

Green Computing

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November 5, 2010, Austin, TX

- 4th largest public school district in Bexar County, Texas (San Antonio area)
- About 22,000 students and 3,000 employees
- 31 IT staff members
- Over 7000 desktops and laptops
- Additional 3,200 virtual desktops
- 115 virtual servers
- More info at <http://www.judsonisd.org>



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- **Can computing really be “green”?**
- **Technology is not particularly green by most measures**
- **While technology can offer enormous productivity and efficiency gains....**
- **Technology can have a huge negative impact on the environment:**
 - **Materials use**
 - **Metals, plastics**
 - **Energy consumption**
 - **Heat creation (and need for cooling)**
 - **Waste impact of old equipment**



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- **But, technology can be made much greener by managing its negative impacts on the environment**
- **Look at how it makes sense for your organization to limit or improve:**
 - **Materials consumption**
 - **Energy use**
 - **Heat dissipation/creation (and need for cooling)**
 - **Discarding of old devices**
 - **Lifecycle of devices**



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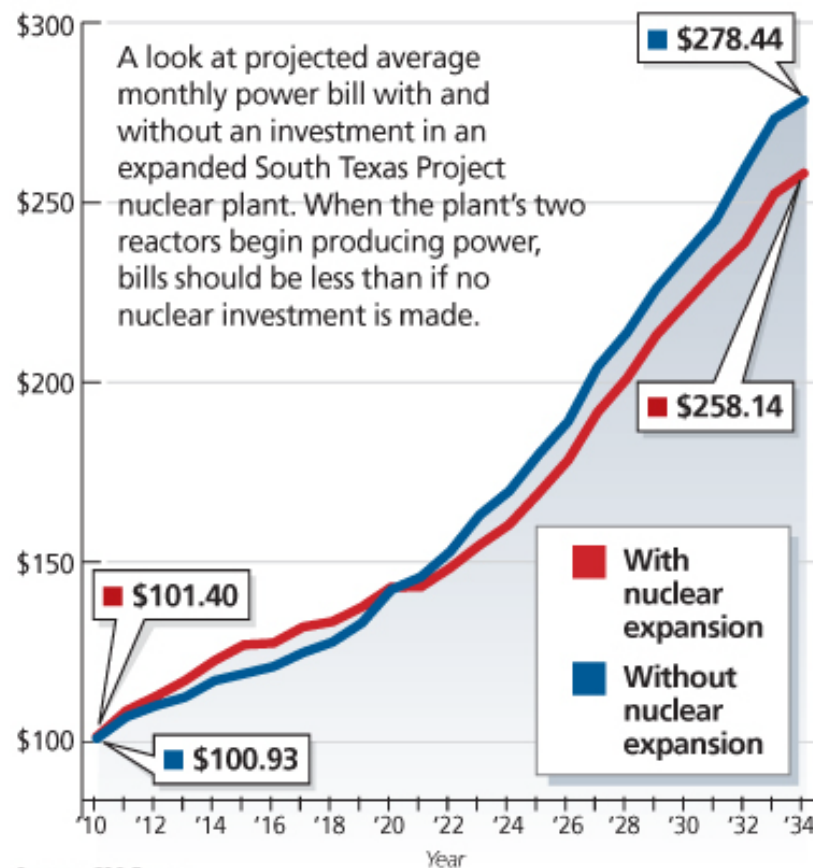
Figure out which **green computing drivers make sense for your organization— these are not the same for everybody!**

- ▶ **Economics – Save \$\$\$ by going green.**
 - ▶ This is the holy grail of going green and the most difficult to achieve.
- ▶ **Reduce electricity consumption.**
 - ▶ Often this can offer significant payback over time, but can require a large up front capital outlay
- ▶ **Reduce heat creation.**
- ▶ **May be part of a larger organizational green initiative**
- ▶ **Social responsibility & Concern for environment.**
- ▶ **Good for public relations.**

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- Energy costs often not seen by IT
- But are a major organizational expense
- In San Antonio, Texas, CPS Energy estimates 50% increase in electricity bills in just 10 years
- Bills projected to rise at an even faster rate after 2020
- Many utilities now offer rebates for conserving energy

