Energy Consumption in a CE World

2008 ACEEE/CEE Market Transformation Symposium

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eco ideas

Panasonic ideas for life

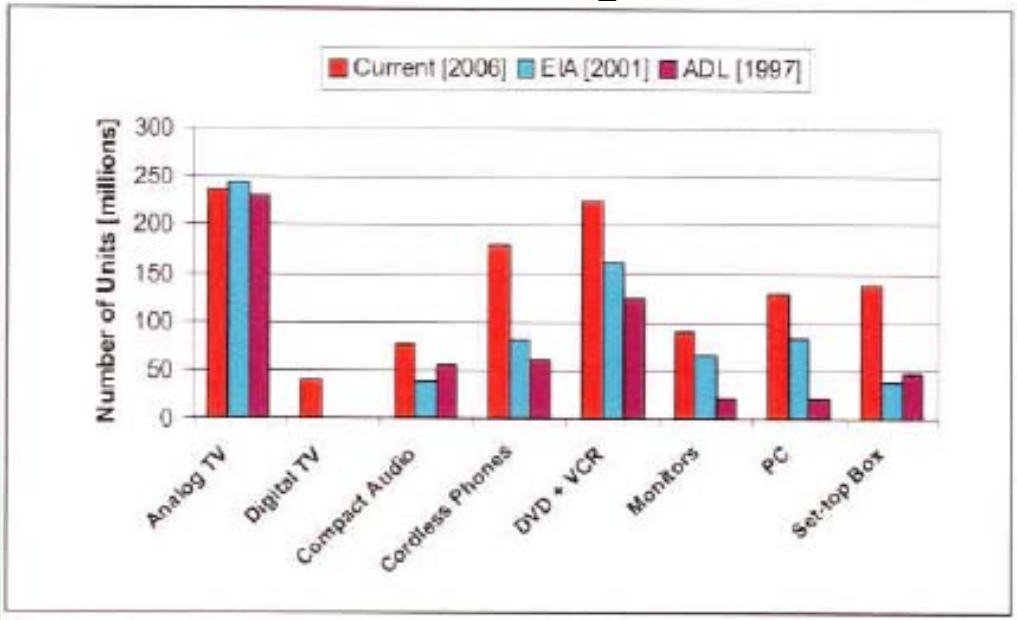
Energy Consumption in a CE World

1. Popularity of CE products leading to growth in energy use
2. Panasonic commitment to energy efficiency
3. Consumer Trends and Technologies' impact on energy consumption of CE products
4. Impact of digital transition

Energy Consumption in a CE World

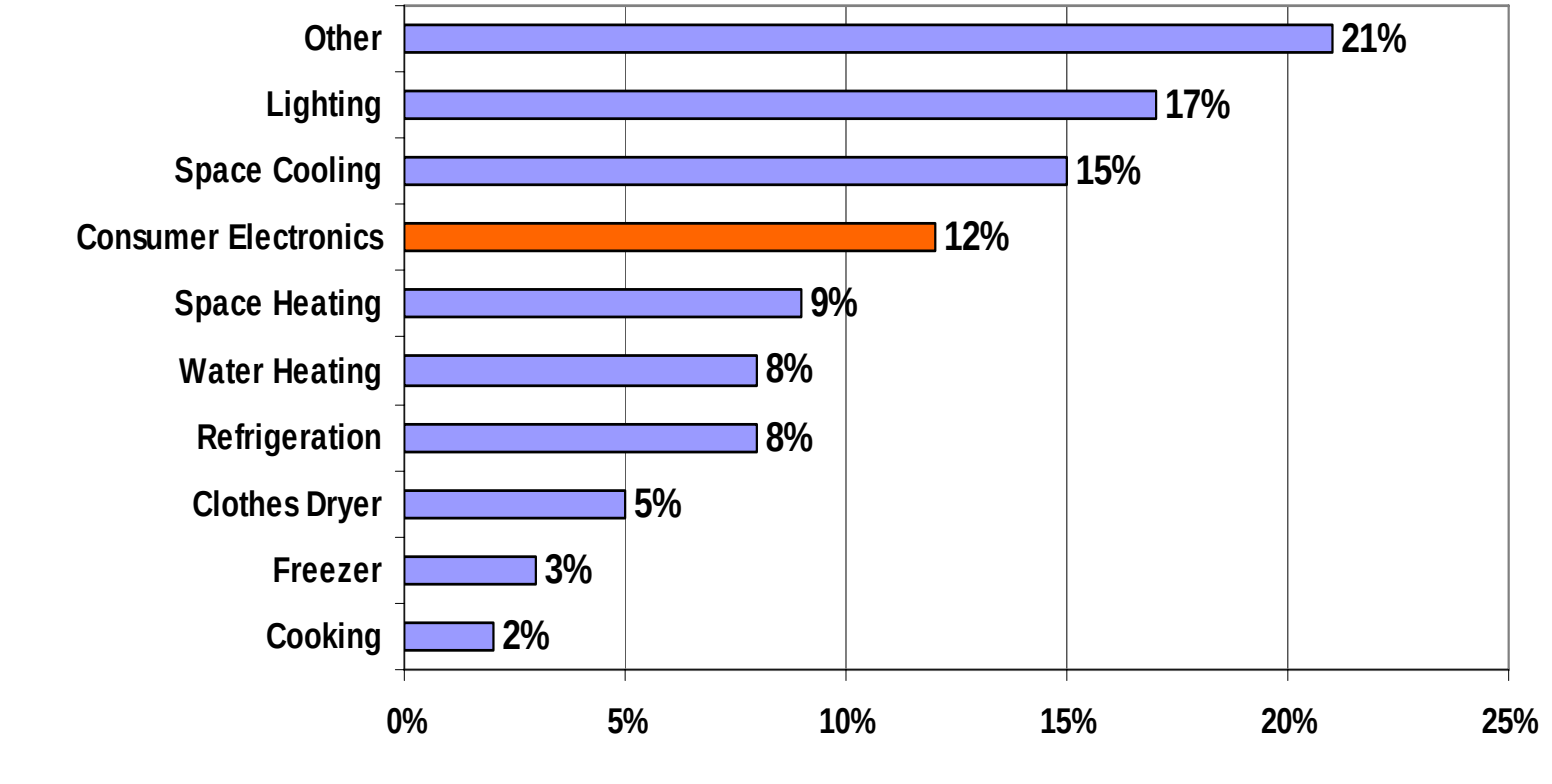
- Energy consumption by CE products has increased in past 5-10 years largely due to growth in its installed base

