Pulse2011

Tivoli Endpoint Manager for Power Management Built on BigFix Technology

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PC Power Management

- Launched in 2006
- Millions of managed computers across hundreds of customers
- Alliances with industry-leading organizations
- 100+ rebate relationships with utilities

ENERGY STAR PARTNER

Pacific Gas and Electric Company

climate savers smart computing

the green grid

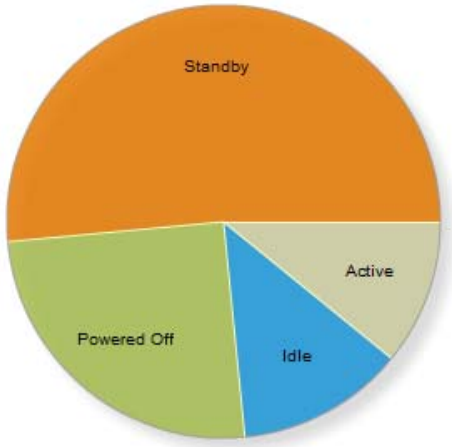
PC Power Management Complexities

- Users chronically disable power management
  - –According to the Lawrence Berkeley National Laboratory, over 80% of users disable their PCs power conservation settings within 90 days
- Computers in low power mode can't be updated so IT staff are reluctant to enable power management
- Central management of power settings is difficult

TEM Approach to PC Power Management

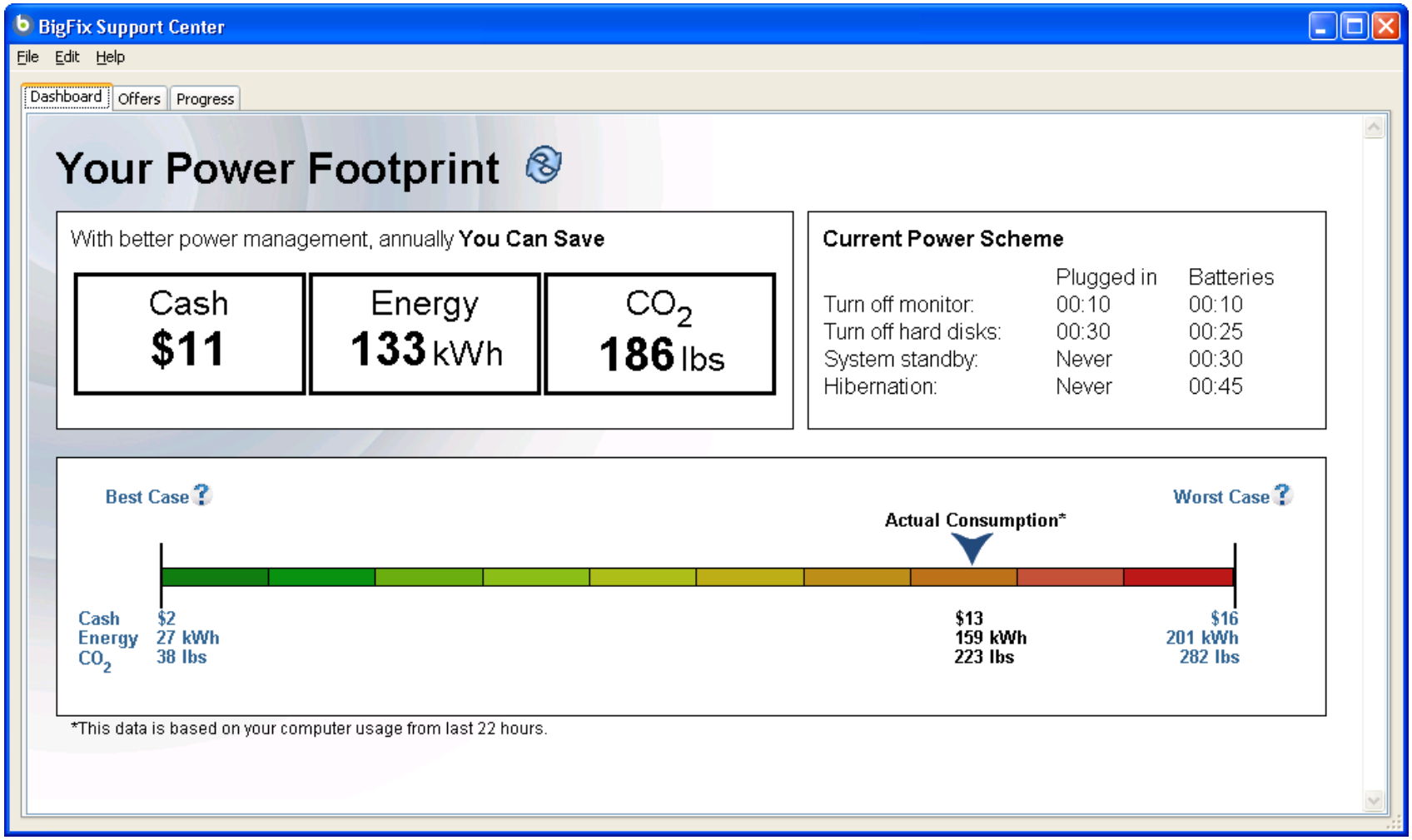
- **Fundamental idea is straightforward**
  - –Allow companies to apply computer power savings technologies while minimizing end-user and IT impact
- **Manage the complexities of power management**
  - –Granular controls to deal with OS issues
- **Simplicity of Reporting**
  - –Allow companies to measure their power savings potential
  - –Give simple metrics about performance
- **Results**
  - –Significant money savings
  - –Aligns with green initiatives

