

# FUPWG Fall Meeting '07

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**VERDIEM**

Power Management for PC Networks

## **Background**

- Scope of the Problem
- Organizational Roles and Responsibilities

## **Solution Options**

- Various approaches
- Key considerations and success factors

## **Measurement & Verification**

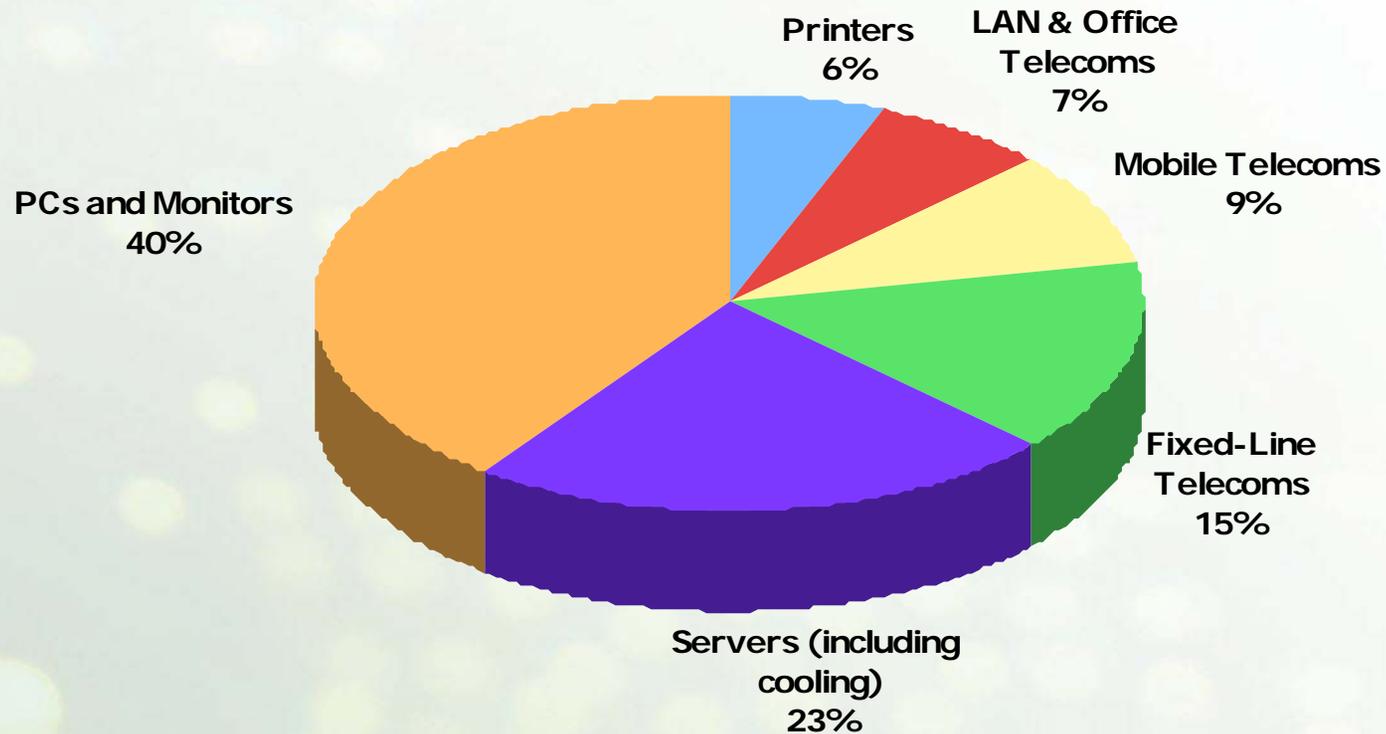
- Critical for UESC and ESPC projects
- Basis for Utility Incentive programs

## **Making it Happen**

- Scope of Savings
- Examples of Federal efforts to date
- Best approach with IT

## **Summary/Q&A**

## Estimated Distribution of Global Carbon Dioxide Emissions From IT Devices



Source: Gartner Group (September 2007)