- Installed base of 8 key CE product categories has approximately doubled since 1997, according to TIAX LLC study.
  - Includes:
    - TVs analog and digital
    - Compact audio
    - Cordless phones
    - DVD & VCRs
    - Monitors
    - PCs and laptops
    - Set top boxes



Energy Consumption in a CE World

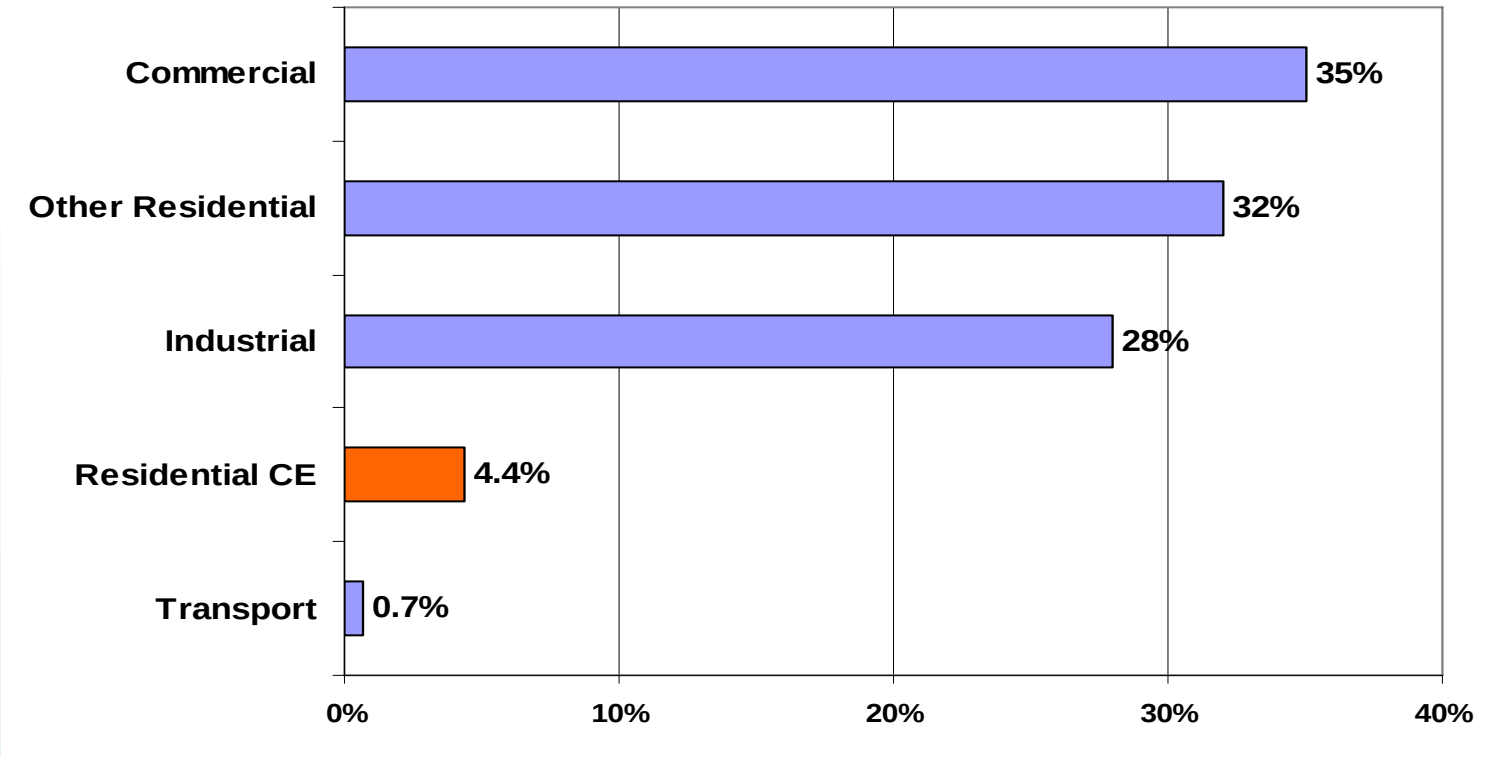
Residential consumer electronics consumes 12% of U.S. residential electricity