Key Functionality



- **Multiplatform**
  - –Covers both Windows and Mac
- **Granular tracking of computer and user behavior**
  - –Tracks time in active, idle, standby, and powered off states
- **Works within the culture of your organization to minimize end-user impact**
  - –Allow end-users to opt-in to power policies
  - –Client-side dashboards to increase buy-in and end-user engagement
  - –Save work in applications prior to shut down

Key Functionality: End-User Dashboard

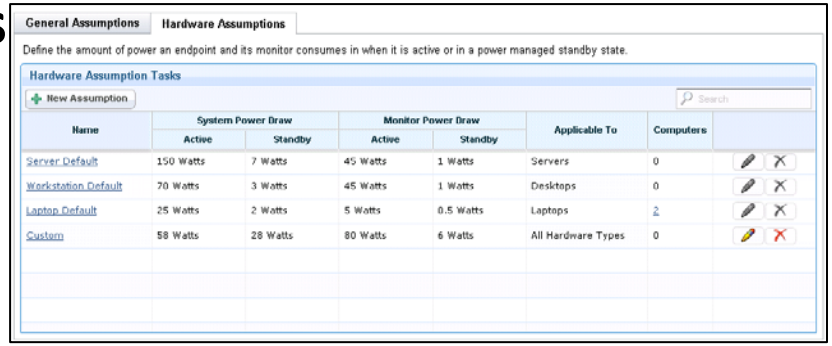


Key Functionality

- **Granular Control Over Power Profiles and States**
  - –Targets: Individuals, groups, buildings, hardware manufacturers, models, Active Directory OUs, and more
- **Utilities and APIs facilitate integration with existing IT solutions and processes**
  - –Command-line Wake-on-LAN utility, SOAP API, Platform API
- **Scales to today's network environment**
  - –Manages up to 250,000 devices on one server
  - –Excels in highly distributed environments
  - –Rapid installation and time-to-value

Overcoming Power Management Complexities in Practice

- **Cures PC Insomnia**
  - By intelligently measuring user idle time, overcomes issue where computers don't enter standby when they should
- **Enables IT Maintenance**
  - Scheduled Wake from Standby, Distributed Wake-on-LAN, and Last Man Standing
- **Accounts for Hardware Differences**
  - Override power and CO_2 assumptions by hardware profile, location, and monitor type for more accurate reporting



- **Sophisticated Wake-on-LAN technology that works in any network environment**

Customer Profile: Large Public School District

- 90,000 computers
- 370 distributed locations – schools and administrative sites
- Annual Savings: $4.2M, 42M kWh, 58M lbs CO_2

"BigFix Power Management has been easy to install, easy to operate, and very flexible. It's currently working exactly as we expected from the proof-of- concept."

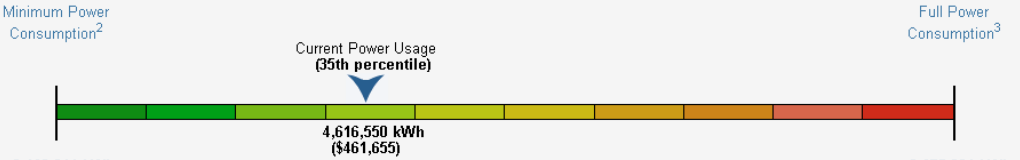
– Director of Network Systems

School System Power Usage - Before

Monthly Power Consumption

Work hours in a day: 9
Electricity Cost: .10 $/kWh
Display estimated power cost: ☑
Display Power Usage / Display CO_2 Emissions
Update

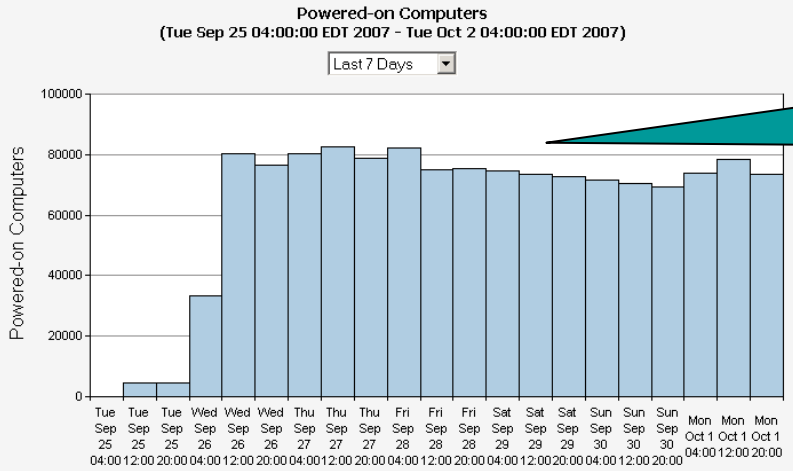
Computers with System Standby enabled: 13207 of 89513 - 14%
Monitors with Power Management enabled: 74764 of 89513 - 83%
Hard drives with Power Management enabled: 20627 of 89513 - 23%
Average computer powered-on time per day: 20:46:00 - (87% of a day)



Monthly Potential Power Savings[1]: 2,147,739 kWh : $214,774 (47%)

