



Developing an ENERGY STAR[®] Program for Set-top Boxes

Stakeholder Meeting

May 15, 2007

Washington, DC



Desired Meeting Outcomes



- Definition of an STB in the context of ENERGY STAR
- Test procedure(s) to measure power or energy consumption
- Viable options for structuring an ENERGY STAR STB program that achieves the maximum energy savings in a reasonable amount of time
- Understanding of the varied parties in the STB universe and the role each must play to contribute to a successful STB program
- Plan for the collection of test data and commitment from stakeholders
- Timeline for next steps

Today's Agenda



- 9:00 a.m. Conference room opens
- 9:15 a.m. Meeting begins
- 9:15 a.m. Welcome
- Introductions
 - Meeting goals
 - Agenda review
- 9:45 a.m. ENERGY STAR update
- Energy, environmental, and consumer demand trends
 - ENERGY STAR as a solution
 - Goals for ENERGY STAR STB program
- 10:00 a.m. Presentation from CEA
- 10:30 a.m. Break
- 10:45 a.m. Discussion of summary document
- STB definition
 - Test procedures
 - Current and future energy use

Today's Agenda (continued)



- | | |
|------------|---|
| 12:15 p.m. | Break for lunch |
| 1:00 p.m. | Discussion of summary document (continued) <ul style="list-style-type: none">• Possible approaches, program structure• Opportunities for savings• Roles |
| 3:00 p.m. | Future data collection <ul style="list-style-type: none">• EPA's testing plans• Call for data |
| 3:15 p.m. | Break |
| 3:30 p.m. | Conclusion <ul style="list-style-type: none">• Summary of today's discussion• Next steps to address open questions and timeline |
| 4:30 p.m. | Meeting adjourn |

ENERGY STAR Update

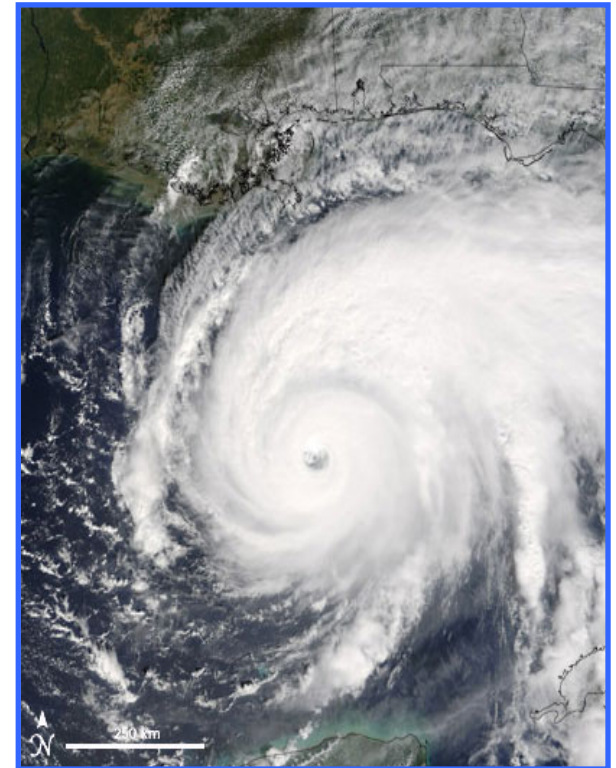


- Energy, environmental and consumer demand trends
- ENERGY STAR as a solution
- Goals for an ENERGY STAR set-top box program

Trend: Growing Energy & Environmental Concerns



- Gallup polls show Americans' concerns about environmental issues have increased **more than 10 percentage points** between 2004 and 2006
- **88%** of US adults responded that “energy efficient” was very important in their electronics, appliance, lighting, and heating/cooling equipment purchases*
- Annual Pew Surveys report:
 - **58%** of Americans rank “dealing with the nation’s energy problem” as a top priority in 2006, up from 40% in 2003
 - **87%** of Americans cite home heating and energy prices as a “very big” or “big” problem for the nation’s economy
- ABC News/Washington Post Poll:
 - **79%** of Americans think global warming poses a serious threat to future generations



Source: NASA

* The Natural Marketing Institute, *Understanding the 2004 LOHAS Consumer Report™: A Focus on Durable Goods*, February 2004.