TIAX LLC study, 2007, commissioned by CEA

Energy Consumption in a CE World

Residential consumer electronics consumes 4.4% of total U.S. electricity



Percent of total U.S. electricity consumption

TIAX LLC study, 2007, commissioned by CEA

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- Power consumption by certain CE products also has changed appreciably during the past decade
  - INCREASES
    - **TVs:** Growth in screen sizes and display resolution
    - **PCs:** Increased processing power and speed
    - **Video games:** Increased processing power and enhanced graphics
  - DECREASES
    - **Monitors:** Move to LCDs from CRTs
  - MIXED RESULTS
    - **Set top boxes:** Basic units draw less power but growth in PVRs and HD function increases power draw
    - **Cordless phones:** Generally more efficient although growth in multiple handsets consumes more power

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- Panasonic has a long history of developing energy efficient products dating back to one of our founder's earliest and innovative products sold in 1918
  - An improved Edison screw-type adaptor to allow electrical appliances to be connected into light sockets

  - From those humble beginnings, Konosuke Matsushita grew Panasonic into one of the world's largest CE manufacturers with annual sales approaching $75 billion (US)

Energy Consumption in a CE World

- Last Fall, Panasonic unveiled its eco ideas strategy to reduce its greenhouse gas emissions by 300,000 tons within 3 years while accelerating activities to achieve a “coexistence with the global environment”

- One of the 3 pillars of Panasonic’s strategy is “eco ideas for products,” which includes an emphasis on producing energy efficient products
- Basic concept to increase the number of products with the top industry wide energy efficient performance, and to phase out low energy efficient products

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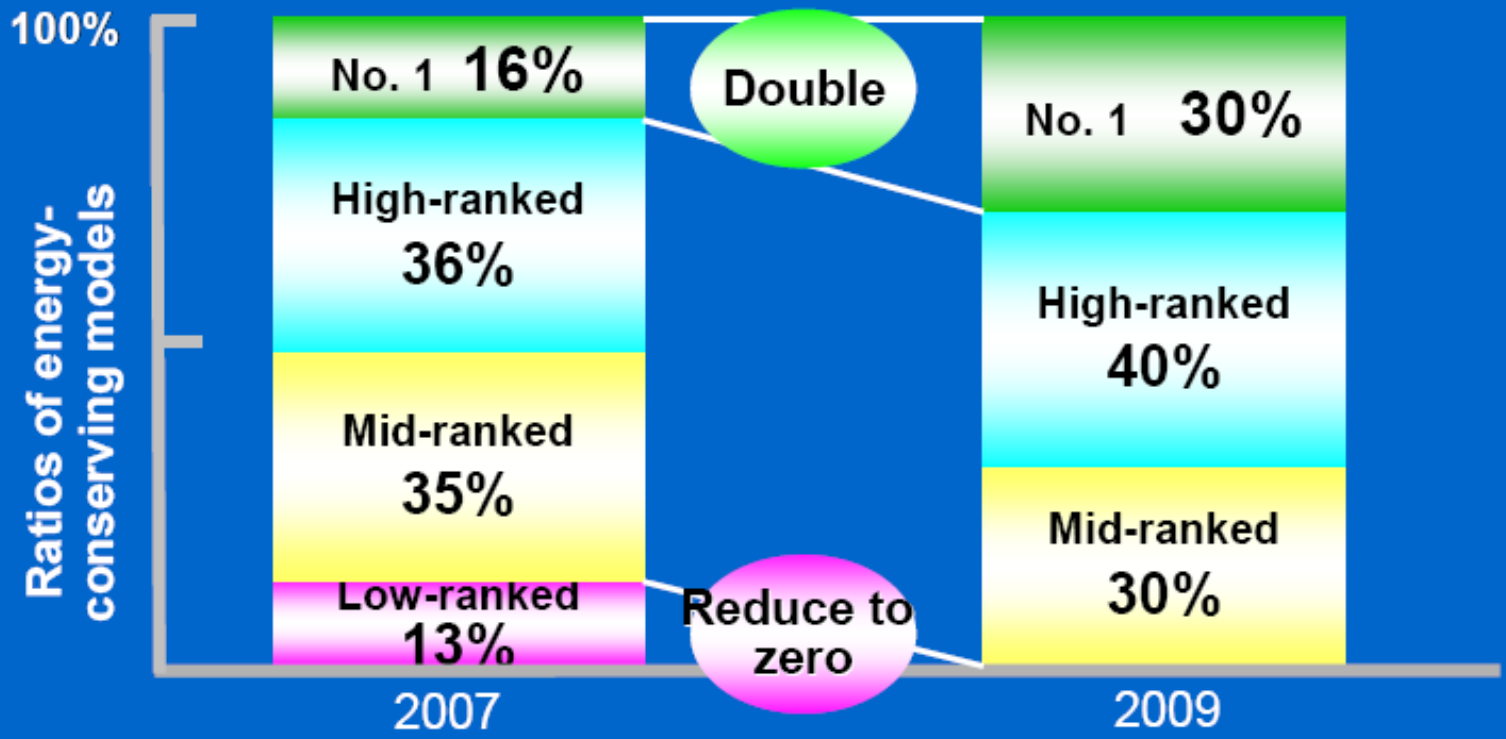
Increase the number of products featuring the No.1 energy-conserving performance and eliminate energy inefficient products