Additional Information

Aggregate Statistics



Computers left on at night and on weekends

School System Power Usage – After

Monthly Power Consumption

Work hours in a day: 9
Electricity Cost: .10 $/kWh
Display estimated power cost: ☑
Display Power Usage / Display CO_2 Emissions
Update

Computers with System Standby enabled: 13794 of 90497 - 15%
Monitors with Power Management enabled: 75833 of 90497 - 83%
Hard drives with Power Management enabled: 21475 of 90497 - 23%
Average computer powered-on time per day: 09:04:00 - (38% of a day)

Minimum Power Consumption[2]
Current Power Usage
(0th percentile)

Realizing Savings of 42 million kWh per year

Full Power Consumption[3]

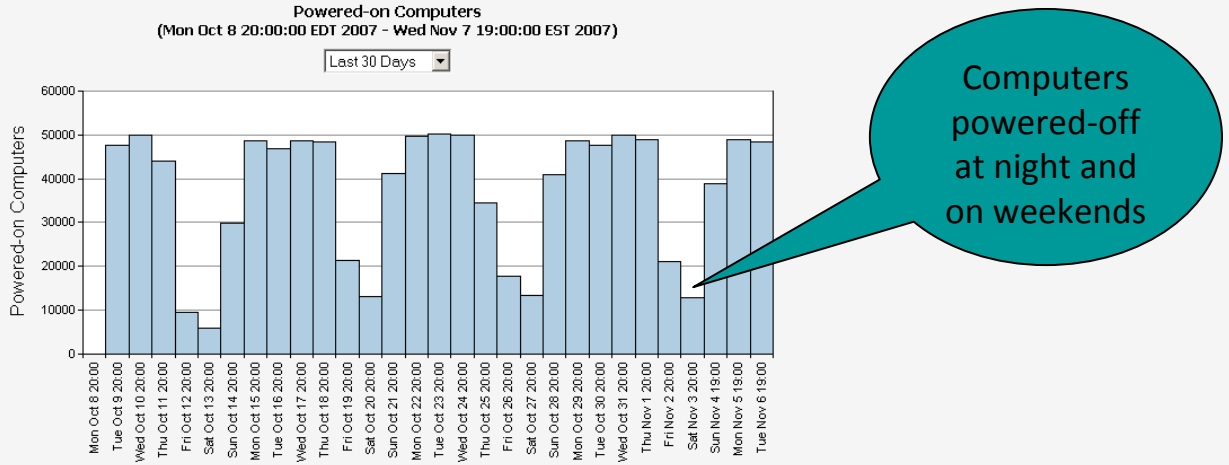
2,451,119 kWh
($245,112)
2,438,714 kWh
($243,871)

8,812,968 kWh
($881,297)

Monthly Potential Power Savings[1]: 12,405 kWh : $1,241 (1%)

⊞ Additional Information

Aggregate Statistics



Computers powered-off at night and on weekends

BigFix @ Stanford

- BigFix deployed in January 2004
- 40,000 computers
- Opt-in Power Management
- Security Patching – Windows and MAC
- Inventory
- Anti Malware
- Application Updates (Firefox, Java, Acrobat, etc.)
- Software deployment
- Managed Desktop Services (MDS)
- Laptop Recovery
- PGP Whole Disk Encryption
- …and more…..

Power Management

- **Stanford Opt-in Power Management Model**
  - IT Department deployment
  - End User deployment
  - Windows & MAC supported
  - Enforced or first time initial setting

- **Pacific Gas & Electric Rebate ~$70,000 May 2009**
  - Challenges
  - Competition
  - Rebates back to Depts.

Power Management – Console Operator

Description

WINDOWS and MAC

This task manages the participation level and settings of Windows and MAC computers in the Sustainable Stanford power management prog
Vista, Windows 7 and MAC 10.4+ computers are eligible for participation.