Trend: Rising Energy Costs

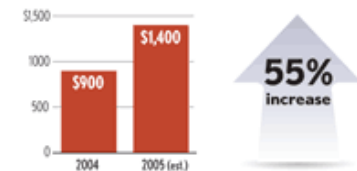


- Average annual household utility bills have increased **48%** since 1980
- Electricity costs continue to rise, with some utilities requesting rate increases of **35% or more**
- Spending on electricity is the **highest share of total consumer spending** since the Energy Crisis of 2000

ENERGY PRICES SOAR

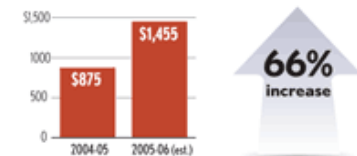
Sharply higher energy prices are expected to seriously squeeze family budgets in coming months, particularly seniors living on fixed incomes.

Annual Baltimore gasoline bill



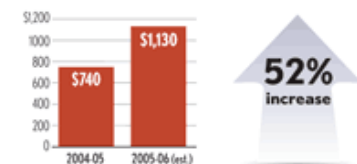
(Assumes 2005 average gasoline price of \$2.80 a gallon compared with \$1.80 in 2004. Assumes 10,000 miles driven in a vehicle that gets 20 miles to a gallon.)

Home heating oil bill



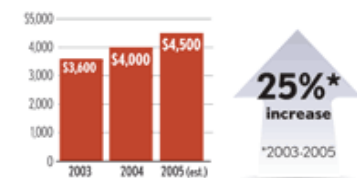
Source: Energy Department estimate of Northeast fuel costs.

Natural gas heating bill



Source: Energy Department National estimate.

Total household energy costs



Source: Global Insight

[SUN NEWS GRAPHIC]

Impacts on Consumer Spending/Purchasing Decisions



- 6% of consumer spending was projected to be accounted for by energy prices by the end of 2005, which is higher than any point in the last decade[#]
- 47% of consumers plan to spend less on discretionary items like HDTVs, PCs, and major appliances, due to higher energy and gas bills^{*}
- 88% of consumers agree “somewhat” to “completely” that it is important for household appliances, electronics, heating/cooling systems, and lighting products to have the ENERGY STAR label ^{**}
- 80% of consumers rate energy efficiency as important to their purchase decisions^{**}

[#]Daniel Chung and Zachary Karabell; Alger Market Commentary, as it appeared in the online edition of *Forbes Magazine*. “Energy Costs Drain Joe Six-Pack” (September 30, 2005)

^{*}Mary Ellen Lloyd, Dow Jones Newspapers, as appeared in the online edition of the *Wall Street Journal*. “Best Buy, Circuit City Down: Angst Over Consumers Continues” (July 12, 2006)

^{**}*Understanding the LOHAS Consumer Report*, The Natural Marketing Institute, 2004

What Does This Mean?



Consumers care about energy efficiency

- **78%** of survey respondents state that ENERGY STAR certification is very or somewhat important for electronics*
- **79%** of survey respondents said they would look to a national home appliance store to purchase energy-efficient products**
- **95%** of recent purchasers of qualified product are likely to purchase an item with the ENERGY STAR mark in the future*

The bottom line is that concerns about energy costs are an issue that consumers increasingly care about when looking at electronics, especially TVs and the home theatre package.

* National Awareness of ENERGY STAR: Analysis of CEE Household Survey Data, 2004.

** The Shelton Group, *Energy Pulse 2005*, 2005.



ENERGY STAR as a Solution

What is ENERGY STAR?



- ENERGY STAR is a government-backed program dedicated to helping individuals protect the environment through superior energy efficiency
- Products that have earned the ENERGY STAR meet strict energy-efficiency guidelines set by the US Environmental Protection Agency and the US Department of Energy
- These products not only cut customers' energy costs, but also help protect the environment
- Saving energy reduces the burning of fossil fuels, which leads to less air pollution and ultimately reduces global warming

Why ENERGY STAR?