Comparing power bills



EXPRESS-NEWS GRAPHIC



**Green Computing
Initiative**

Judson ISD Technology Services

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1. Running virtual servers with VMWare, which reduces: number of physical servers, power consumption, cooling, and data center space requirements.
2. Remote management of desktops, servers and network equipment
3. Consolidating and virtualizing storage on SAN
4. Upgrading to more energy efficient servers



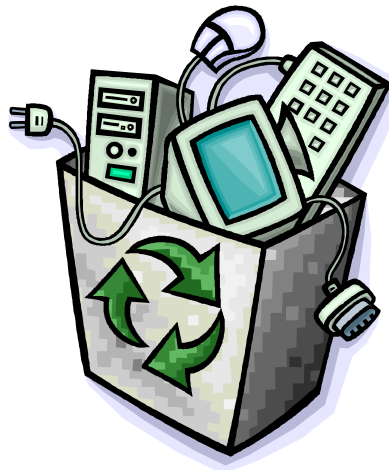
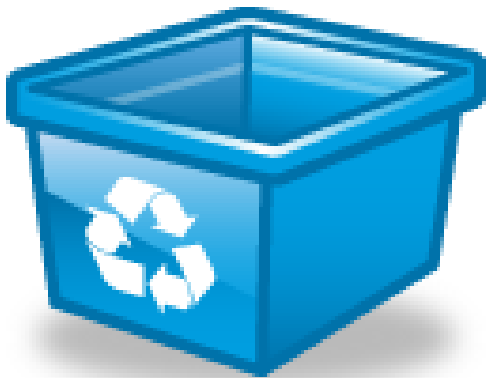
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5. Purchasing Energy Star rated and EPEAT certified computers
6. Utilizing energy efficient LCD monitors and phasing out CRT monitors
7. Eliminating almost all ink jet printers and providing a much smaller quantity of shared laser printers and networked copiers



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8. Automating shutdown of most district computers
9. Recycling toner cartridges
10. Establishing procedures for redistribution, reuse, and recycling of technology assets
11. Recycling of disposed technology assets with company which certifies that it uses responsible environmental practices and tries to reuse as many parts as possible



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12. Pushing large volumes of student data to Judson ISD parents via web applications and using electronic forms for business processes.
13. Intensive desktop virtualization using nComputing X-Series, saving the district money on acquisition, energy, cooling, and network wiring.
14. Migrating to Windows 7 operating system, which is designed to be more energy efficient.
15. Converting PC's at end of life cycle to become virtual desktops with Citrix Xenapp, giving them the look, feel, and performance of a new Windows 7 desktop computer.

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- Do not ignore Public Relations!
- Toot your own horn about your successes in and out of your organization.
- We were certified by CoSN as a Green Computing School District



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- We found avenues for sharing our story:
 - Built very visible web site
 - Had media attention
 - Technology and Learning “Being Lean & Green...”
 - Judson ISD featured in CoSN's "Weathering the Storm 2010 Compendium“
 - Featured in eSchoolNews Case Study



The following series of slides will look deeper at the following projects that are part of the Judson ISD Green Computing Initiative (GCI):

- 1. Desktop Virtualization with nComputing X Series Devices**
- 2. Replacing CRT Monitors with LCD Monitors**
- 3. Automating Computer Shutdown**

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- **Chose non-traditional approach**
 - Virtualized a host PC locally and increased PC access by 300%
- **Why go the route we did?**
 - Needed to offer increased computer access, but cost was the key factor
 - We chose the...
 - lowest deployment cost option
 - most staff supportable option
 - most green option
- **What we chose**
 - nComputing X300 / X350
- **What it is?**
 - Modified thin client
 - It virtualizes the host OS and shares the host's resources
- **What we deployed –**
 - Deployed 761 X Series sets for an additional 2283 computing seats.