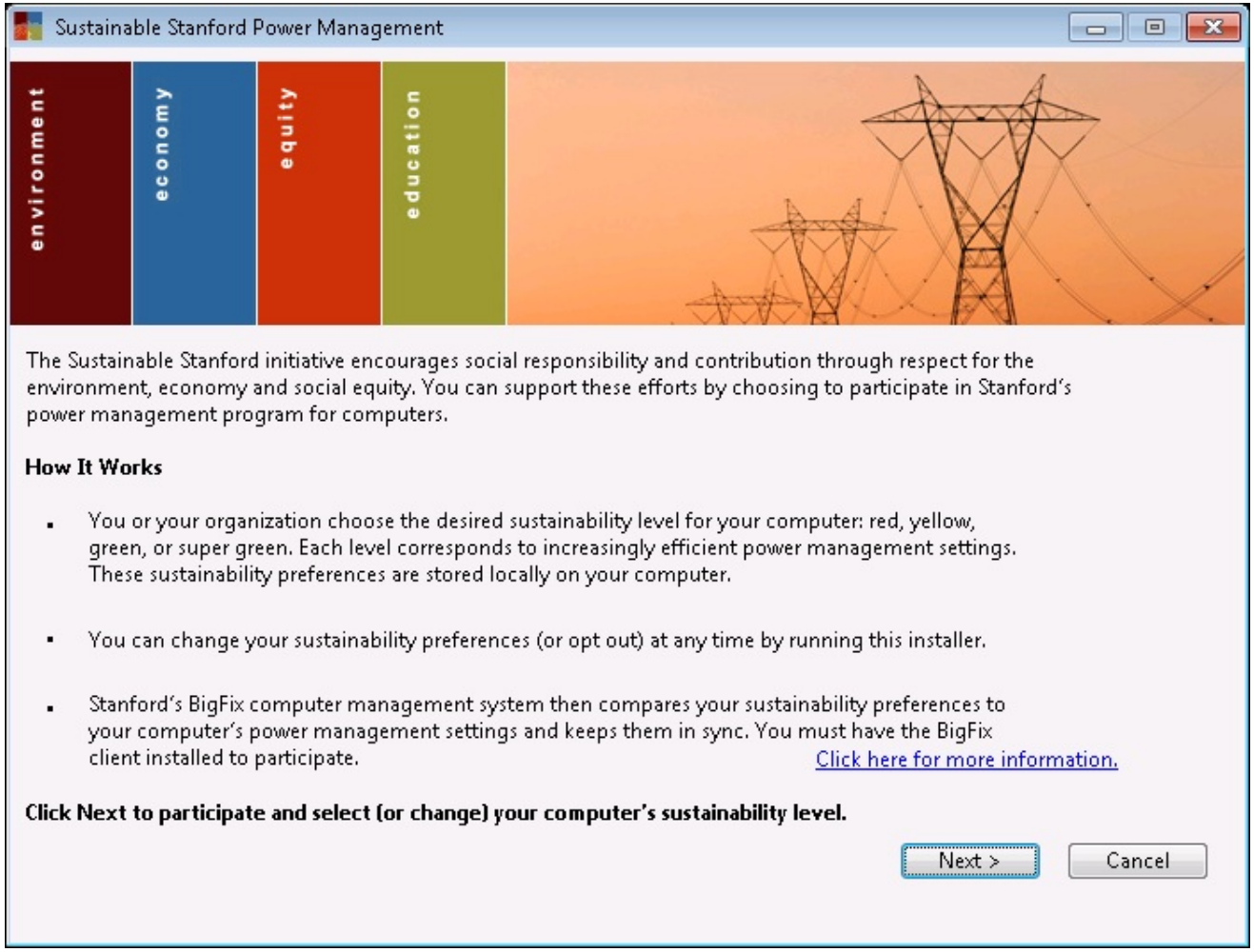
Each of Stanford's sustainability levels corresponds to a Stanford power scheme and associated power management settings, presented in t
Control Panel or System Preferences - Energy Saver on MAC. Settings include monitor power down, standby/sleep. Each setting has two v
battery power. The DC battery power values are only applicable to laptops (and rarely, computers with UPS configurations in Windows).

Sustainability Levels & Corresponding Settings
(shown as *AC / DC*, merged when values are identical)

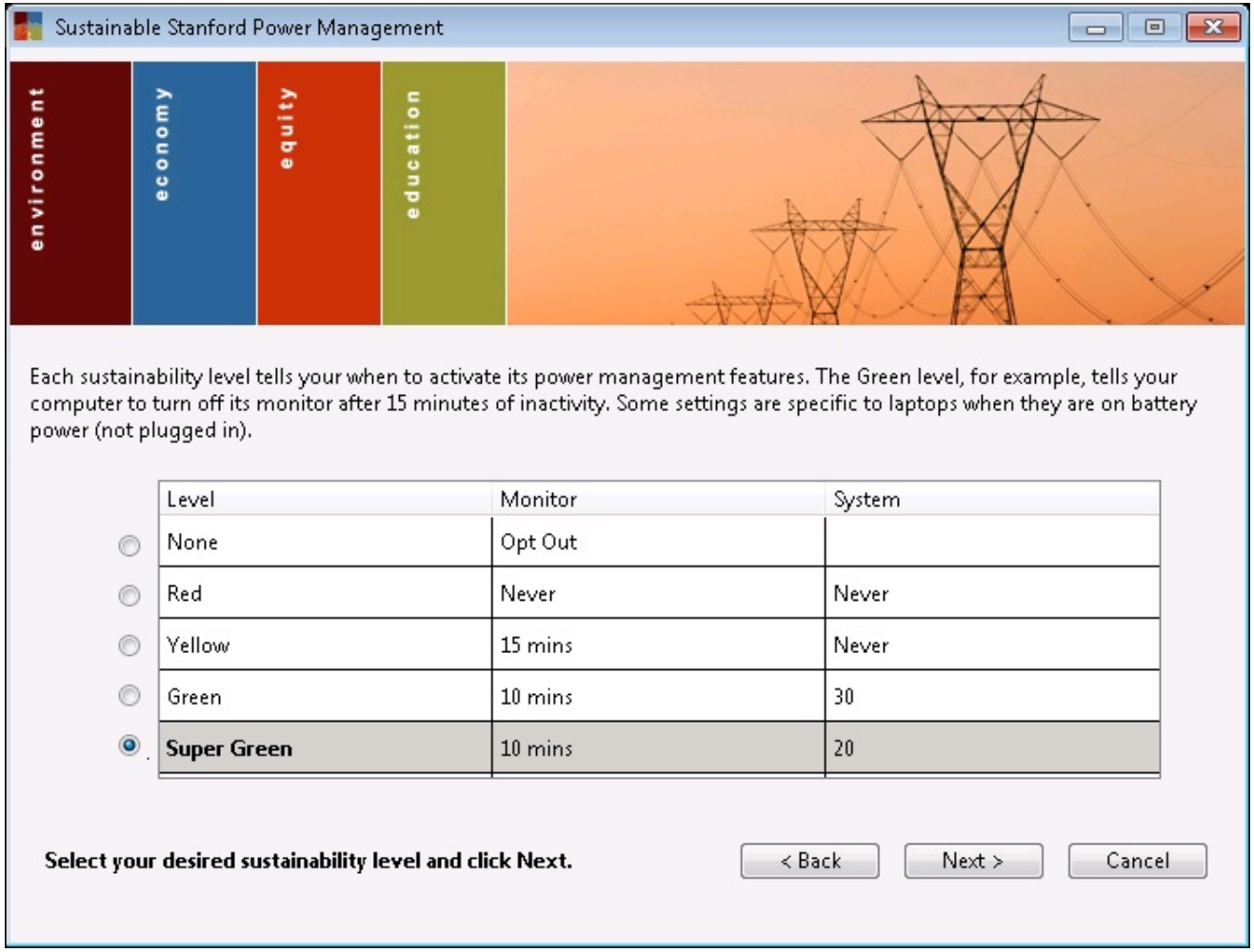
Level	Monitor	Standby
Super Green	10 / 5	20 / 10
Green	10 / 5	30 / 20
Yellow	15 / 10	never / 30
Red	never	never

