	
PDMG-INVX7959	Workstation	16:47:00 - 70%	6.3¢	1.106 lb	X	X	
PDAIR-AVX8090	Workstation	05:15:00 - 22%	3.9¢	0.684 lb	X	X	

Challenges

- Sleep not enabled on all machines due to the following challenges:
 - VPN Users
 - Security Patches
 - Sleep mode terminates open application sessions (i.e. – Remote Desktop, VPN, Web)
 - Wake-On-LAN

What's Next?

- Improve the penetration of managed Sleep Mode and Power Off states
- Microsoft Systems Center Configuration Manager R2
- Integrated Wake-On-LAN and Patch Management
- Improved Reporting