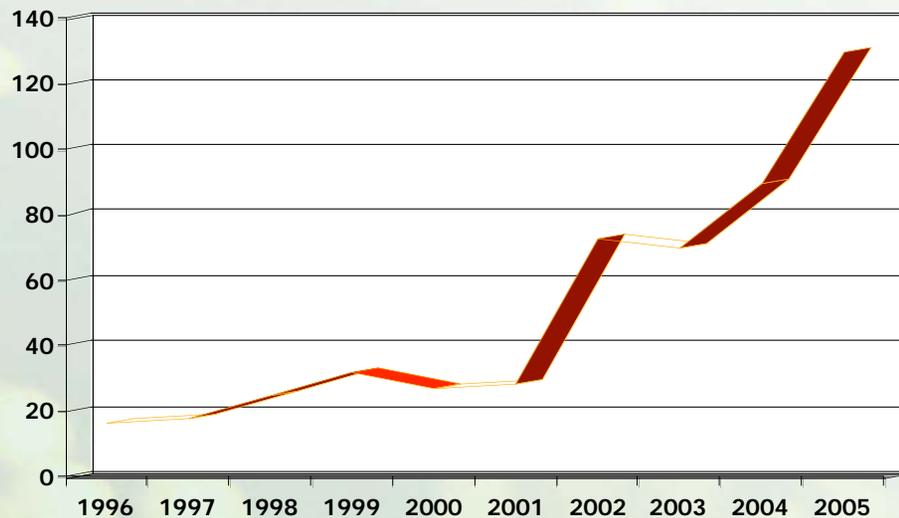
Publication Date: 07 September 2007

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# PC Energy Waste

- **Personal Computers and their monitors consume between 5% to 13% of all electricity consumed in an office environment**  
\_ US Department of Energy and Energy Information Administration
- **PCs and Monitors consumed over 36 terawatt-hours (TWh) in 2000**  
- 66% of that electricity is wasted - Arthur D. Little
- **Only about 6% of users enable power management functions on their PCs** - US Department of Energy