Syncronization

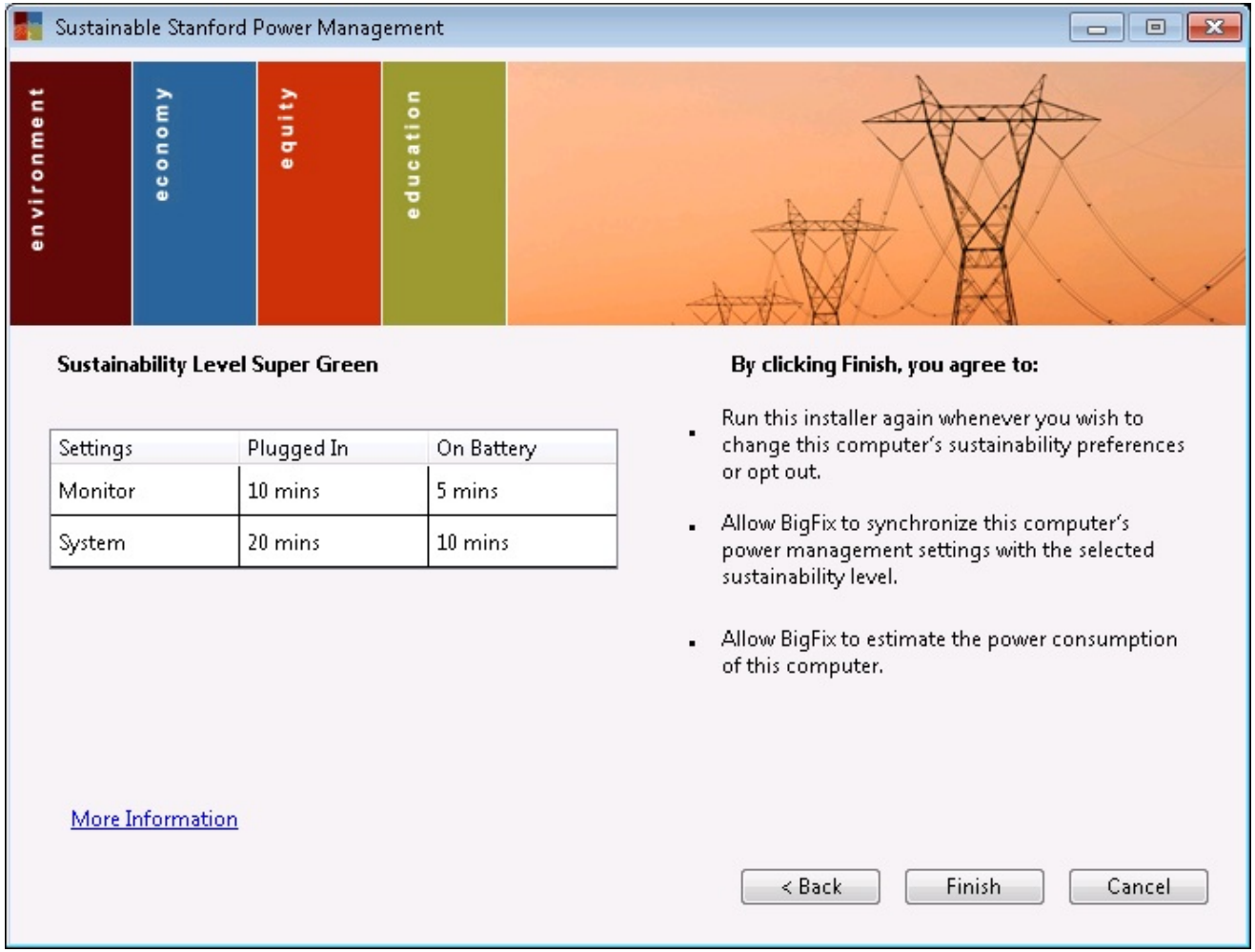
Power Management – End User



Power Management – End User



Power Management – End User



About Penn State

- 94,301 Students
- 24,156 Full-Time Employees
- 24 Campuses

- Decentralized IT Model
  - IT at Penn State: ~1,200 staff
  - Central IT: Information Technology Services (ITS)
    549 staff to support university wide services
  - Distributed IT: Dozens of areas consisting of ~650 staff to support each area's local needs
- 20,000 BigFix-managed computers

