



Consumer Electronics: Global Harmonization Opportunities for Energy Savings

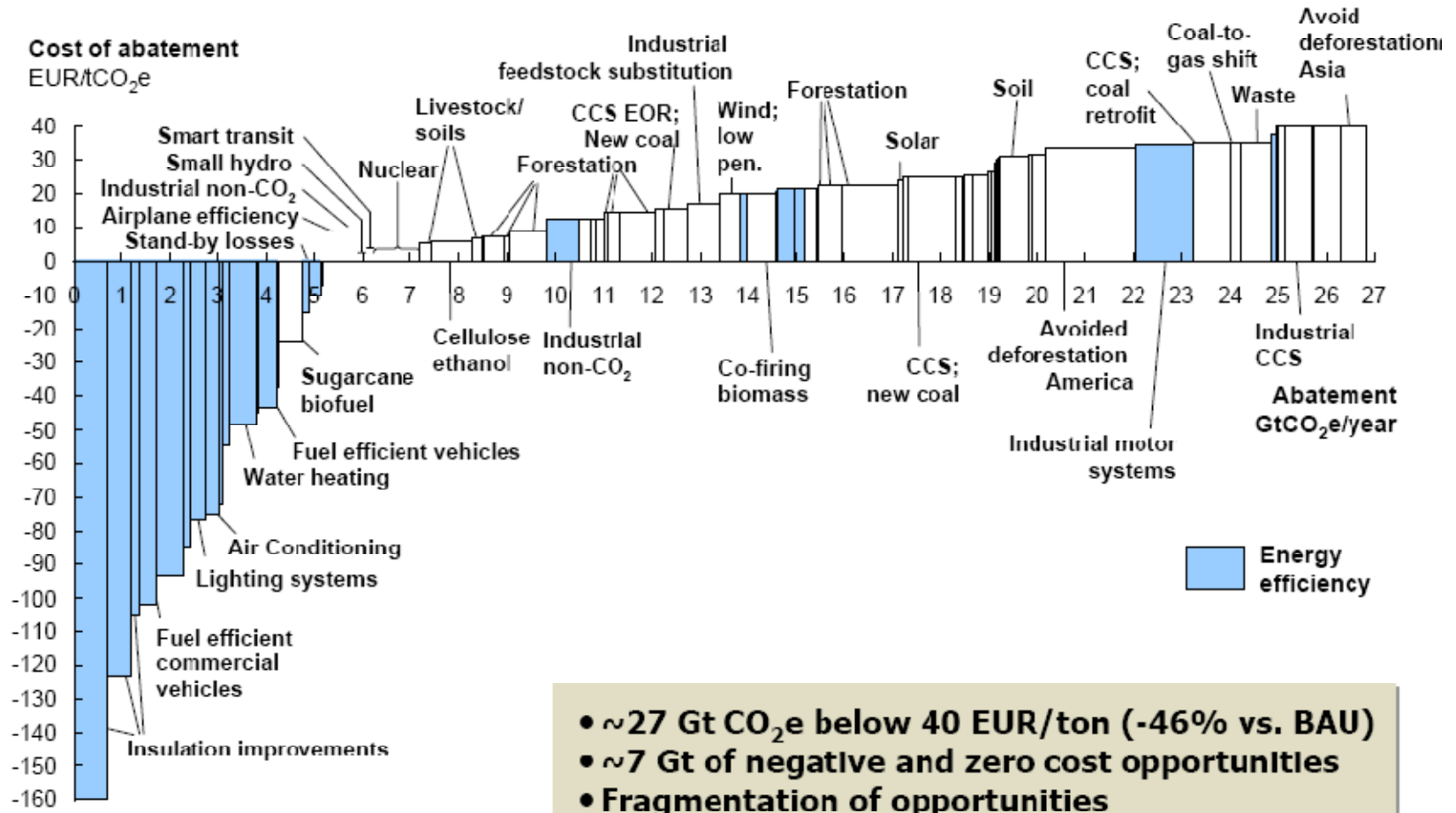
Chris Calwell
Vice President, Policy & Research



Presented at Global Product Efficiency 2008:
Brussels, Belgium
October 31, 2008

Design to Win Cost Summary

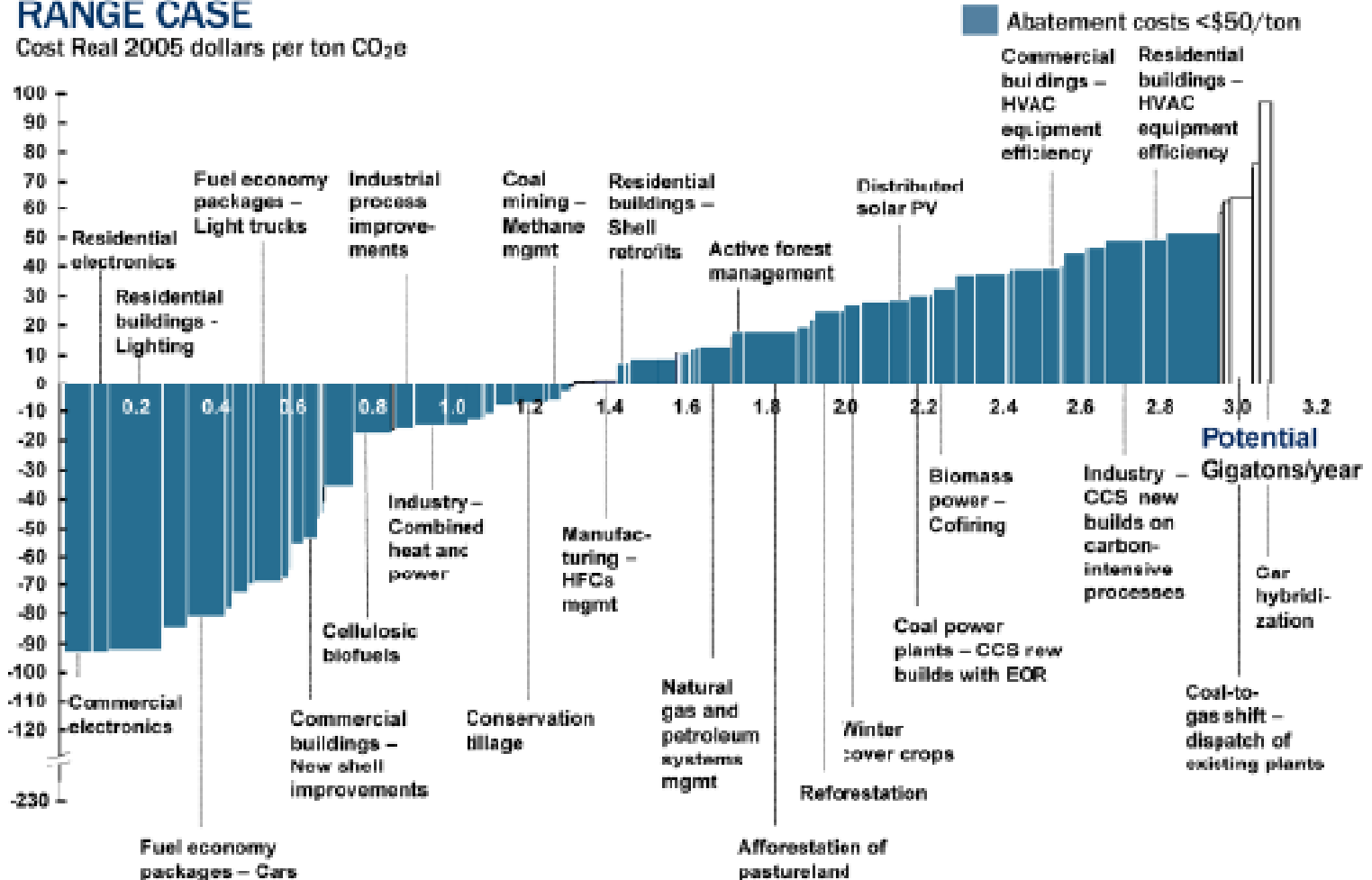
Global cost curve of GHG abatement opportunities in 2030