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Lower Acquisition Costs for 3,044 Seats

Acquisition for a PC only deployment	\$ 2,374,320
Possible additional network growth	\$ 776,220
Acquisition cost for X Series Deployment	
Shared PC's	\$ 593,580
Access Terminals (X Series)	\$ 152,200
Extra Monitors	\$ 285,375
Keyboards & Mice	\$ 45,660
MS OS Licensing	\$ 108,594
Total X Series Acquisition Cost	\$ 1,185,409

\$1,188,911 Acquisition Savings for JISD
\$1,965,131 Savings if network ports needed

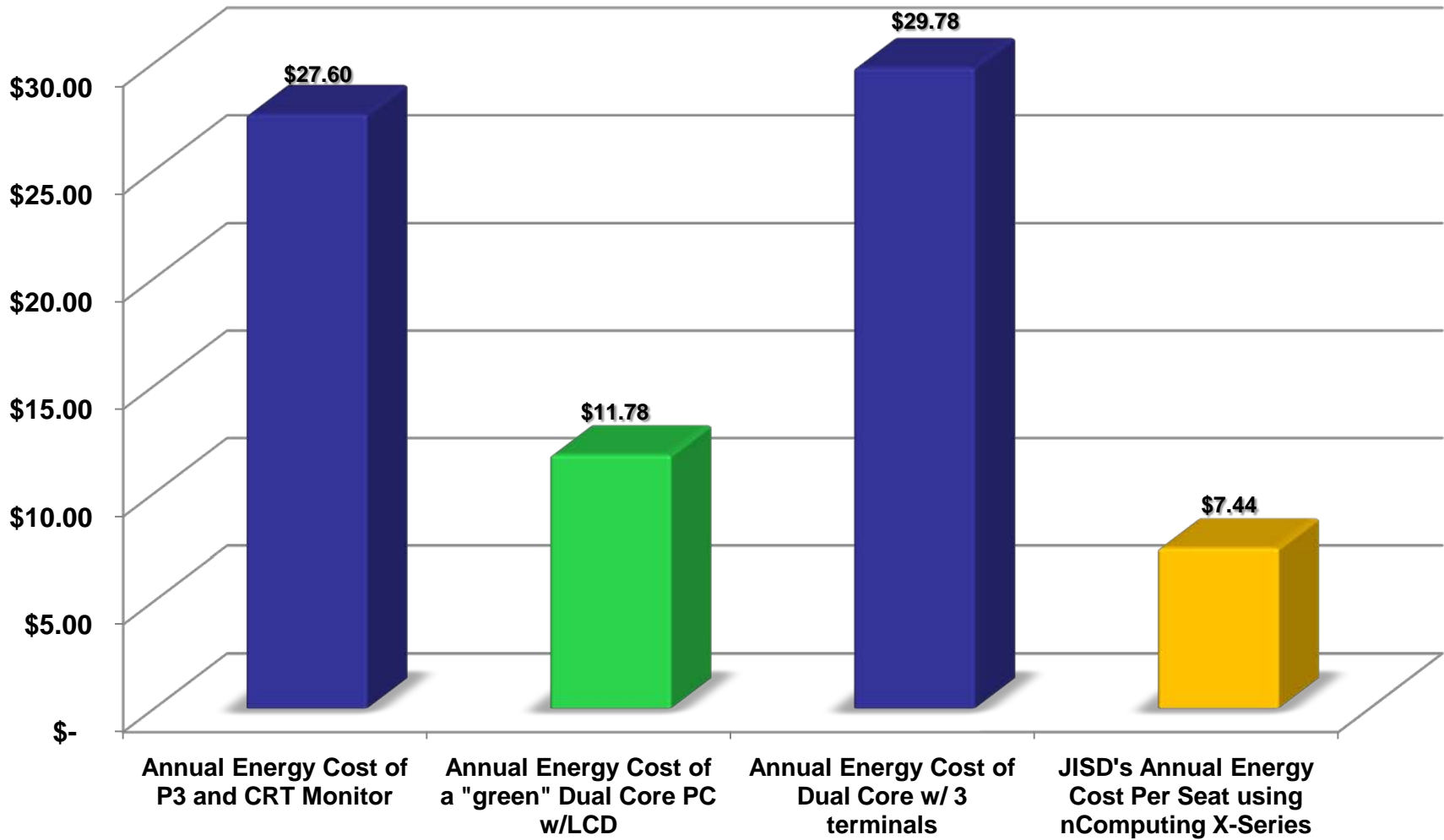
Savings of

50%

- **There was much less physical hardware deployed**
 - **Resulting in:**
 - **less natural resources, packaging, etc are used at the onset**
 - **less materials that need recycling and end up in landfills at the end of the life cycle**
- **Purchased greener host computers**
 - **EPEAT gold/Energy Star computers with LCDs**
 - **Much more energy efficient than older computers**
- **X Series virtual machines use 1 watt electricity per seat**
- **At least 70% less HVAC capacity was needed**
- **75% less building electrical capacity was needed per computing seat**
- **Network port needs trimmed by 75%**