Energy Costs @ Penn State

- Utility costs are paid centrally for non-cost recovered areas
- In 2007, PSU set a goal to lower Green House Gas emissions by 17.5% by 2012
- In 2009, University Park's power rate doubled!
- Budget Cuts
  - All university budgets reduced by 2%
  - UP energy budget reduced by an additional $1.5M
  - Campus energy budget reduced by an additional $375k

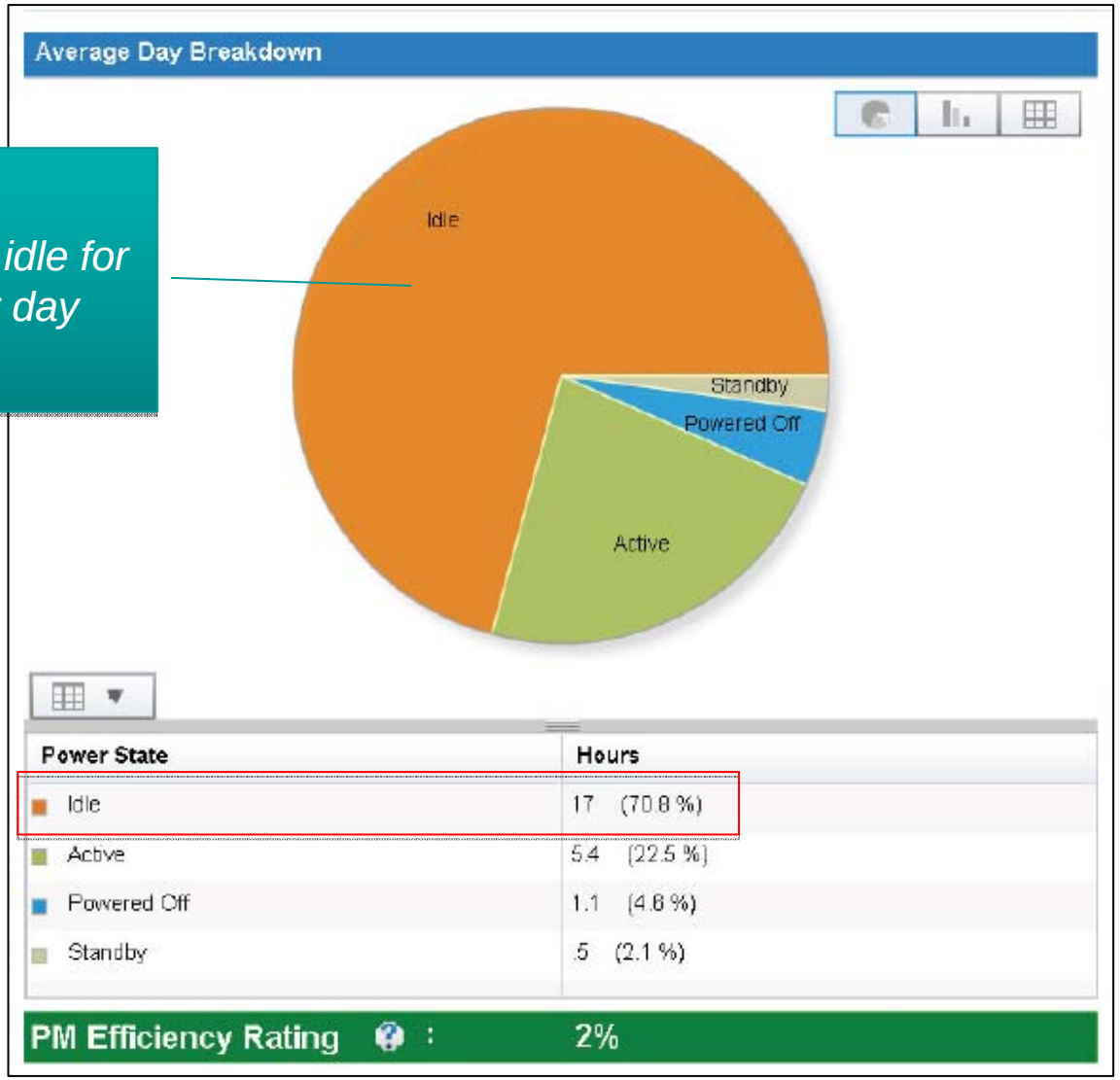
“Idle computers don’t waste *that much* power.”

- IT staff didn’t know how much power a computer consumed nor the associated costs
- Few would consider putting their computers to sleep without a good reason, because it would make patching harder
- When in doubt...
  - Measure the amount of power consumed by your hardware in its different power states
  - Do the math and calculate the potential cost savings
  - Share the results and educate IT Administrators
  - Eat your own dog food