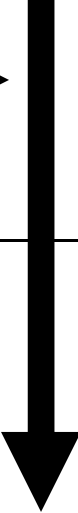

Detailed McKinsey Analysis for US

GHG REDUCTION OPPORTUNITIES WIDELY DISTRIBUTED - 2030 MID-RANGE CASE

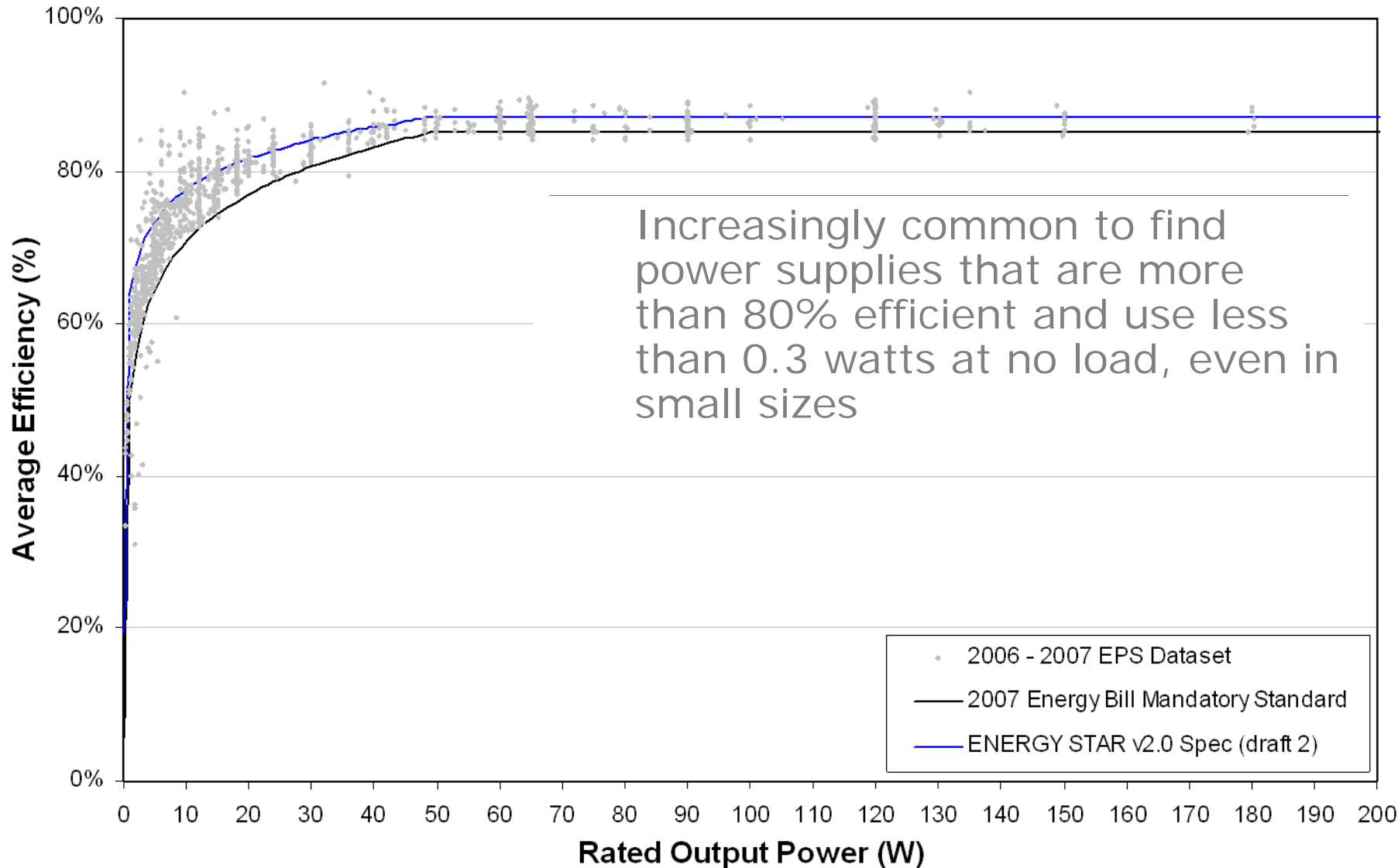
Cost Real 2005 dollars per ton CO₂e



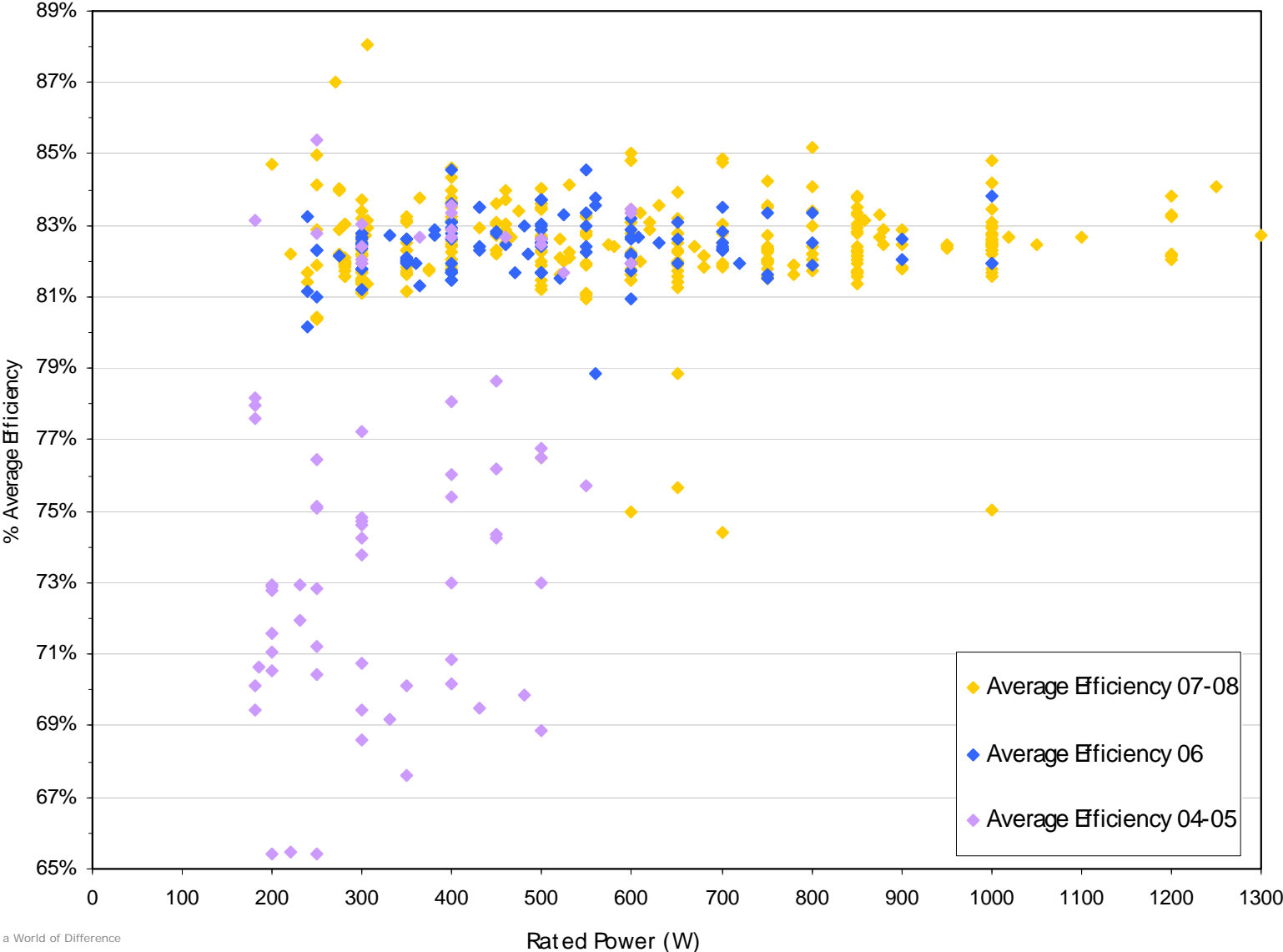
A Sequence to Addressing the Consumer Electronics Efficiency Problem

	No Battery Charger	Battery Charger
External Power Supply		
Internal Power Supply		

External Power Supply Efficiency Largely Addressed at this Point via MEPS and ENERGY STAR



Internal PC Power Supplies: Big Efficiency Gains from 80 PLUS, ENERGY STAR, and Climate Savers; Some Takeback with Bigger Power Supply Sizes



John is your typical metropolitan, young, cash-rich, technophile with a penchant for gadgets, music and the latest in technological innovation. He has no idea or care for the size of his energy bills and feels life is too short to 'turn things off'!