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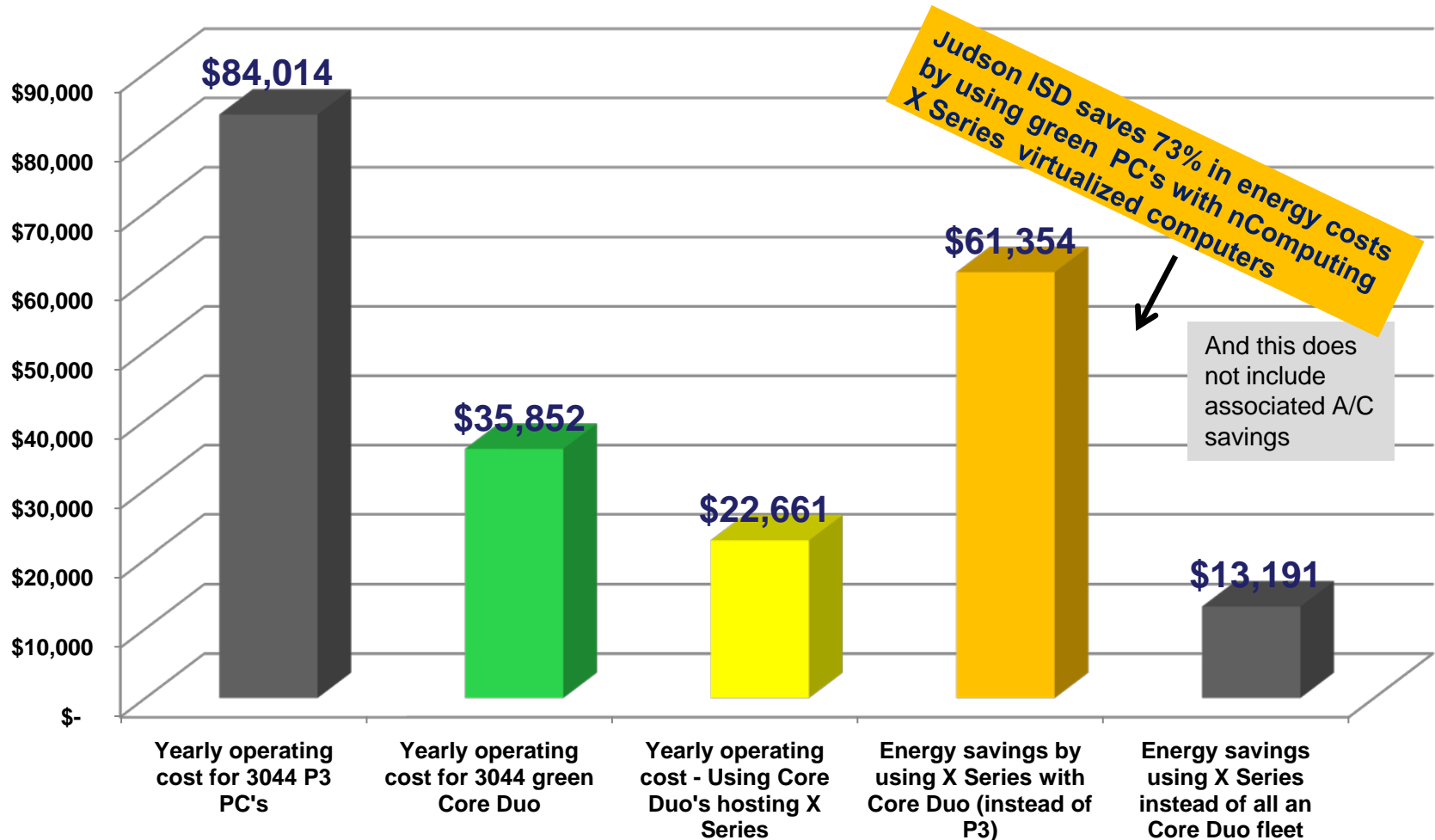
Judson ISD's School Year Energy Cost Comparison



Numbers calculated in house by Judson ISD

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One Year Energy Cost & Savings for Judson ISD for 3044 Total Computing Seats



Numbers calculated in house by Judson ISD

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- LCD monitors are far more energy efficient than CRT monitors (by at least 40%)
- The long term energy savings are easily quantified for calculating an ROI (return on investment).
- Most schools are being forced to switch to LCD over time as they replace computers.
- But it still takes up front capital expenditure to accomplish the replacement.
- The ROI numbers do not support replacing the monitors ONLY because of energy costs savings.