◆ **Numerical target setting example based on the "Energy Conservation Performance Catalog"**



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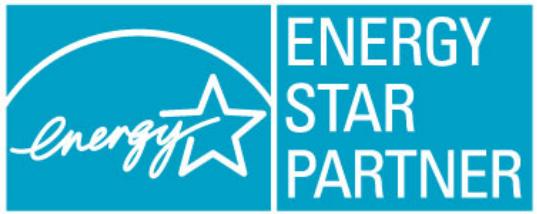
- Panasonic currently has more high rankings and fewer low rankings than other companies
- Although limited to seven major products, including TVs and air conditioners, it nonetheless is a yardstick to objectively measure our energy-saving performance
- Objective is to double the proportion of products with Number 1 energy efficient performance & phase out the lower ranked models in time for the FY2010 catalog
- Continuous efficiency improvements also fueled by Japan's Top Runner Conservation program

Energy Consumption in a CE World

- From the U.S., Panasonic has been a leading proponent of the successful ENERGY STAR program
- Panasonic also has received ENERGY STAR award recognition for 7 consecutive years (1999-2005)



- Currently, more than 300 Panasonic models across 11 product categories qualify for ENERGY STAR
  - More than any other CE manufacturer

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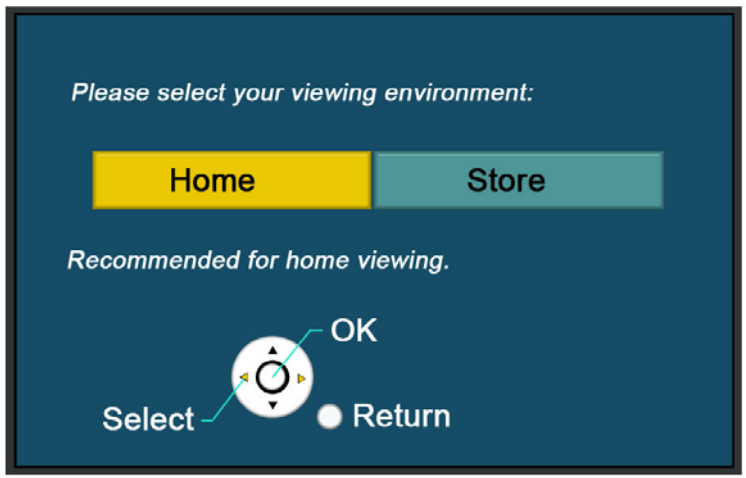
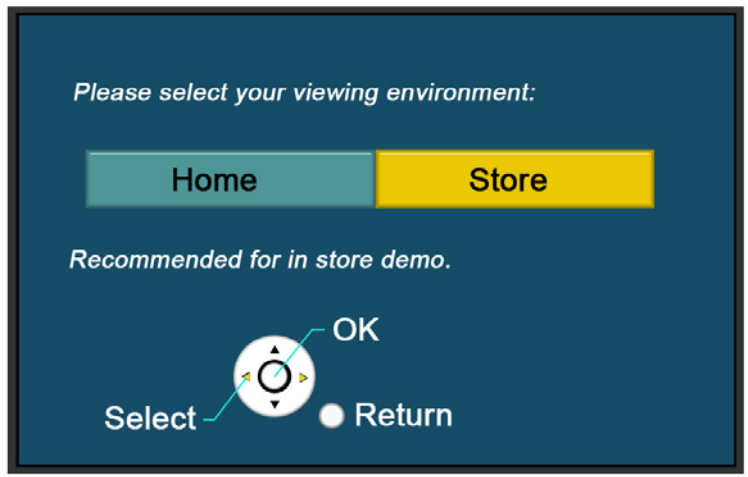
- Panasonic also provided leadership during negotiations on EPA's recently updated ENERGY STAR TVs specification, breaking an impasse that will result in savings of 2.66 billion kWh in 2011*
  - Setup menu prompts will push consumers to use less consumptive screen settings





- * Savings estimate based on all TVs sold in 2011 with "Home" lower power setting enabled

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- Consumer choices can drive energy efficiency improvements
- Important to recognize what consumers really want in order to meet their needs
- Simply offering “more efficient” CE products probably not enough to motivate most typical consumers
- Building energy efficiency into all products, not just full-featured models, and meaningful promotion is needed
  - Marketing and retailing truisms must be recognized
    - Audio and home theater receivers cannot be successfully marketed as “low-powered” using just X watts
    - Flat panel TVs cannot be successfully marketed as “bright enough” for typical home viewing needs