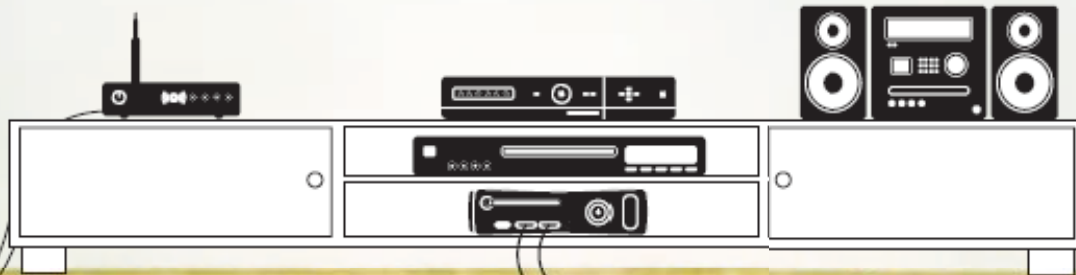


John the technophile

- Xbox
- 42" plasma TV
- 14" CRT in bedroom
- Sky +
- 2 Mobile phones - work and personal
- iPod
- DVD Home Theatre
- VCR
- Digital radio (kitchen and bedroom)
- Personal organiser
- PC & Monitor

Annual Cost

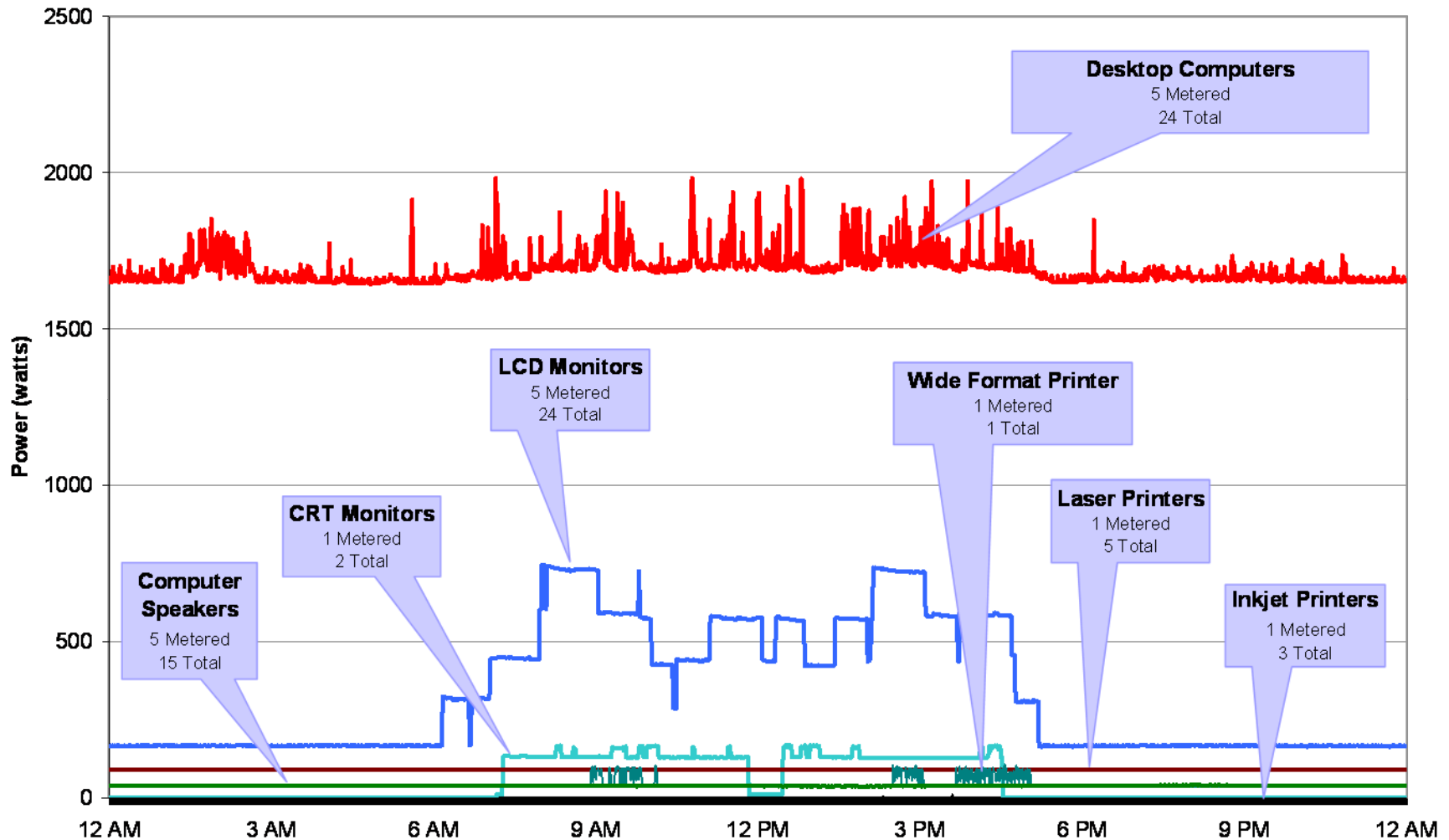
£14	Laptop	£9
£86.50	Printer	£10
£2	Fax/Scanner (MFD)	£7.50
£16.50	Broadband router	£11
£1	PC Speakers	£3
£0.50		
£8		
£11		
£9		
£0.50		
£29.50		
Total annual running cost: £219		



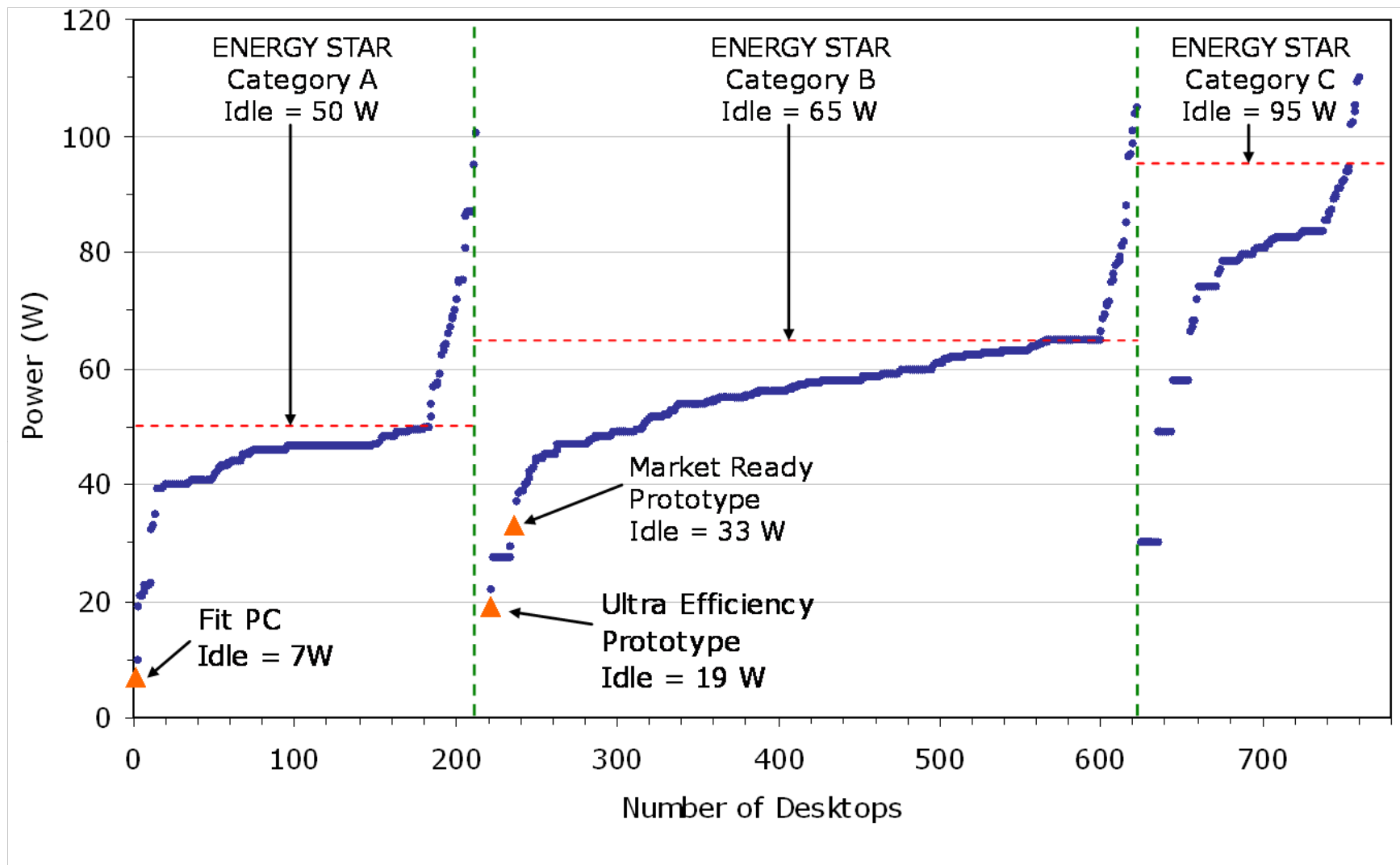
Source: *The ampere strikes back: How consumer electronics are taking over the world*, UK Energy Saving Trust, July 2007.