## CPU Energy Consumption



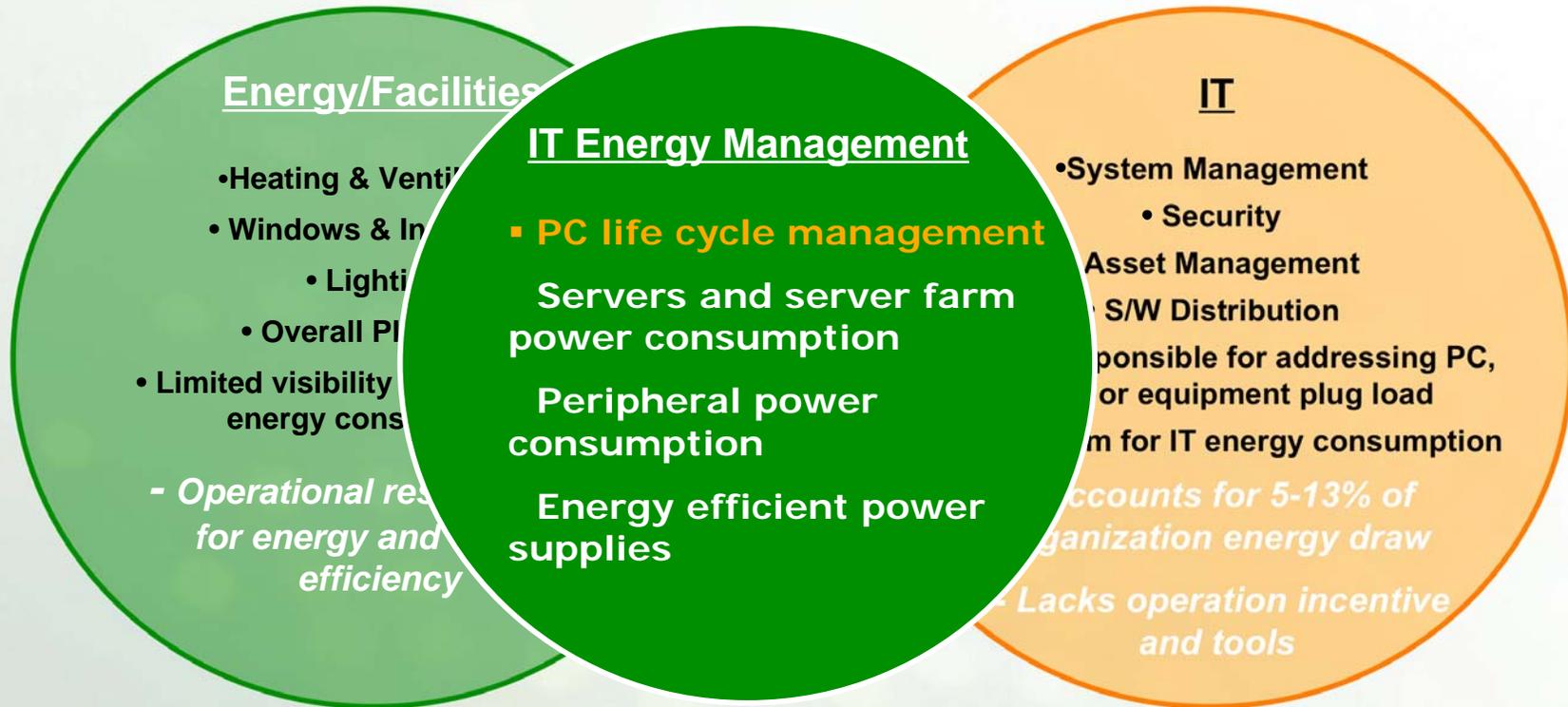
Tom's Hardware Guide, 2005

## Power Draw (watts)

	Active	Suspend / Standby	Off
Laptop	40.0	3.0	2.0
LCD Monitor (17 in.)	35.0	4.8	0.8

U.S. Department of Energy

# Who is Responsible?



# PC Power Management Approaches



**Most**

**NETWORK ENERGY MANAGEMENT SOLUTIONS**

**INTERNAL IT SOLUTIONS**

**MANUAL SOLUTIONS**

**OCCUPANCY SENSORS**

**BEHAVIOR MODIFICATION**

**Least**



**A defined network energy management solution provides operational balance, savings persistence, and true M&V**

## Balancing end-user and IT needs is critical to PC power management success and savings

### IT Productivity

PCs turned on for network updates and maintenance

### User Productivity

No disruptions



### Results

Cost savings

Energy savings

Greenhouse gas reductions

Federal – EO 13423, EPACK 2005, OMB Scorecard

- **Energy And Cost Analysis**

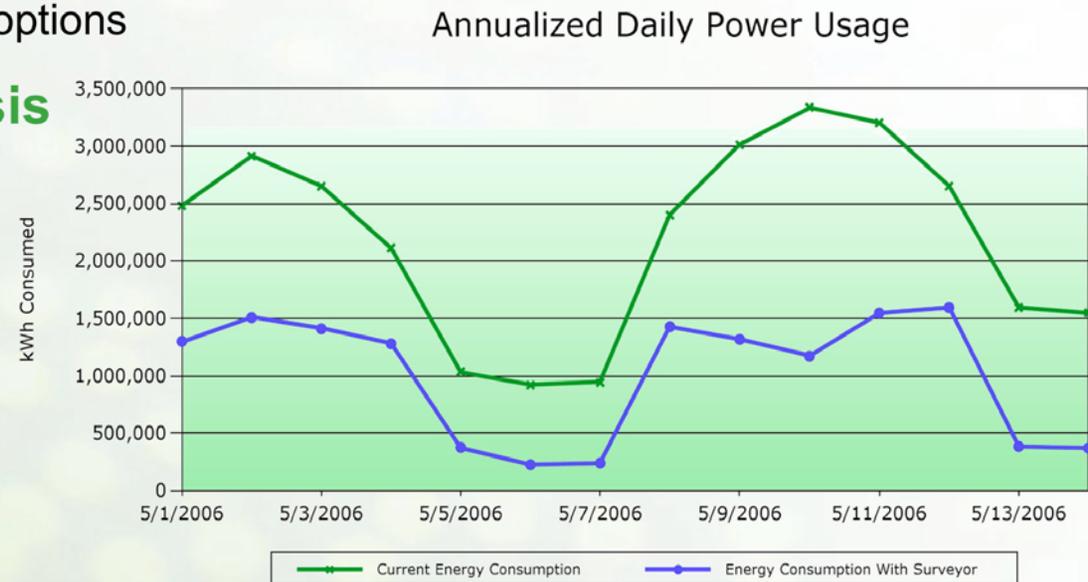
Built-in reporting measures energy use, validates the effectiveness of power profiles and gives "before-and-after" analysis – key for detailed energy study/audit baselines