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- Flat panel TV growth continuing
  - Name brand manufacturers dominate the market despite some inroads by new start-up manufacturers (e.g., Vizio, Olevia)
- Consumers becoming better informed about TV technologies but in larger sizes voting with their wallets
- Increased sales of TVs at warehouse clubs & mass merchants challenges consumer education on energy use
- Expect 36.3 million TVs to be sold in N.A. market in 2008 including 4.4 million Plasma TVs; another 28.7 million LCD TV unit sales of all sizes (Source: Display Search Oct. 2007)
- 9 of 10 TVs sold in 2007 were priced under $2,500; average TV price is just over $900
- Much of the growth is in the larger (50+) inch size displays

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- Growth in home size in U.S. also increasing

- Today's average home size is 2,495 square feet, up from 2,150 in 1997 (up from 1,905 sq. ft in 1987)
- Configurations also changing as media rooms displace living rooms in popularity
  - Many DIY shows routinely "rip-out" walls to create larger rooms for flat panel displays
  - 47% of HDTVs connected to Home Theater System

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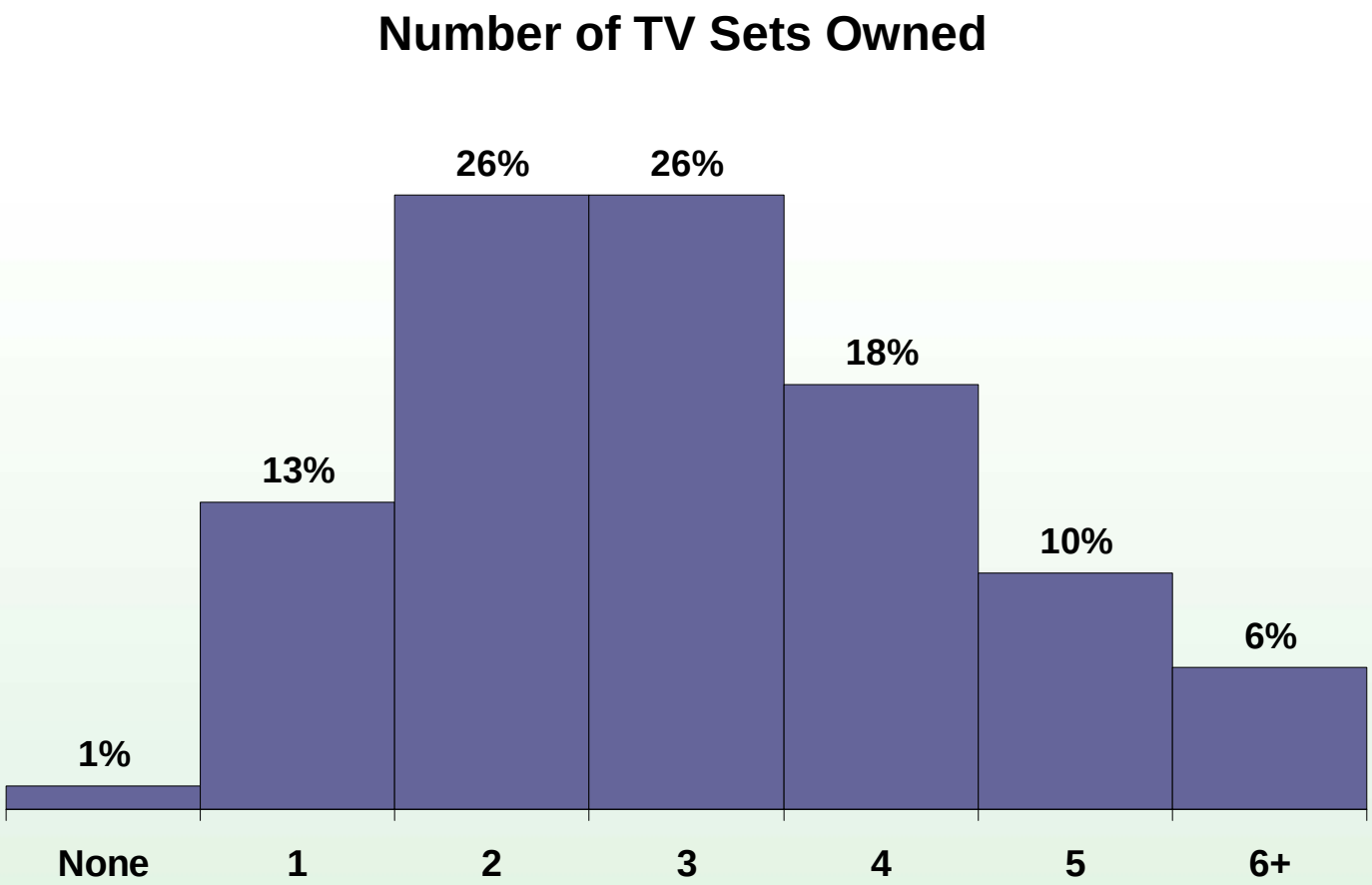
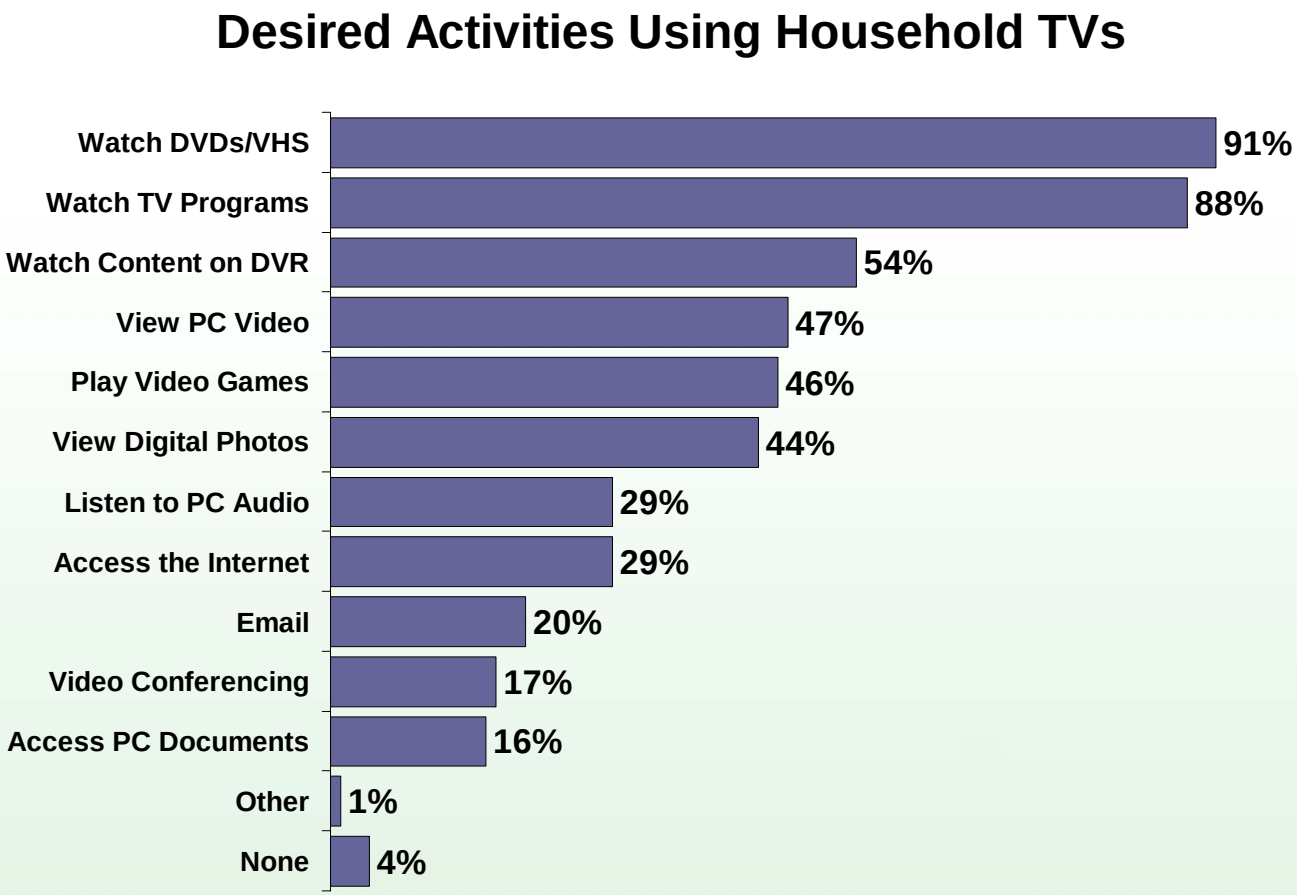