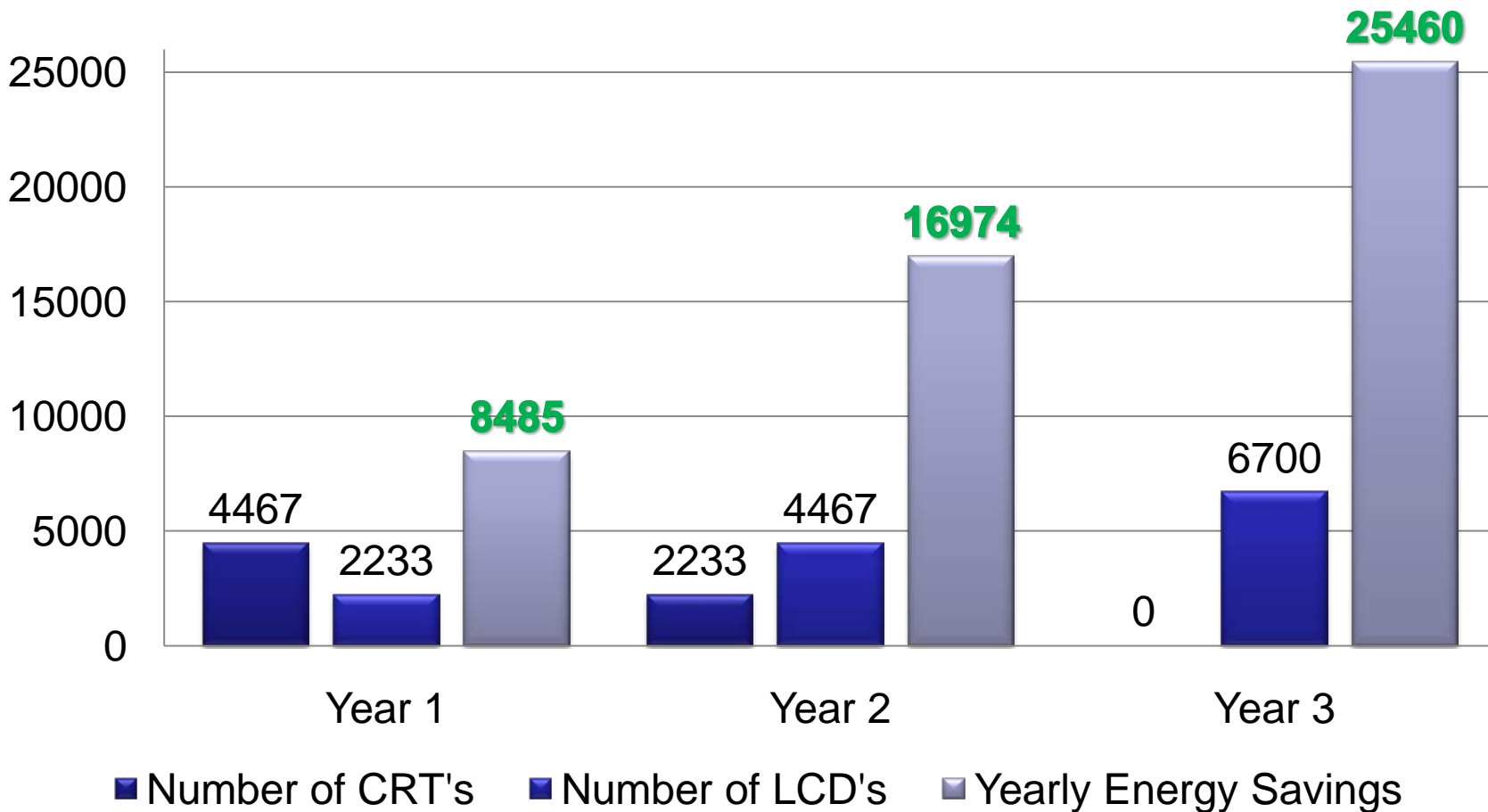
Judson ISD's Numbers

- Had about 6,700 CRTs in 2006
- Estimated CRT energy cost per school year of \$60,300.00
- We replaced with much greener LCDs as part of a computer refresh over 3 years.
- Now our 6,700 monitor estimated annual energy costs is \$34,840.00, which is a savings of \$25,460, by utilizing LCD's.