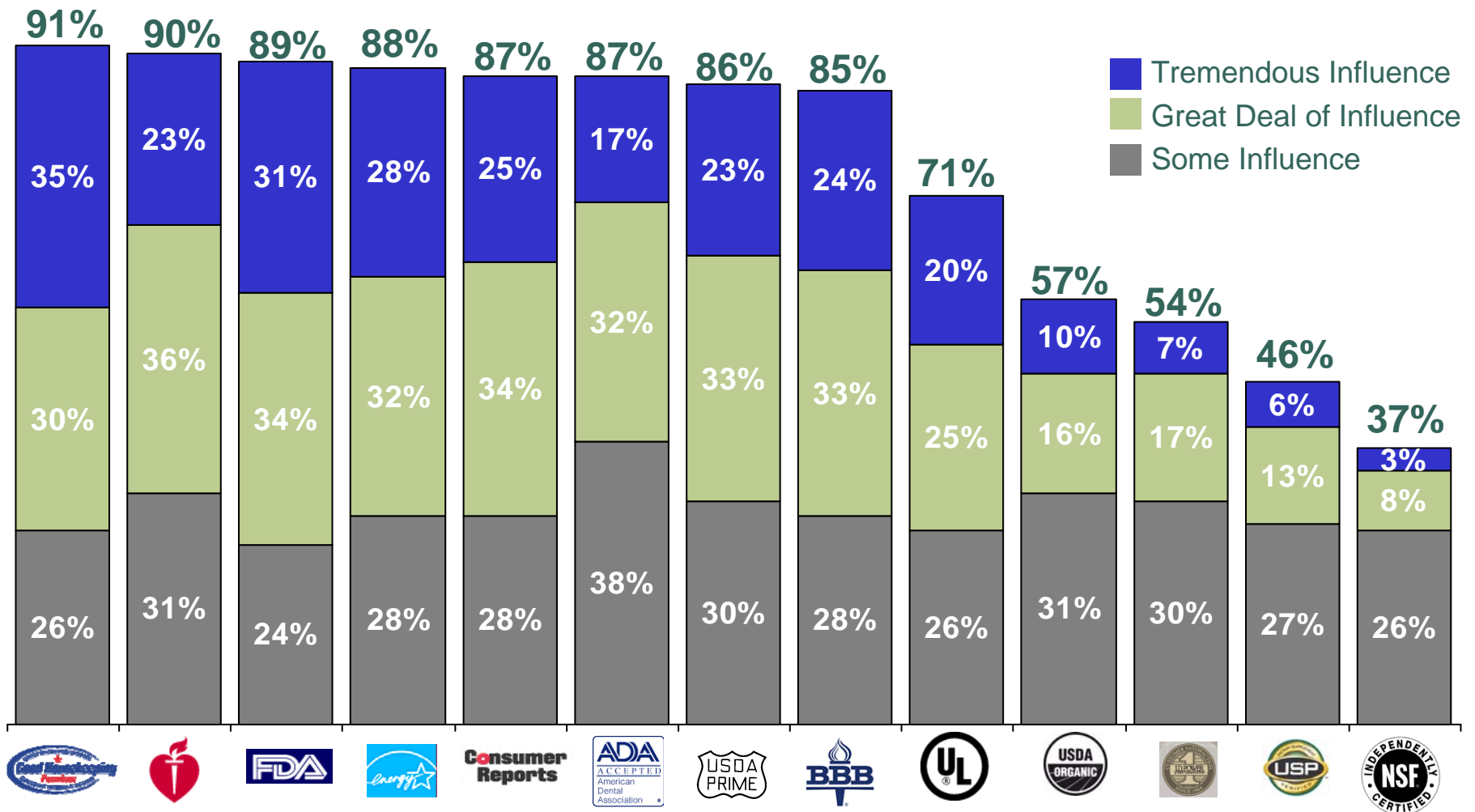
- ENERGY STAR **makes it easy** to offer energy saving products and for customers to find them
- ENERGY STAR **saves money**
 - The average home has 2 TVs, 1 VCR, 3 phones, and 1 DVD player. With ENERGY STAR, a home saves more than \$125 over the products' lifetimes
 - This number will **more than double with active power**; and could even triple with increased usage of electronics
- ENERGY STAR **increases sales**
 - Over 175 million qualified products were sold in 2005 alone
 - The cumulative number of ENERGY STAR products sold has steadily increased from 600 million in 2000—to 1.5 billion in 2004—to more than **2 billion in 2005**
- ENERGY STAR is a **trusted and recognized brand**
 - Aided recognition levels for ENERGY STAR are over 60%, according to latest survey results*
- ENERGY STAR means products that are **feature-rich** and **high performance** with **lower environmental impacts**