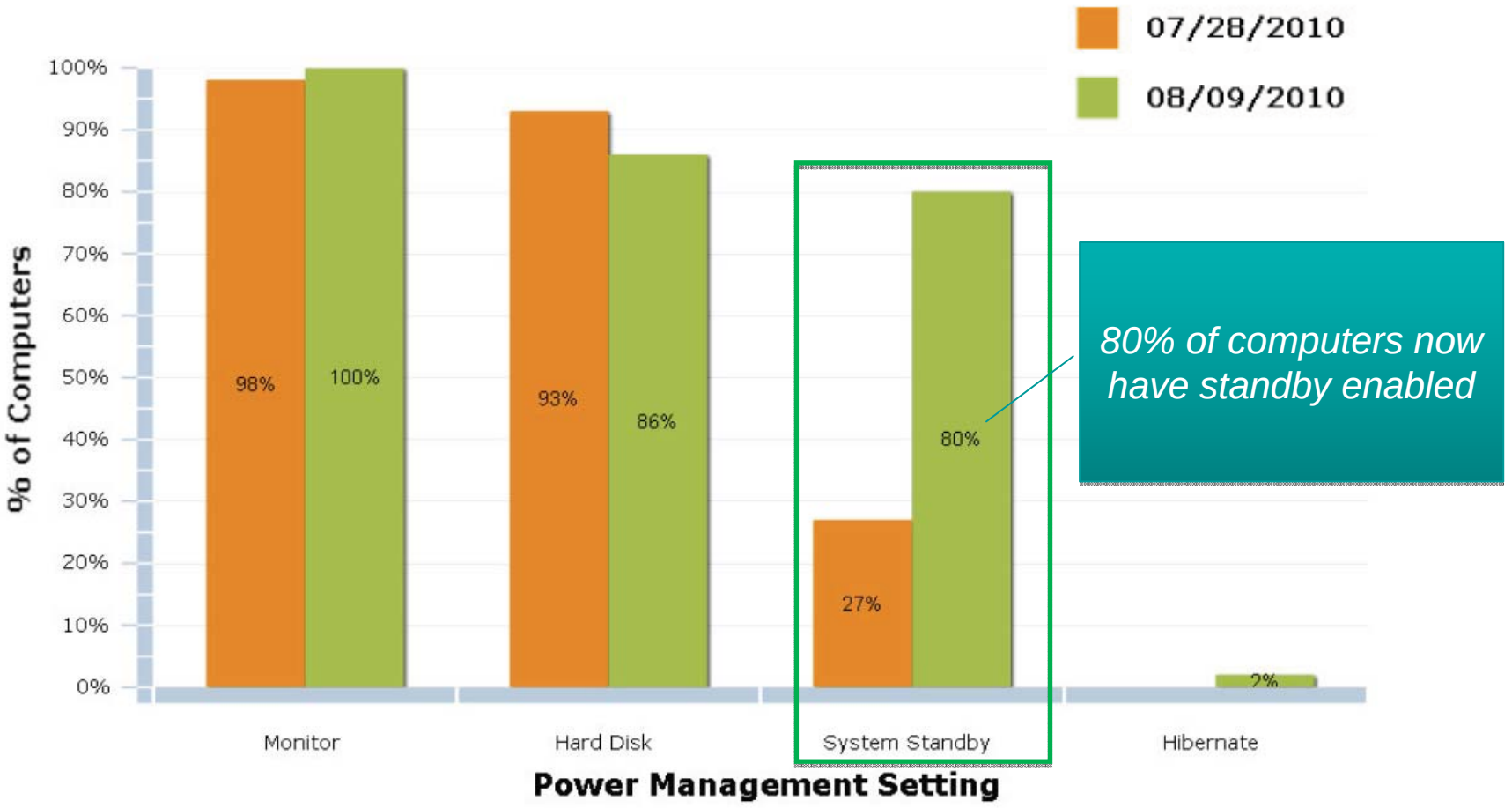
Sample Reports

Computer Power State Behavior

Computers are idle for 17 hours per day



Power Management Settings Over Time



Power Consumption Summary

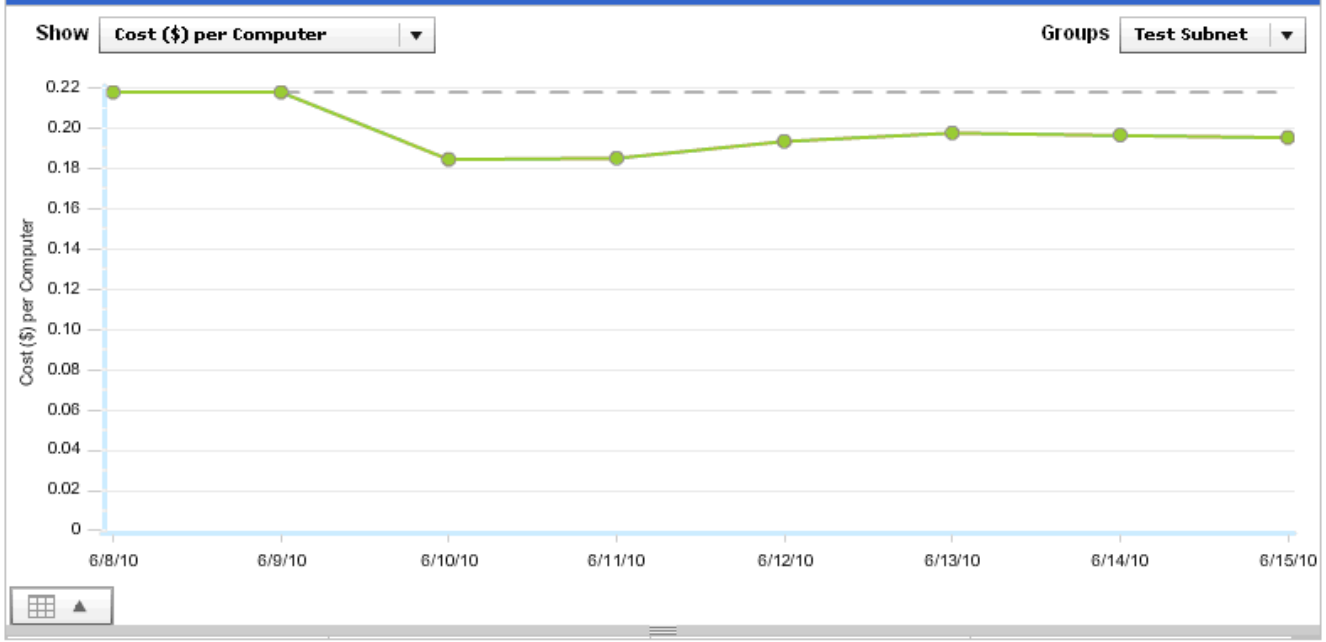
Power Consumption Over Time

Store | Export to PDF

Report Options:

Average Power Consumption data per computer over a period from 06/08/2010 to 06/15/2010, with savings compared to start date average on 06/08/2010 for Laptops, Desktops in the "Location By Subnet" grouping policy.