Source: CEA online survey U.S. Adults, December 2005

Energy Consumption in a CE World



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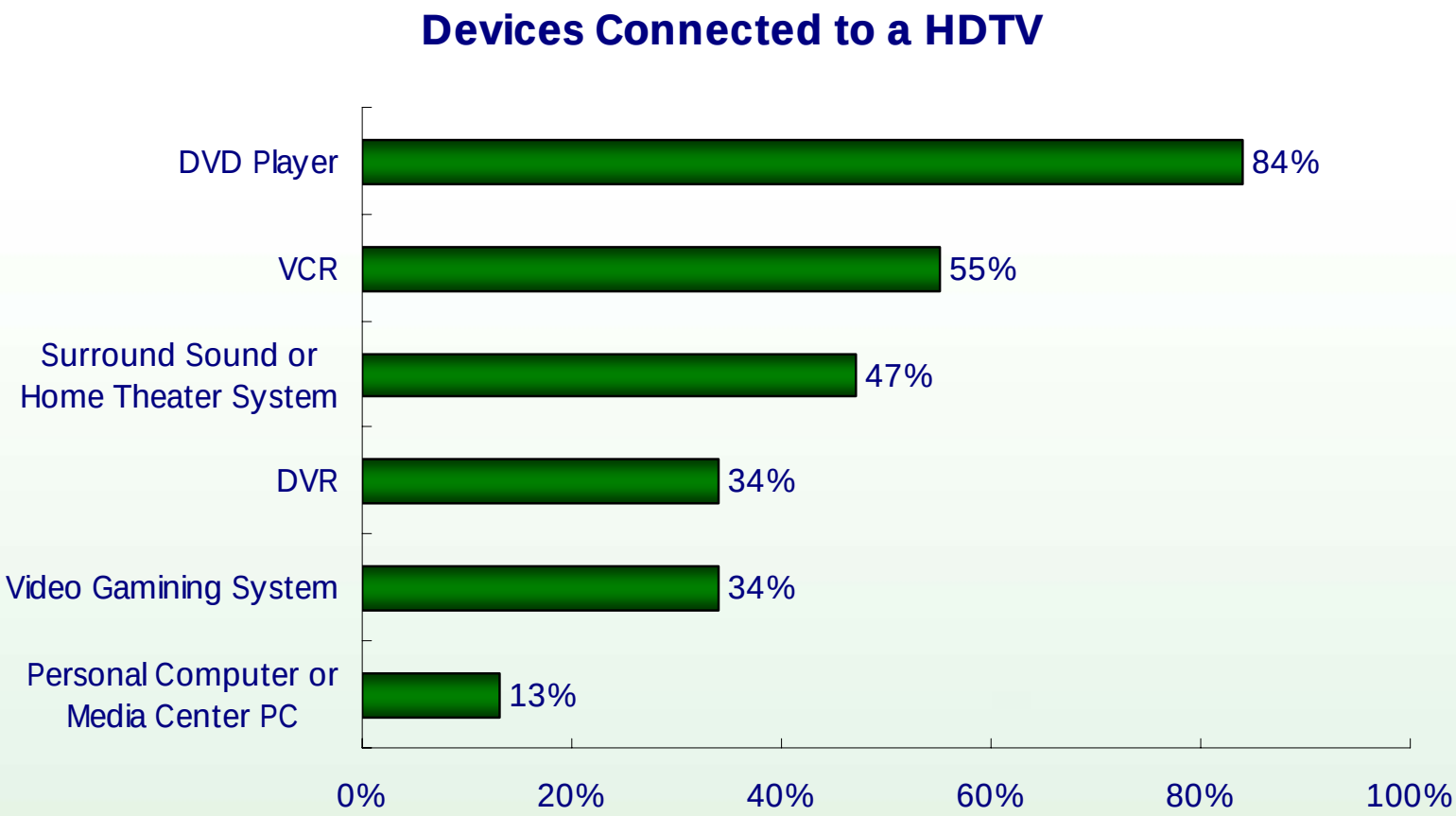

Base: 713 US adults with at least one HDTV

Source: CEA, June 2007

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- Our larger homes are filled with more CE products than ever before thanks to continued strong consumer demand, affordable pricing, and product innovation
  - In 1999, there was no MP3 player or iPod; they are now ubiquitous
  - In 2005, Digital Picture Frames were virtually unknown; now found in 11% of households and 20mm unit sales expected in 2008
  - What new CE breakthrough technology will be next??
- New larger, more vivid Flat Panel TVs offer consumers unprecedented picture quality at increasingly affordable prices
  - Each TV technology offers unique characteristics that contribute to their energy consumption
  - Panasonic currently manufactures all types of TV technologies and is involved in extensive research into new display types

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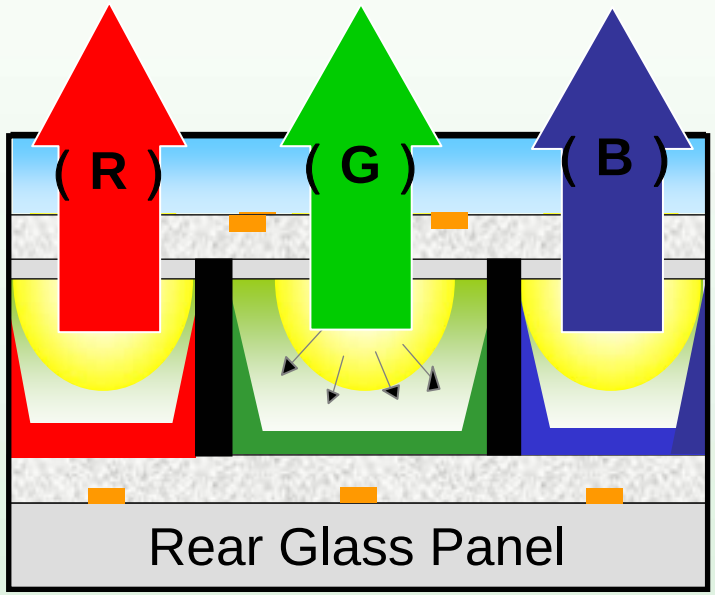
- Plasma Display Panel TVs
  - Relatively new to consumer market (less than 10 years)
  - A power-on-demand technology with power consumption based on image brightness
  - Power demands largely variable upon viewing content; many popular movies and shows can use less power due to darker screen images



