COOL FACTS:

- Set-top boxes (STBs) are the cable, satellite, or digital adapters that receive television signals. Most standard STBs use almost as much power when not in use as when they are playing or recording.
- ENERGY STAR set-top boxes are 45% more efficient than conventional boxes.
- Through an innovative partnership with pay-TV providers and set-top box manufacturers, nearly 90% of STBs shipped in 2012 were ENERGY STAR certified.

September 2013

U.S. ENVIRONMENTAL PROTECTION AGENCY

ENERGY STAR Set-Top Boxes

The Complex Set-Top Box Market

In 2008 the set-top box (STB) was one of the biggest energy users in the American home. These devices, typically provided by cable, satellite, or phone companies, consumed 27 billion kilowatt-hours of electricity that year, as much as the entire state of Maryland. Thanks to ENERGY STAR and its partners, in 2013 the energy consumption associated with these products has been dramatically reduced, and the ENERGY STAR program is recognized as a practical, win-win solution to this serious problem.

Home entertainment has changed a lot in the last decade. Where once there was a cable-ready tube television and VCR, most households now have at least one of each from a suite of products that includes flat screen TVs, set-top boxes, DVD/blu-ray players, wireless routers, and video game systems. Of all that powerful equipment, the set-top box is often the most energy consumptive.

The key issue is that many standard STBs use almost as much power when **not** in use as when they are playing or recording programming. A Nielsen poll shows Americans watch TV 4 to 7 hours per day, meaning STBs can use two to three times more energy when consumers assume they are powered off than when they are actually delivering content. Since most boxes are provided by third-party pay TV providers, consumers typically have limited choice as to which STB they use or what settings it comes with. These disconnected incentives prompted EPA to seek an innovative approach to reducing energy waste in the set-top box market.

A Catalyst for Change: ENERGY STAR Set-top Boxes

In 2008, in addition to setting rigorous ENERGY STAR requirements for set-top box hardware, EPA partnered with pay TV providers, asking them to purchase and deploy ENERGY STAR set-tops or upgrade a large part of their deployed fleet to meet ENERGY STAR requirements. In 2011, EPA raised the bar for both box makers and pay TV providers, and is revising these requirements yet again, with plans to complete new requirements in the fall of 2013.

To drive towards ever-increasing levels of greater efficiencies, EPA first focused on a number of technological hurdles. Its first challenge was the development of a **fair and repeatable energy use test**. The ENERGY STAR test procedure for this product has since been codified into an industry-wide standard for testing STBs.

EPA also identified common industry practices that were barriers to energy efficiency. For years, it was accepted industry practice for STBs to be on 24 hours a day and for standard STB communication and data transmission to assume that the device was always on and operating at full power. The Agency worked through key industry standard development efforts to minimize energy waste, including MoCa 2.0, DOCSIS, and the Open Cable standard. Industry now recognizes that boxes should operate in a range of power states and scale power based on its activity level- realizing big energy savings.

A Catalyst for Change: ENERGY STAR Set-top Boxes

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EPA then turned its attention to rewarding a **meaningful sleep mode** in STBs to allow the box to consume significantly less energy when not in use. With this goal in mind, EPA provided incentives through its ENERGY STAR requirements for manufacturers and pay TV providers to reach the next frontier in savings, **Deep Sleep**. Products in Deep Sleep use only a handful of watts when the vast majority of Americans are asleep. The savings potential from Deep Sleep is staggering- if every STB in the U.S. automatically entered a Deep Sleep state for just 4 hours per day, consumer energy cost savings would be $350 million per year from this sleep state alone.

Driving for even more savings, ENERGY STAR offers an incentive for boxes that dive into Deep Sleep, a setting that will deliver up to $350 million in national savings.

EPA has also provided incentives through its specifications for the deployment of efficient **multi-room constellations**. In these arrangements, central server boxes direct content to lower power boxes in secondary rooms of a home that would otherwise be served by two to three high-power STBs with DVR functionality. This multi-room architecture allows for all but one power-hungry DVR to be removed from every home. For a home with three televisions, STB energy savings can be up to 30% versus the typical "one DVR per television" scenario. The more televisions in the home, the more savings can be achieved through multi-room and thin-client architectures.

The energy consumption of a set top box has dropped significantly, even while functionality has exploded since EPA began its work with manufacturers and pay TV providers 5 years ago. A pre-ENERGY STAR recording set-top box (DVR) used over 300 kWh a year, while a DVR set-top box today uses 160 kWh a year . On average, ENERGY STAR set-top boxes are 45 percent more efficient than conventional models, and will save about $80 over the lifetime of the product.

Products, homes and buildings that earn the ENERGY STAR label meet strict requirements for energy efficiency and performance set by the U.S. Environmental Protection Agency.

In 2012 alone, Americans, with the help of ENERGY STAR, saved $24 billion on their utility bills and prevented greenhouse gas emissions equal to those of 50 million vehicles.

The Power of Partnership

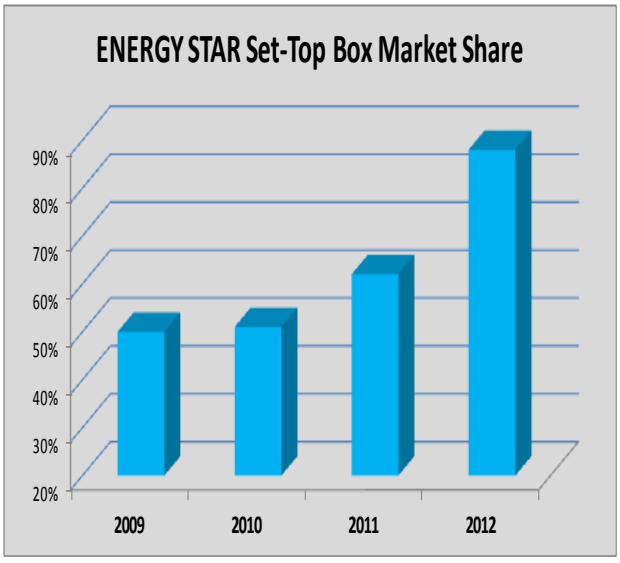
Global warming is a real and urgent challenge affecting people and the climate worldwide.

Electricity used in our homes predominantly comes from the burning of fossil fuels, which contributes to climate change.

Using energy-efficient products helps reduce greenhouse gas emissions and our impact on the environment.

EPA's dual focus in this effort - establishing standards for efficient STBs and raising demand for them among pay TV providers – has paid off, as evidenced by the label's rapidly growing market share. In 2009, 50% of set top boxes shipped to US costumers were ENERGY STAR certified. By 2011, this number grew to 62% and in 2012, 88% of these boxes are ENERGY STAR certified- a total of nearly 35 million ENERGY STAR STBs delivering nearly $450 million in consumer savings and a reduction of 6 billion pounds of greenhouse gases in 2012 alone.

Leadership from companies that partner with the ENERGY STAR program, including service providers AT&T, DirecTV, Dish Network, EPB, Suddenlink, and Verizon, as well as 14 STB manufacturers, made these remarkable efficiency gains possible. With these strides under our collective belt, the ENERGY STAR program is setting its sights on even greater savings in the future, all with the goal of reducing greenhouse gas emissions and saving Americans money.



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