"Test Subnet" Detailed Cost ($) per Computer History

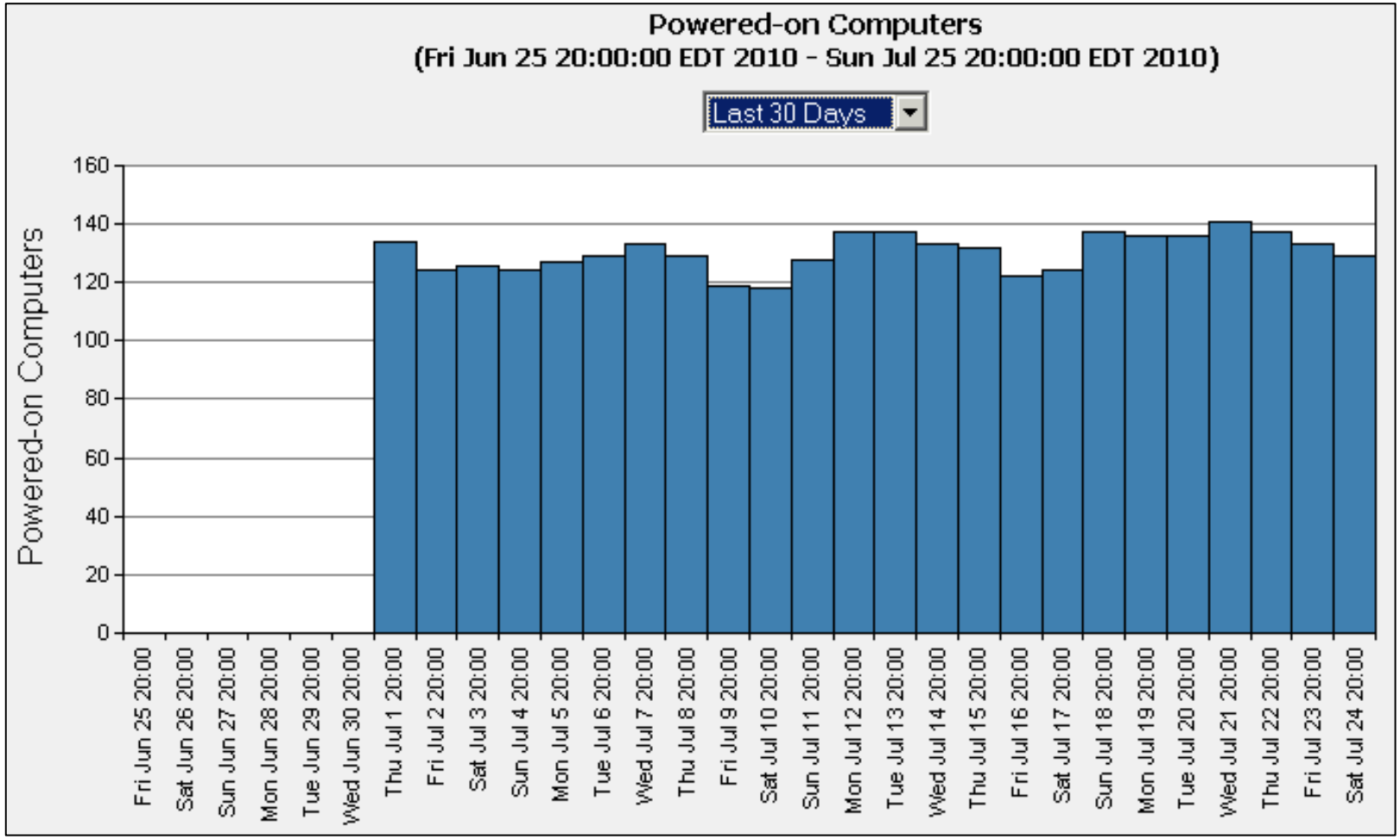


Average per Computer Consumption Over Period by Group

Groups	Total Consumption over Period			Savings Compared to Start Date		
	Cost	Power	Carbon	Cost	Power	Carbon
Test Subnet	$1.59	19.9 kWh	28 kg	$0.15	1.9 kWh	3 kg

Model Power Savings

Powered-On Behavior by Time of Day and Day of Week



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