Commercial Field Monitoring Results – Sample Site

Wednesday, November 14th, 2007



Huge Savings Possible in Desktop Computers



Micro-Sized Desktops with Basic Functionality and Ultra-Low Power Use



Fit PC: 4 to 6 watts



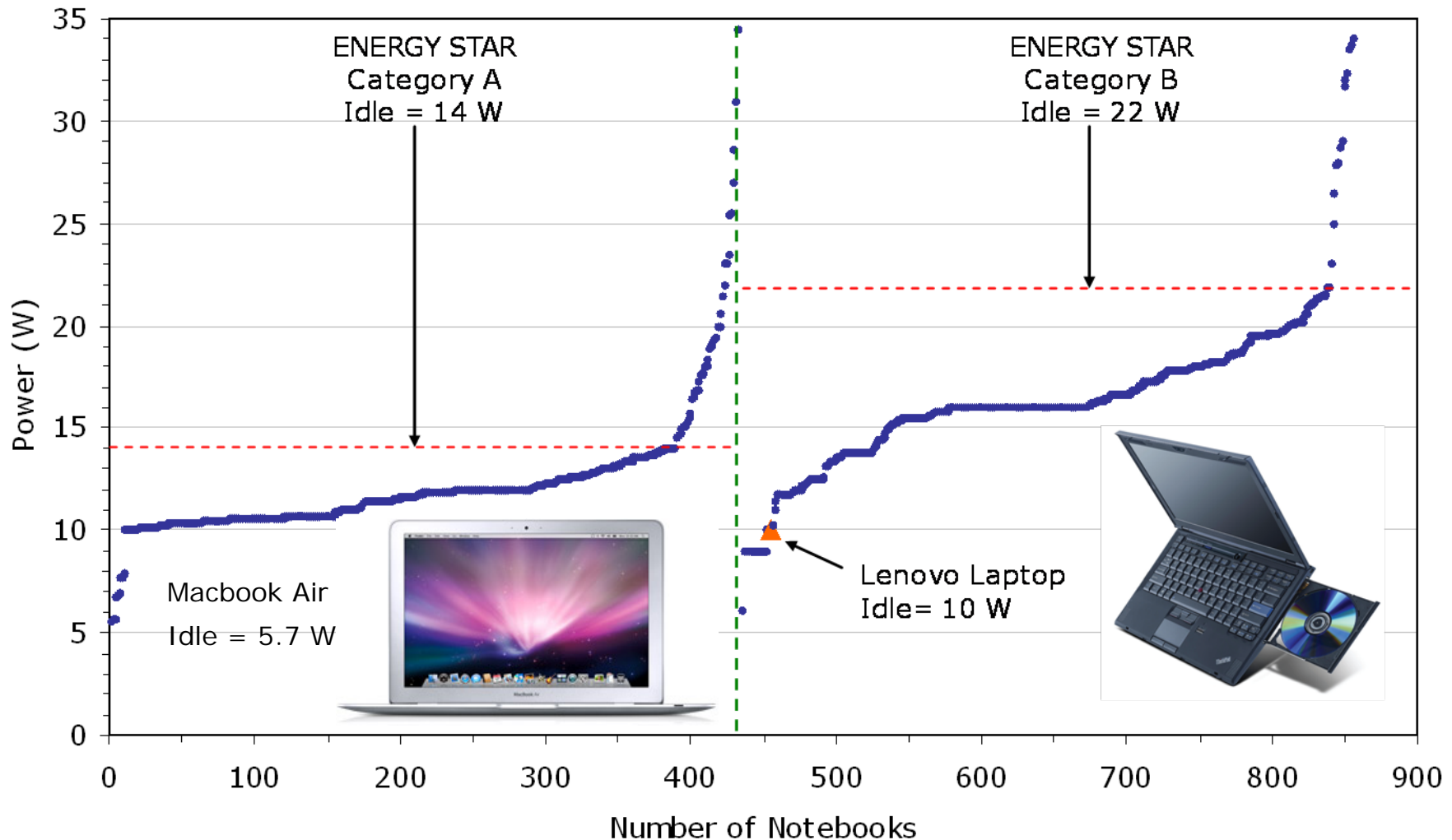
Aleutia E2: 8 to 11 watts (operating)

Aleutia Atom: 25 watts (operating)