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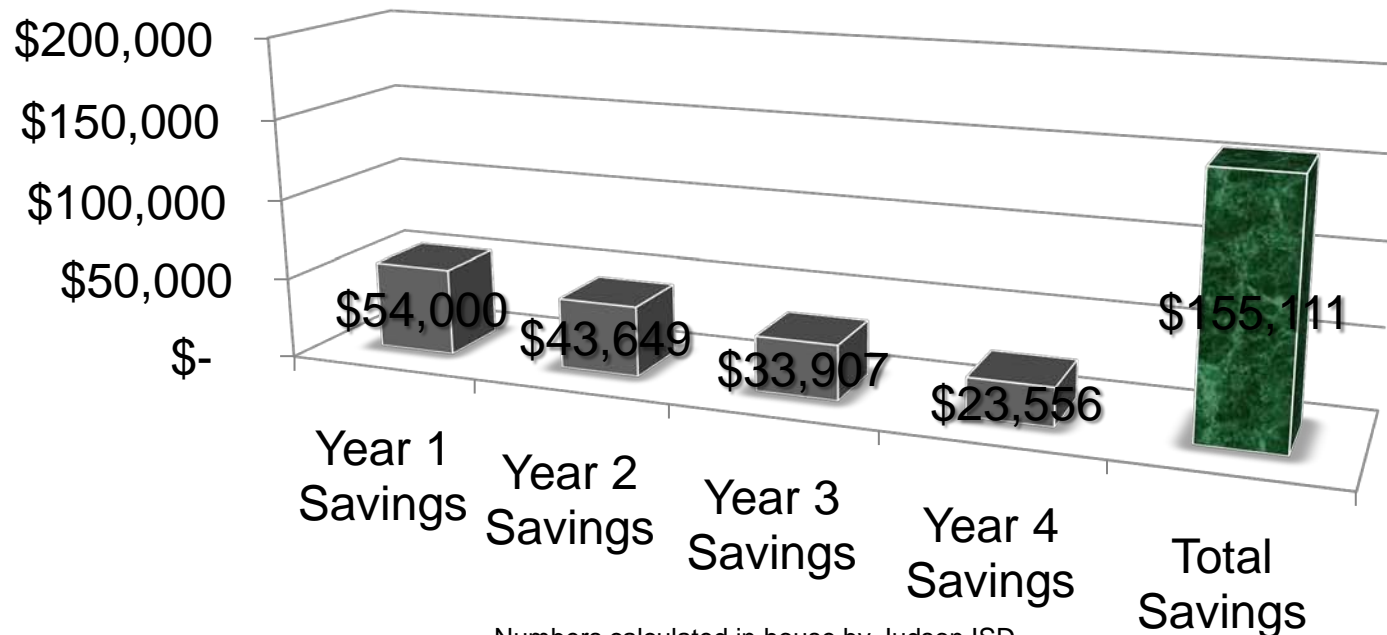
Judson ISD's Energy Savings from Using LCD Monitors (2007-2010)



Numbers calculated in house by Judson ISD

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- **Judson ISD started automated shutdown of school computers in 2007**
- **Numbers based on 25% of 4000 machines left on**
- **Over time savings are less as PC base becomes more green**
- **Savings are greater than chart shows – this chart assumed no growth in PC's but our count has grown 50%**
- **The bottom line is shutdown overnight!**
- **Investigate Windows 7 and other OS's advances power savings options for increased savings**



Numbers calculated in house by Judson ISD

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- **Go green(er) with a purpose in mind**
- **Calculate savings and TCO for large projects**
- **A project that makes sense for one organization, may not be right for another**
- **Sell your initiatives & successes – IT often does not excel at public relations**

• **Questions**

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