*National Awareness of ENERGY STAR: Analysis of CEE Household Survey Data, 2004.

ENERGY STAR Influences Purchasing Decisions



The ENERGY STAR label ranks among the highest level of influence on product purchase among all consumer emblems, similar in ranking to the Good Housekeeping Seal and Consumer Reports.



Source: Fairfield Research, May 2003

EPA Responds to Trends



EPA is currently writing and revising specifications in the following product categories:

1. New specification for **DTAs**
 - New specification finalized and effective on January 31, 2007
 - Includes active mode criteria and an auto-off power down requirement
2. Revised **television** specification in development
 - Opportunity to participate in the development of the new 'active mode' specification
 - First-to-market opportunity to launch qualifying products in 2008
3. New specification for **battery chargers and power adapters**
 - ENERGY STAR models make a huge environmental difference with no associated costs – all you have to do is tell your vendors you want them.
 - Opportunity to pair end-use products with qualifying chargers and adapters
4. New specification for **set top boxes** (includes DVRs)
 - Opportunity to be involved in specification development
 - Tentative launch first quarter 2007
5. Revised specifications for **imaging equipment** (includes printers, scanners, MFDs, fax machines, and copiers)
 - New active mode specification took effect April 1, 2007
6. Revised specification for **computers** addressing active mode
 - New active mode specification takes effect July 20, 2007

Partners and Stakeholders



- Panasonic
- Sony
- Samsung
- Motorola
- Scientific Atlanta
- Sharp
- Hewlett-Packard
- Apple
- LG
- Thomson
- Zoran
- ATI
- AMD
- Power Integrations
- ON Semiconductor
- ST Microtechnologies
- Via Technologies
- Delta Electronics
- Pace
- Microsoft

Goals for an STB Program



- Develop a STB program that drives for the **greatest energy savings** practical for this category
- Identify appropriate **roles and responsibilities** for all relevant stakeholders
- Develop energy efficiency specifications for STBs that are **performance-based** and **technology neutral** – recognizing leaders in the market in terms of energy efficiency
- Make use of existing test procedures and **harmonize**, where technically appropriate, with domestic and international partners on both test procedures and requirements
- Develop Program Requirements that offer **longevity**, as well as **simplicity**, **fair comparison** of products, and consideration of feature richness.



Presentation from Consumer Electronics Association (CEA)

(see separate file)



Discussion of Summary Document

STB Definitions



CEA-2022 Definitions:

- Digital STB – A general term to cover a consumer electronic device that receives and decodes digital video signals from one or any combination of satellite, cable, terrestrial and/or internet protocol (IP) service, and presents the decoded video to a display and/or recording device via one or more analog and/or digital interfaces for consumption by an end user.
- Cable STB – Any STB whose principal function is to receive television signals from a broadband, hybrid/fiber coaxial, community cable distribution system and deliver them to a consumer receiving or display device, where the service provider is providing cable service, as defined in the Communications Act of 1934, as amended.
- Satellite STB – Any STB whose principal function is to receive television signals from satellites and deliver them to a consumer display and/or recording device.
- IP (Internet Protocol) STB – Any STB whose principal function is to receive television/video signals encapsulated in IP packets and deliver them to a consumer display and/or recording device.
- Terrestrial STB – Any STB whose principal function is to receive television signals over the air (OTA) and deliver them to a consumer display and/or recording device.