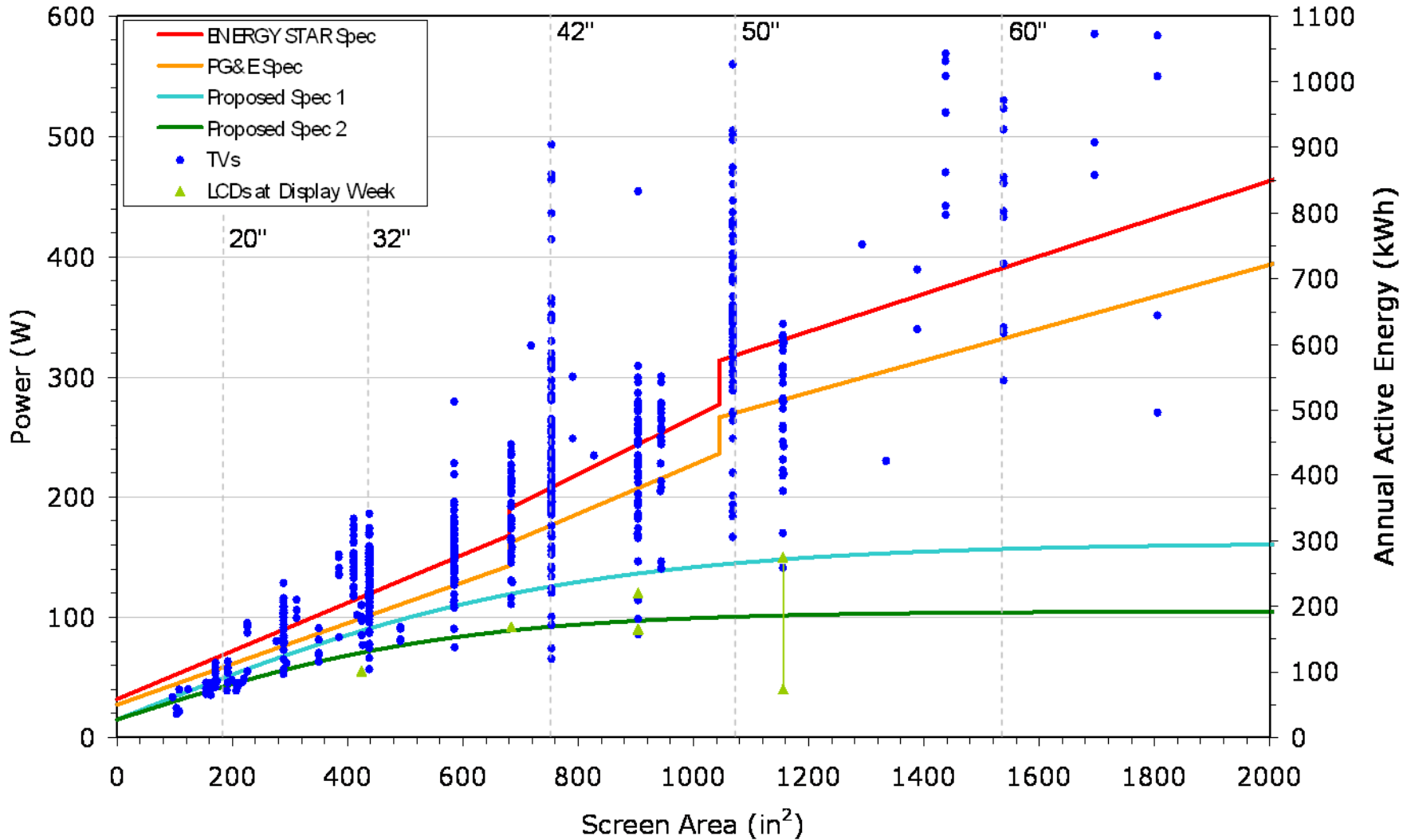


The Most Efficient Laptops Operate >60% Below ENERGY STAR Levels

Measured Notebook Idle Power and ENERGY STAR v.4.0 Specifications



Television Efficiency Specifications



The Most Efficient TVs Use 50 to 70% Less Power than the Pending ENERGY STAR Specification Allows



Samsung LN-46950A LED-backlit LCD: 100-120 watts



Luxeon LED



Samsung P400 LED projector: < 48 watts



Sony KDL-32JE1 LCD TV: 50-89 watts



XEL-1

Sony XEL-1 OLED: ~25 watts

Sony's Curved OLED Display Prototype: HD, 27 Inches, 0.3 mm(!) Thick

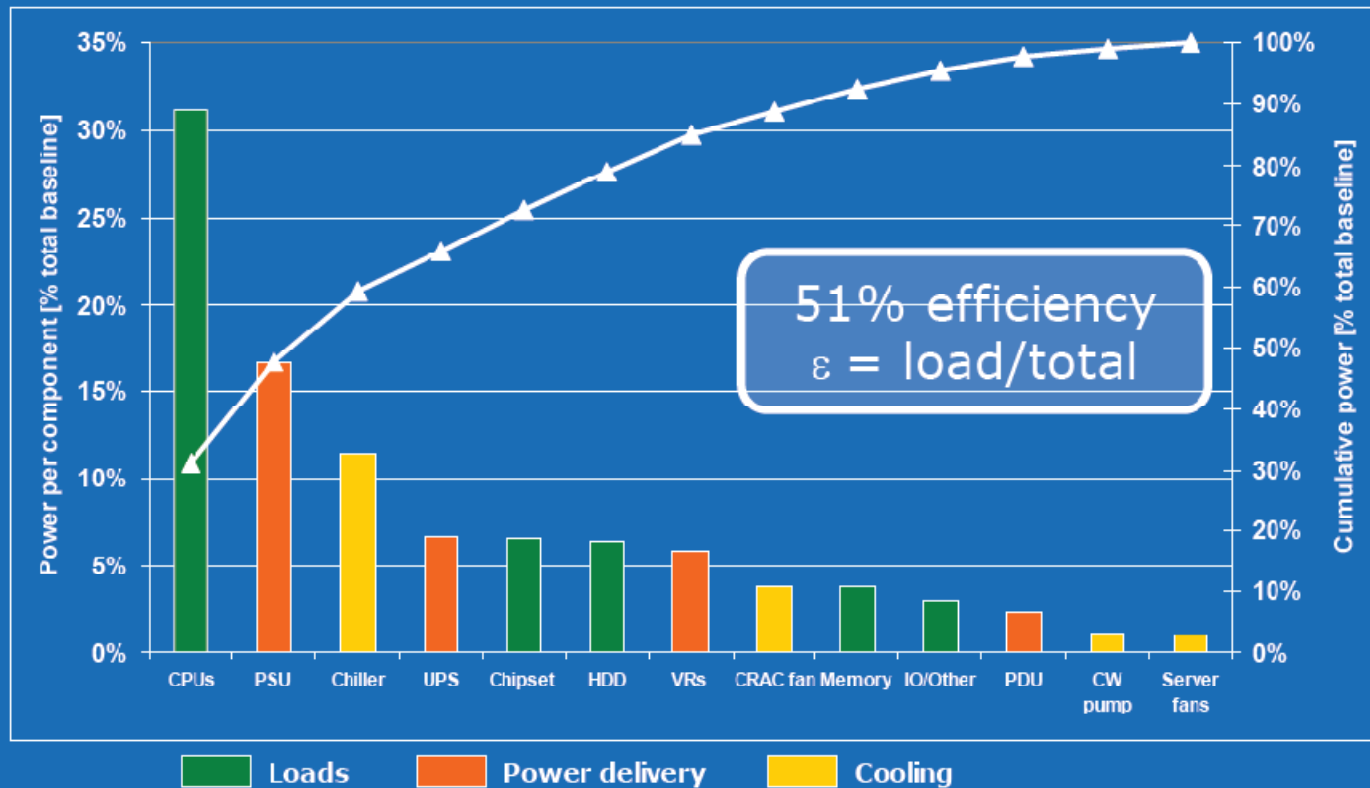


What's Needed Globally? A Consistent Philosophy of Efficiency

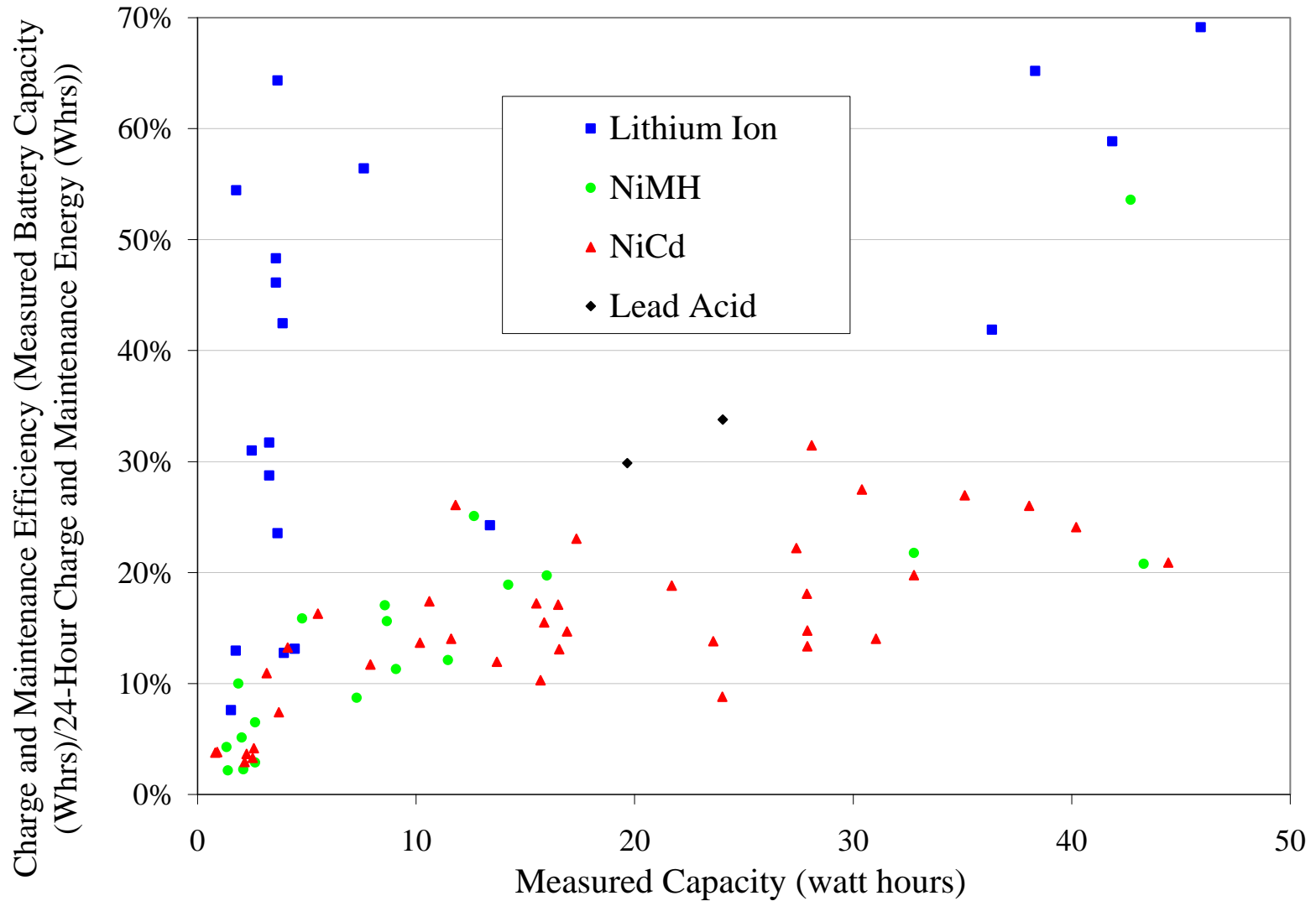
- ▶ Efficiency community began developing this at ACEEE Summer Study in 2006
- ▶ Further refinement over time with input from many U.S. and international stakeholders
- ▶ 7 key elements