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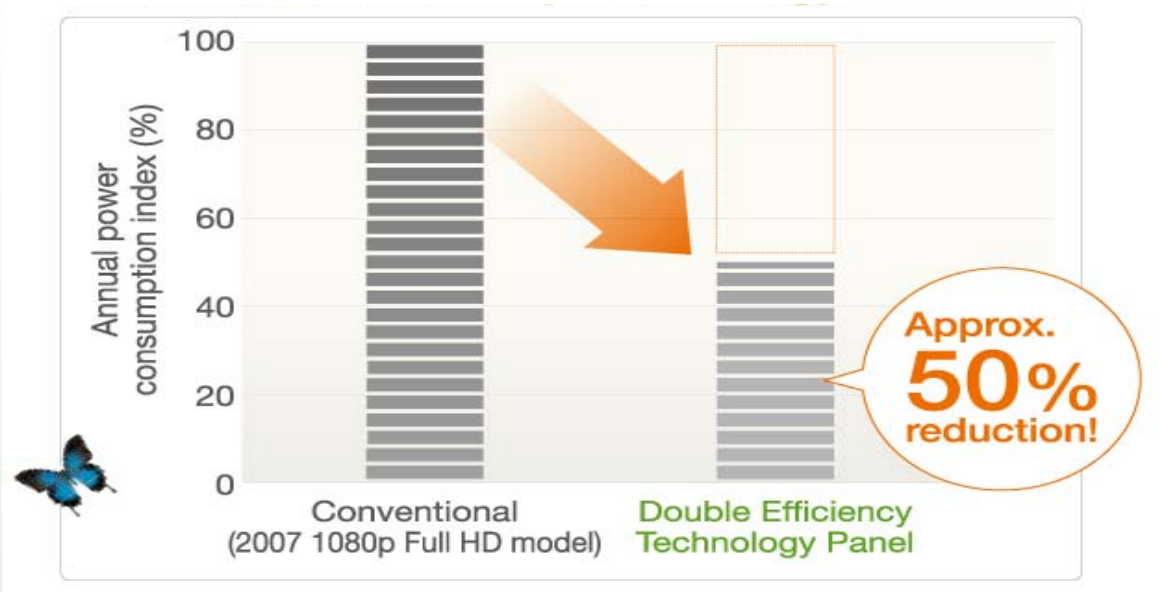
- Opportunities for PDP efficiency improvements
  - In January 2008, Panasonic unveiled its “Double Efficiency Technology” that is designed to maintain the same level of picture brightness at half the energy consumption



  - Greater lumens per watt goal also reduces heat to save energy

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- Panasonic's Double Efficiency Technology to halve Panasonic PDP TVs energy consumption while maintaining the same brightness
  - Development of new phosphors and cell design for improved discharge
    - Phosphors can be a "low efficiency" part in a plasma panel so making them more efficiently absorb vacuum ultra violet rays is critical to improved overall energy efficiency
    - Dimensions of cell size can be modified to reduce power loss
  - Development of new circuits and drive technologies to significantly reduce power loss
    - Luminous efficacy can be increased by improvements to the drive method of the discharge cells
  - Panasonic has begun to implement many of these improvements and expects to continue their adoption through its 2009 models

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- LCD TVs with CCFL backlights:
  - Conventional LCD TVs use a light source that is constant provided by cold cathode fluorescent lamps (CCFLs)
  - Regardless of video content being viewed, the same amount of light and energy is used
  - More efficient designs exist for more advanced displays which dim the backlight on darker images

- LCD TVs with LED backlights:
  - More costly, less proven updated design may enhance color rendition but it is unclear whether models with LED backlights will actually save energy compared with their CCFL predecessors
    - One large competitor offers a 70-inch LCD TV with LED backlight that consumes 650 watts in operation, according to its spec sheet

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- Rear projection TVs :
  - While relatively efficient for their larger size displays, their form factor and comparatively inferior pictures, make them less desirable to consumers despite lower prices

Market share of rear projection expected to approach less than 1% within the next 2 years

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- CRT (Picture Tube) TVs:
  - Size and heavy weight make this old, mature technology unattractive to consumers looking for larger display TVs despite newer flat screen design
  - Lack of consumer demand obviates any potential energy savings

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- OLED TVs:
  - Organic Light Emitting Diode TVs represent a future technology far from the mainstream with an unclear level of energy consumption
    - Currently available models limited to 11 inches and priced at $2,500
    - Power consumption listed at 45 watts compared with 39 watts for 15” LCD TV from same manufacturer
    - Larger size prototypes have appeared in trade shows but no mass production plans announced

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- Digital Transition:
  - Fears of mass obsolescence unwarranted
    - 84% of households in U.S. have cable or satellite feeds so they can do nothing and still receive HD signals on existing TVs after February 18. 2009
    - Households receiving over the air signals eligible for government-subsidized converter boxes to ensure the continued functionality of their existing TVs
    - **Net Result**: No urgent need to replace existing units with newer, potentially larger displays
    - Early reports from government agency show huge demand for converter box coupons, which suggests most consumers will not discard existing TVs next February
  - Some bump in sales of larger TV displays is possible but concerns of great new power demands linked to the transition are greatly exaggerated.