Definitions: Discussion Questions



- Which current STB products are important to consider for energy use, potential energy savings, and market growth?
- What new STB products are expected to be on the market in the next few years and what are the implications for energy use and potential energy savings?
- Are any product types omitted from the above definitions that should be considered under an ENERGY STAR STB program?
- Are these definitions problematic for products with multiple primary functions?
- Of particular interest is whether the definition of Digital STB in CEA-2022 is inclusive of all devices that warrant interest for potential energy savings opportunities. For example, should analog cable STBs be included in the ENERGY STAR STB specification?
- Are there other definitions that should be considered?
- Which are the most important differences among products that may warrant separate treatment in a specification? Where are their similarities?

Establishing a Test Procedure



- Establishing a test procedure is a first step
- Strive for harmonization, where possible
- CEA-2022 and CEA-2013 as a starting point

Test Procedure: Discussion Questions



- Are CEA-2022 and 2013 reasonable starting points to test the power consumption of STBs?
- Where can you see need for improvement? How burdensome would it be to test a product to these methods?
- Are there other test procedures that should be considered?
- Are there other data points that should be captured during modal testing?

Current and Future Energy Use



- Currently-installed US STBs consume 20 TWh per year.
 - This is 13% of the total electricity consumed by CE devices (not including digital TVs), which collectively accounts for 11% of US residential electricity consumption

Roth, Kurt W., and Kurtis McKenney, TIAX, LLC., *Energy Consumption by Consumer Electronics in U.S. Residences*, TIAX. Here in after referred to as “TIAX Report.” See Table 5-46: Annual Energy Consumption of Set-Top Boxes (TWh/yr).

Current and Future Energy Use (continued)



Annual Energy Consumption of Set-Top Boxes (TWh/yr) [Table 5-46, TIAX Report]				
	Cable	Satellite	Stand Alone	Total
Analog STB	4	n/a	n/a	4
Digital STB	5	7	n/a	12
HD Digital STB	0	0	n/a	0.4
PVR Digital STB	1	1	0.4	3
HD DVR Digital STB	0	1	n/a	1
Total	10	9	0.4	20

Energy Use: Discussion Questions



- Will energy use likely grow, and if so, under which categories will the growth be seen?
- How quickly do hardware manufacturers and content providers expect the overall stock of STBs to turn over to DVR-enabled products?
- What other estimates of current STB energy use in the US exist and do these estimates generally agree the data presented here?
- What projections are there for STB energy use in the next five years?
- What are the industry best-practice energy saving features that, if broadly adopted, could result in a significant deviation from the current energy usage growth in this product area?

Possible Specification Approaches



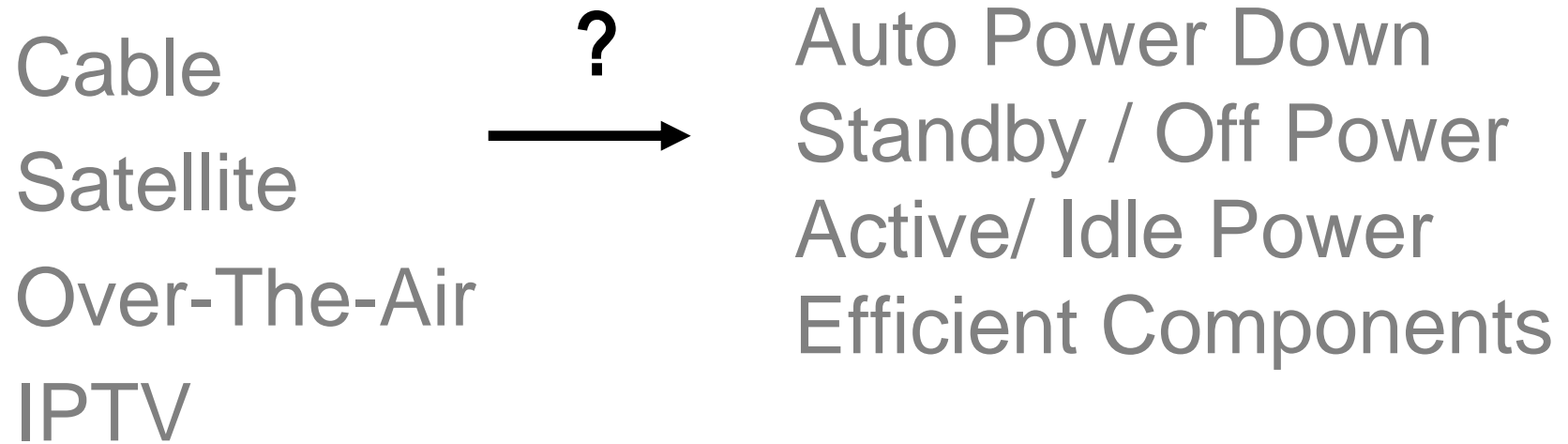
- Energy saving opportunities
- Challenges
- Interfaces