1. Products should convert power efficiently

Server/Data Center power use – today



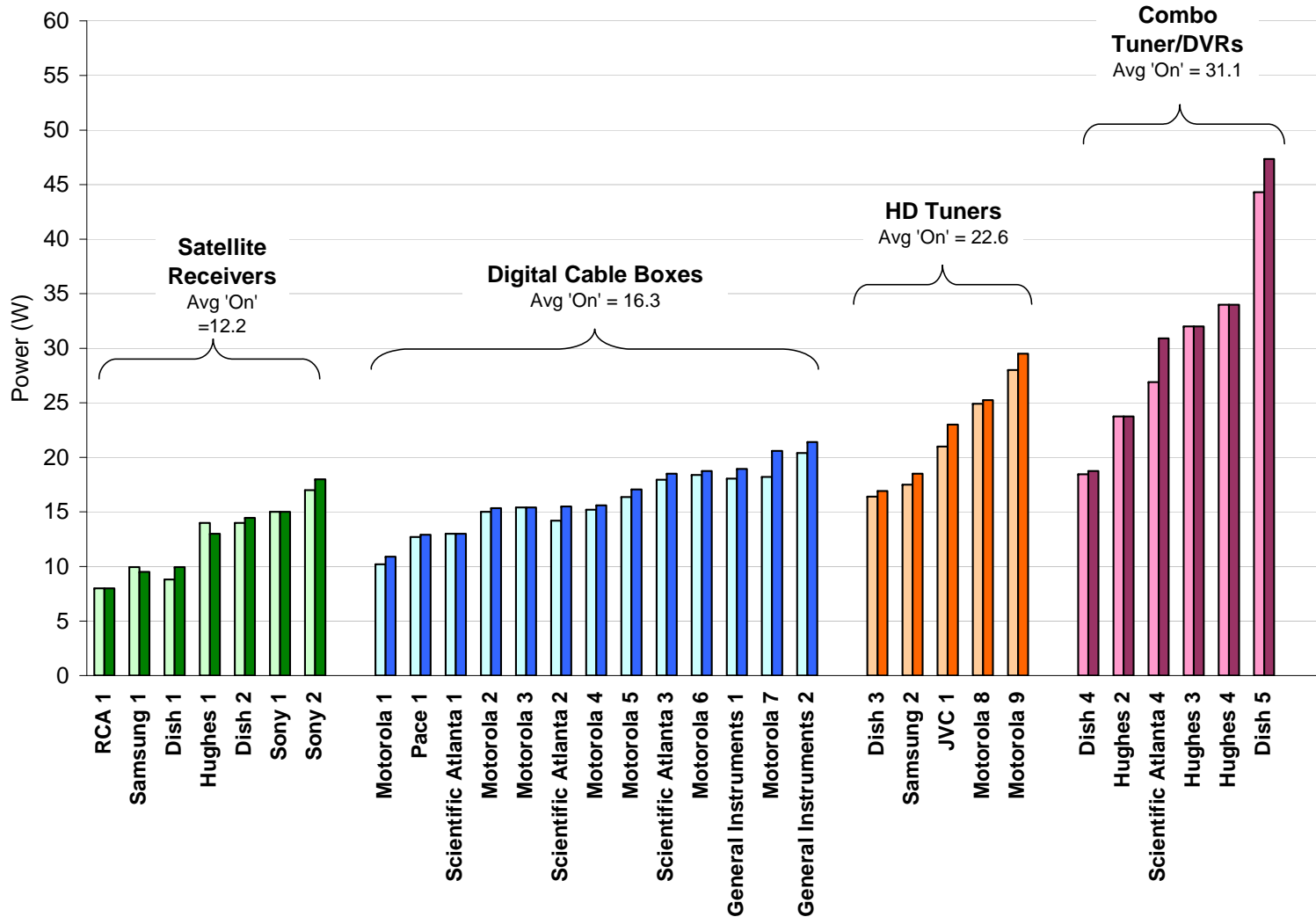
2. Products should store and retrieve energy efficiently



3. Products should closely match their power consumption to the level of service or function being performed

Power Use of Set Top Boxes When 'Off' and 'On'

Lighter color indicates 'Off' mode - Darker color indicates 'On' mode

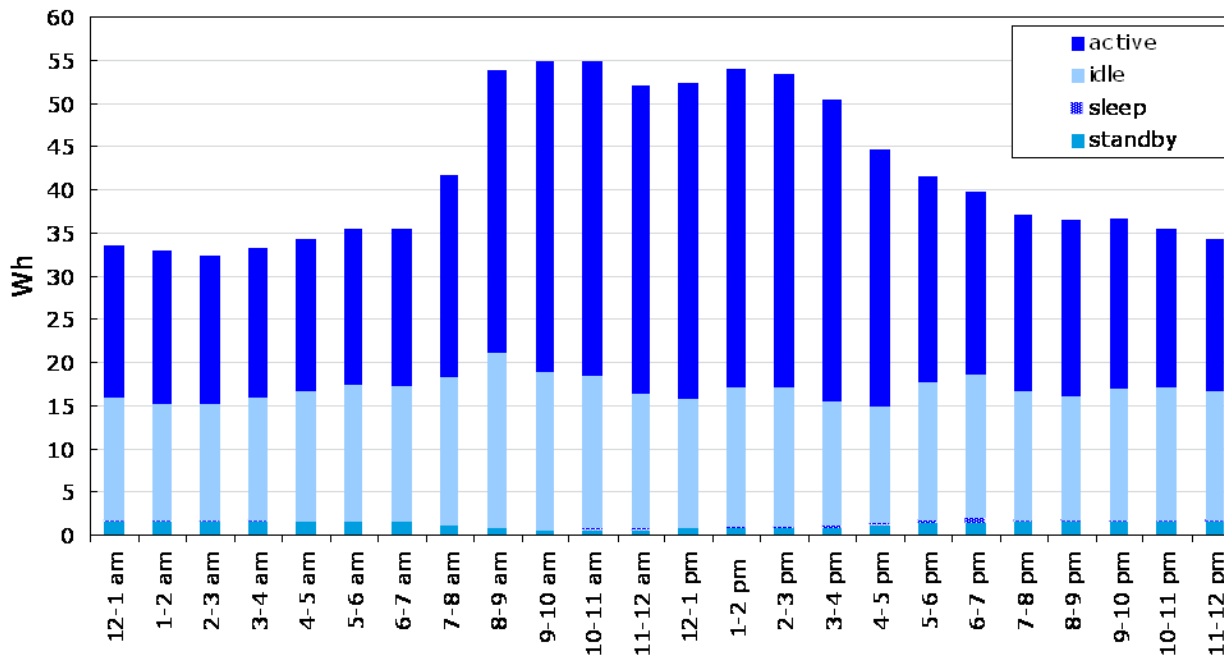


Two More Elements of Philosophy:

4. Devices should clearly and consistently communicate their operating state to users and other devices to which they are networked

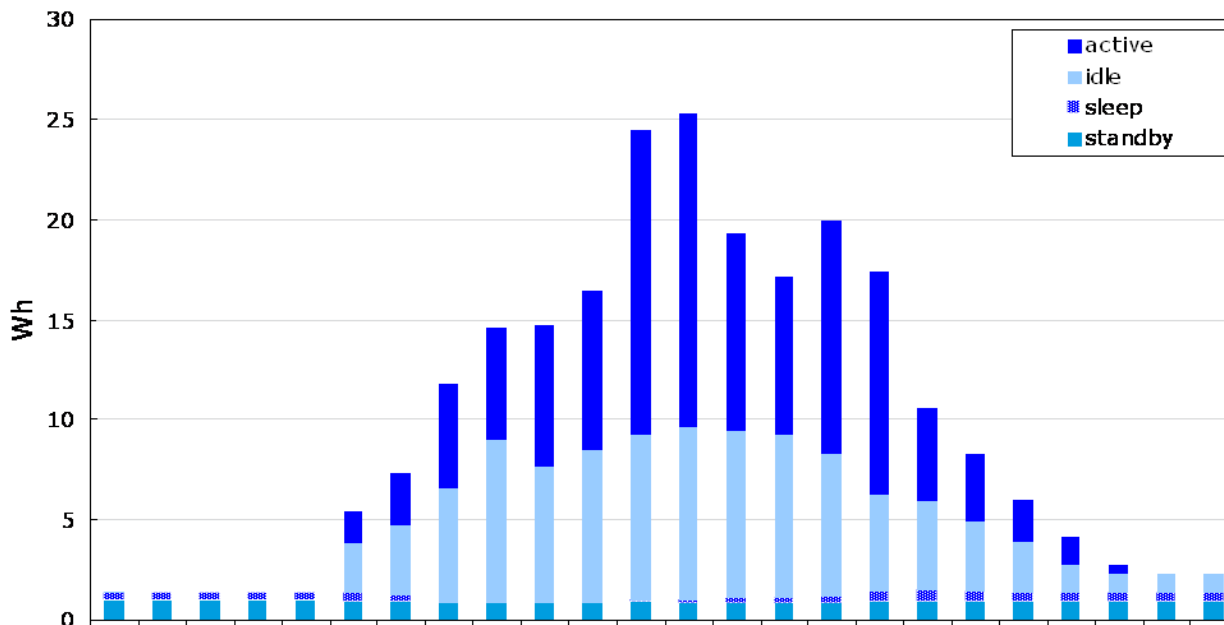
5. Products should be shipped with power-saving features enabled as the default

24 Hour Energy Usage of an Average Desktop Computer



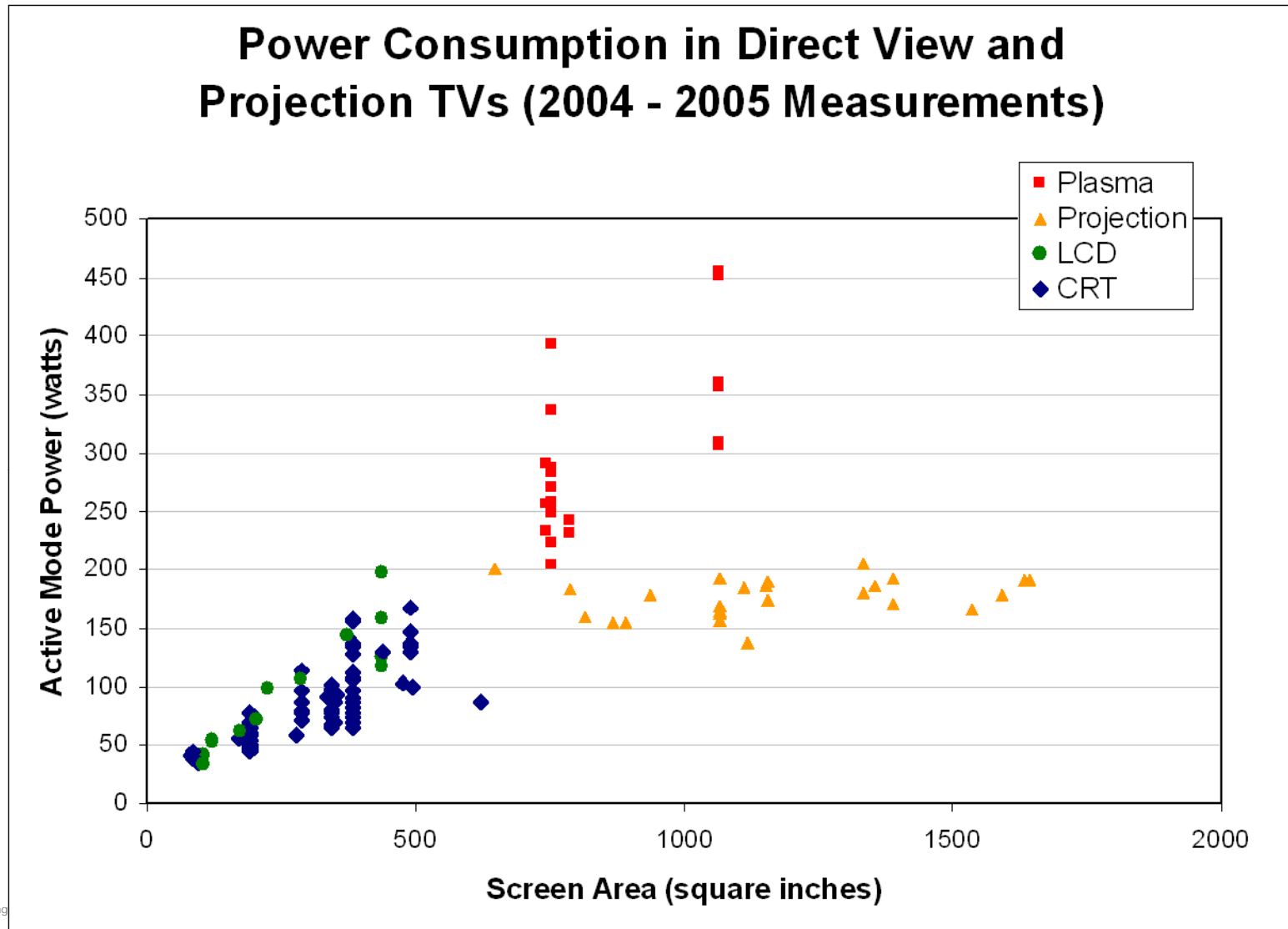
Very little use of sleep or standby seen in desktops; peak to off-peak power difference only 40%

24 Hour Energy Usage of an Average Notebook Computer



Power management or removal more common with laptops at night; peak to off-peak power difference of >90%

6. Manufacturers should test the power use of their products in their dominant modes of operation according to standard test procedures and disclose that information publicly



7. Product capability or performance should never be marketed or promoted by the manufacturer or retailer in terms of power consumed

GENERAL PURPOSE



reveal 60

clean, beautiful light™

Soft White Reveal



Enhanced Color Spectrum



light output: **630** lumens energy used: **60** watts life: **1000** hours contains: **4** bulbs(A19)

To save energy costs, find the bulbs with the light output you need, then choose the one with the lowest watt.

MAXIMUM-PERFORMANCE POWER SUPPLIES

▶ Turbo-Cool 1KW-SR
(max server power)
(max graphics power)

Ultimate Power!
1 Kilowatt Continuous

+12V@72A/78A
Single Rail Design!