- **Energy Use Forecasting**

Includes "simulation tool" that forecasts the energy-saving benefits of new power schemes and shutdown options

- **Ongoing Energy Analysis**

Collects power use data for PCs / monitors, including power state, time-in-state, power events and user activities or exception



Energy consumption is extrapolated to a population of 5,000 PCs based on actual measurements of 200 PCs.



## Actual vs. Simulated Power Consumption

### ABC Company

#### Summary of Annualized Energy Consumption Data

	Annual Per PC Average	All 2,888 PCs
Baseline Energy Consumption	611.1 kWh	1,764,930 kWh
Energy Consumption with Surveyor	279.47 kWh	807,105 kWh
Energy SAVINGS	331.66 kWh	957,824 kWh
Greenhouse Gas Emission REDUCTION	695.15 lbs	2,007,599 lbs
Energy REDUCTION %	54.3 %	

#### Summary of Annualized Energy Costs

	Annual Per PC Average	All 2,888 PCs
Current Energy Cost	\$ 42.78	\$ 123,545.07
Energy Cost with Surveyor	\$ 19.56	\$ 56,497.38
Cost SAVINGS	\$ 23.22	\$ 67,047.69
Cost SAVINGS %	54.3 %	

## Consider a 10,000 PC environment....

- **Typical demonstrated energy savings of 200 kWh/PC/yr**
- **At an average rate of \$.08/kWh - \$16/PC/yr**
- **Based on kWh rate & PC #s, typical ROI = 12-24 months**
- **In this example, annual savings would be roughly \$160,000 with sub-18 month ROI**
- **A typical deployment can be completed in 1-2 onsite days with 2-4 week total rollout scope**

## Examples of leading Federal environments already addressing PC energy waste:

- **Oak Ridge National Labs (DOE)**
  - Live deployment kick-off for 5,000 PCs
  - >330 kWh/PC/yr savings captured in prelim phase
- **National Institutes of Health (DHHS)**
  - Initial launch in ORS - >340kWh/PC/yr
  - UESC through Pepco Energy Services
- **NASA – MSFC**
  - 5,500 PCs in partnership with Lockheed Martin IT Services
- **DOD**
  - USAF memo issued in September '07 speaks to \$15MM savings
  - Defense Authorization Bill '08 calls for DOD-wide study

- **Leverage existing high-level relationships within the organization to bring a high level IT contact to the table**
- **Engage Verdiem prior to formal introduction of Surveyor to the IT department**
- **Stress that funds for project WILL NOT come from IT budget**
- **Stress that deployment and ongoing administration require limited IT resources**
- **Verdiem will directly address and escalate all IT concerns through the course of the dialogue and/or energy audit phase**

- **Significant savings opportunity:**
  - Typical demonstrated savings of 200 kWh/PC/yr
- **Rapid ROI:**
  - Typical ROI, even in low energy cost areas, of <24 months
- **Overall Project Impact**
  - Organizations can broaden their project's impact by addressing waste from an often overlooked source – the PC network
  - Rapid payback from PCs helps to underwrite longer term measures that might not have fit into the UESC or ESPC
- **Rapid deployment:**
  - Surveyor software requires no disruptive capital improvements
  - Deployment can be completed in 1<sup>st</sup> month

# Start the Conversation!

**“Network software that enables power management for networked office equipment has the greatest energy savings potential of all measures selected for study.”**

*Energy Consumption by Office and Telecommunications Equipment in Commercial Buildings, Volume II: Energy Savings Potential -- Arthur D. Little, US Dept. of Energy 12/04*

- **PC power management is well suited to Federal, State & Local organizations. Large number of PCs = large savings opportunity**
- **Consider partnering with your client or utility partner on existing projects (initial or follow-on phases) or as a stand-alone ECM**
- **Start a high-level dialogue internally to set a partnership between Facilities and IT, with a roadmap towards optimized IT efficiencies**

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**Q&A**