Energy Saving Opportunities



- What features / components can be turned off when not in use by the end user?
- What technologies are available now, or on the horizon, that can be employed to make STBs more efficient?
- Hypothetical: If we were starting from scratch, how could STBs be designed to provide great service but use minimal energy?

Energy Saving Opportunities Tuners And Base Functionality

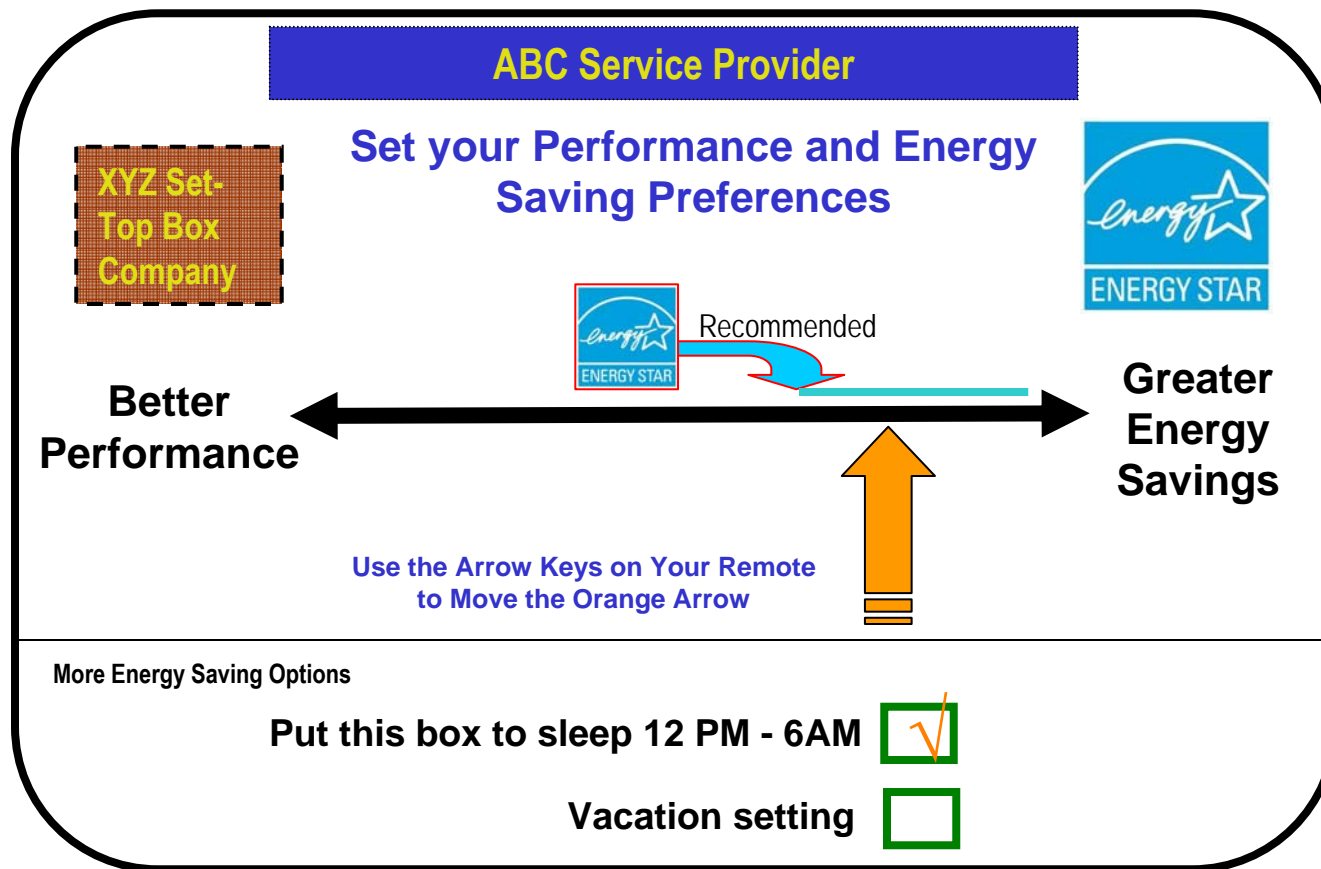


Energy Saving Opportunities Additional Functionality

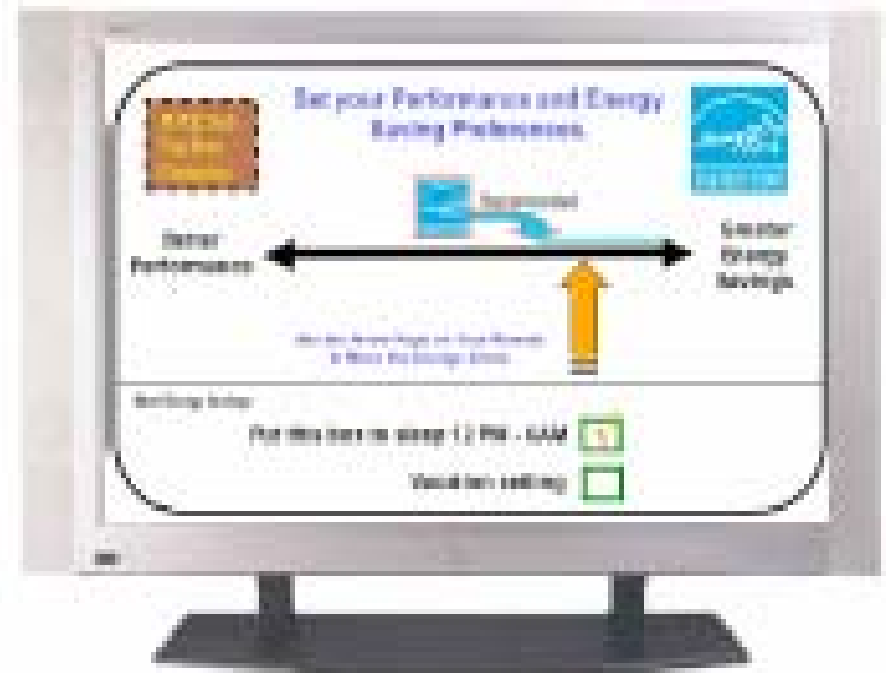


- DVRs
 - Video buffering (spin down hard disks + other savings?)
 - Sky TV example: UK satellite / DVR STB
- DVD Players and Recorders
 - Can these features be powered down when not in use?
- Additional Tuners
- High Definition Resolution

Example of User Information -- An "Energy Dashboard"



How the Dashboard Looks in Practice



Approaches: Discussion Questions



- What energy saving approaches are effective in terms of reducing energy use in STBs and cost effective for manufacturers and consumers?
- Should ENERGY STAR address downstream energy aspects, such as whether or not an STB can power down certain linked products?
- Which products will be sold at retail, and which will be provided as part of a service agreement?
- Will those provided by service providers require an alternative ENERGY STAR marketing approach as opposed to the typical retail strategies?
- What are the pros and cons of a 25% vs alternative approach for ENERGY STAR?