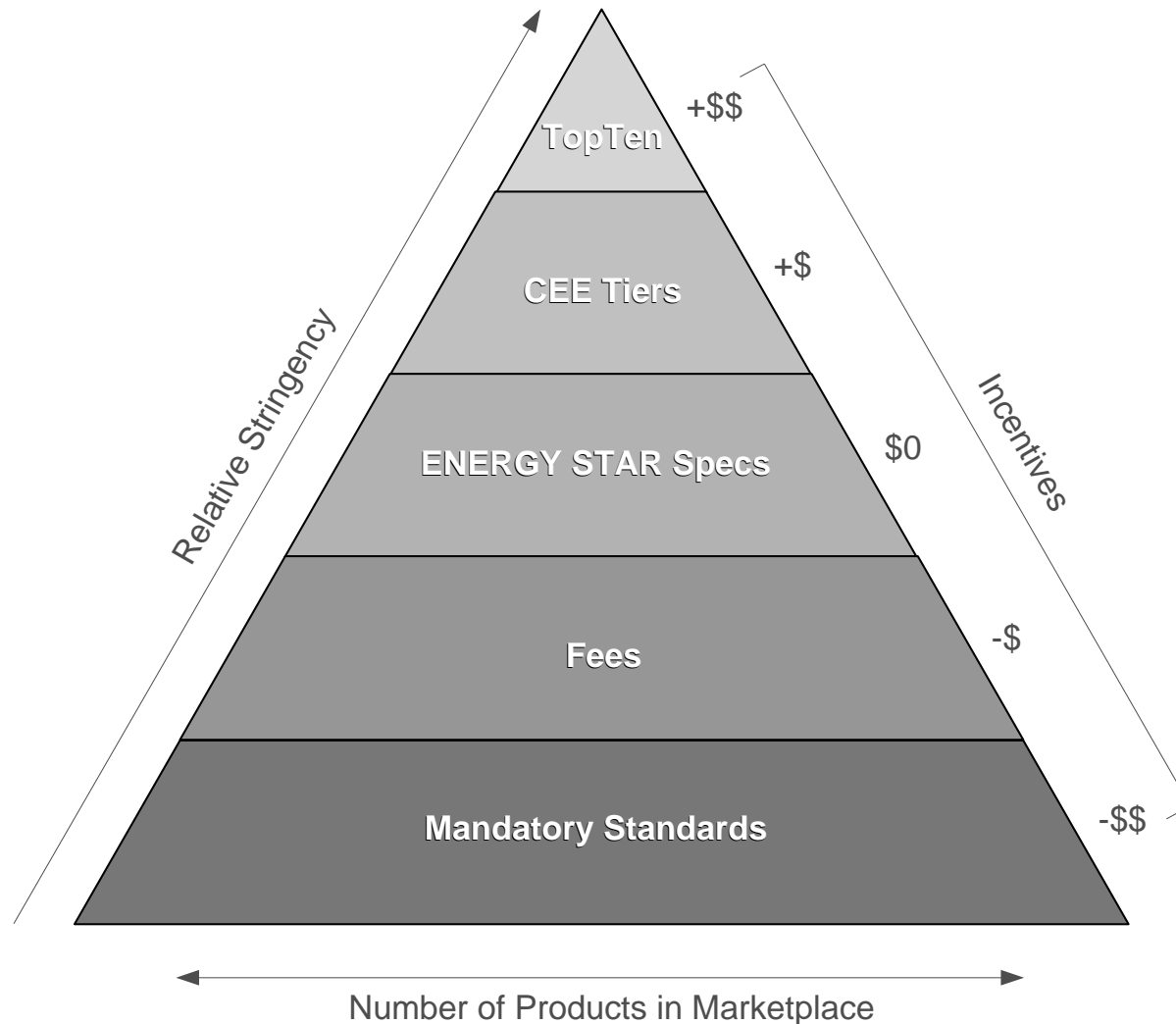
5 YR WARRANTY



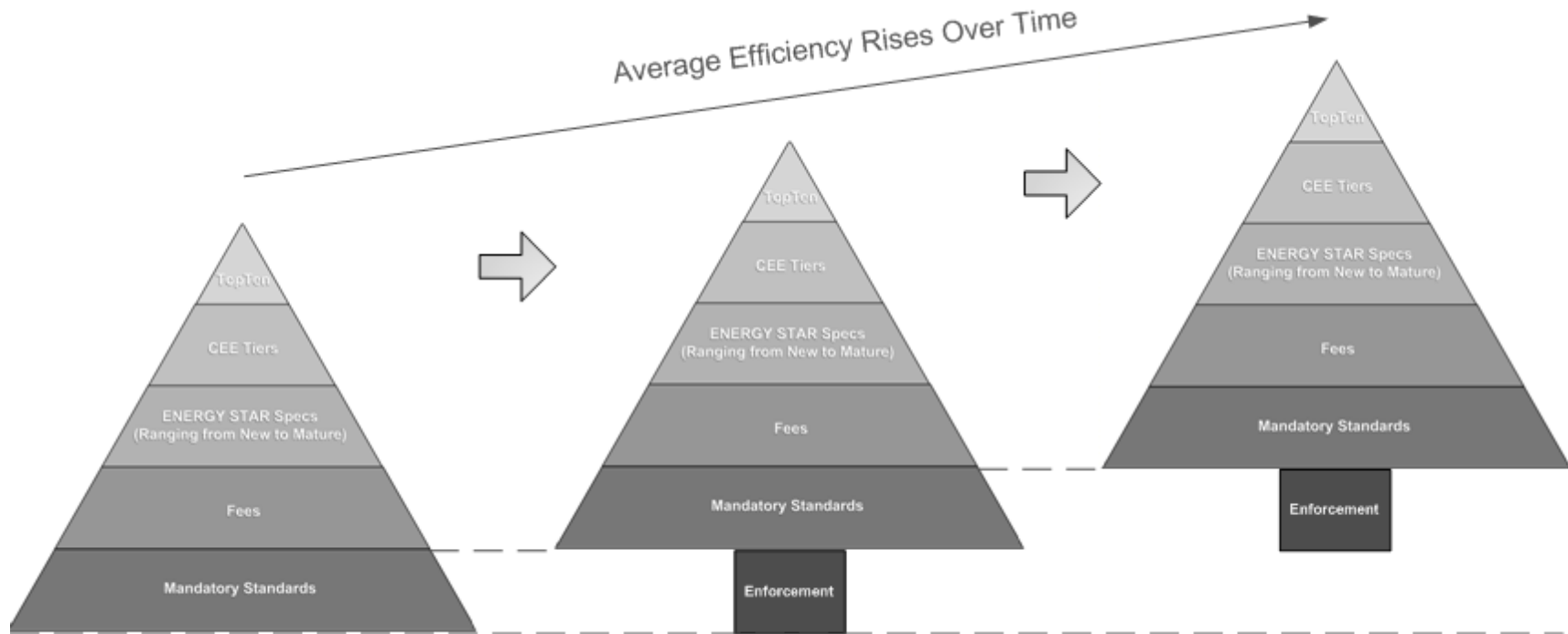
CO₂ Emissions from China's Exports = Total Germany, France & UK Emissions Combined

- ▶ **33%** of China's CO₂ and 6% of *global* CO₂ emissions now come from manufacturing the goods China exports (mostly to us).
- ▶ Electronics are 22% of that.
- ▶ We can't rebate our way to a stable climate if it means selling ever-taller mountains of imported, disposable (albeit efficient) merchandise.
- ▶ New plug loads need to be *efficient*, *durable*, and *upgradeable*, and must *replace* (not add to) current products

How Might Rebates *and* Fees Work Together to Drive Efficiency Levels Higher? Fees Price Carbon Into Products, Not Just Power



Use Fees and Rebates to Ratchet Up Efficiency Over Time



Vision for the Future

- ▶ All external and internal power supplies are highly efficient and properly sized
- ▶ All electronic devices scale power use closely with work load
- ▶ Improved smart plug strips control legacy loads and new products imbed that capability
- ▶ One highly efficient computer remains on continuously (low idle power) to download and display content, monitor status of other devices, and control them
- ▶ Separate set top boxes, DVRs, DVD recorders, game consoles, and video players mostly displaced by simpler, highly capable computers