Approaches: Discussion Questions (continued)



- Do STBs need to be qualified for ENERGY STAR labels as shipped from their manufacturers or from the end content provider?
- Could STB manufacturers collaborate with service providers to design interfaces to allow consumers more control over energy consumption and performance?
- How should ENERGY STAR consider host/client boxes?
- Can any considerations re: the networked home be included in Tier 1 or 2?

Roles



EPA has the following understanding of the needs of varied STB stakeholders:

- STB manufacturers need to keep their costs low, participate in programs that allow for innovation, and deliver on customers' needs for reliable, easy-to-operate, feature-rich products;
- Cable and satellite providers need easy-to-understand products and service options, the ability to deliver on consumers' desires for programming and features, low cost options for efficiency, and the ability to maintain security;
- Utilities need significant, verifiable savings; and
- End users need the programs and features they seek, savings on energy bills, and affordable products and services.

Roles: Discussion Questions



- Should additional stakeholders be invited to participate in the specification setting process?
 - What roles can the utilities play?
- Will a STB tested by a manufacturer and shown to meet ENERGY STAR criteria actually save the end user energy when deployed?
- Or should additional testing of a representative sample of STBs after deployment within the jurisdiction of a specific service provider be required to assure delivery of energy savings?

Future Data Collection



- Important for EPA:
 - Know how products are changing
 - Access to test data for future products (POD-enabled and IPTV boxes)
- EPA's testing plans
- Working with a third party

Data Collection: Discussion Questions



- Would you be willing to test products and provide power/energy consumption data to EPA or a third party?
- Do you have access to test products in situ?
- Could you test soon-to-be-released products?
- Would you be willing to allow a third party to test your products?

Action Items



Definitions:

- EPA review combined 2013 & 2022 definitions in CSA. Circulate edited, as needed, version.
- EPA review definitions for issues with multifunction products. Circulate edited, as needed, version
- EPA consider methods of excluding specific products not to be addressed at this time. Circulate edited, as needed, version
- EPA consider IP STBs for Tier I, recognizing it may not be the primary focus.

Action Items (continued)



Test Procedures

- EPA propose what lab simulation is (can CableLabs inform). Who wants to help?
- EPA draft proposed duty cycle for use during testing. Who wants to help? Service providers share usage data?
- EPA propose edits to 2013 to reflect power management feature options. Who wants to help?
- EPA allow option for testing in lab or at live plant.

Logistics

- EPA update timeline

Action Items (continued)



Current and Future Energy Use

- EPA evaluate value of iStat report for purchase.
- EPA to look at including analog only boxes (as requested by Canada).
- NRDC share recent metering results. Invites suggestions for how data could be best presented, and feedback on most important/popular models tested.

Savings Opportunities

- EPA to draft possible approach and circulate for comment.

Draft Process/Timeline



Key Milestone	Date
Publicly launch spec. development process by distributing announcement letter	March 15
Meetings in Denver with cable and satellite providers	April 25 - 27
Distribute an update document with a list of key questions for stakeholders	Early May
Stakeholder meeting in Washington, DC	May 15
Deadline for stakeholders to offer response to questions distributed in early May and share thoughts post May 15 stakeholder meeting	May 23
Release proposed specification approach and test procedure (First Draft)	Mid June
Deadline for initial stakeholder comments on First Draft	June 29
International STB meeting at the IEA in Paris	July 4 - 6
Deadline for final stakeholder comments on First Draft and Paris meeting	July 12

Draft Process/Timeline (continued)



Key Milestone (continued)	Date
Stakeholder meeting	July 18
Data collection	July 19 – Aug. 31
Release Second Draft Specification with proposed levels	Sept. 14
Stakeholder meeting	Oct. 2
Deadline for stakeholder comments on Second Draft Specification	Oct. 15
Release Draft Final Specification	Late Oct.
Deadline for stakeholder comments on Final Draft Specification (expected to be minor)	Late Nov.
Publication of Final Specification	Mid Dec.
Specification effective date	Sept. 2008



Thank You!

Contacts



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